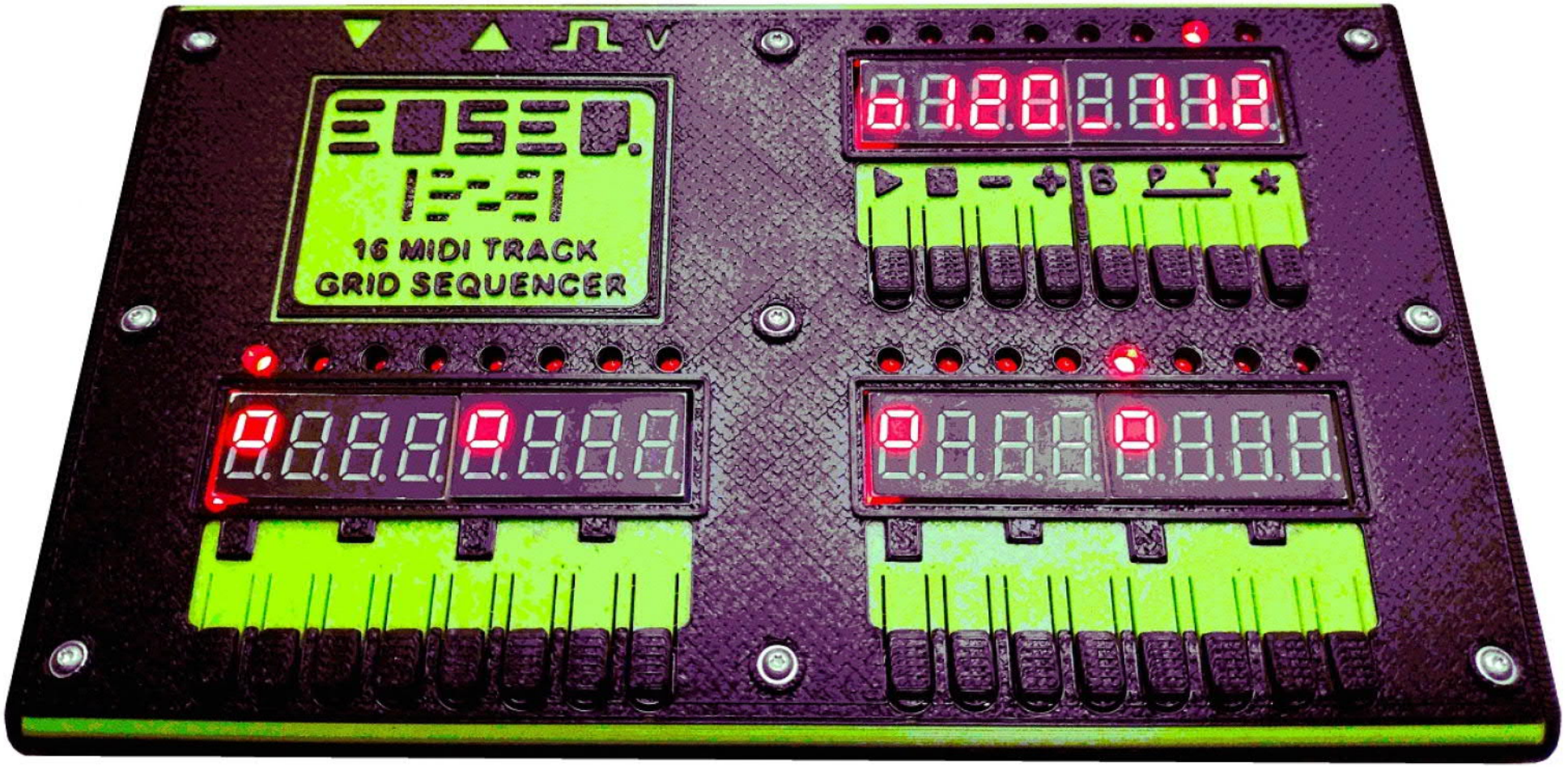
EOSEQUENCER



DIY BUILD MANUAL
PCB VERSION 1.1

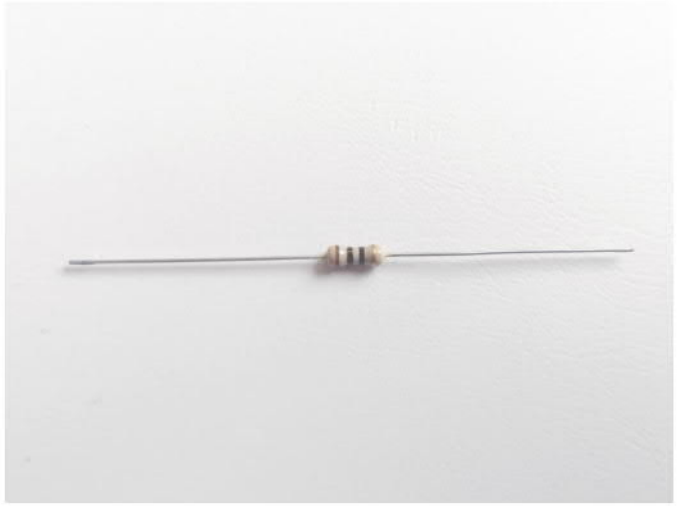
Required tools:
Low wattage soldering iron or station with fine tip
Soldering tin (preferably lead free)
Small side cutter to cut component legs
Small flathead screwdriver
"Cross" Screwdriver PH1
Optional: Screwdriver PZ1
A piece of duct tape
A piece of aluminum foil

Handle all ICs and the Arduino with care to avoid static discharge (ESD); ground yourself before touching sensitive components.

This kit is designed to be built using lead-free solder, such as SAC305 or Sn99Cu, which is safer for health and complies with environmental regulations (RoHS). While leaded solder (e.g., Sn60Pb40) is still widely used by hobbyists due to its lower melting point and easier handling, it contains toxic lead and should only be used in well-ventilated areas with proper safety precautions. If you plan to sell, distribute, or exhibit your build, only use RoHS-compliant lead-free solder to ensure legal compliance. Always wash your hands after handling solder and avoid inhaling fumes, regardless of type.

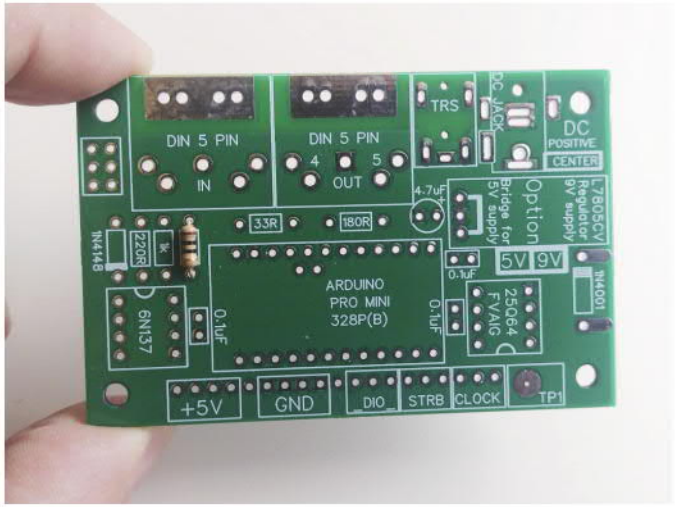
Complexity of build:
Intermediate

Parts in kit:
Eosequencer V1.1 pcb
Resistor 10 Ohm
Resistor 33 Ohm
Resistor 180 Ohm
Resistor 220 Ohm
Resistor 1k Ohm
Diode 1N4531 (Or alternate part 1N4148)
Diode 1N4004 (Or alternate part 1N4001)
3x Ceramic capacitor 0.1uF (Body marking 104)
Regulator L7805CV
2x 8 pin IC socket
TRS headphone jack
Atmega 328P(B) 3.3V 8Mhz with pins (pre-programmed)
5x 5 pin header socket
2.1mm barrel PSU jack
4.7uF ≥ 50V electrolytic capacitor
2x DIN 5 pin socket
20x 90 degree header pins
IC Optocoupler 6N137
IC Flash memory W25Q64
5M SAM2695 GM synthesizer
3x TM1638 led&key pcb
One set of female to female dupont header cables
3D printed enclosure base and top
5 pin DIN connector for cable mounting
(Optional) 9VDC power supply
(Optional) 2.1mm barrel plug with terminals

