

How to Build pedalSHIELD UNO

This is a 5 steps guide to build pedalSHIELD UNO. With all the materials on hand it takes around 2-3 hours to build it successfully. Take your time to double-check every step and enjoy!

Step 0 – Prepare the Materials.

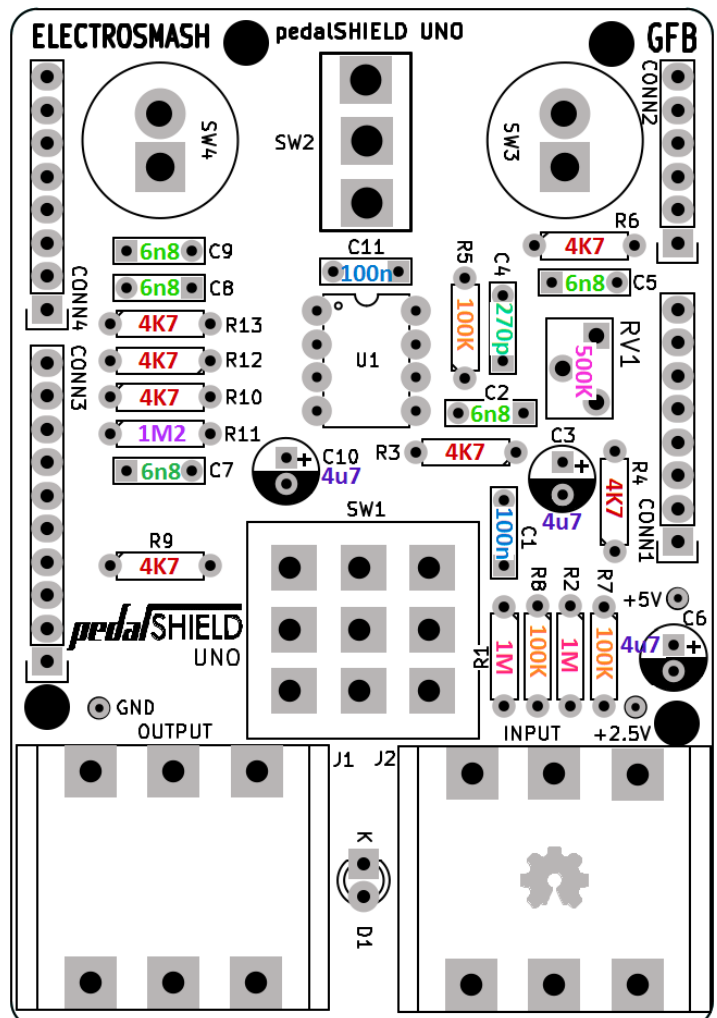
You need a solder iron, lead and cutting pliers. Additionally cutter, scissors and pliers are convenient.

The PCB has solder mask and plated holes, so it is easy to solder with any 15-30W solder iron.



