

How to Build pedalSHIELD

This is a 5 steps guide to build pedalSHIELD. With all the materials on hand it takes around 2 hours to build it successfully.

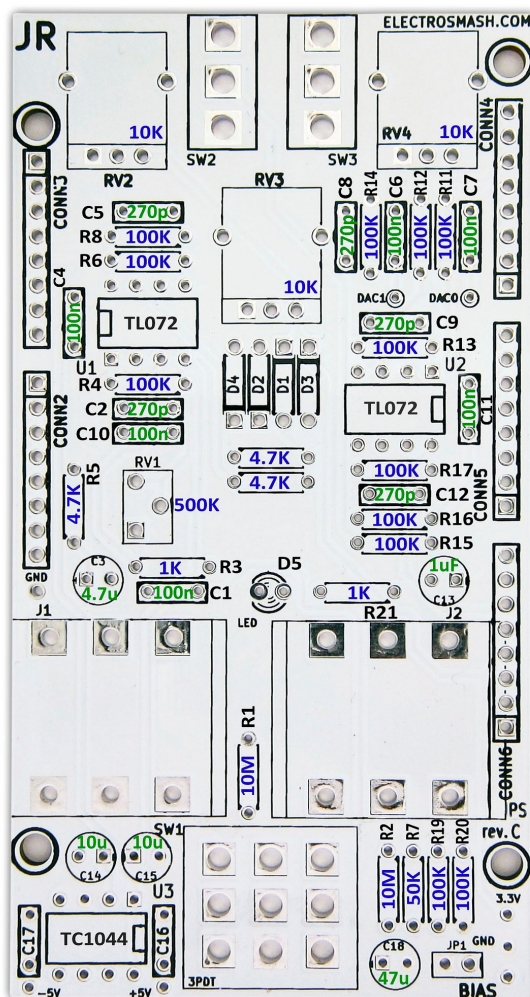
Step 1 – Prepare the Materials.



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 very easy to solder with any 15-30W cheap solder iron.

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



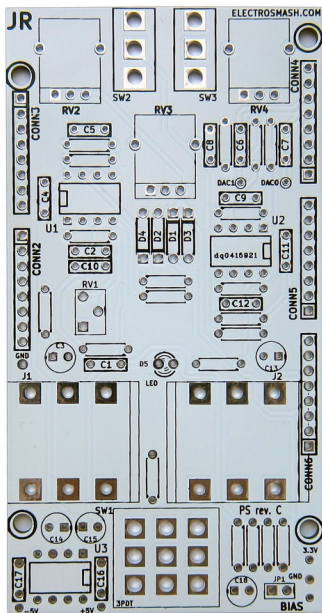
pedalSHIELD Bill of Materials

Value	Qty	References
Capacitors		
270p	5	C2 C5 C8 C9 C12
0.1u	6	C1 C4 C6 C7 C10 C11
1u	1	C13
4.7u	1	C3
10u	2	C14 C15
47uF	1	C18
Resistors		
1K	2	R3 R21
4.7K	3	R5 R9 R10
50K	1	R7
100K	12	R4 R6 R8 R11 R12 R13 R14 R15 R16 R17 R19 R20
10M	2	R1 R2
500K	1	RV1
10K	3	RV2 RV3 RV4
Plastic Knobs	3	RV2, RV3, RV4
Others		
1N5817	4	D1 D2 D3 D4
LED	1	D5
SWITCH_3PDT	1	SW1
SWITCH_INV	2	SW2 SW3
Connectors		
CONN_8pins	5	CONN2 CONN3 CONN4 CONN5 CONN6
JACKS	2	J1, J2
IC's		
TL072	2	U1 U2
TC1044	1	U3
8PIN SOCKETS	3	U1, U2, U3

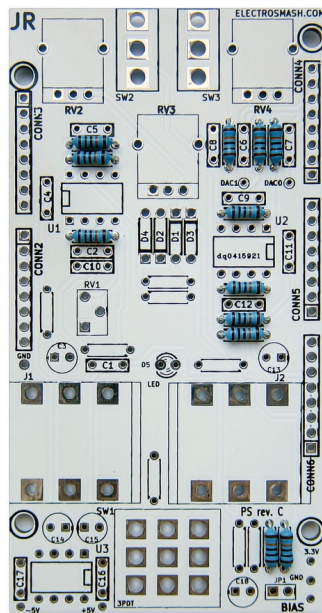
Step 2 – Soldering Resistors and Diodes.

