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ETERNAL SPRING FILTER - Assembly Guide

snazzyfx.com

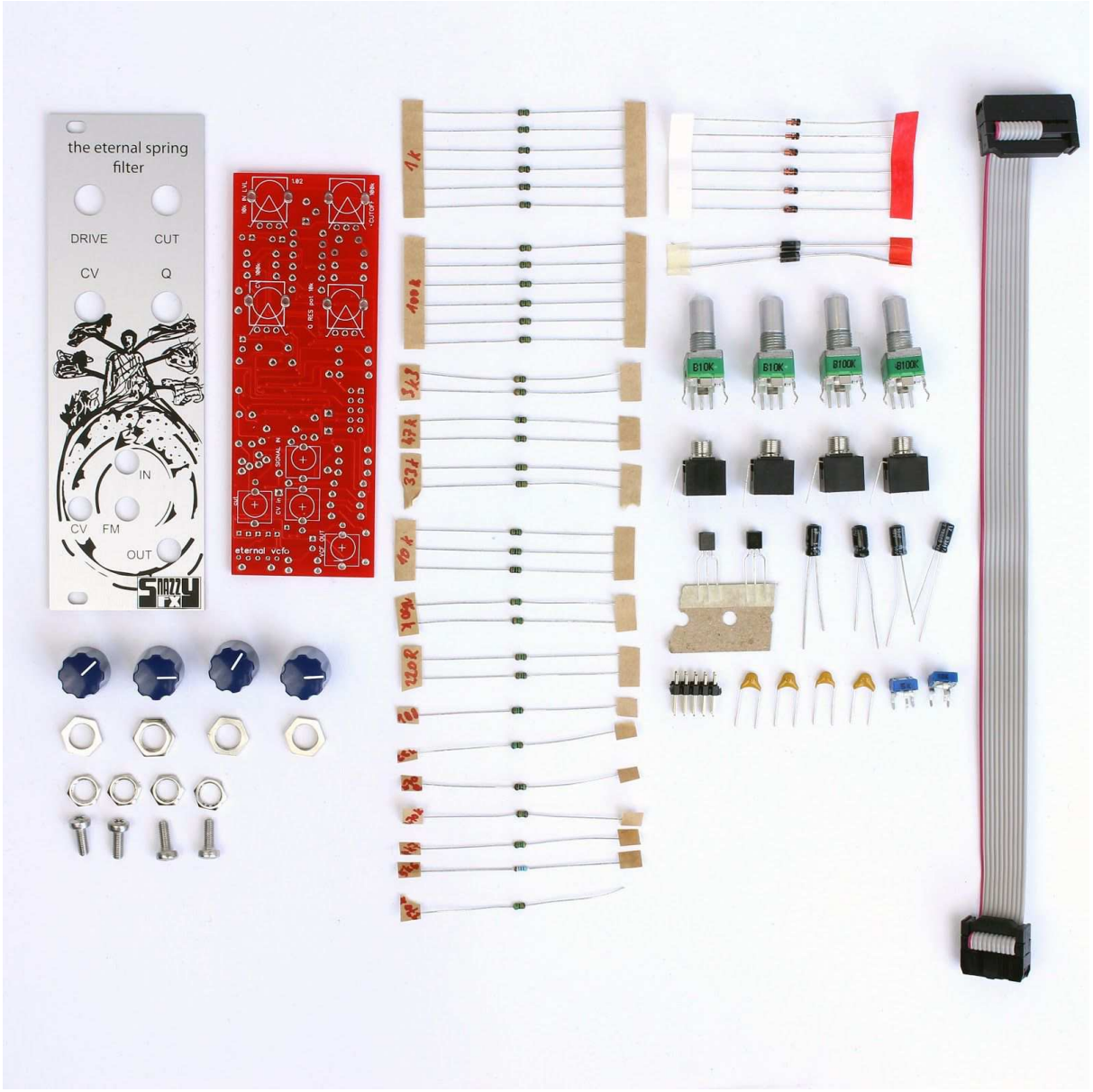
INTRODUCTION

This guide is for building **ETERNAL SPRING** module by **SNAZZY FX**. It is good to have basic soldering skills and to be able to identify electronic components before starting this kit. However if you have never soldered before, check out this tutorial first[1]. We even included some of the best quality solder to help you solder everything faster and better.

This kit consists of just one printed circuit board (PCB). See the Bill of Materials (BOM) for detailed list of all components.

[1] https://cdn-learn.adafruit.com/downloads/pdf/adafruit-guide-excellent-soldering.pdf

BILL OF MATERIALS



ETERNAL SPRING - BILL OF MATERIALS		
qty	**value**	**part**
	SOLDERING	
1	100R	R-EU_0204/5
2	220R	R-EU_0204/5
1	470R	R-EU_0204/5
6	1k	R-EU_0204/5
2	3k3	R-EU_0204/5
1	4k7	R-EU_0204/5
1	5k6	R-EU_0204/5
3	10k	R-EU_0204/5
2	33k	R-EU_0204/5
2	47k	R-EU_0204/5
1	68k	R-EU_0204/5
6	100k	R-EU_0204/5
2	150k	R-EU_0204/5
1	270k	R-EU_0204/5
1	470k	R-EU_0204/5
2	1N4007	DIODE-D-7.5
6	1N4148	small signal diode
1	100p	ceramic capacitor
2	470p	ceramic capacitor
1	1n	ceramic capacitor
2	CE 1uF	electrolytic capacitor
2	CE 10uF	electrolytic capacitor
2	2N3906	PNP, BULK
2	TL72 smd	IC (presoldered)
1	LM13700 smd	IC (presoldered)
2	B10k	linear potentiometer – metal
2	B100k	linear potentiometer – metal
1	trimmer 50k	trimmer
1	trimmer 5k	trimmer
4	3,5mm thonkiconn jack	thonkiconn jack
1	2x5pin	Double male pinheader
	ASSEMBLY	
4		panel screw / w washers
4		big nut pots
4		nut jack
4	davies blue	knob
1	ETERNAL SPRING	PCB
1	ETERNAL SPRING	front panel

Before starting this kit, prepare the following tools:

- Soldering iron
- Multi-meter
- Flush cutters
- Phillips screwdriver
- Flat screwdriver
- Wrench No. 8
- Protective eyewear

We suggest that you work in a clean, well lit and ventilated environment to avoid accidents or losing any of the small components.