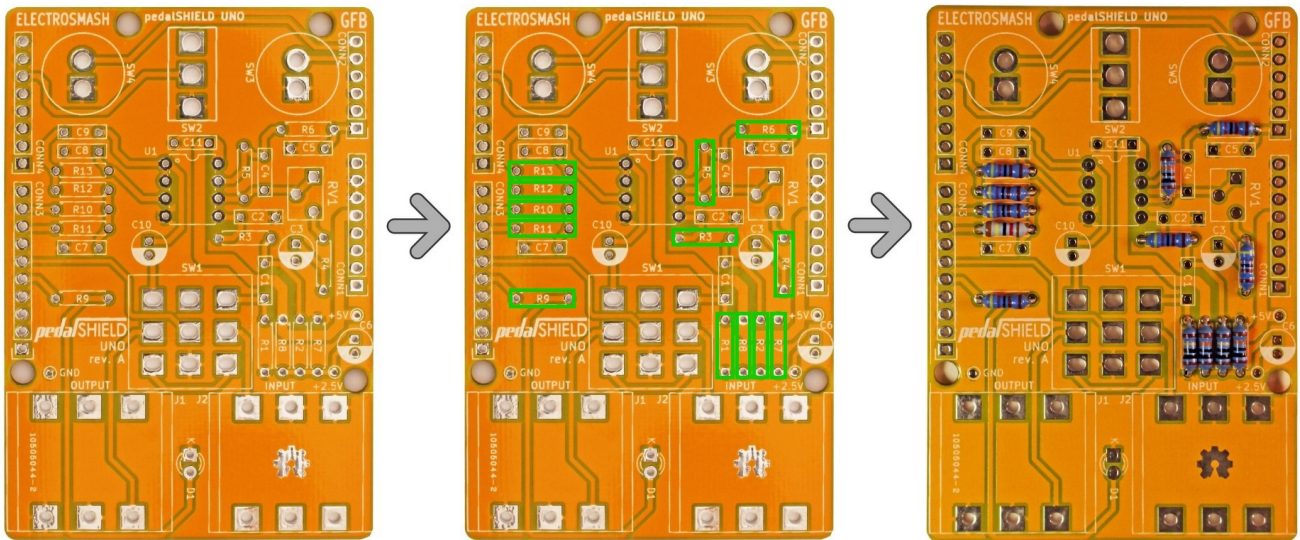
Keep in short hand the PCB plan and the Bill of Materials:

Reference	Qty	Value
Capacitors		
C2, C5, C7, C8, C9	5	6.8n
C3, C6, C10	3	4.7u
C1, C11	2	100n
C4	1	270p
Resistors		
R12, R13, R10, R9, R6, R4, R3	7	4.7K
R5, R7, R8	3	100K
R1, R2	2	1M
R11	1	1M2
Others		
RV1	1	500K
D1	1	Led 3mm blue
U1	1	TL972 pdip-8
socket	1	dip 8 socket
SW1	1	3DPT footswitch
SW2	1	Toggle switch
SW3, SW4	2	Pushbutton
Conn1,2,3,4	1	40 pin header
J1, J2	2	1/4 Jack audio



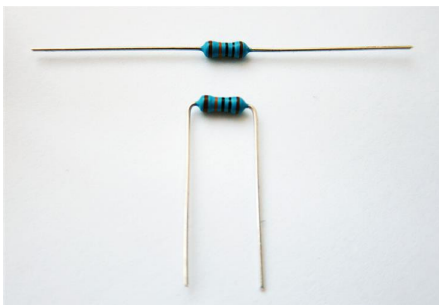
Step 1 – Soldering Resistors.

There are 13 resistors to be placed:



- Solder the 4.7K Ω resistors (7 units): R3, R4, R6, R9, R10, R12, R13.
- Solder the 100K Ω resistors (3 units): R5, R7, R8.
- Solder the 1M resistors (2 units): R1, R2.
- Solder the 1.2M resistor: R11.

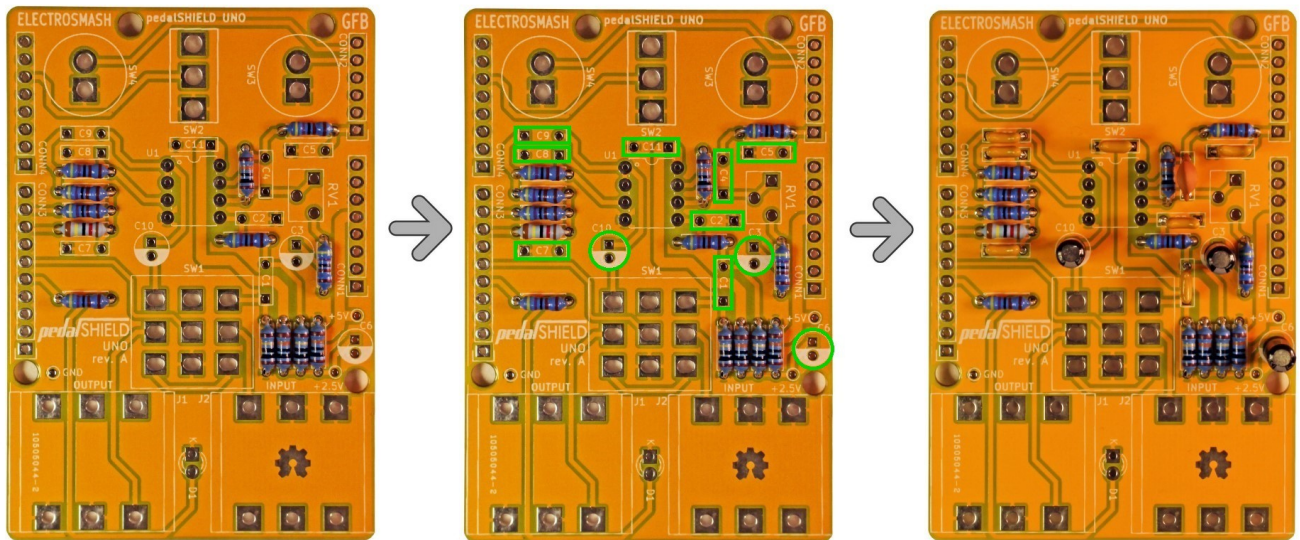
tips:



- In order to solder the components, bend the leads close to the body, introduce them in the footprint and once soldered cut the excess of lead as short as possible to avoid short circuits. There is a [nice video on Youtube](#) to learn how to solder from scratch.

Step 2 – Soldering the Capacitors.

There are 8 film/ceramic and 3 electrolytic caps.



- Solder the 6.8nF capacitors (5 units): C2, C5, C7, C8, C9.
- Solder the 4.7uF capacitors (3 units): C3, C6, C10.
- Solder the 100nF capacitors (2 units): C1, C11.
- Solder the 270pF capacitor: C4.

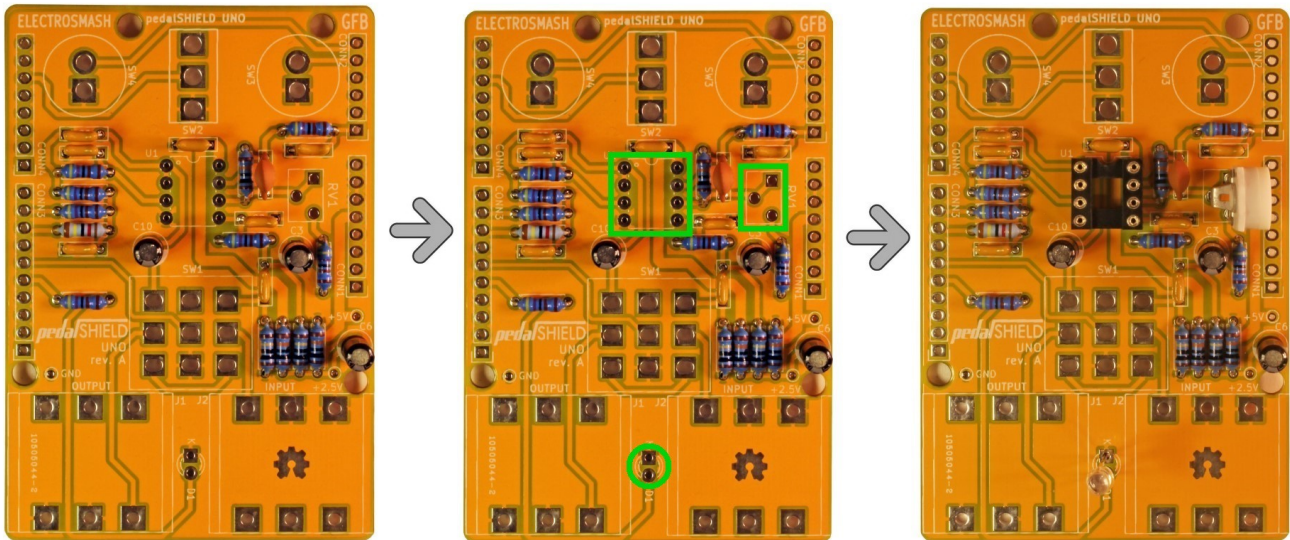
tips:

- Be careful with the electrolytic caps polarity, the negative lead (the short one) has to be placed in the round hole with the white semicircular paint. The positive hole is always square-shaped (zoom the above image to be sure).