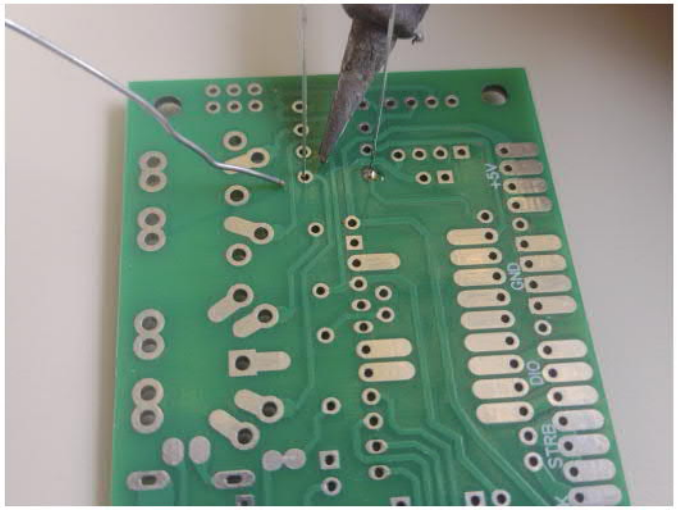


Find resistor 10 Ohm
Brown Black Black Gold

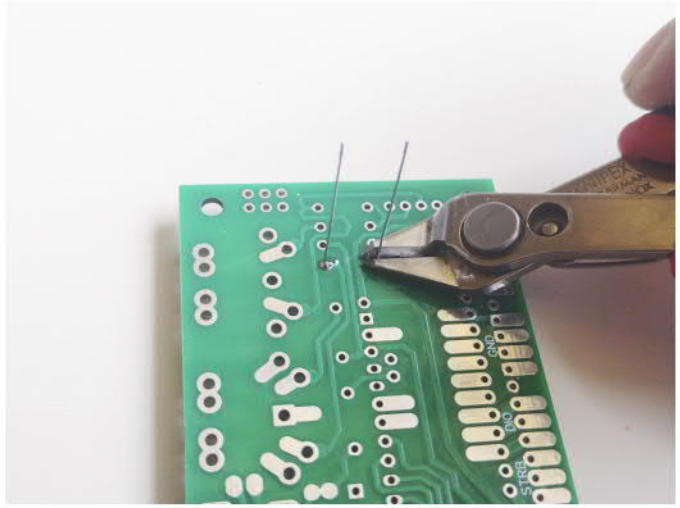
Bend legs



Put resistor in place



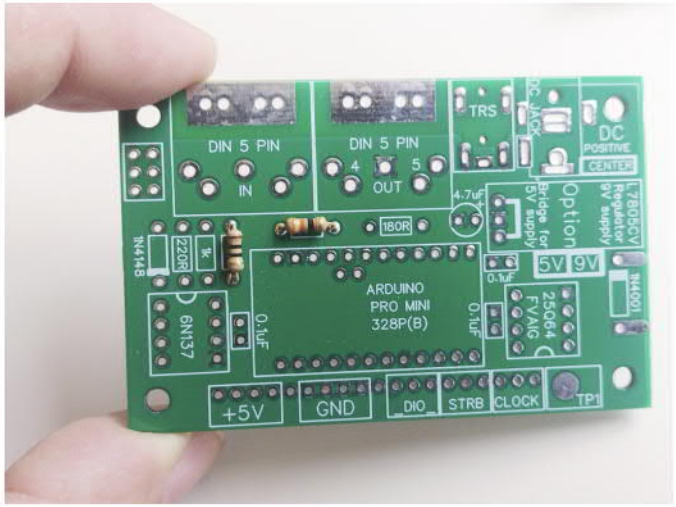
Solder in place



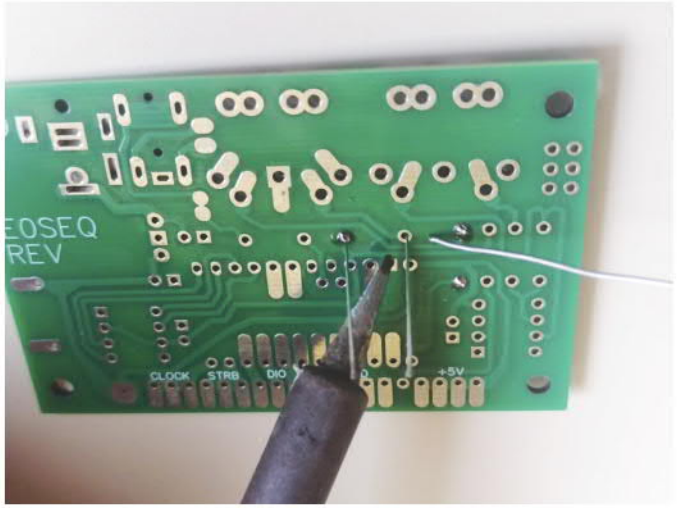
Trim legs

Find resistor 33 Ohm
Orange Orange Black Gold

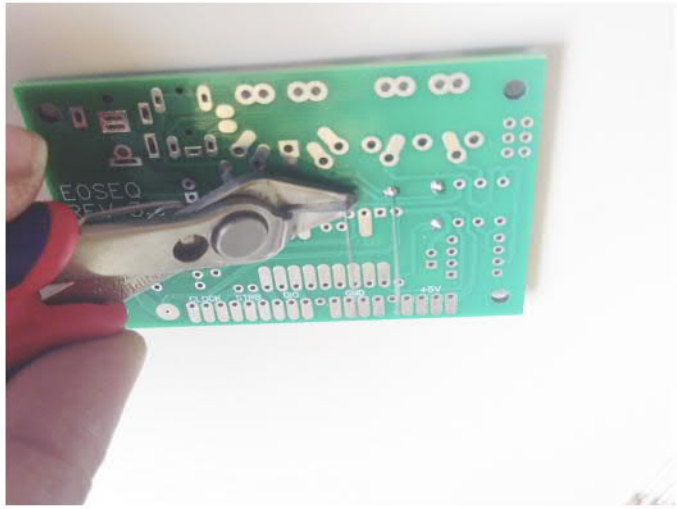
Bend legs



Put resistor in place



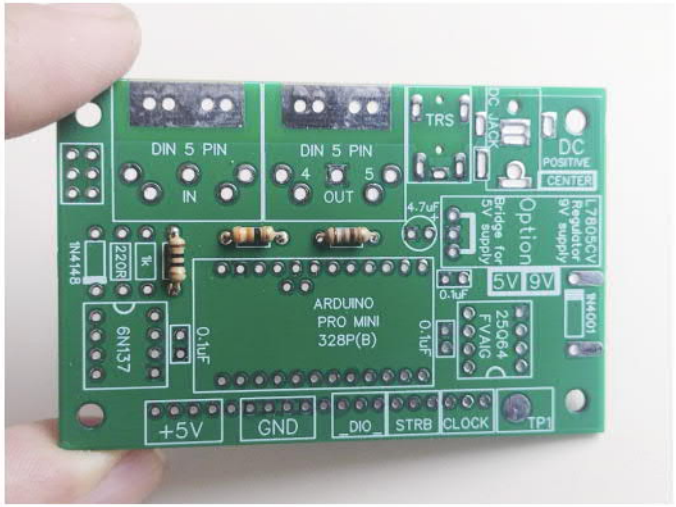
Solder in place



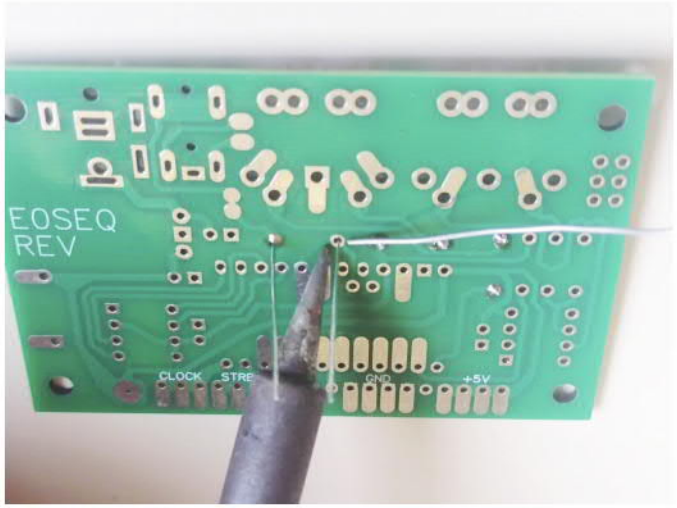
Trim legs

Find resistor 180 Ohm
Brown Gray Brown Gold

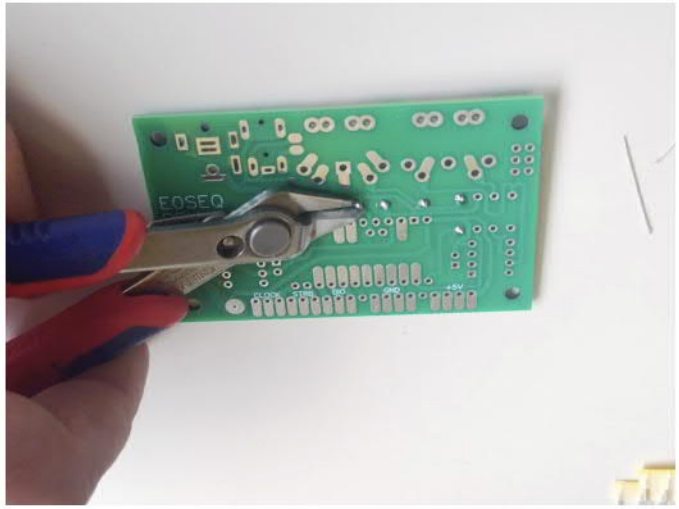
Bend legs



Put resistor in place



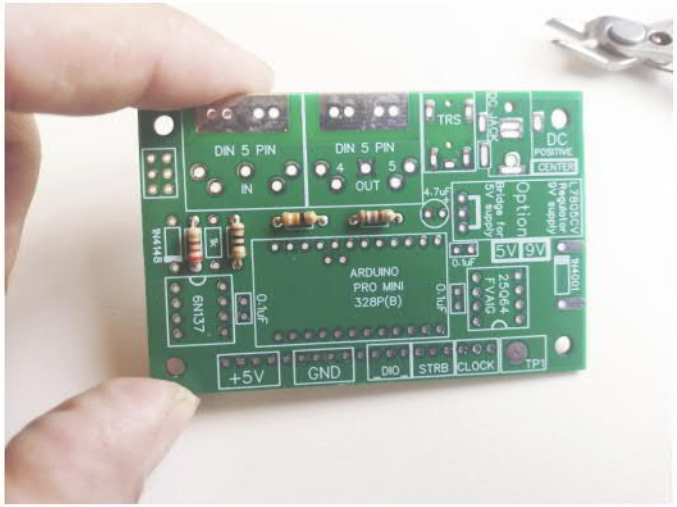
Solder in place



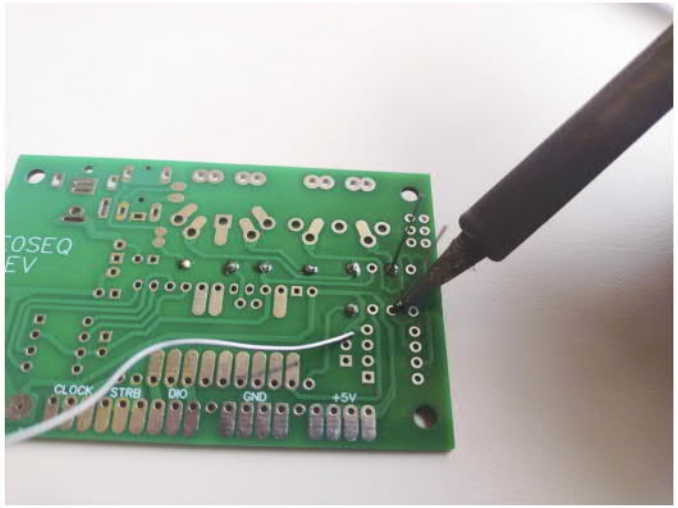
Trim legs

Find resistor 220 Ohm
Red Red Brown Gold

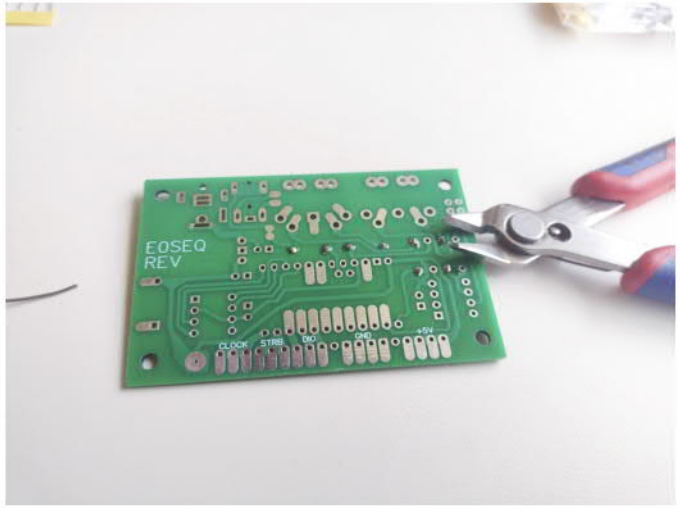
Bend legs



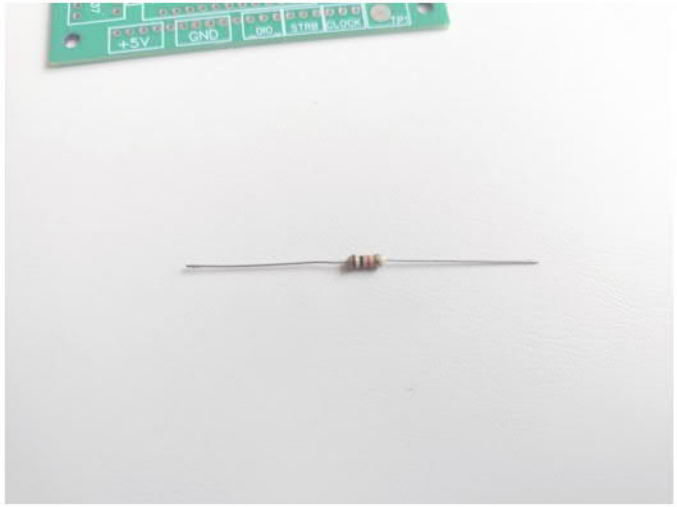
Put resistor in place



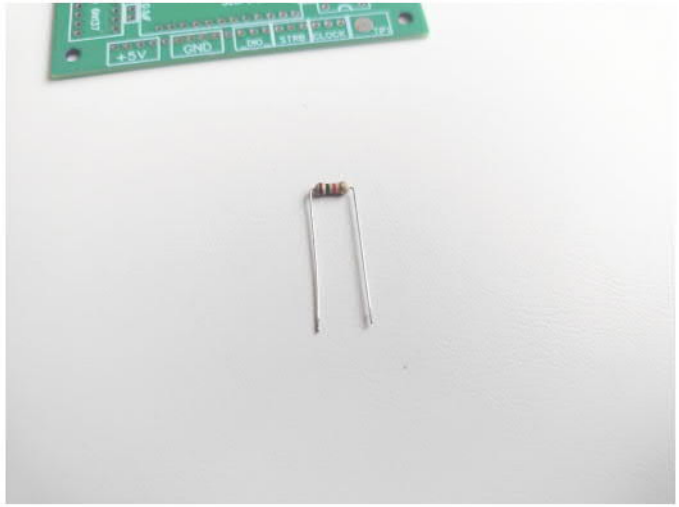
Solder in place



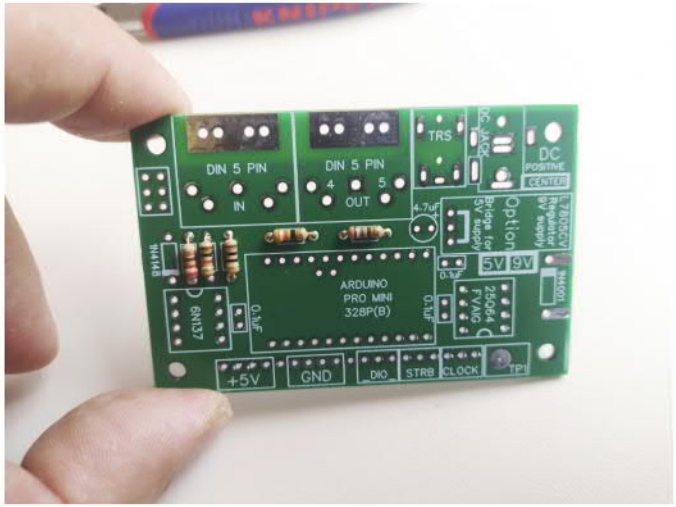
Trim legs



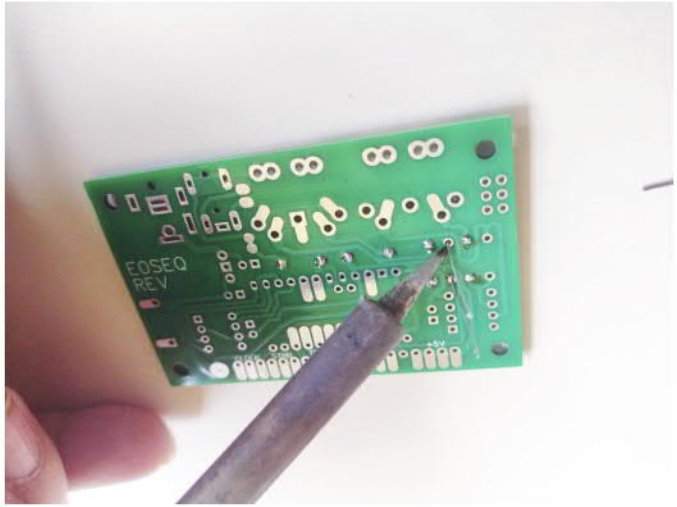
Find resistor 1k Ohm
Brown Black Red Gold



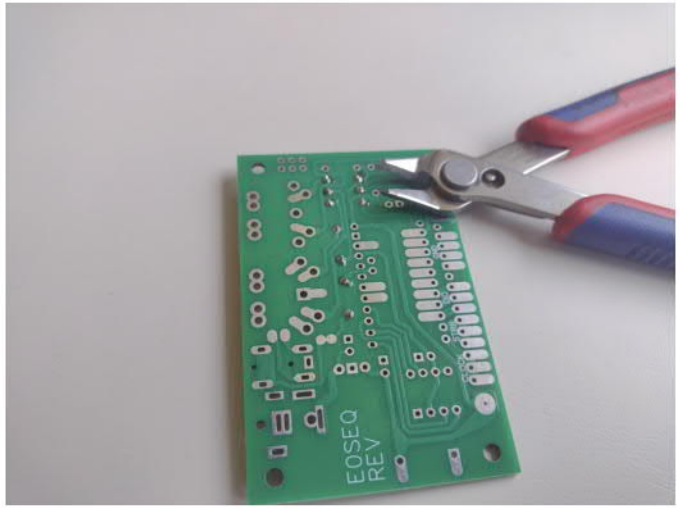
Bend legs



Put resistor in place



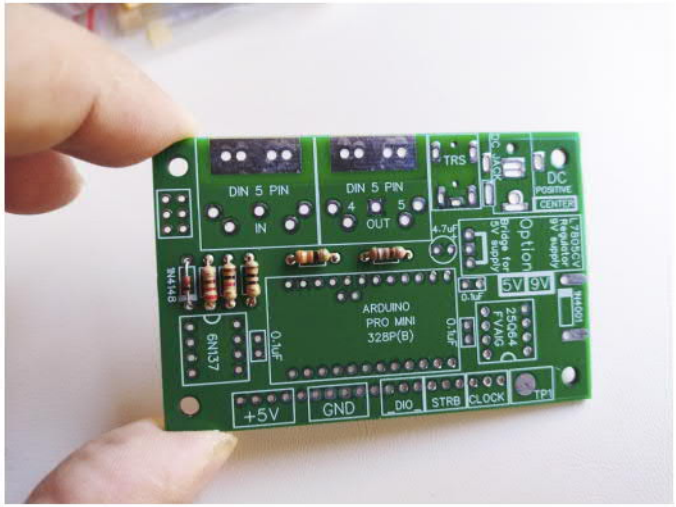
Solder in place



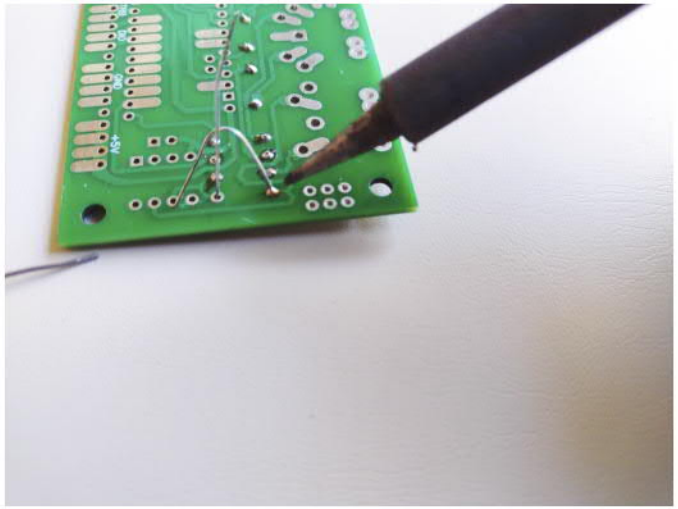
Trim legs

Find diode 1N4531
Red body colour
Alternate part: 1N4148

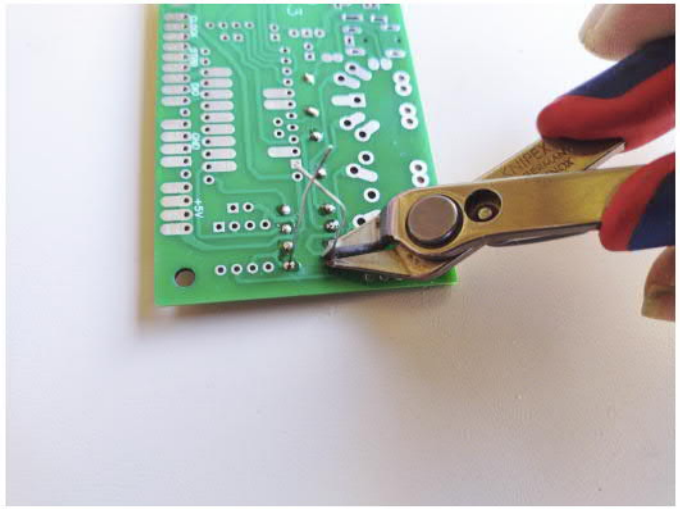
Bend legs



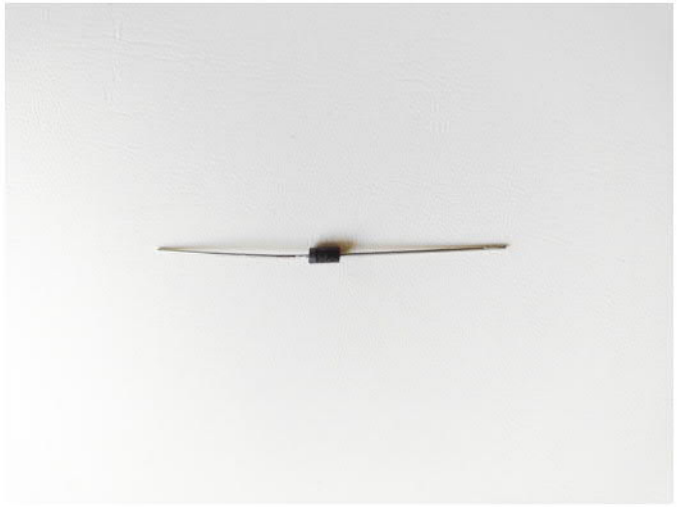
Put diode in place, observe correct orientation as indicated on pcb