Also briefly go through this guide and make sure that you understand all the steps.

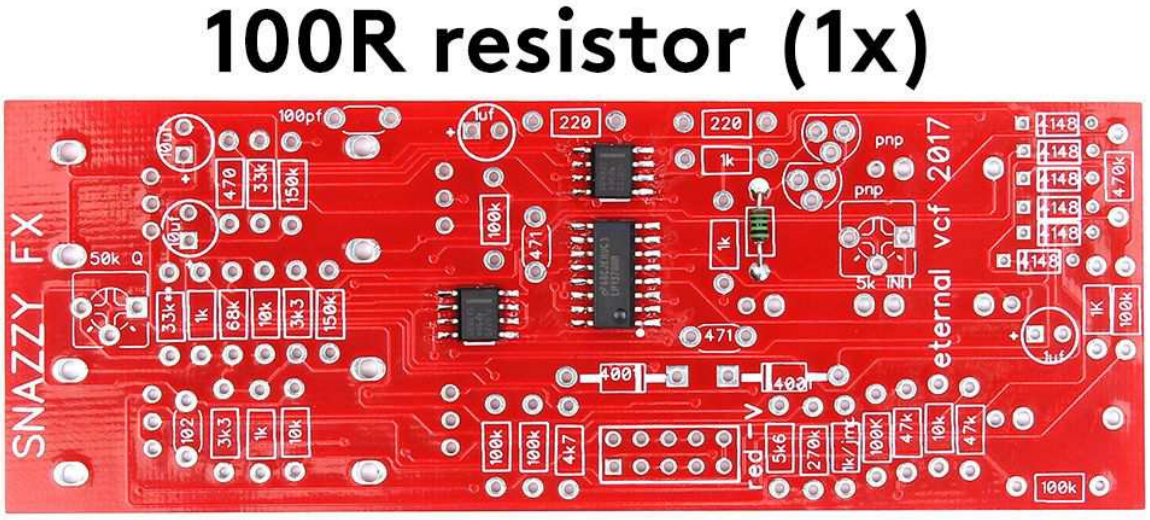
SOLDERING

Eternal Spring is completely through-hole thing except three SMD ICs that comes already pre-soldered on the PCB.

Before you start soldering, take your time and find all the **resistors values** using a multimeter[2] (or you can check the color codes if you are seasoned enough).

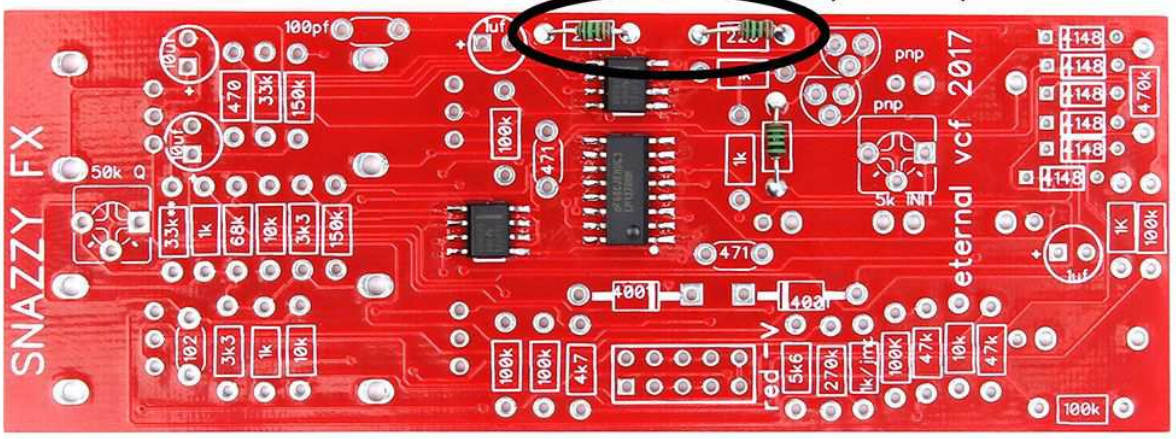
RESISTORS

There are thirty two **resistors** of different values (1x **100R**, 2x **220R**, 1x **470R**, 6x **1k**, 2x **3k3**, 1x **4k7**, 1x **5k6**, 3x **10k**, 2x **33k**, 2x **47k**, 1x **68k**, 6x **100k**, 2x **150k**, 1x **270k**, 1x **470k**). Be careful to insert these **resistors** on the right place (rectangular with appropriate value) and solder them. Then snip the overhanging leads (be sure to make this step on all remaining leads in the course of this guide).

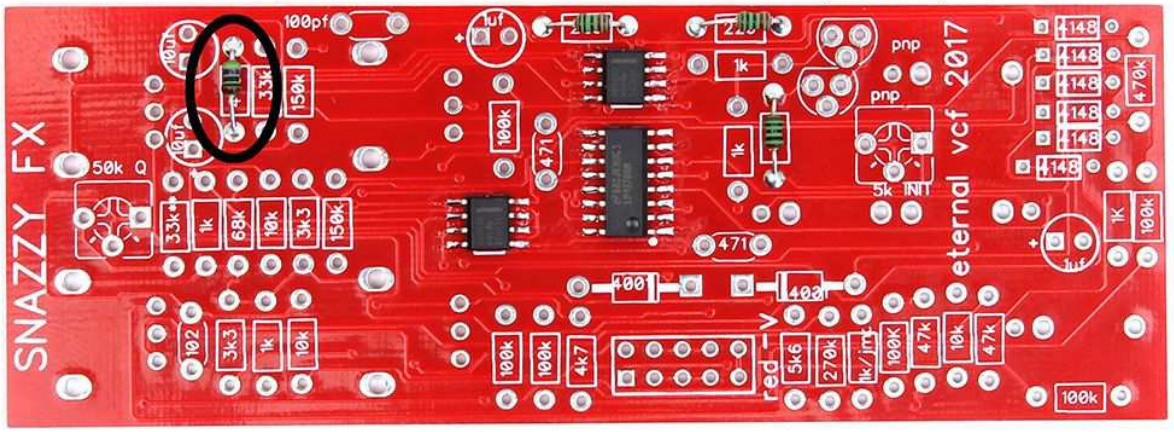


[2] https://learn.sparkfun.com/tutorials/how-to-use-a-multimeter/measuring-resistance