There are 19 resistors and 4 diodes to be placed.

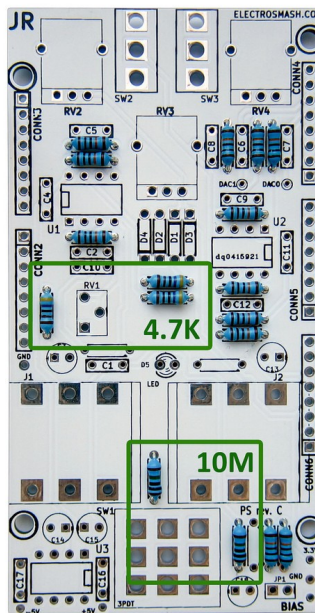
Blank PCB



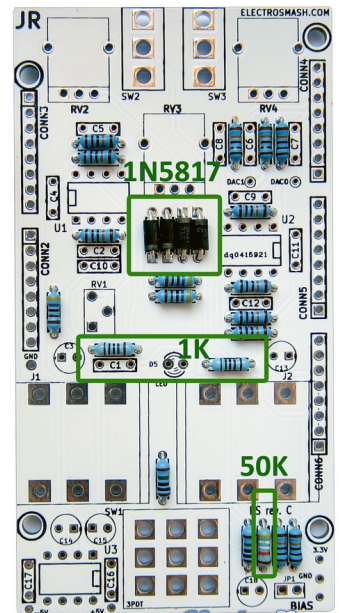
2.a



2.b



2.c

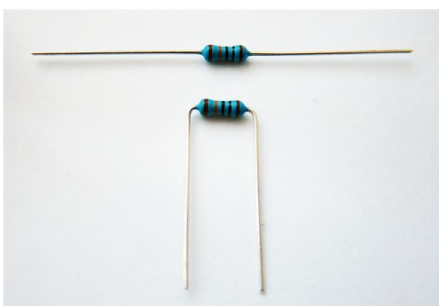


ElectroSmash

- 2.a Solder the 100KΩ resistors (12 units)
- 2.b Solder the 4.7KΩ res. (3 units) and the 10MΩ res. (2 units)
- 2.c Solder the 15817 diodes (4 units), the 1KΩ res. (2 units) and the 50KΩ res. (1 unit)

tips:

- In the step 3.a pay attention to the diodes polarity, there is a line indicating the correct position. They get hot very fast when soldering, so try to do it carefully and wait between each solder point.

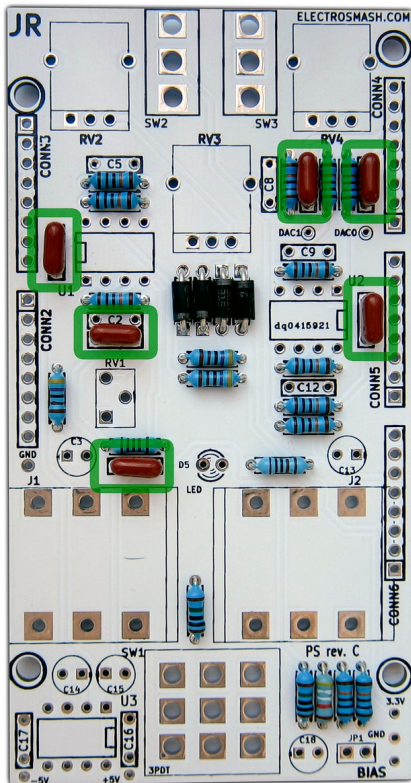


- In order to solder the components, bend the leads, introduce them in the footprint and once soldered cut the excess of lead as short as possible to avoid short circuits.