Solder in place

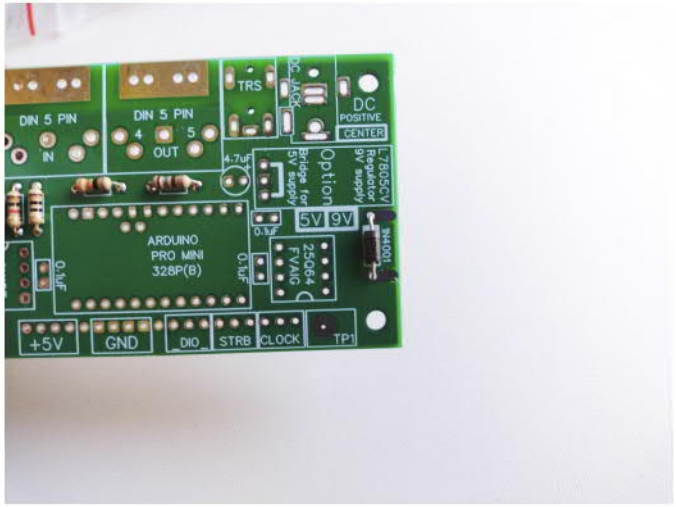


Trim legs

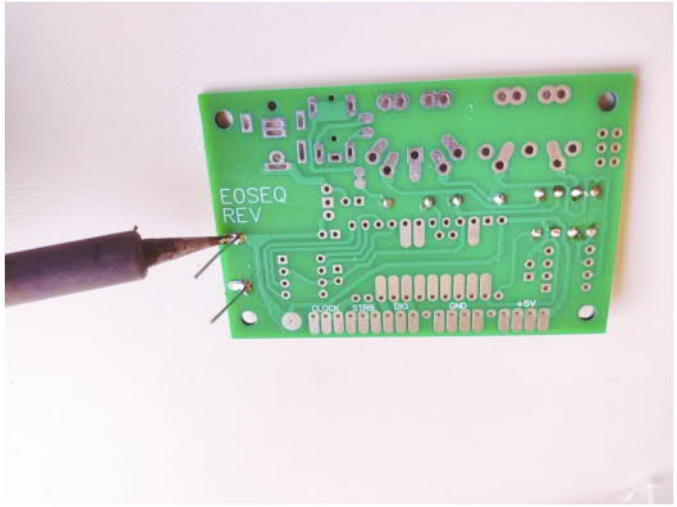


Find diode 1N4004
Black body colour
Alternate part: 1N4001

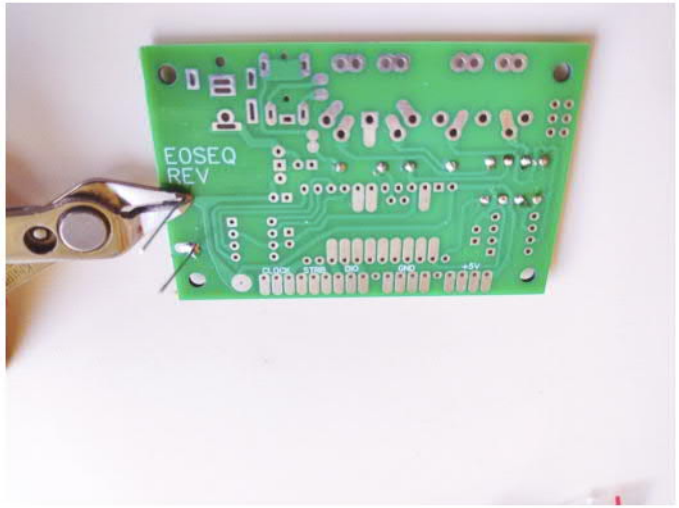
Bend legs



Put diode in place, observe correct orientation as indicated on pcb

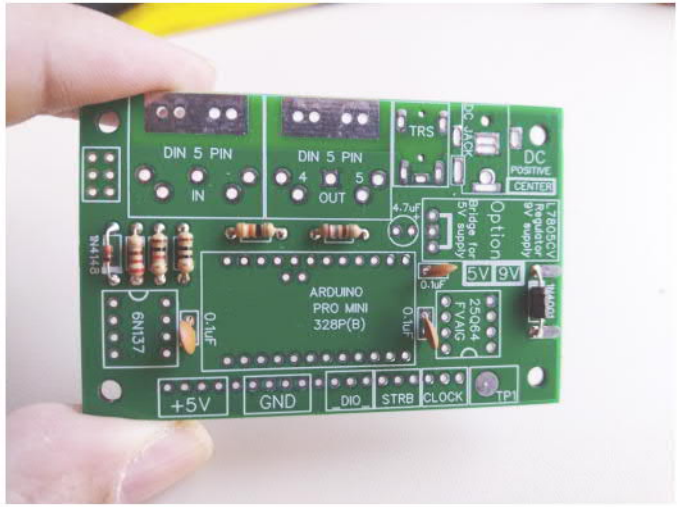


Solder in place

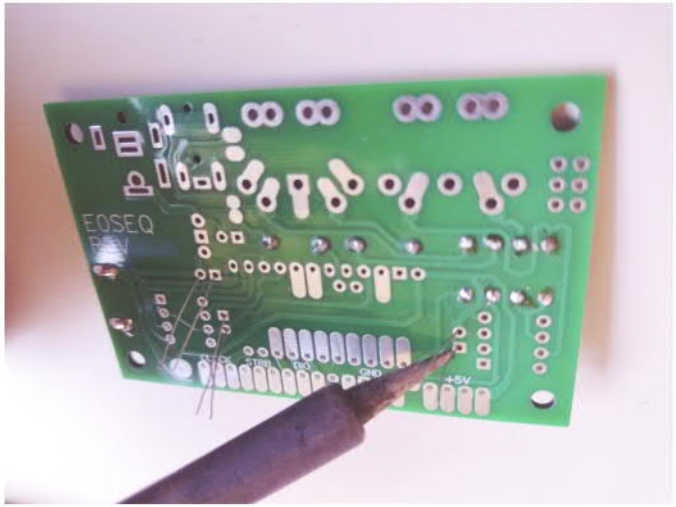


Trim legs

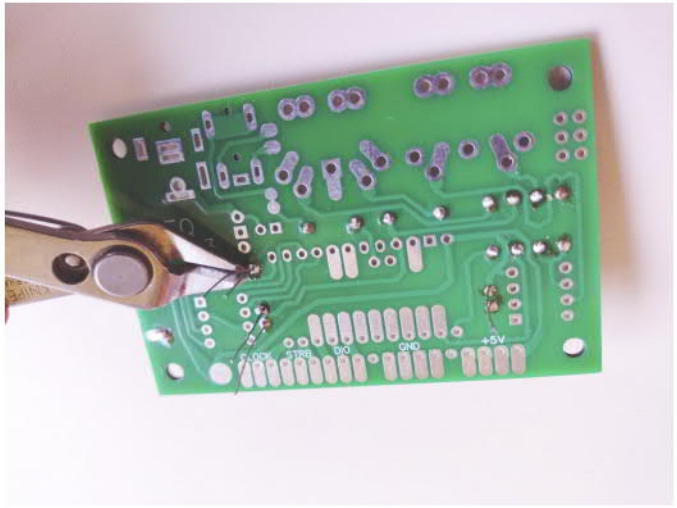
Find 3x capacitor 0.1uF
Body marking 104



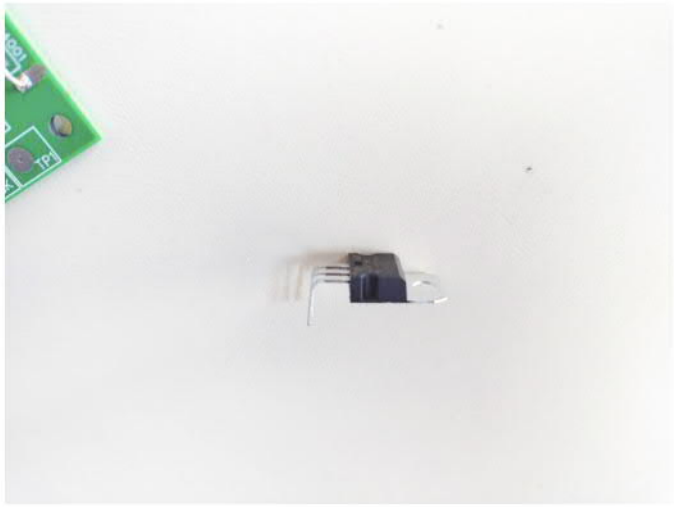
Put capacitors into place



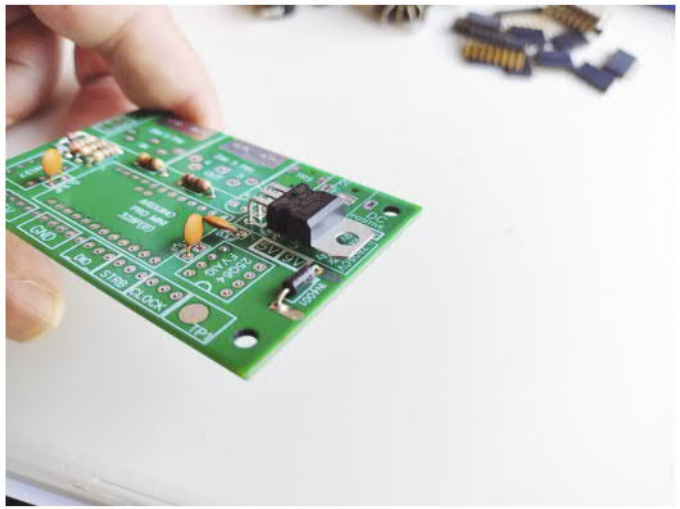
Solder in place



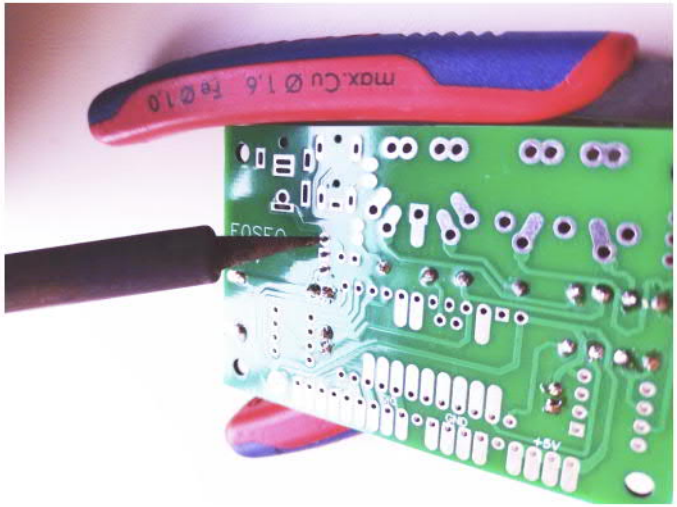
Trim legs



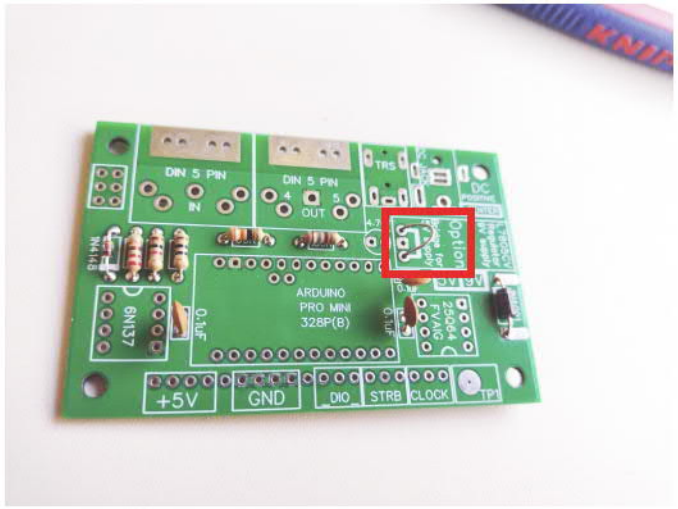
Find voltage regulator L7805CV
Bend legs as shown



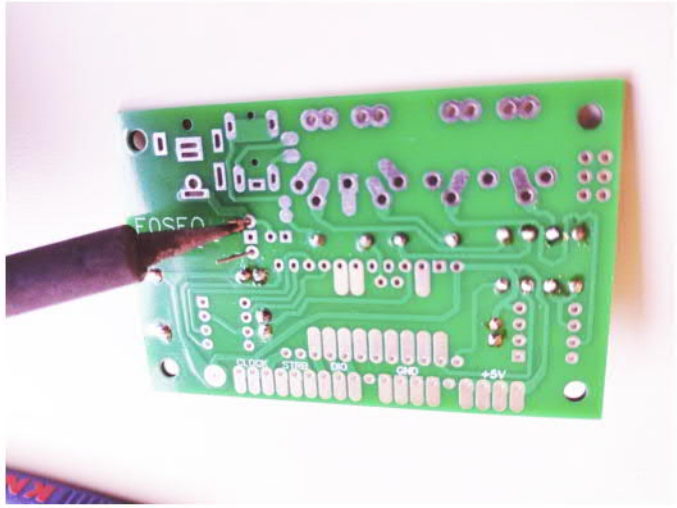
Put regulator into place
Regulator should be mounted with distance from pcb, it can slightly heat up and we do not want heat to spread to other components



Solder regulator pins

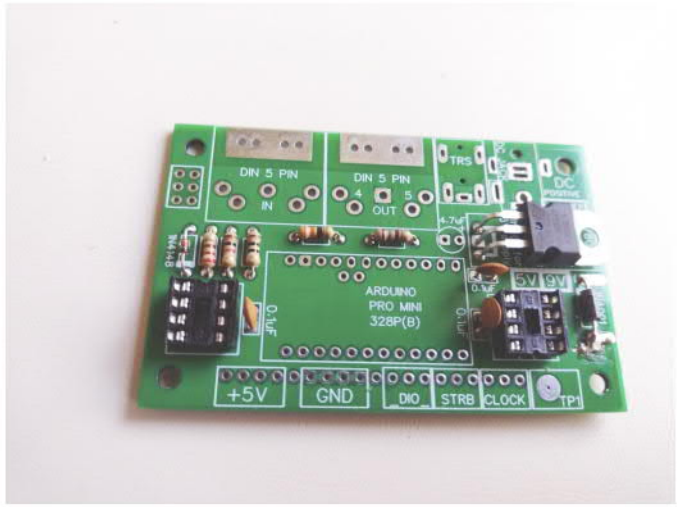


Alternative version for 5VDC supply:
Instead of regulator solder a bridge in place
(Use leftovers from component legs)