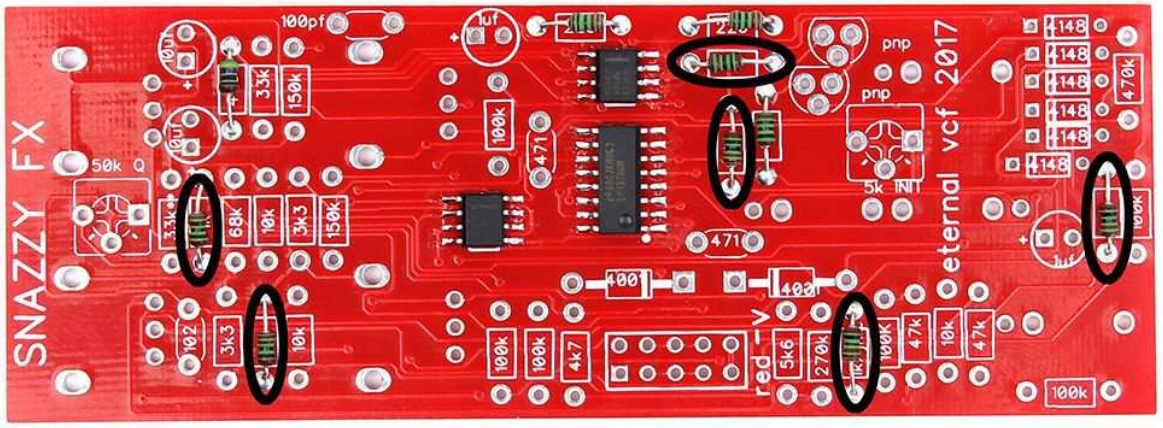
220R resistors (2x)



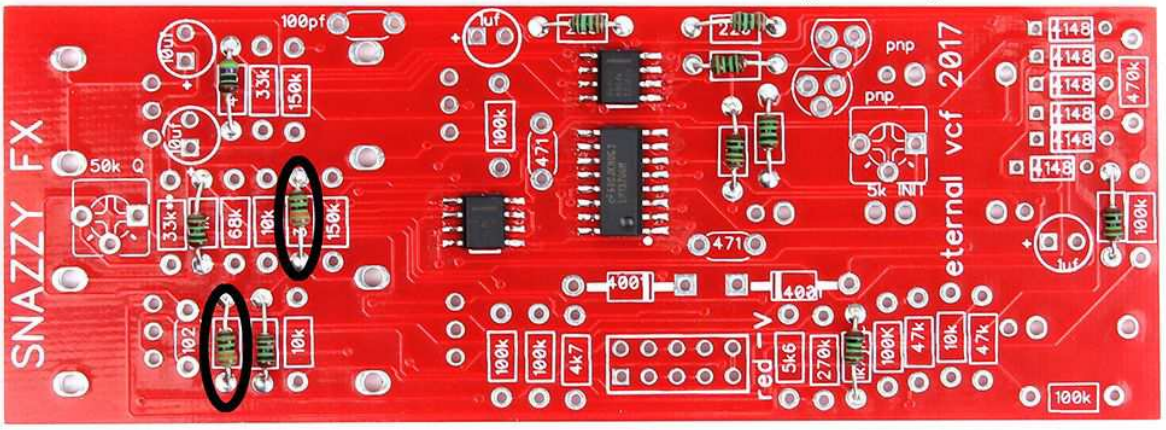
470R resistor (1x)



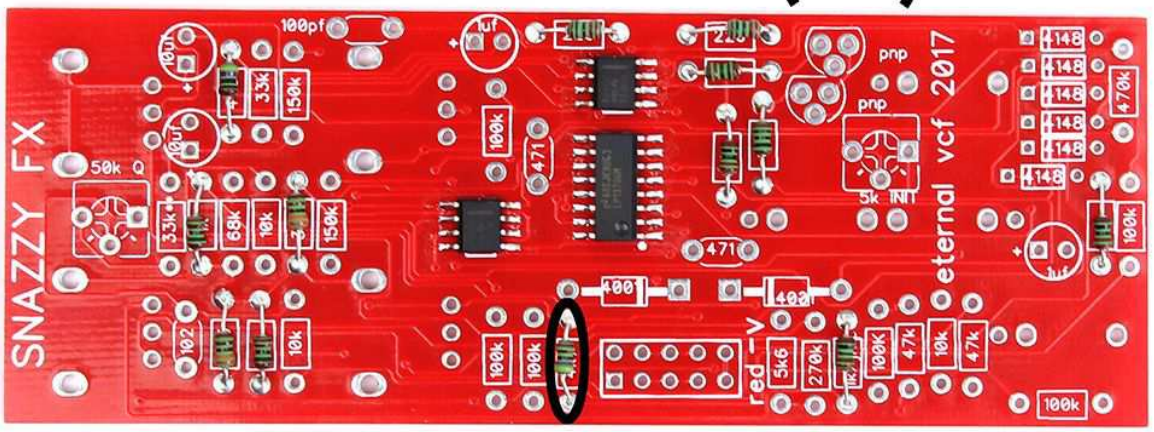
1k resistors (6x)