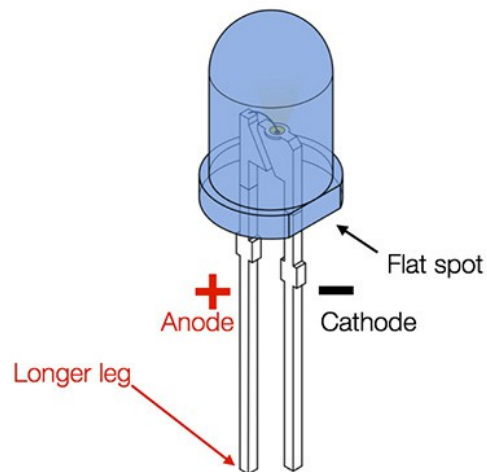
Step 3 – Medium Size Components.

The last components to be placed are the dip sockets, resistor trimmer, and led:



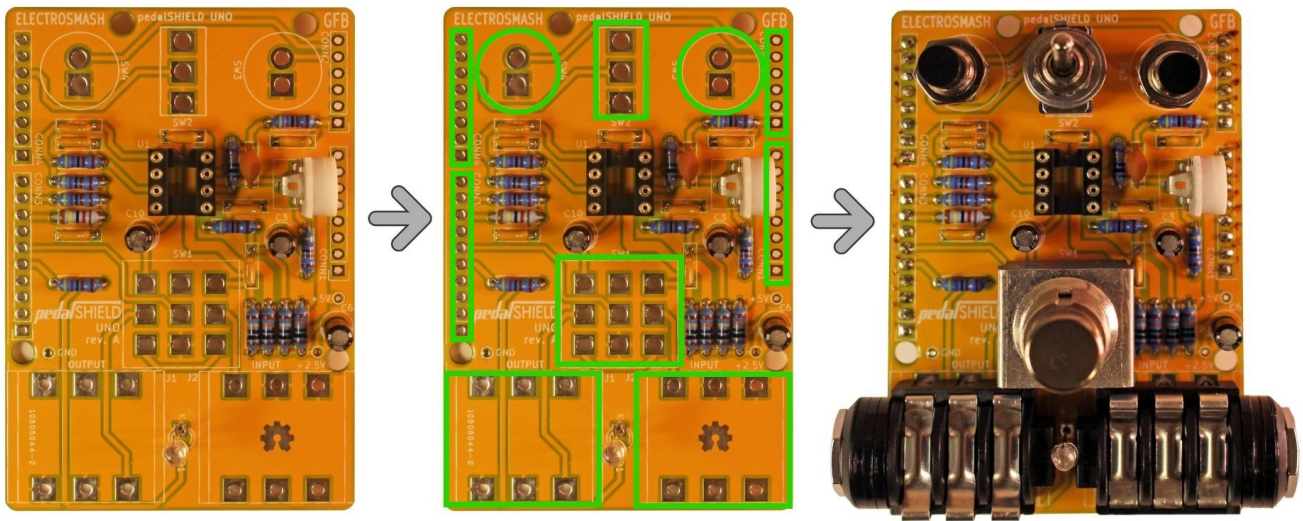
tips:

Take care with the LED D1 soldering: present the plastic cover to size the length of the leads. The short lead (cathode) it is marked with a “K” on the PCB and goes to the flat side of the diode mark.



Step 4 – Soldering the Big Components.