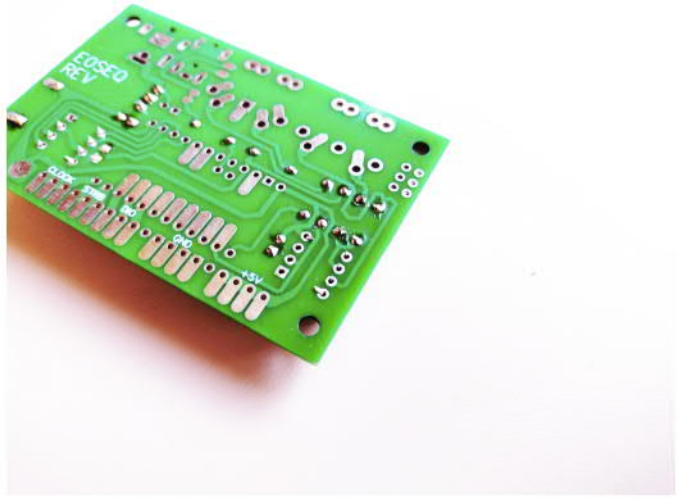


Solder bridge in place

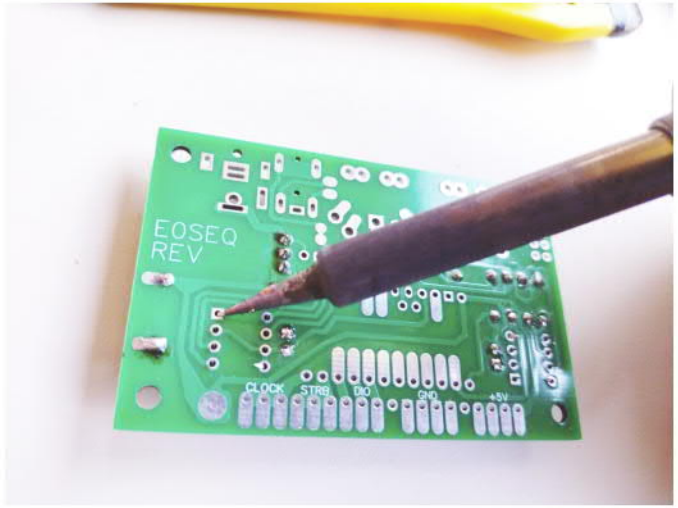
Find 2x 8 pin IC sockets



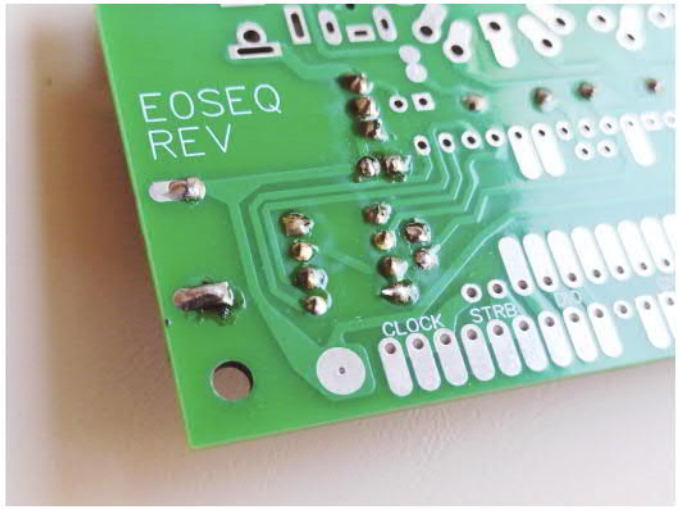
Put sockets into place, mind orientation notch as indicated on pcb



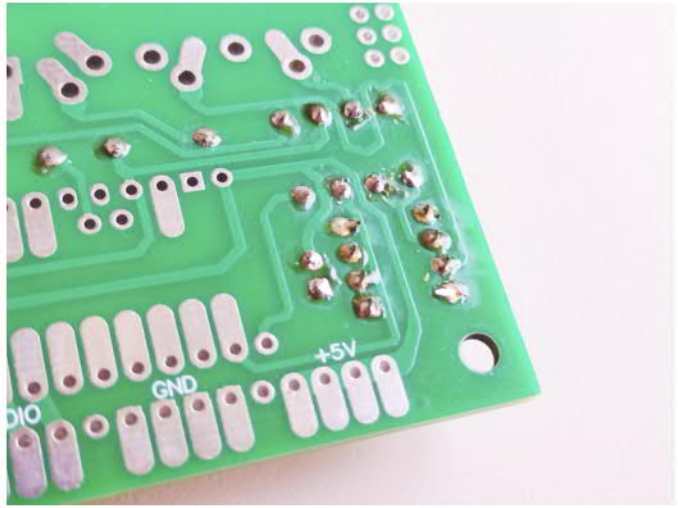
Optionally bend two pins of each socket so they don't fall out



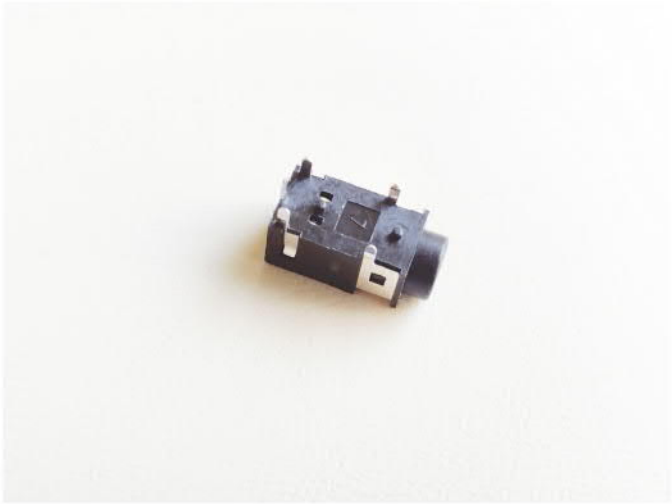
Solder both sockets into place



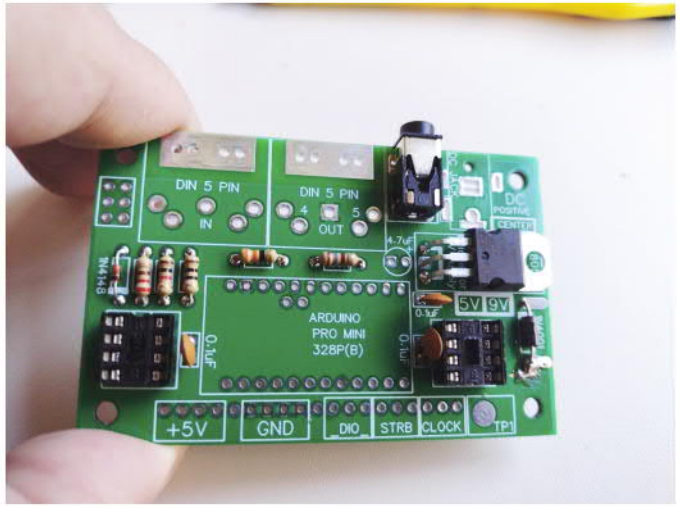
Finished socket left



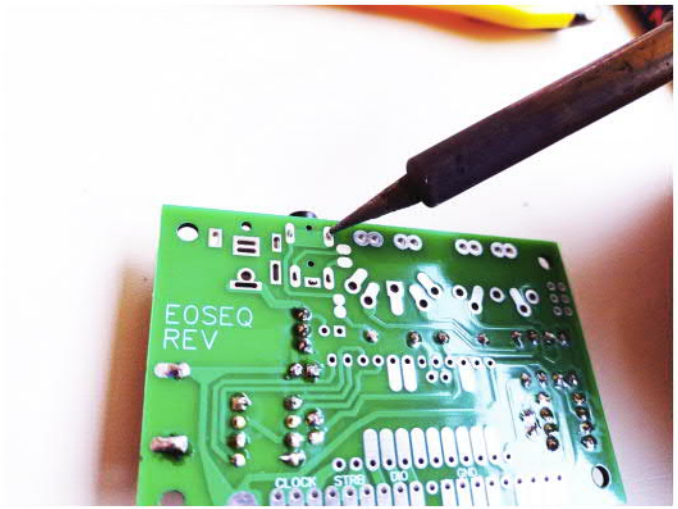
Finished socket right



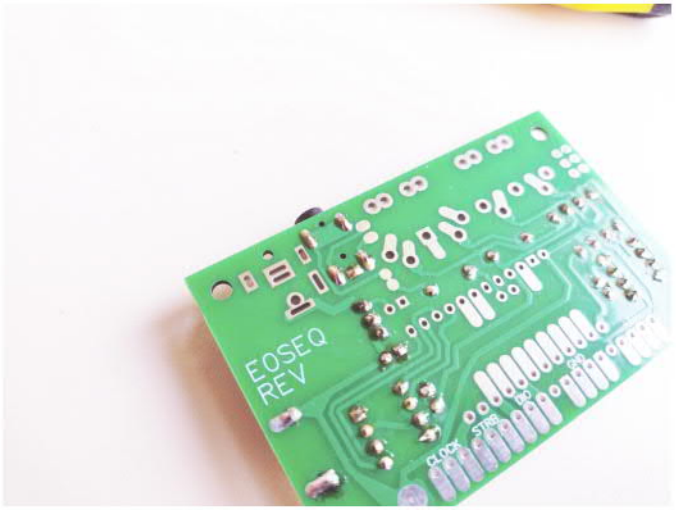
Find TRS headphone jack



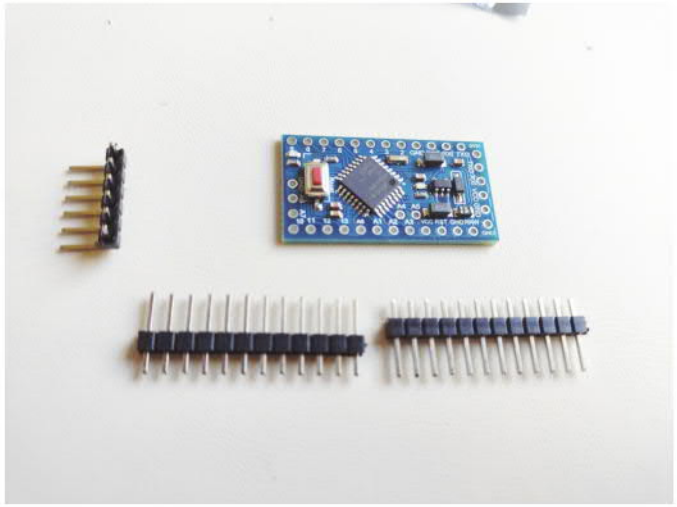
Put headphone jack into place



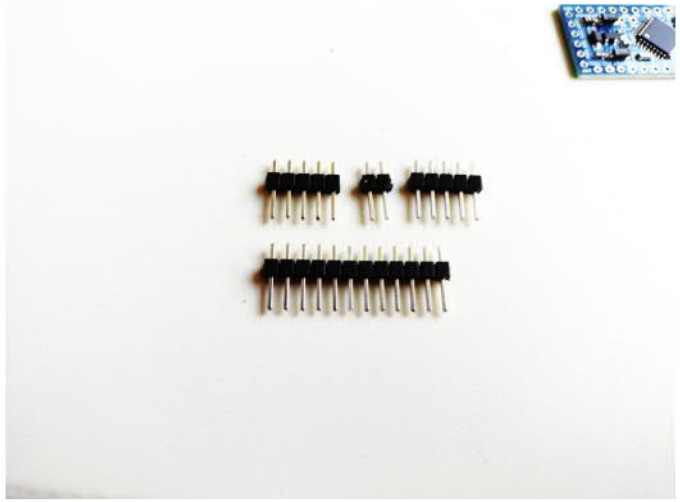
Solder headphone jack in place



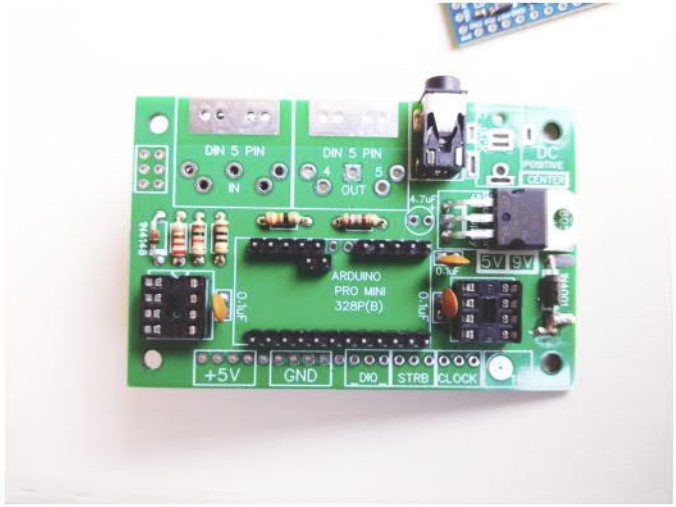
Finished headphone socket



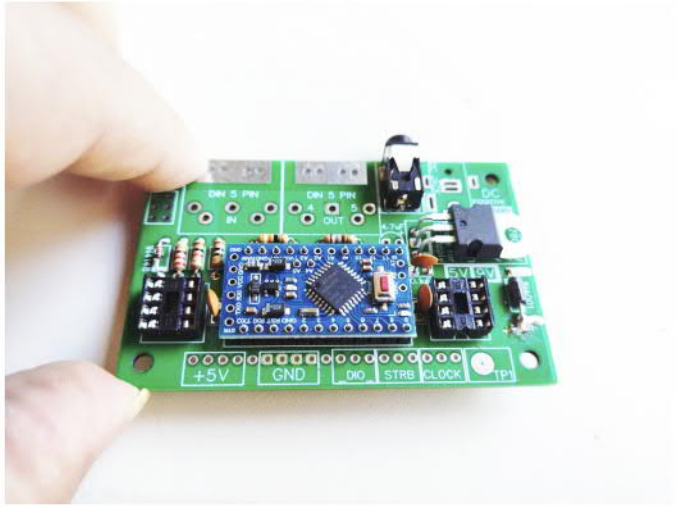
Find arduino and pins in bag



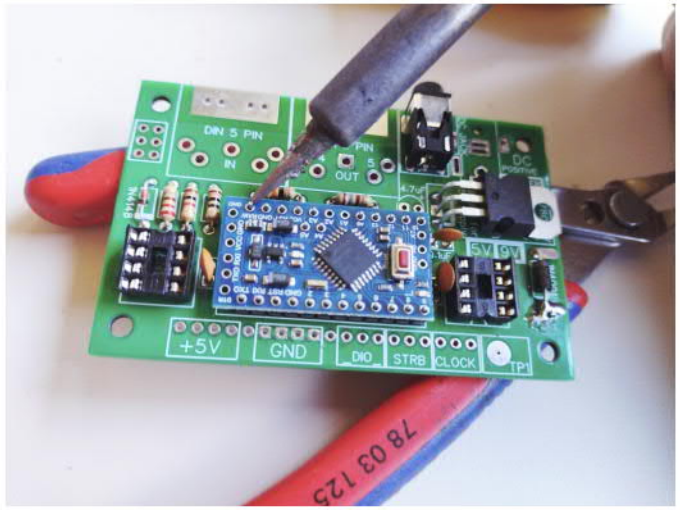
Divide pins as shown, keep 90° pins in bag for later



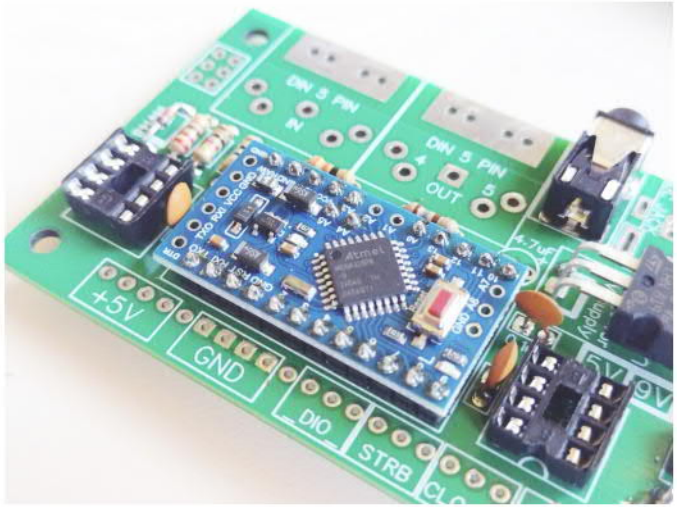
Put pins into pcb as shown, short end on top, mind the gap - We are using pcb as a holder to mount the pins to arduino.