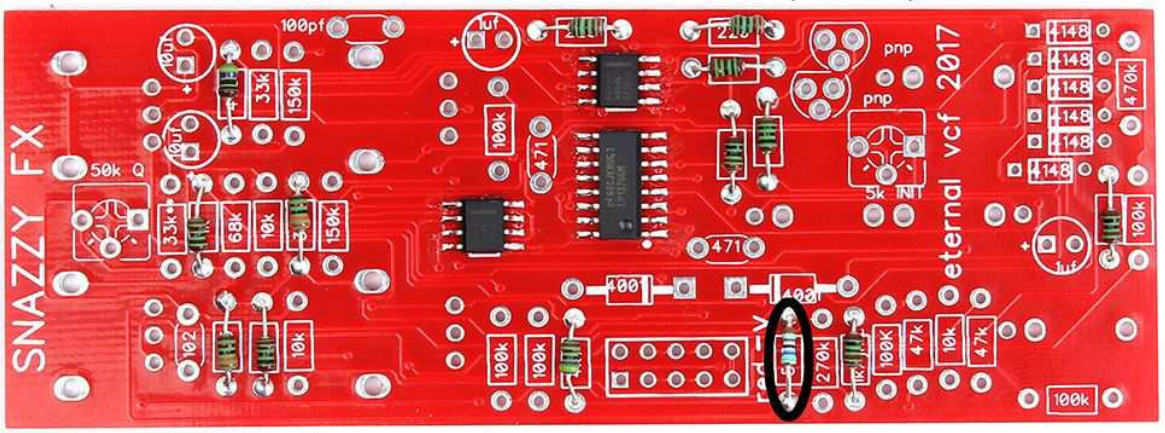
3k3 resistors (2x)



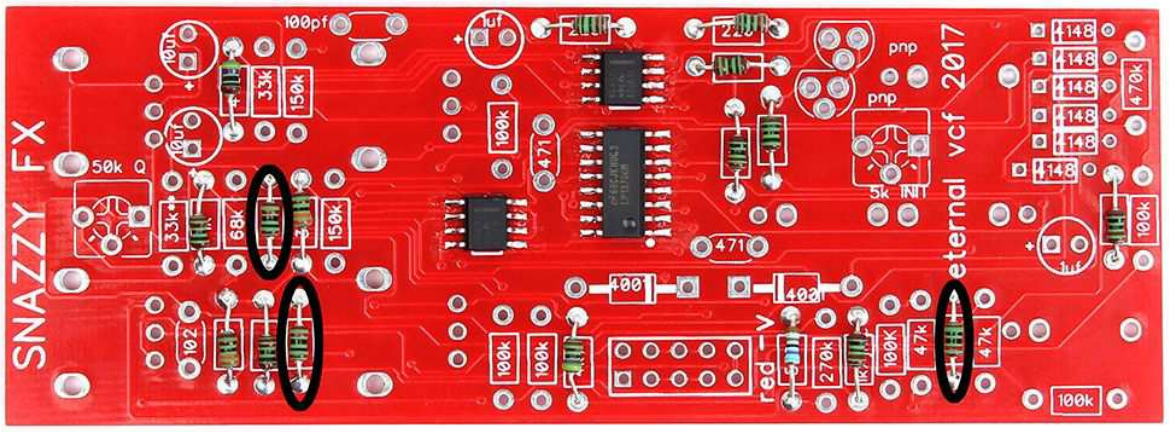
4k7 resistor (1x)



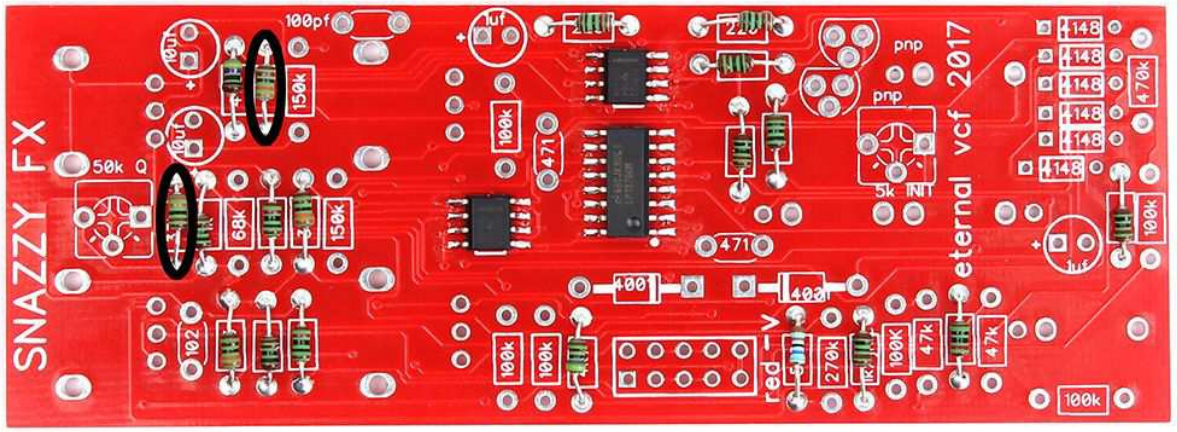
5k6 resistor (1x)



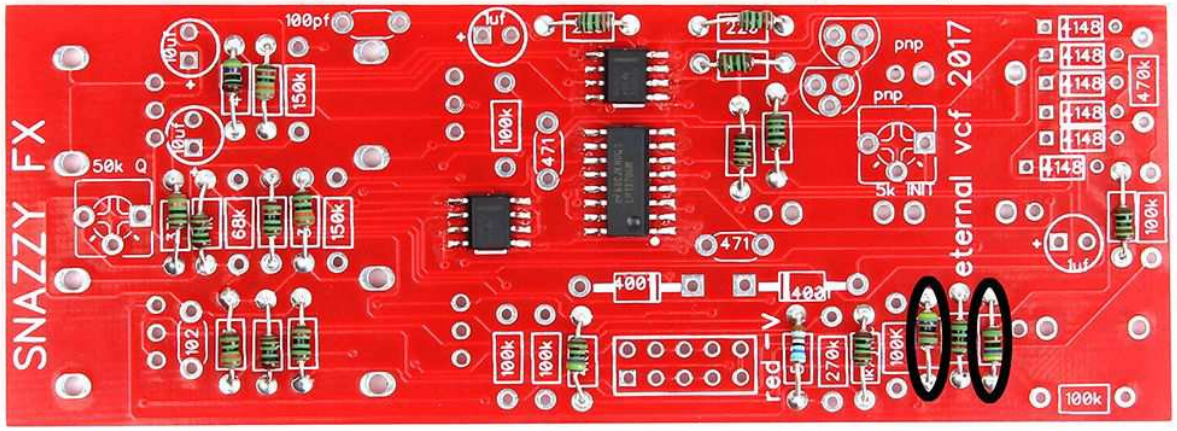
10k resistors (3x)