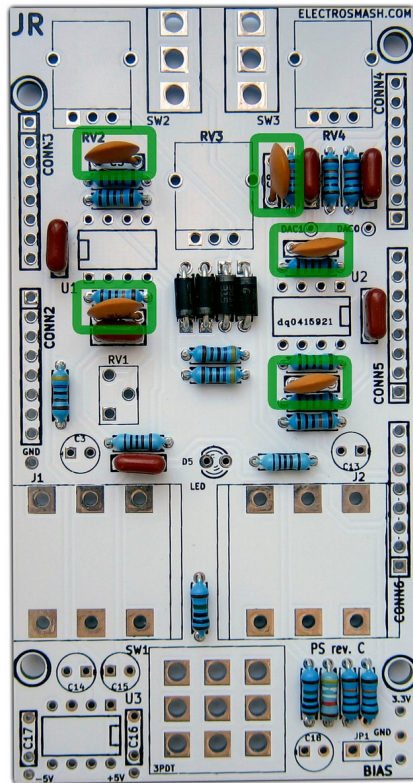
Step 3 – Soldering the Capacitors.

There are 11 film/ceramic and 5 electrolytic caps.

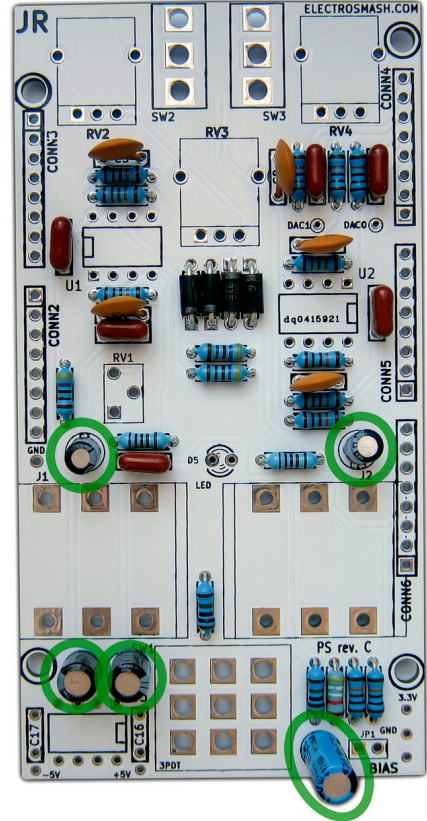
3.a



3.b



3.c



ElectroSmash

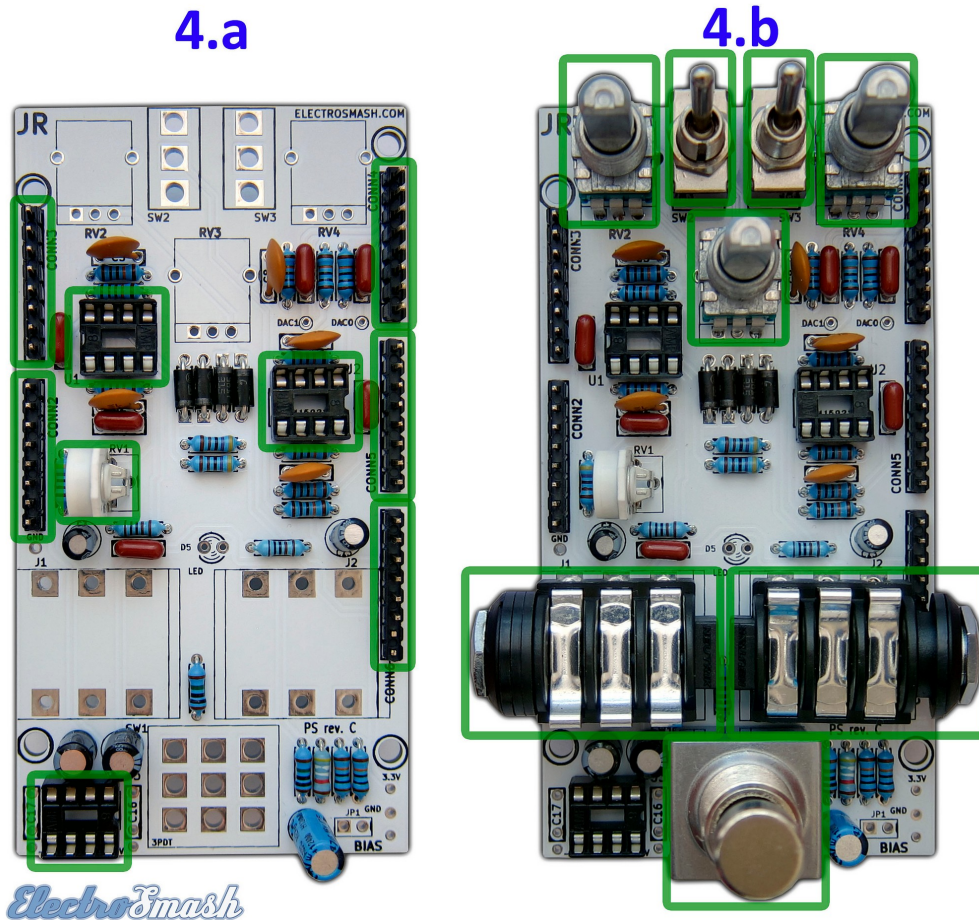
- 3.a Solder the 100nF capacitors (6 units)
- 3.b Solder the 270pF capacitors (5 units)
- 3.c Solder the electrolytic capacitors 4.7uF, 1uF, 10uF (2 units) and 47uF.

tips:

- Be careful with the electrolytic caps polarity, the negative lead (the short one) has to be placed in the round hole. The positive hole is always square-shaped and it is marked with a + symbol.
- The Capacitors C16, C17 and the jumper JP1 are optional and do not need to be mounted.

Step 4 – Soldering the Big Components.

The last components to be placed are the dip sockets (3), connectors (5), trimmer, potentiometers (3), switches (2), jacks (2) and the footswitch:



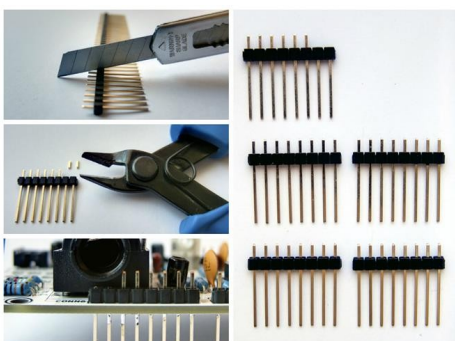
- 4.a Solder the 8pin sockets (3 units), the trimmer res. and the 8pins connectors (5 units)
- 4.b Solder the potentiometers (3 units), switches (2 units), jacks (2 units) and footswitch.

When soldering the potentiometers and switches it would be good to check their positioning against the plastic cover. The cover will fit better if the cover its aligned.

The LED D5 is the last component to be soldered. Place the plastic cover to size the length of the leads. The short lead (cathode) goes to the flat side of the diode mark.

tips:

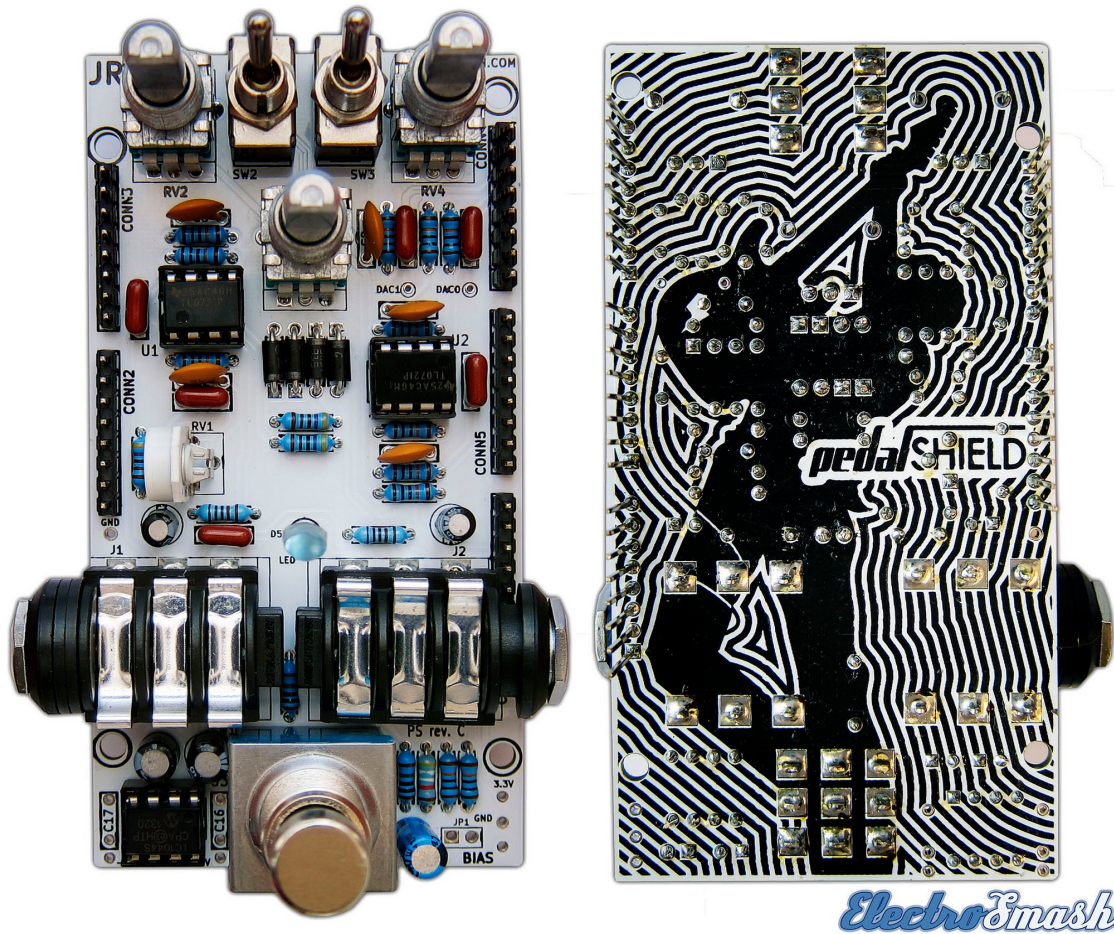
- Be careful soldering the big components perpendicularly because they tend to be slightly tilted.



- The 40 pin stripe has to be cut in 5 segments of 8 pins each. You can use a cutter to carve a groove every 8 pins and then just bend it carefully to break it. One of the segments needs to be cut like the side photo to avoid collision with the output jack.

Step 5 – Checking Out the Job Done.

After this 5 stages you will have a mounted board exactly like the one shown below:



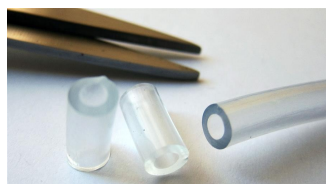
Double check your PCB with the model component by component.

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: diodes and electrolytic caps.
- ☑ 3. The ICs are not swapped or wrongly placed.



Finally the plastic cover can be installed together with 4 screws + nuts. Optionally a plastic spacer can be cut to separate the boards and reduce the mechanic stress.



The plastic knobs and the shaft+nut for the footswitch are the last parts to be mounted.