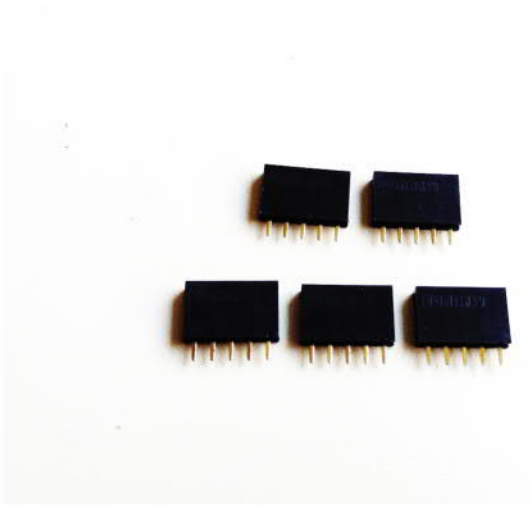
Put arduino onto pins



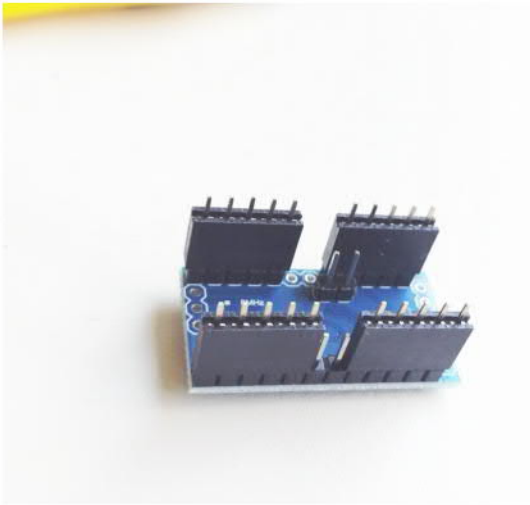
Solder all pins, only on arduino, not on bottom of pcb



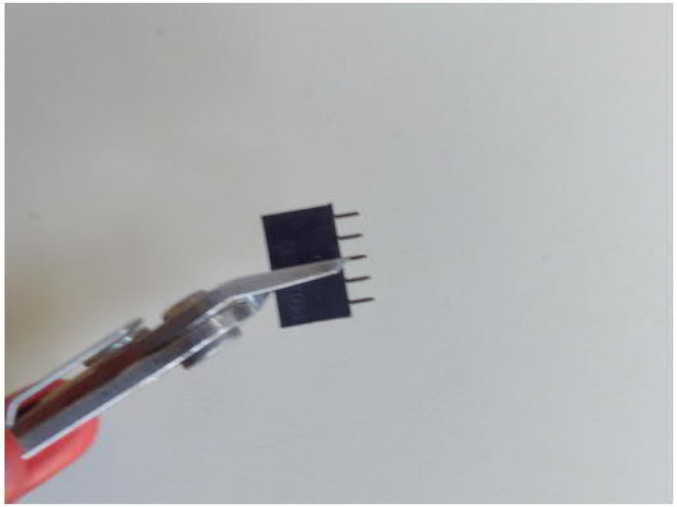
Finished arduino with pins, remove arduino from pcb



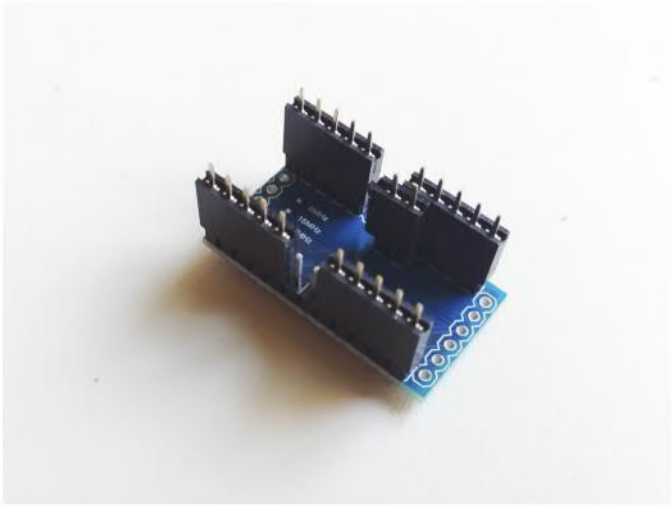
Find 5x 5pin header sockets



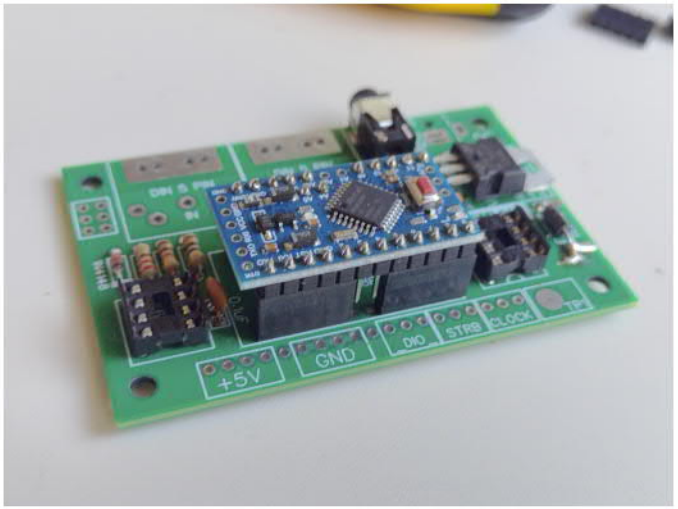
Mount 4x 5pin header sockets as shown



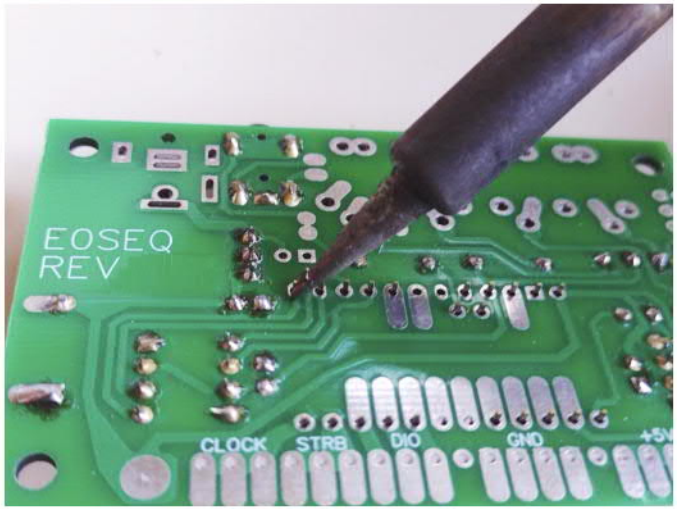
Cut the remaining header socket in the middle to create a 2pin header socket.
If you don't have a proper side cutter, cut the plastic on both sides with a knife and break it apart.



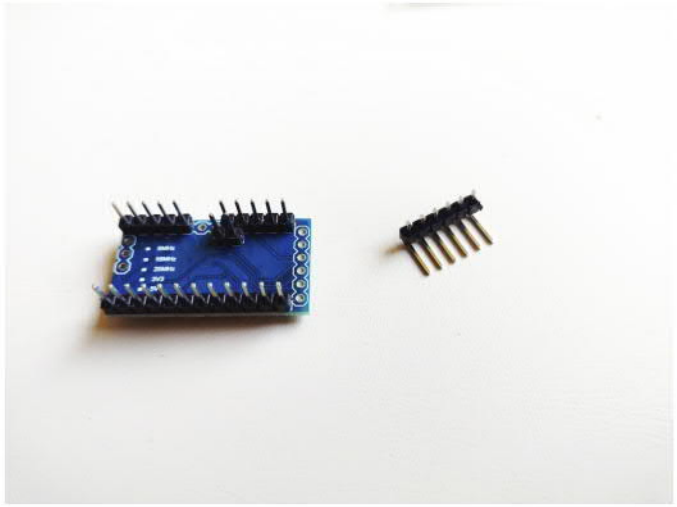
Mount 2pin header socket to arduino



Place arduino with header sockets into pcb

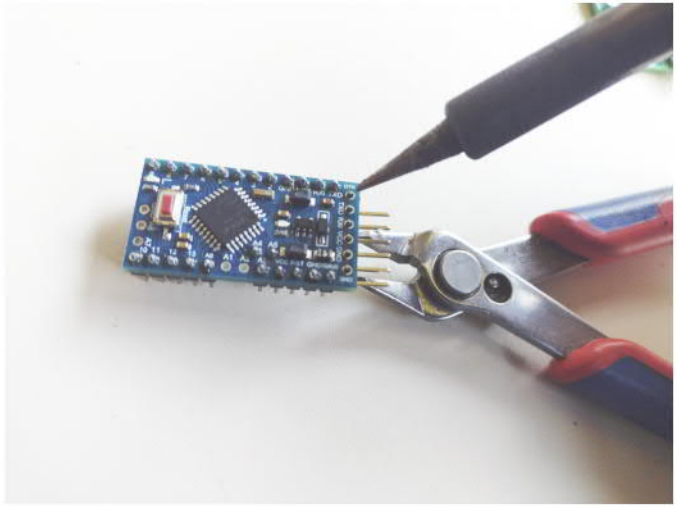


Solder all header socket pins



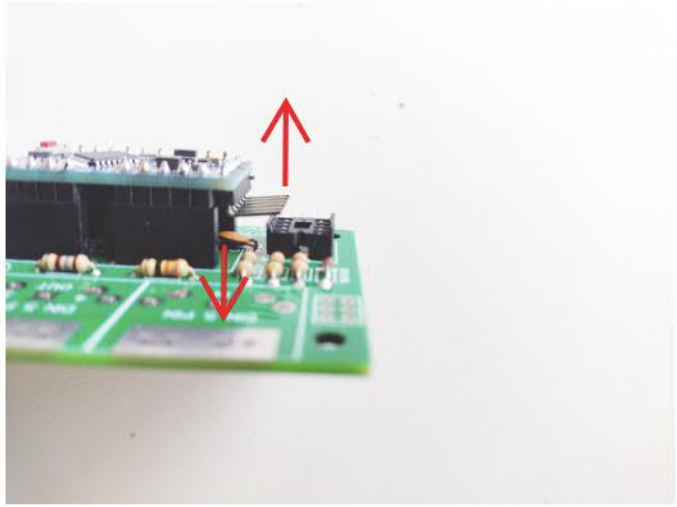
Find remaining 90° pins from arduino bag

Put pins into place



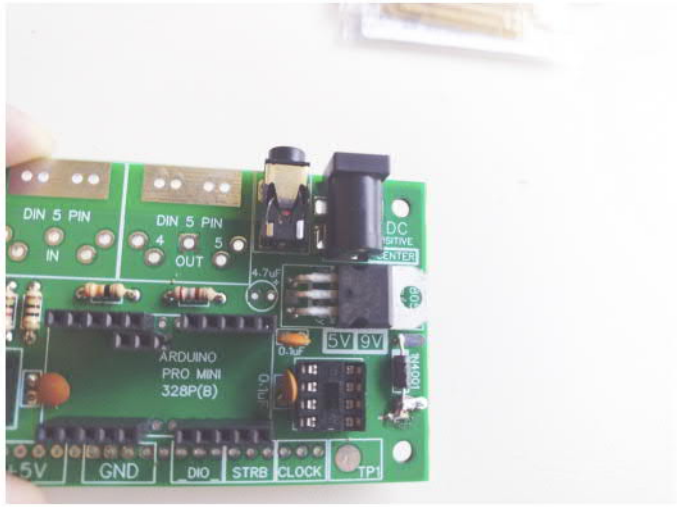
Solder pins in place

Finished 90° pins

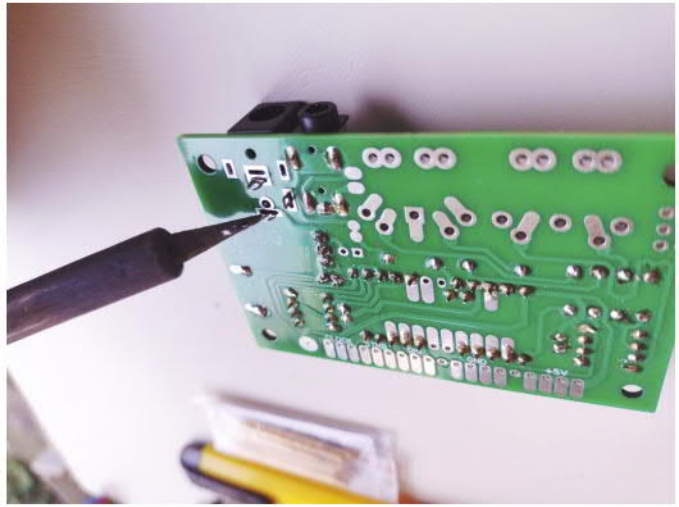


Bend capacitor under pins towards pcb, slightly bend 90° pins upwards not to conflict with later mounted IC

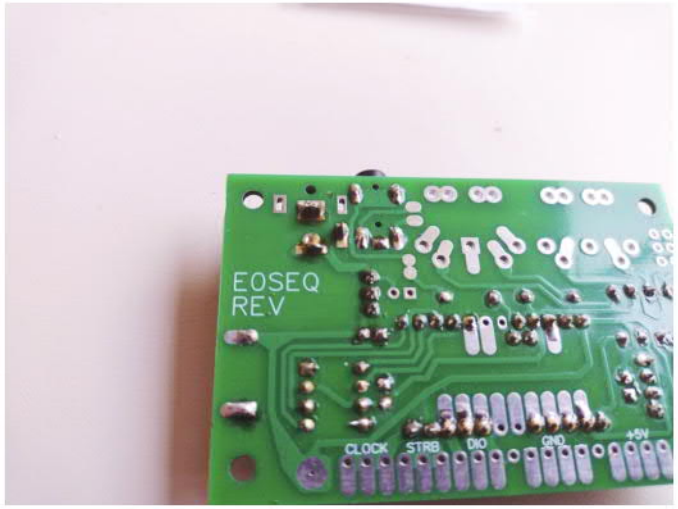
Find PSU socket
Alternate part might have different pins and shielding



Put PSU socket into place

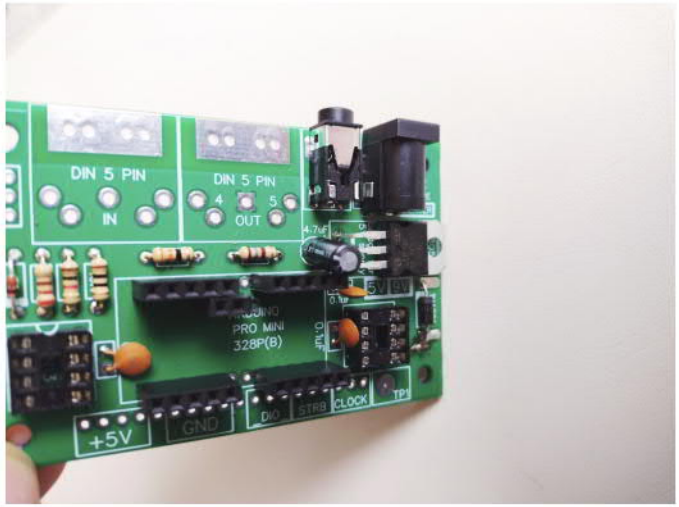


Solder socket in place
Alternate part might have different pins

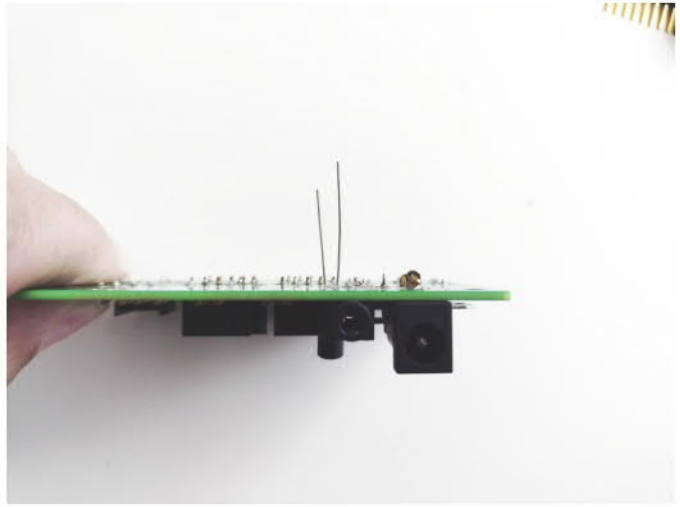


Finished PSU socket

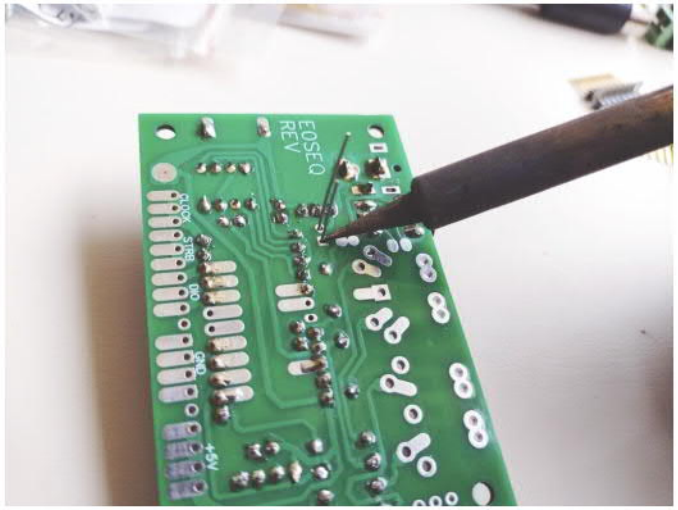
Find capacitor 4.7uF ≥ 50V



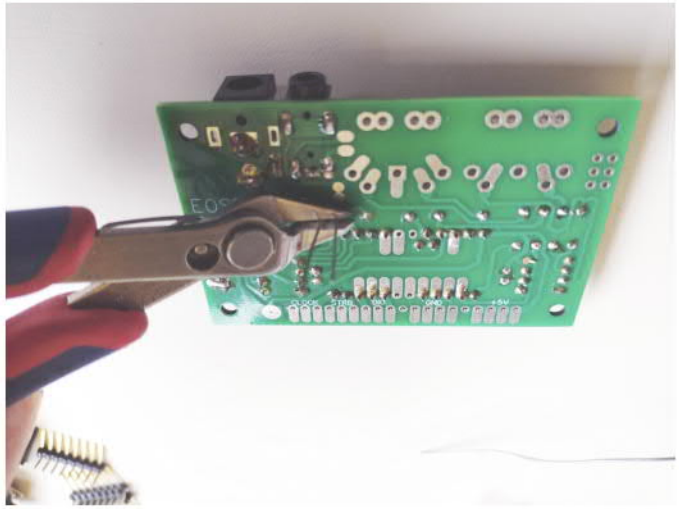
Put capacitor into place,
mind orientation: Line on cap further away from regulator