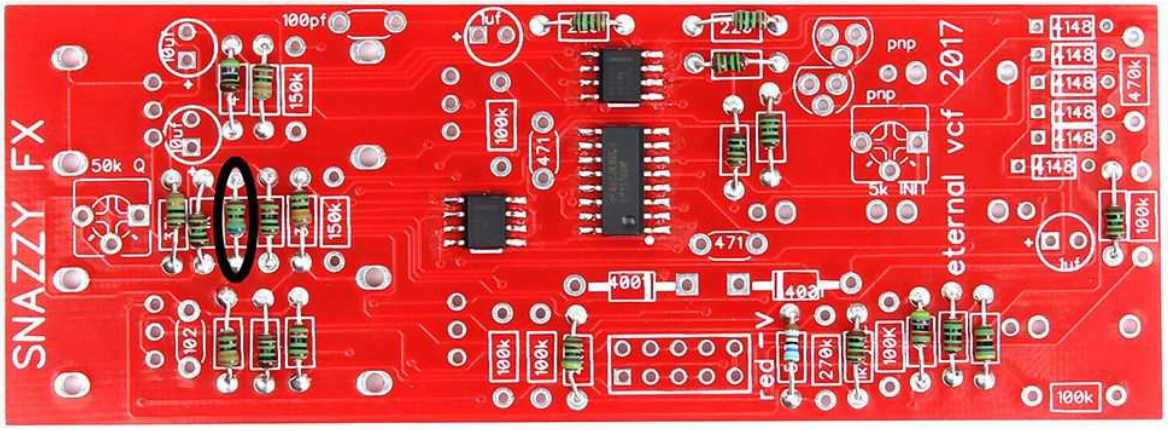
33k resistors (2x)



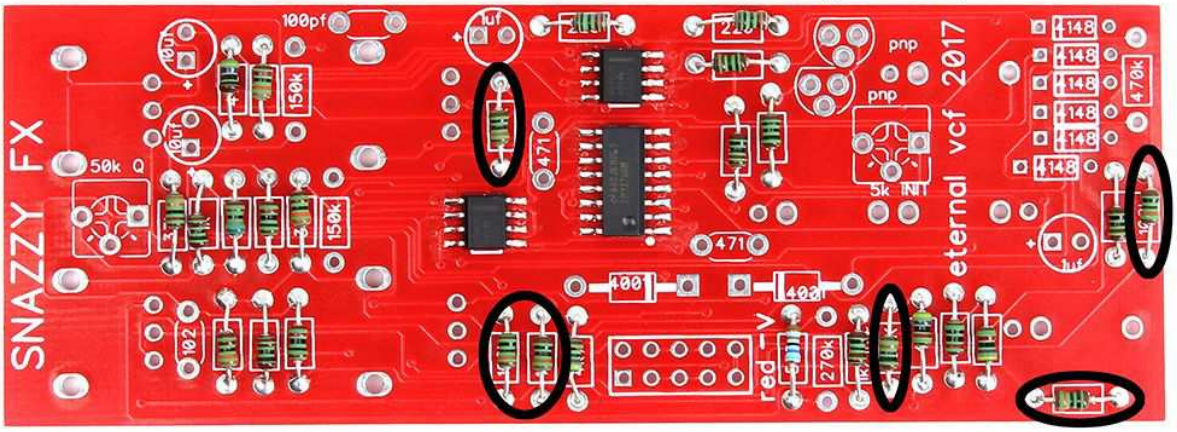
47k resistors (2x)



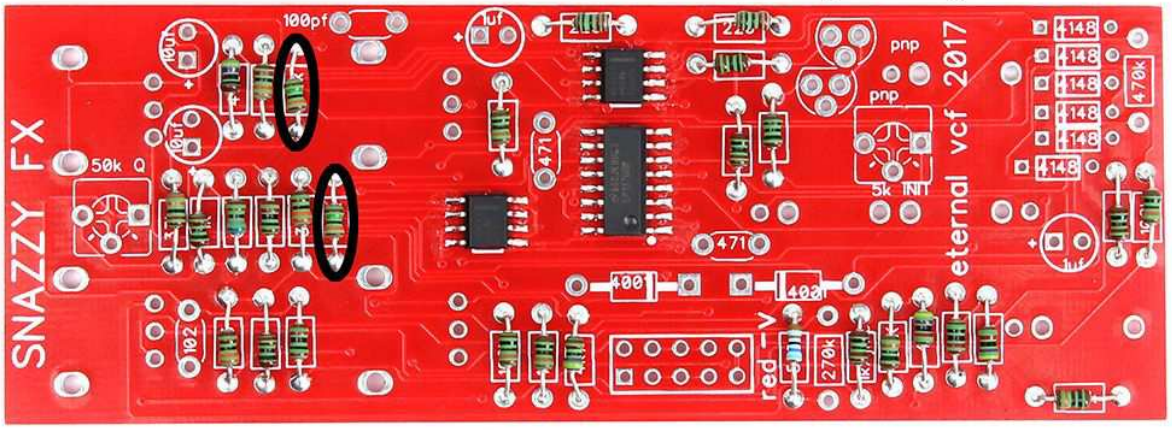
68k resistor (1x)