The last components to be placed are the push-buttons (2), toggle switch (1), 3PDT Foot-switch (1) and jack connectors (2) and the pin stripes:

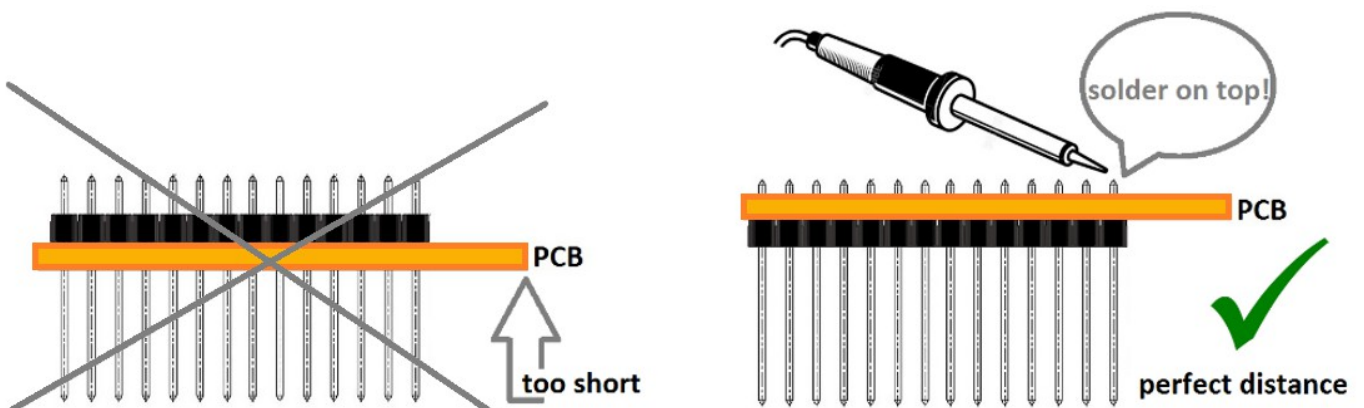


tips:

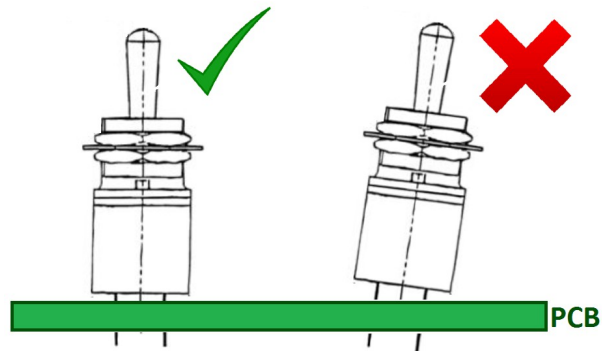


The 40 pin stripe has to be cut in 4 segments of 6 pins, 8 pins, 8 pins and 10 pins each.

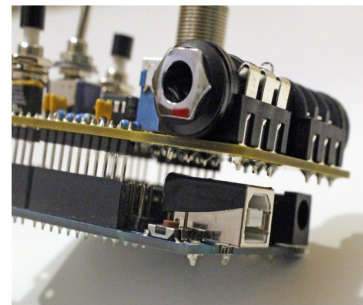
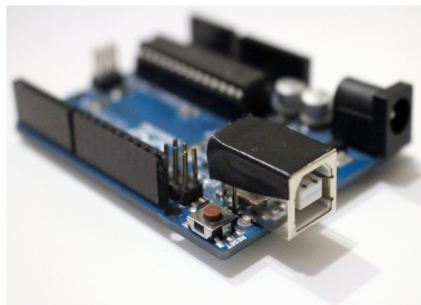
You can use a cutter to carve a groove and then just bend it carefully to break it. Wire-cutters also work fine.



- Big components tent to tilt when solder, make sure they are straight. I usually solder one pin and once I am 100% sure that it's perpendicular I solder the rest of the pins. It would be good to check their positioning against the acrylic cover:

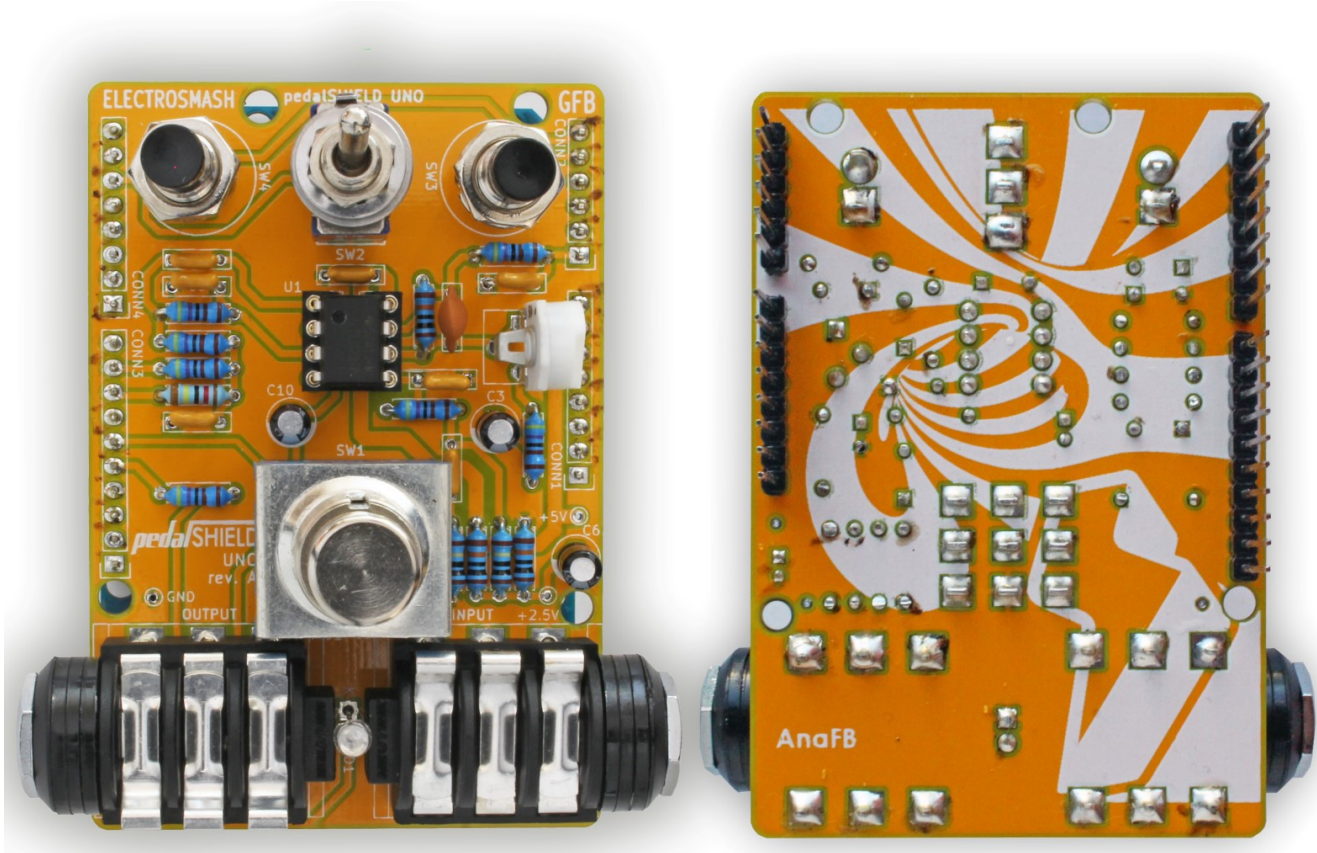


- The USB connector is too close to the output jack, to avoid short circuits isolate the USB jack with some duck tape:



Step 5 – Checking Out the Job Done.

After these 5 stages you will have a finished board exactly like the one shown below:



Double check your PCB with the model component by component.

Before power it up, check this 3 ticks:

- ✓1. Visual inspection of the PCB bottom, there is no short circuits or long uncut leads.
- ✓2. The polarized components are placed correctly: the diode and electrolytic caps.
- ✓3. The op-amp is placed right (not upside down).

If you need more help there is a topic in the forum called [Guide to troubleshoot pedalSHIELD UNO](#).



Finally the plastic cover can be placed, it is kept in place by the foot-switch nut and plastic washer, simple and neat.