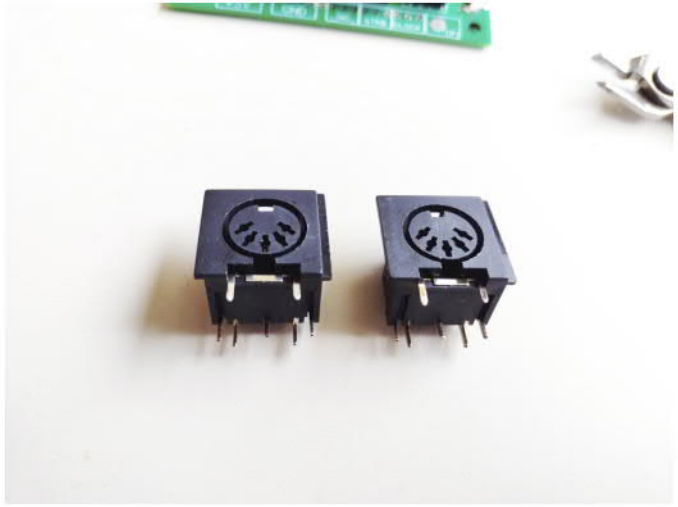
Put capacitor into place,
orientation check: Shorter leg of cap is further away from regulator



Solder cap in place

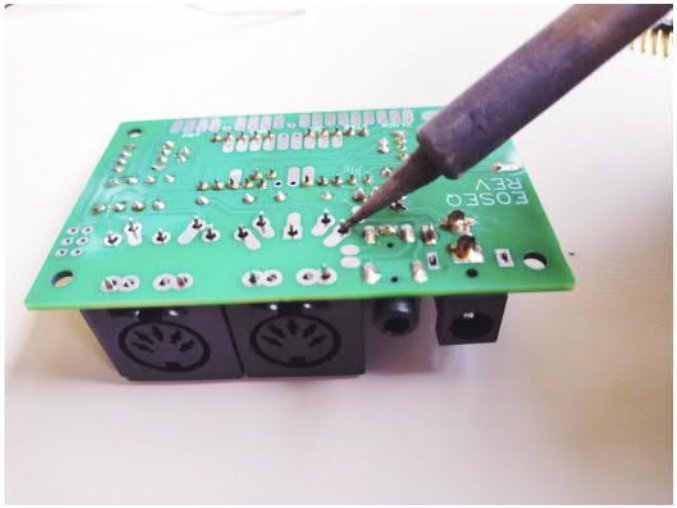


Trim legs

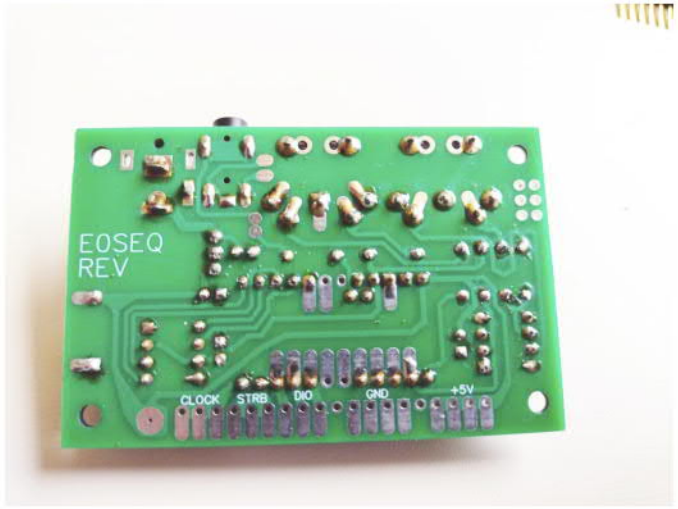


Find 2x DIN 5 pin socker

Put sockets into place

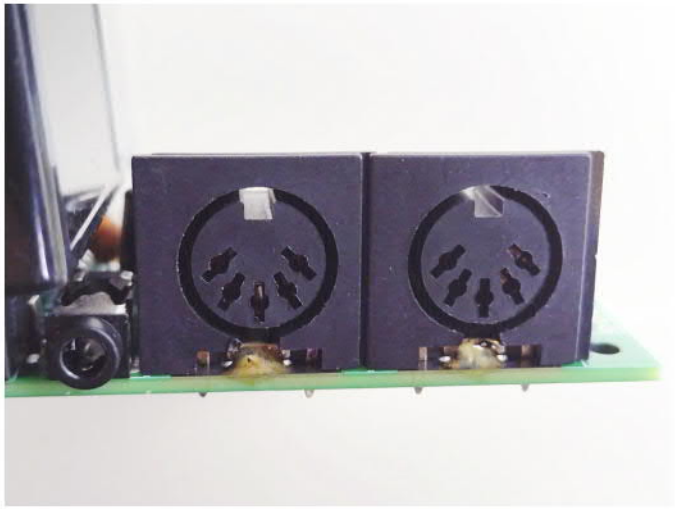


Solder sockets in place

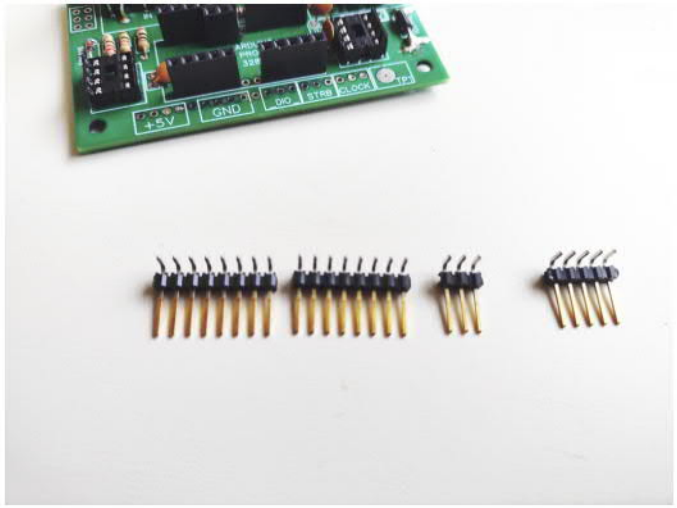


Finished DIN sockets

Optional for more stability:
Solder grounding tab to pcb



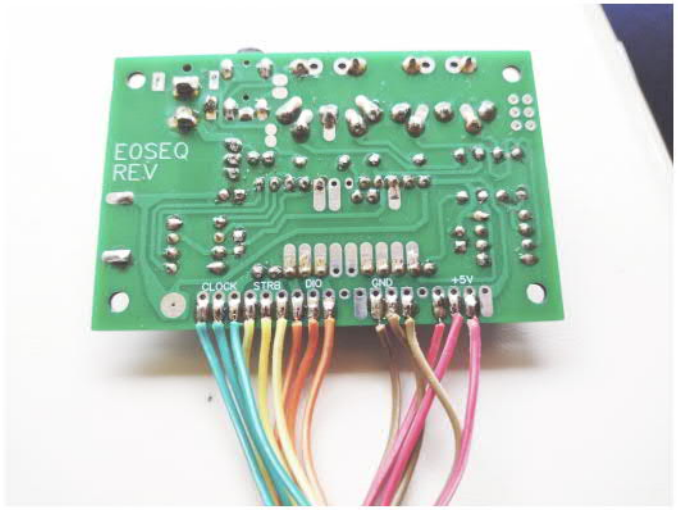
Finished stability improvement



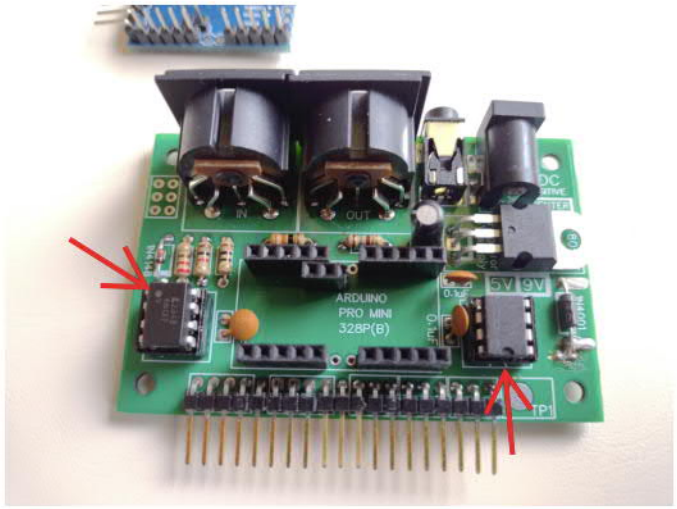
Find 19x 90° pins

Put 90° pins into place

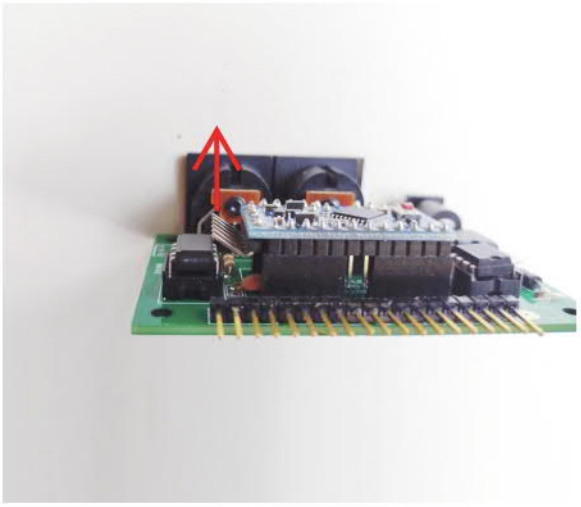
Solder 90° pins in place



Optional: Header wiring can be soldered directly to pcb bottom without any pins



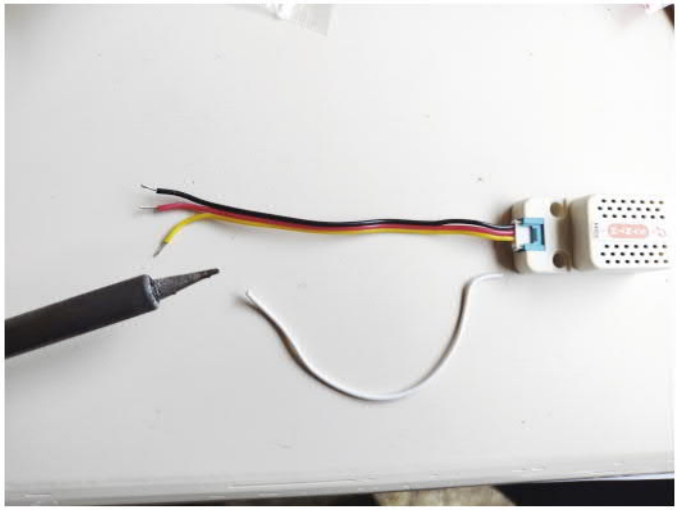
Find IC's 6N137 and W25Q64
Mount IC's into sockets, mind orientation
6N137 might have a dot instead a notch,
dot = notch side



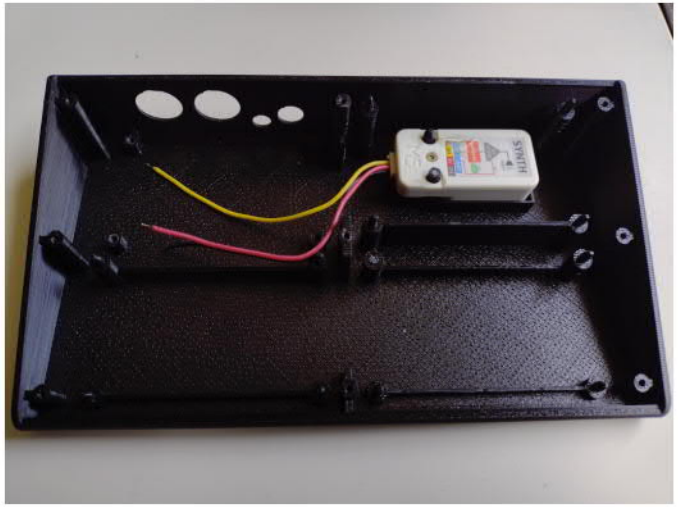
Bend arduino 90° pins if not done yet, mount arduino

Pcb fully assembled

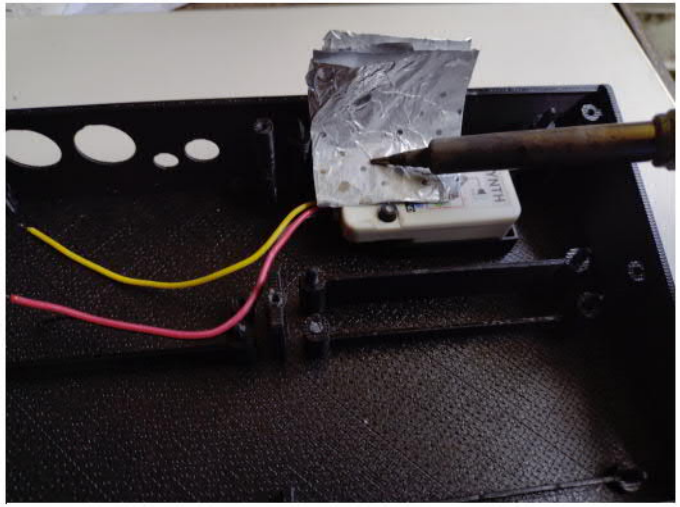
Find M5 SAM2695 midi synthesizer, cut off header cable approximately in half



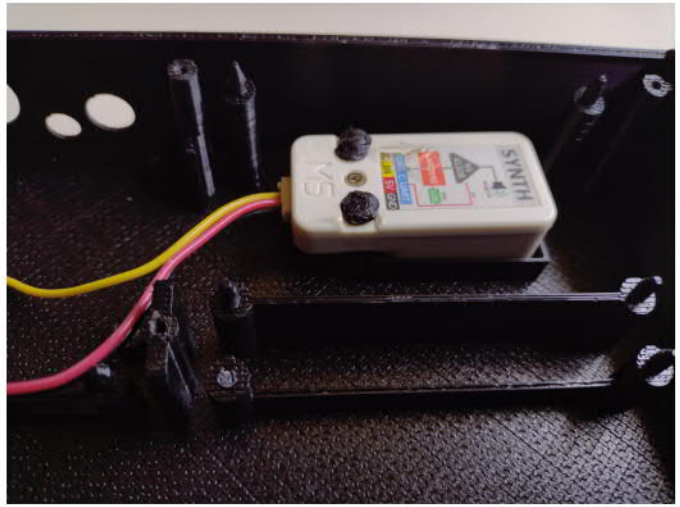
Cut off the white wire, strip and tin the yellow, red and black wire ends