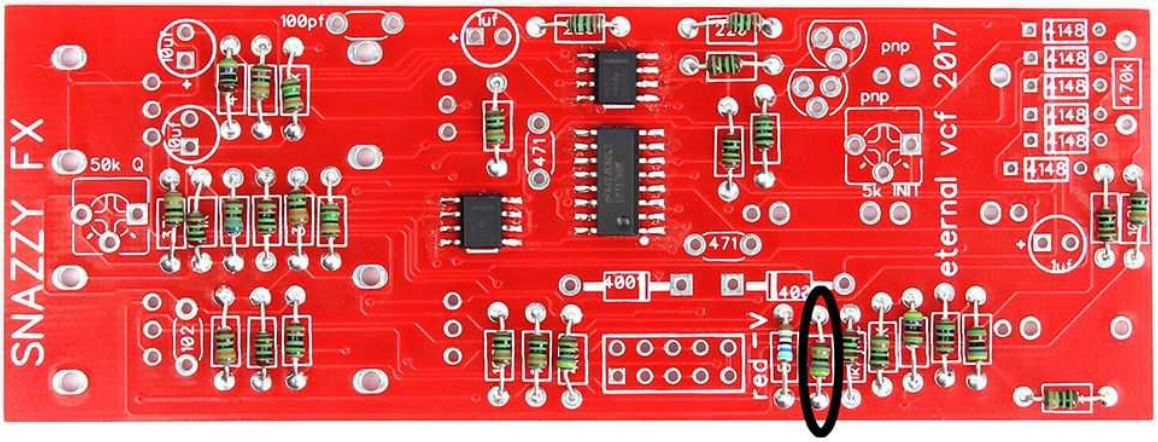
100k resistors (6x)



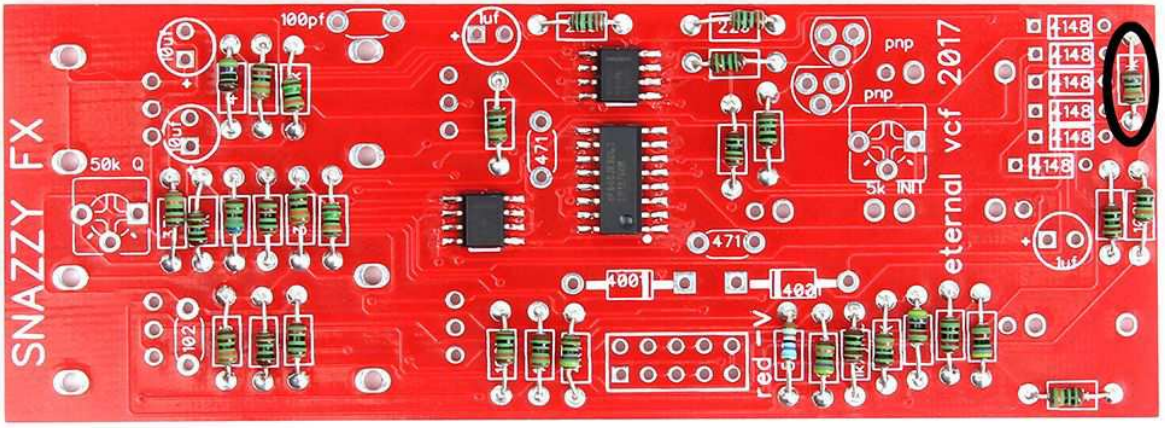
150k resistors (2x)



270k resistor (1x)

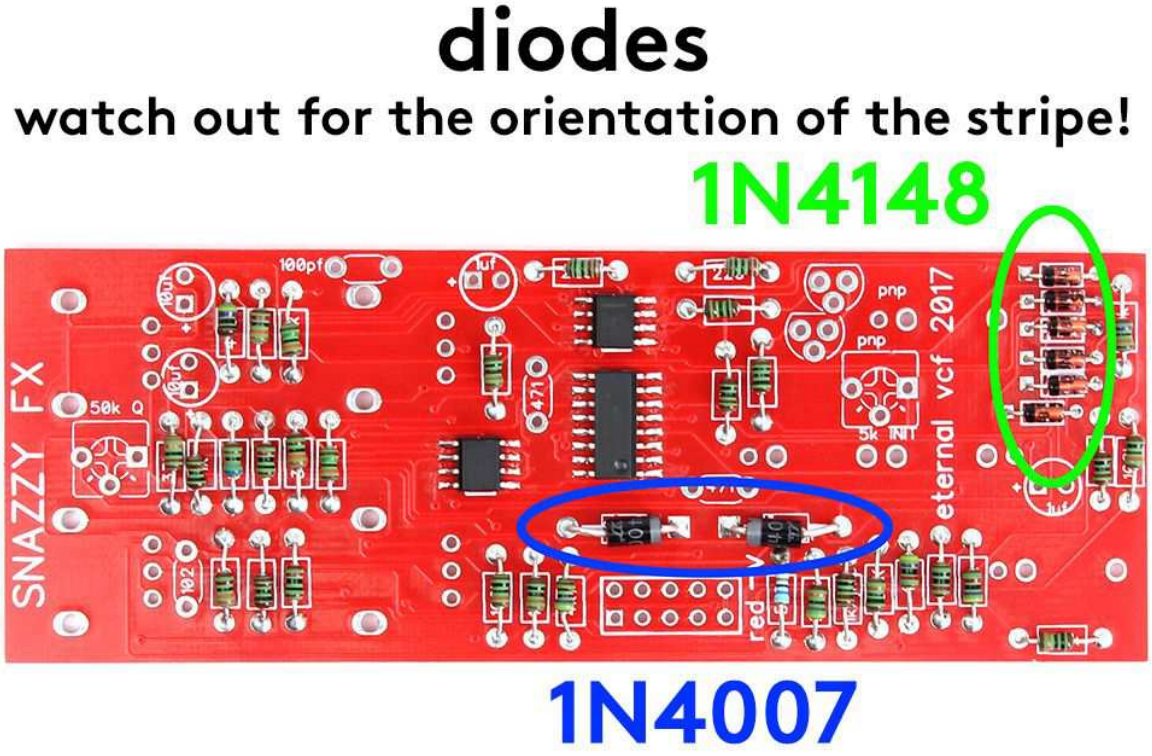


470k resistor (1x)



DIODES

After that solder the **diodes:** 6x **1N4148**, 2x **1N4007**. Place the latter ones in "4001" rectangular. **Be careful, diodes are polarized!** Make sure that the stripe on the diode body matches the stripe on the PCB. Check the photo below.