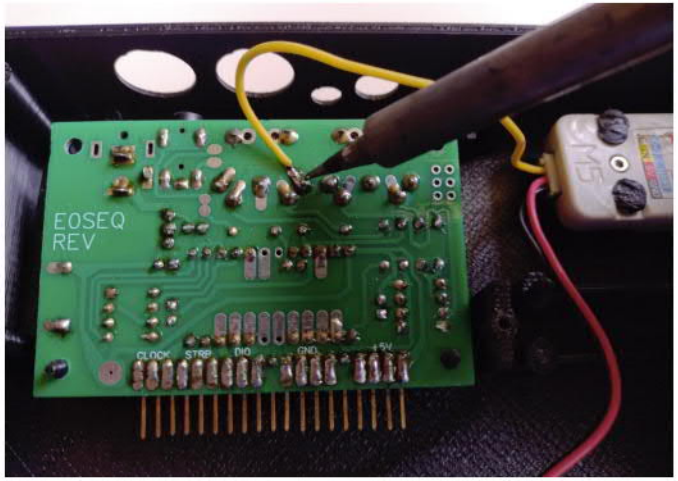
Put M5 SAM2695 into place on plastic pins



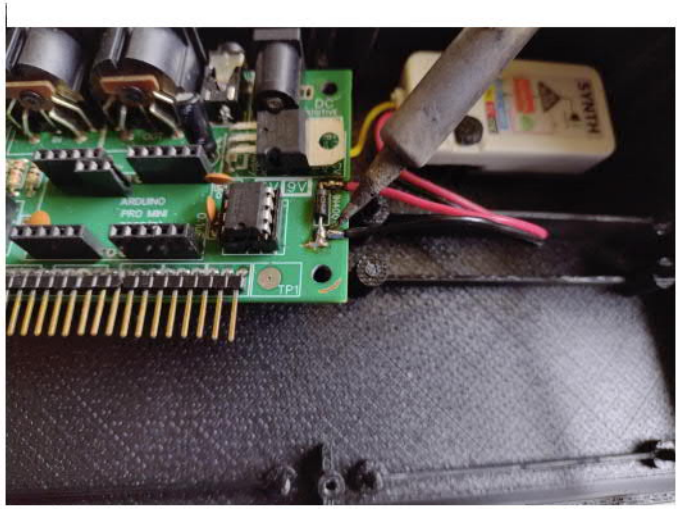
Optional: Melt down the pins to mount M5 SAM2695
Hint: Use a piece of aluminum foil for melting down to keep the soldering tip clean
If pins are not melt down the M5 SAM2695 might slightly rattle inside the enclosure when moved



M5 SAM2695 mounting done

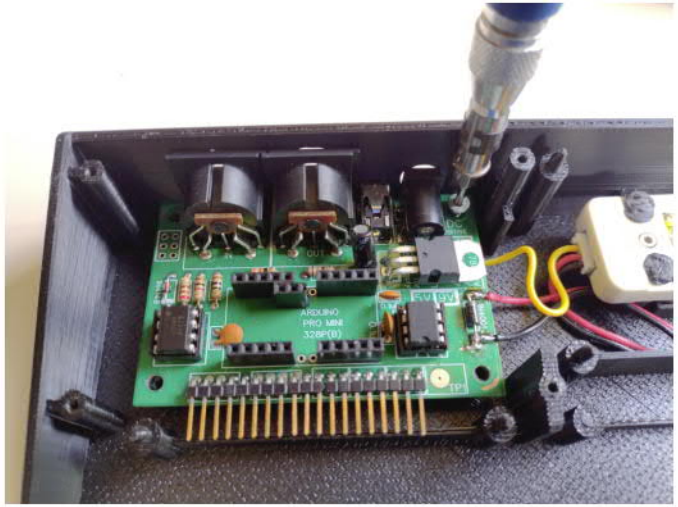


Solder yellow wire to shown pin on midi out

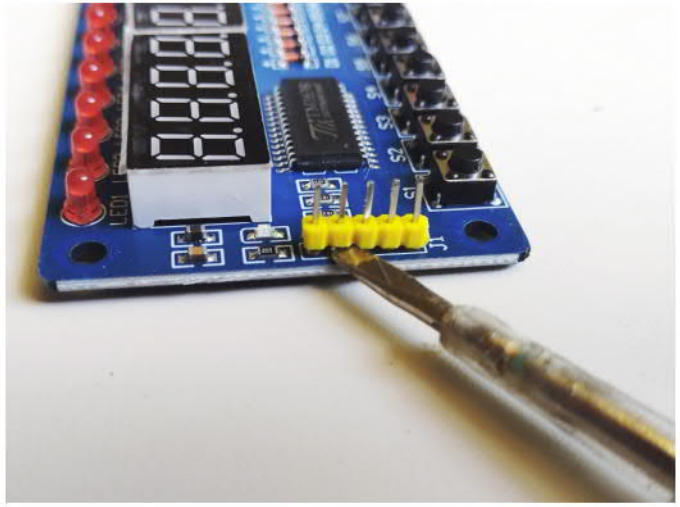


Solder red and black wire to pads at black diode

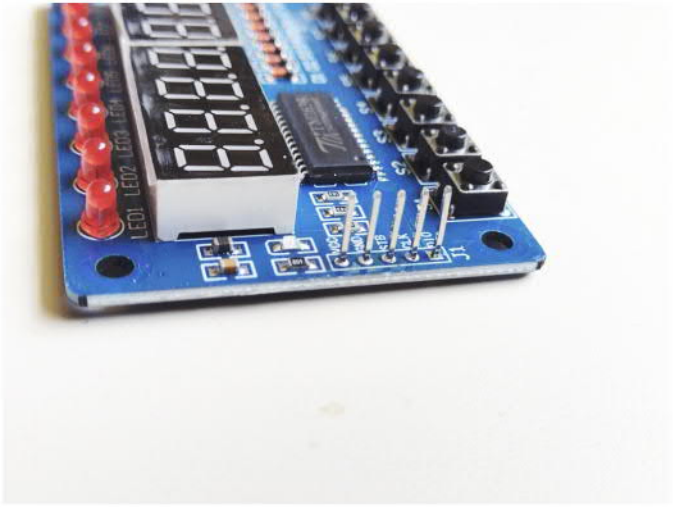
Route wires as shown
M5 SAM2695 installation done



Find 4x B3X6 screws and mount circuit board with
PH1 screwdriver (No need to use PZ1 screwdriver)

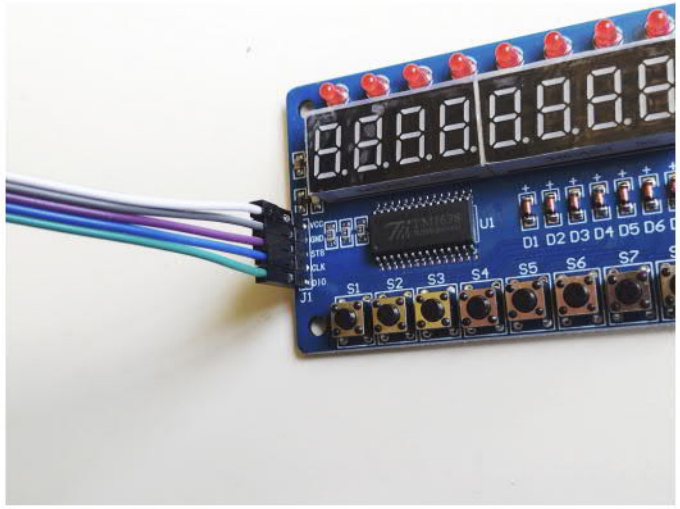


Find 3x TM1638 led&key board
Use a flat screwdriver or flat knife to remove plastic
from TM1638 led&key board

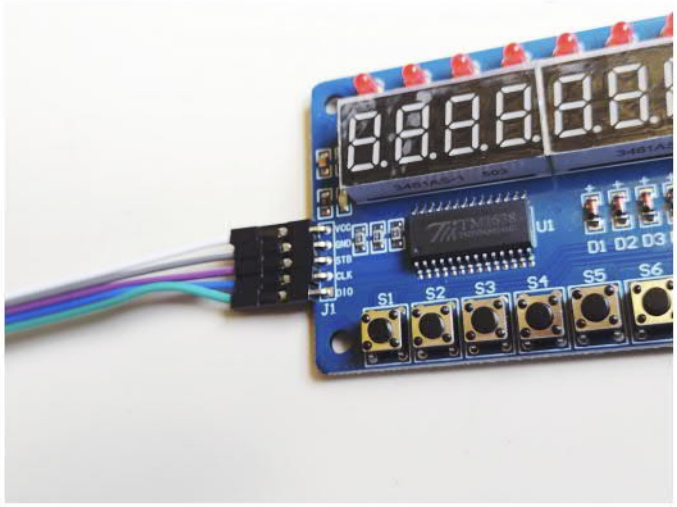


Plastic removed

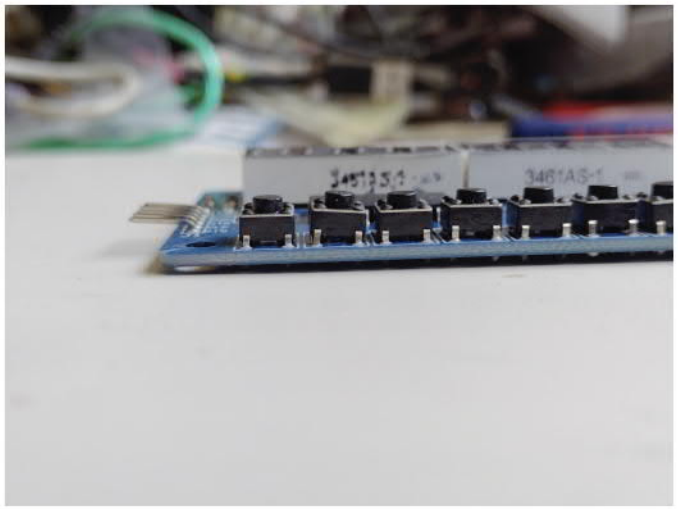
Find female to female header wires
Tear off three sections with 5x identical colours



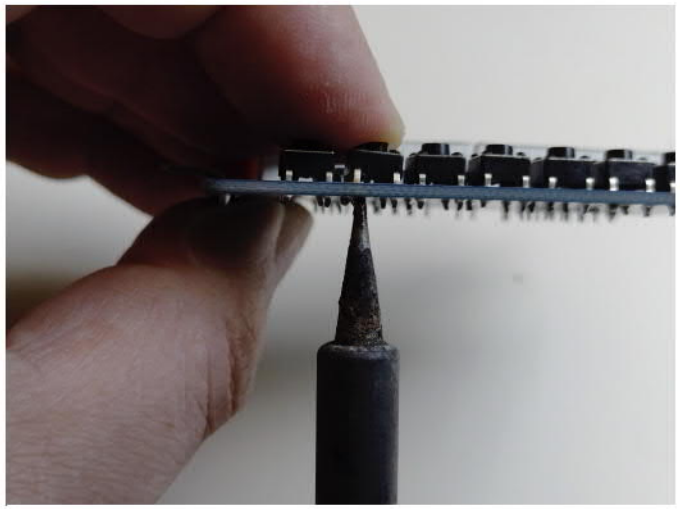
Plug header cables to TM1638 board



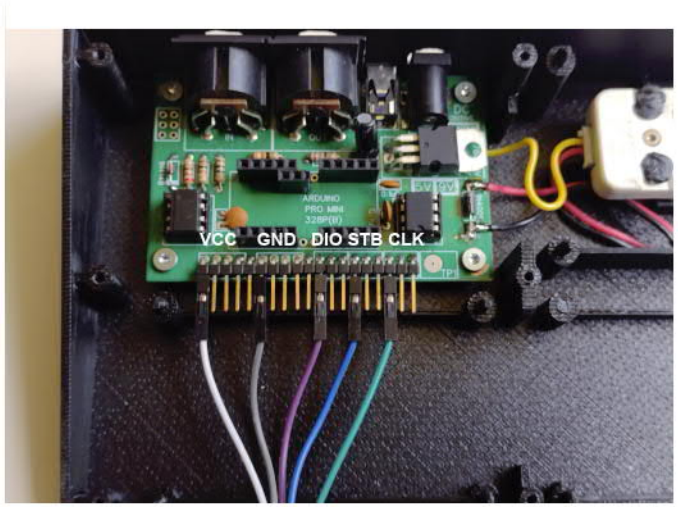
Bend the pins downwards
Do this for all three boards
Remove the header wires after bending



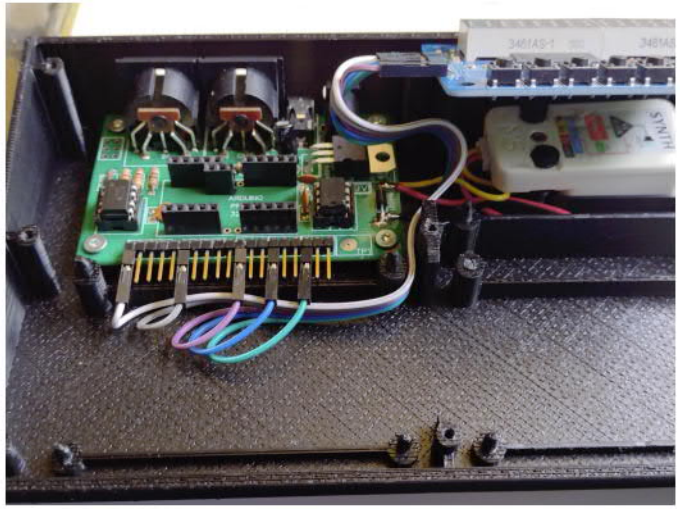
Due to chinese production quality fluctuations it can be that buttons or leds are not perfectly flat Eosequencer tongue principle requires tactiles to be aligned properly with pcb



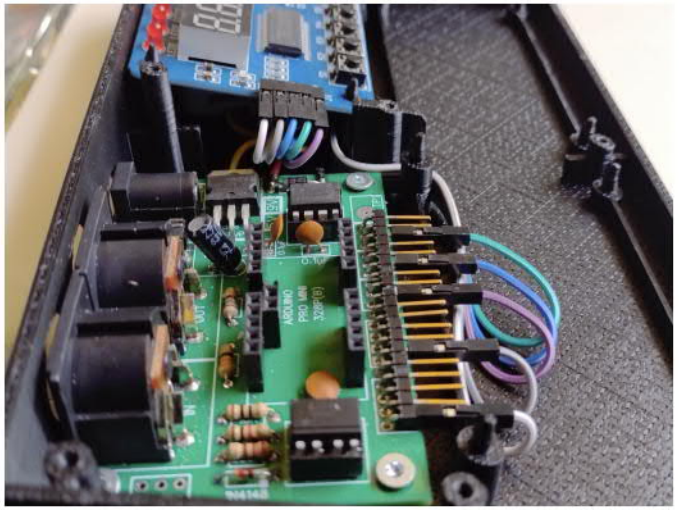
Heat up pins and add some soldering tin if a tactile or LED is not perfectly aligned, push the element into position



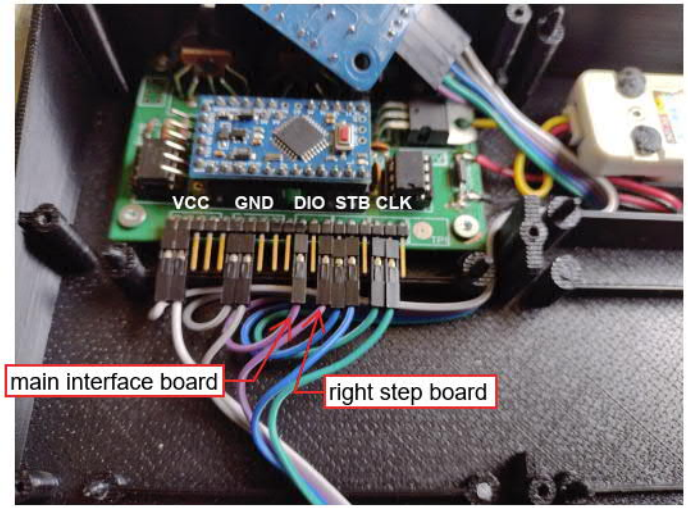
Plug wires to header pins as shown
Wires white, gray, blue, green are routed to all boards identical, only DIO wire (purple) goes individually to each board - Mind, pins between VCC and GND, between GND and DIO are not used