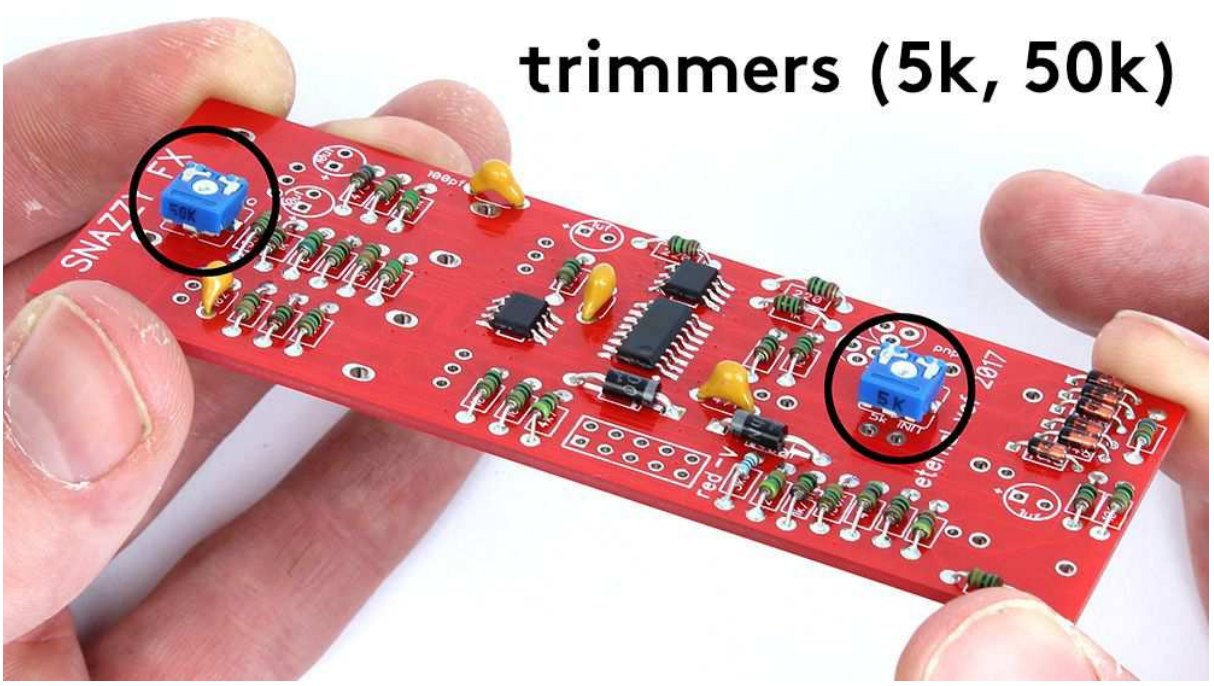


CERAMIC CAPACITORS

Now you can add the **ceramic capacitors**. There is one **100pF** (marked "101" on itself and by the value on the PCB), two **470pF** (marked “471” on itself and on the PCB) and one **1nF** (marked "102" on itself and on the PCB).

TRIMMERS

Let's solder the two **trimmers** of different values: **50k** and **5k**. Just be careful to put them in the right place.



TRANSISTORS

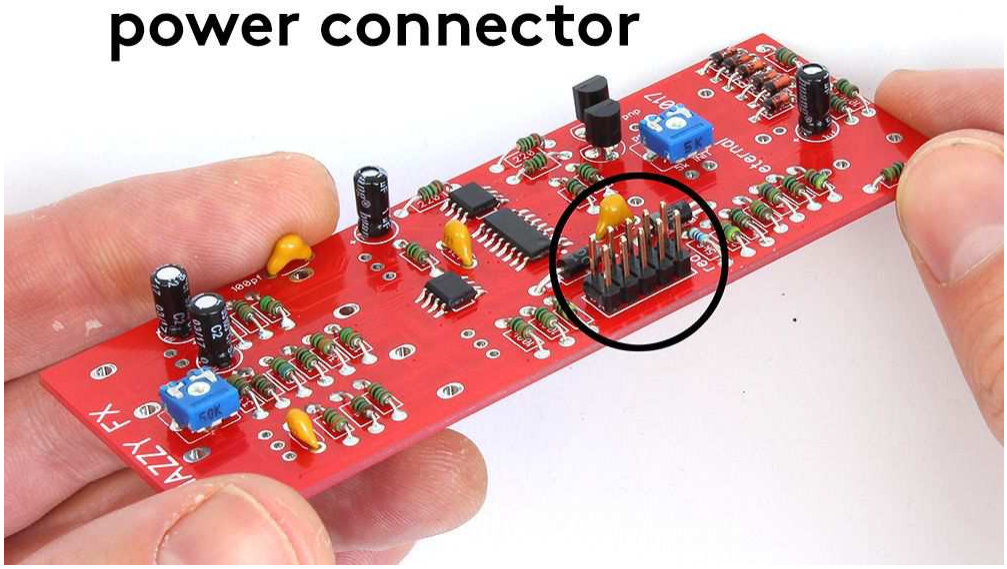
Solder also the two **2N3906 transistors**. The **flat side** has to match with the printing on the PCB.

ELECTROLYTIC CAPACITOR

It is time to add the four **electrolytic capacitors** (2x **1µF,** 2x **10µF**). These ones are **polarized!** There is a plus (+) sign on the PCB that should match the longer lead of the electrolytic capacitor (actually the minus (–) side is also marked on the body of the capacitor with a white strip).

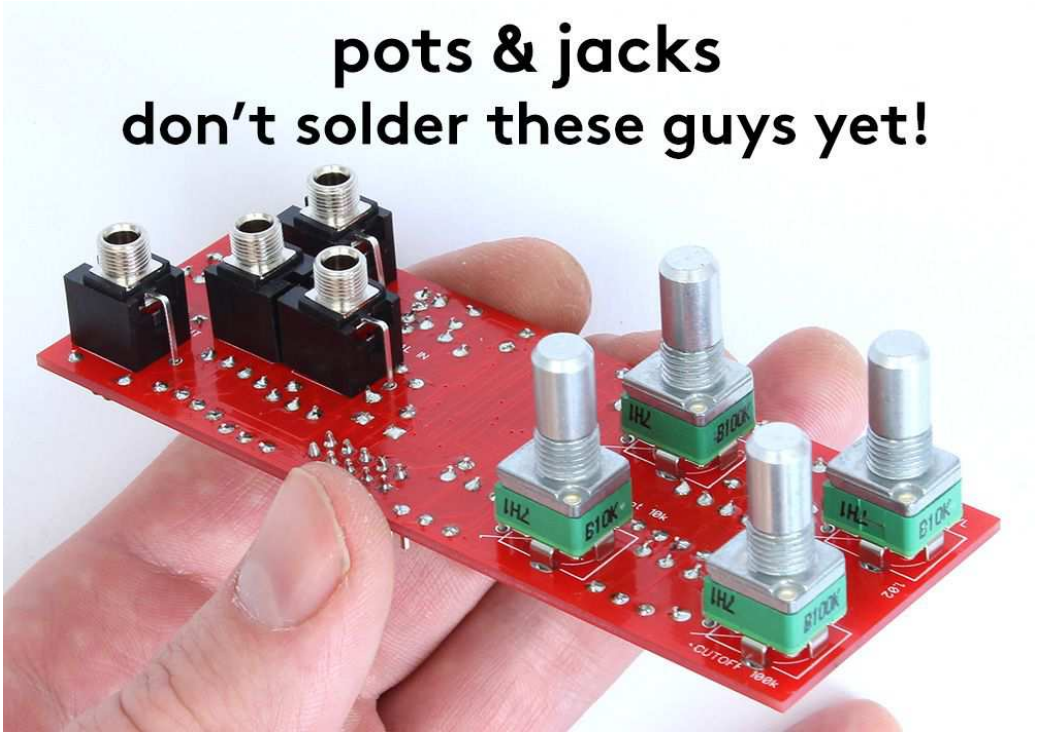
POWER CONNECTOR

Solder the **male pinheader** now. Be careful to solder it straight. You may first solder just one of the pin, take the board in your hand and re-heat that pin while pressing down on the header to align it (be careful, you don't want to touch the pin you are heating up). Wait for it to cool and solder the rest of the pins.

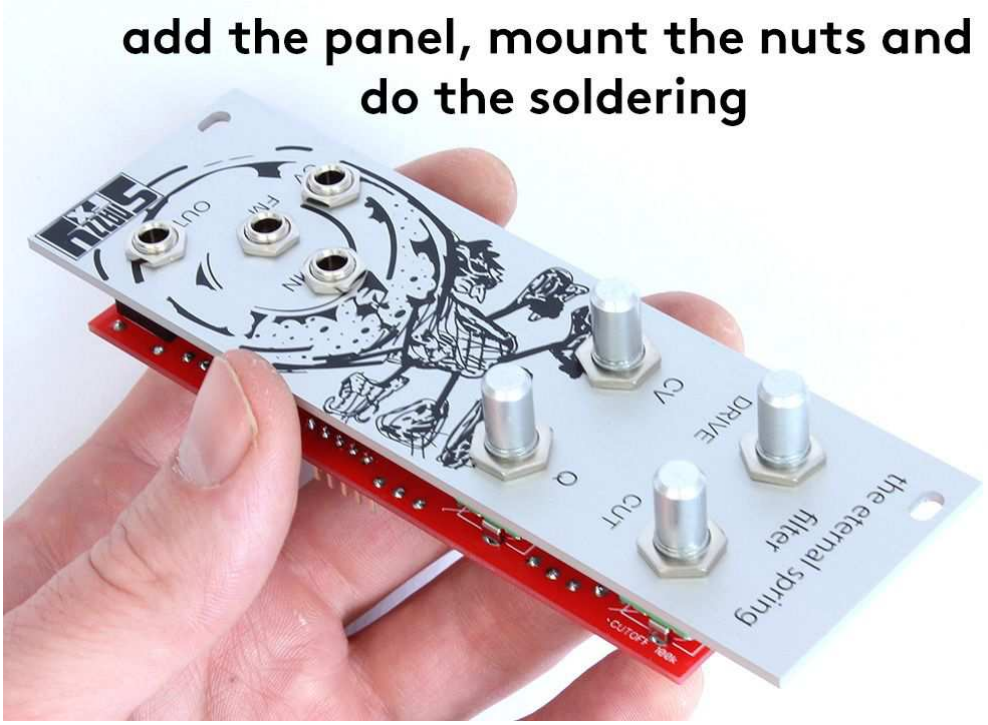


POTS, JACKS AND FRONT PANEL

You are almost done. Let's do the rest of the components. Turn the PCB around and insert **jacks** (4x) and **potentiometers** (4x) of different values: 2x **B10k,** 2x **B100k - be sure to insert them on the right place**. **Don't solder any of these guys yet**!



Place the **front panel** on and mount the pots and jacks with **nuts**. Check the position of all the parts if they are flat on the board and do the soldering.



FINISH

Now you can set the amplitude of the filter by adjusting the upper trimmer and tune it by the second one.

Then you just add the **knobs** and your ETERNAL SPRING is ready to filter! Before you connect anything, make sure that your system is disconnected from power. Also double check the polarity of the ribbon cable, the red cable should match the -12V rail both on the module and on the bus board!