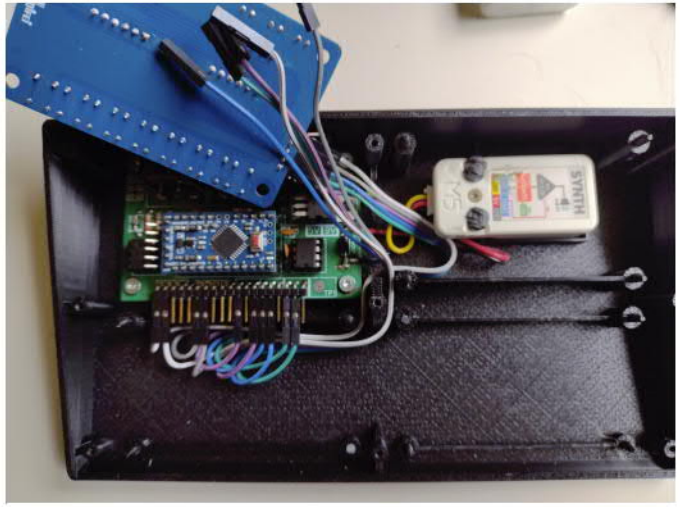
Route wires as shown, bend all header pins on Eosequencer PCB slightly downwards to have more space for installation when fitting led&key PCB



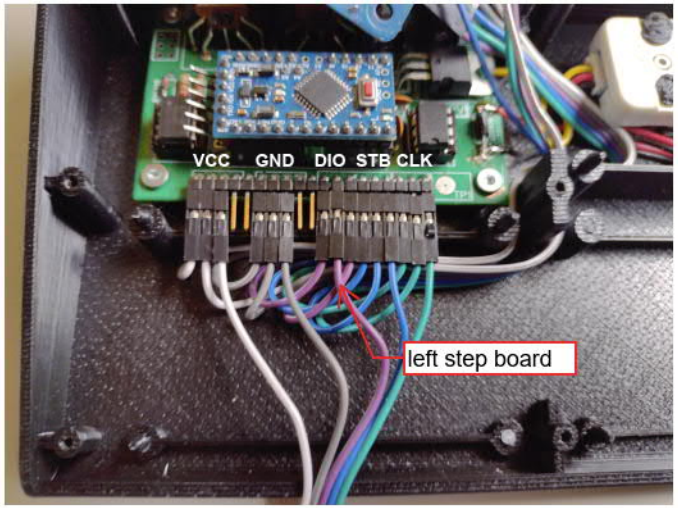
Attach wires to TM1638 board
Finished installation of main interface board



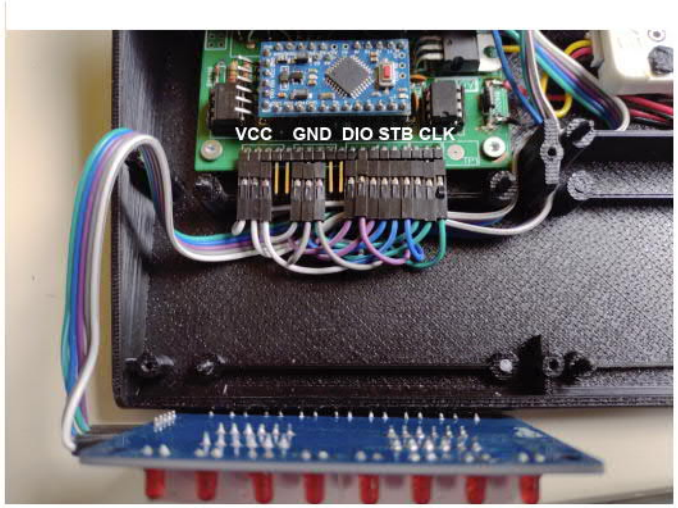
Plug wires for right step board, temporarily remove main interface board for routing wires



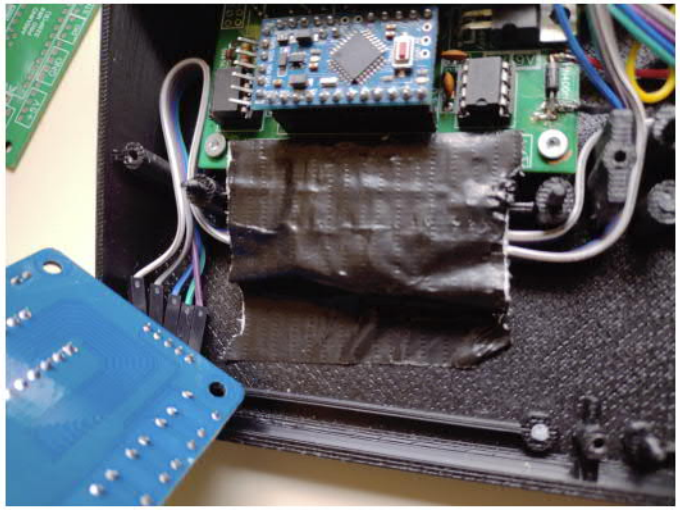
Prepare routed wires for right step board as shown



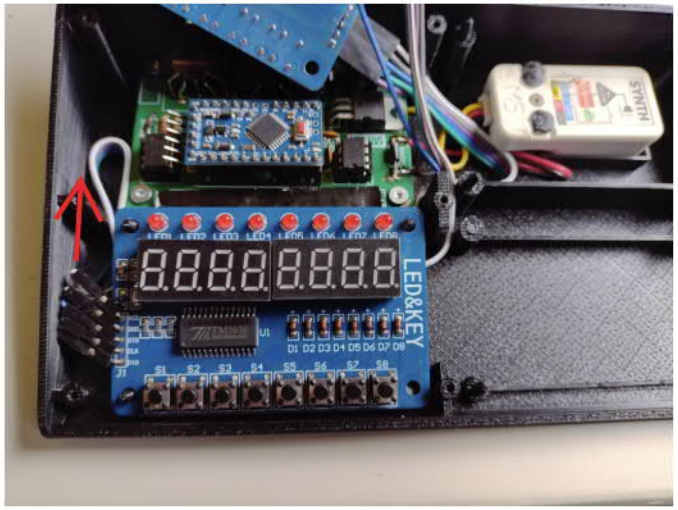
Put wires for right step board aside, plug wires for left step board



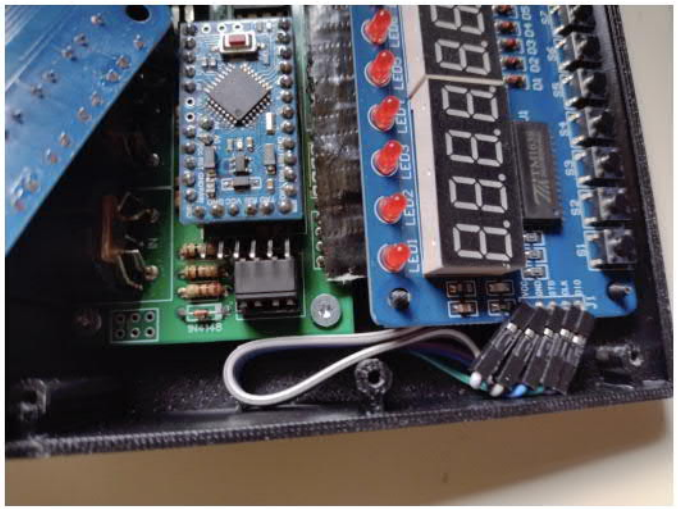
Route wires for left step board as shown, eventually shorten pins of LEDs and segment displays on underside to avoid conflict with header pins



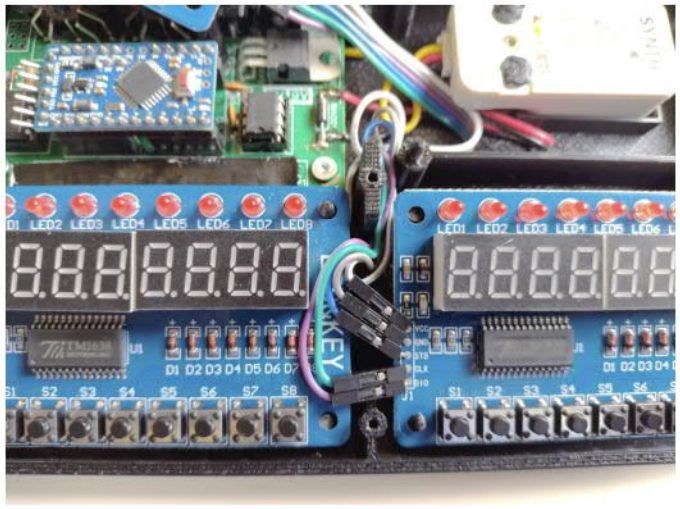
Place duct tape over connectors and wires to prevent accidential unplugging or shorts
Compress the wiring as much as possible to be able to install the left step board without conflict



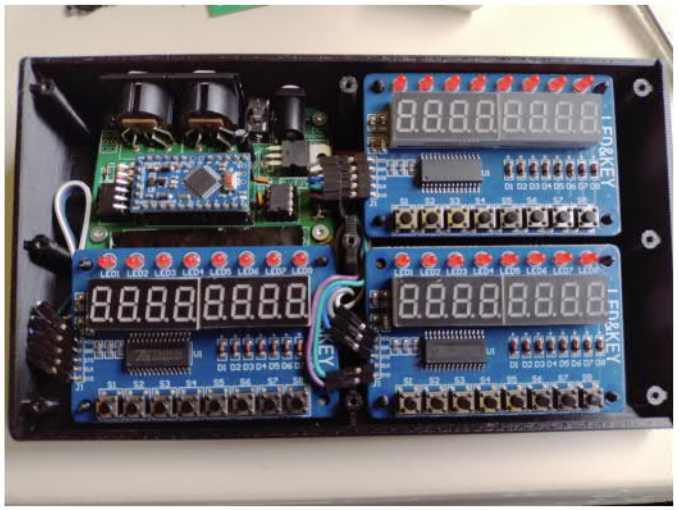
Bend the pins and headers upwards to put the board into place



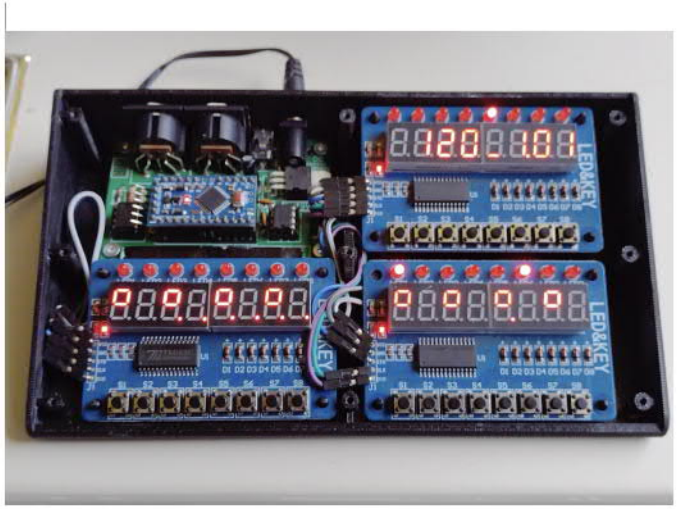
Left step board finished installation



Install right step board, route excess wire under the pcb. Bend pins and headers as shown, the installation must be as flat as possible.

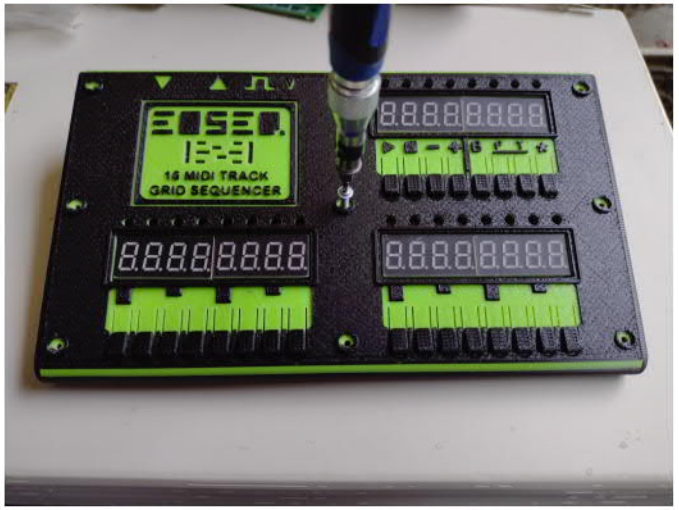


Put main interface board back into place



Do a test run - On first power up Eosequencer is formatting the flash chip which takes a few seconds, do not interrupt the process - If the unit does not power on, check power supply polarity and double-check IC and Arduino pin seating, make sure regulator metal tab does not touch PSU jack or diode!

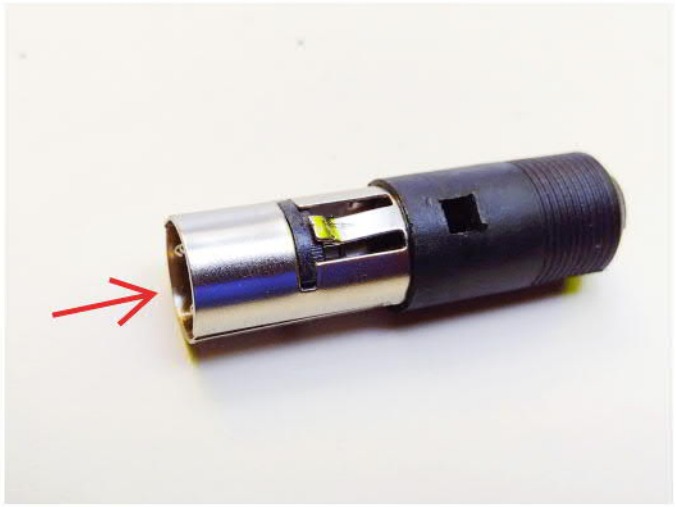
Optional for stability: Melt down all TM1638 mounting pins with aluminium foil, normally the three TM1638 pcb's will stay in their place when the top plate is mounted



Find 9x B2.5X10 screw, mount top plate with PH1 screwdriver
Push top plate into place centered before tightening the first screw

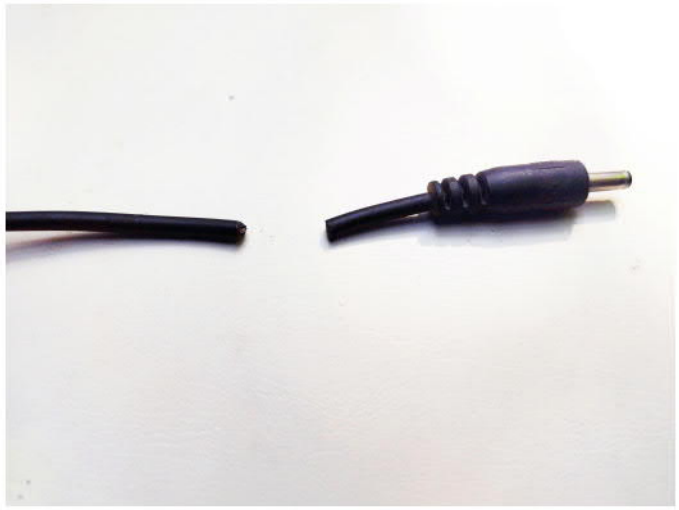
Internal soundcard Midi Out loopback adapter
Find 5 PIN DIN connector, push connector nose and disassemble

Use a clipped off component leg or piece of wire to install the bridge as shown
This routes midi output from Eosequencer back to midi input of the M5 SAM2695 synth, using a pin that is commonly unused for midi connections.



Reassemble the connector, push connector nose upwards again if needed

The 5V power variant can be powered by any old phone charger that delivers atleast 400mA. Also using USB cables or powerbanks is possible
Do not power the 9V variant from 5V - it may behave erratically



Remove original charger connector and connect it to provided barrel plug wit terminals

Since the pcb has a polarity protection diode, just attach the wires and check if it powers up. If not, swap the wire
On a USB power / data cable use only the red and black wires, insulate other wires (white, green etc.)