

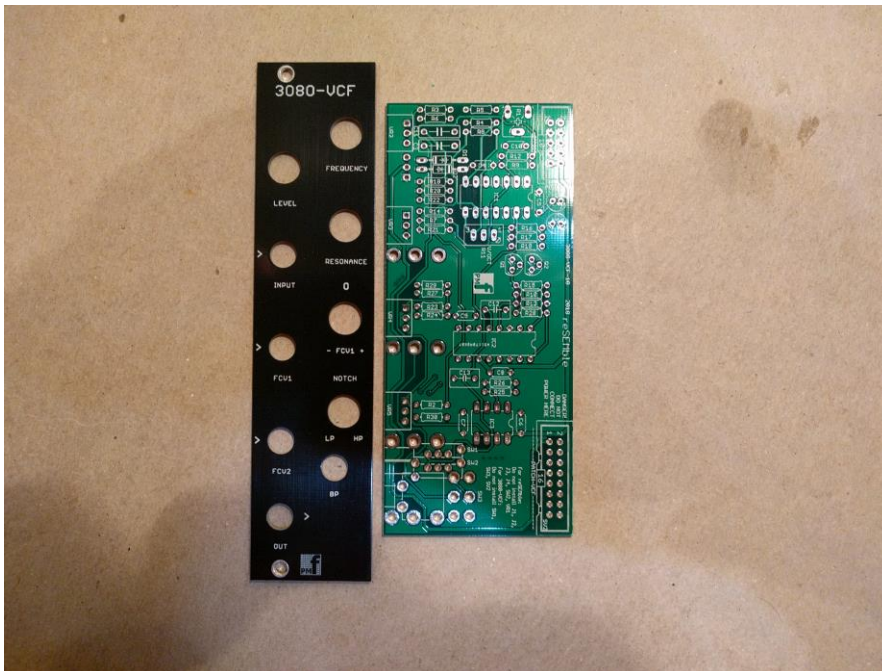
# 3080-VCF v1.2 – Assembly Guide

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Thank you for purchasing this module! This is an easy build. Some of the pads are quite small and you will need a chisel tip or screwdriver tip soldering iron and the skill to solder these tiny joints.

This module is also used in the reSEMBle semi-modular synth. **YOU DO NOT NEED TO AND SHOULD NOT INSTALL THE PARTS that are specific to the reSEMBle synth. These parts are not included in the BOM. These are the parts marked on the PCB that are not required:**

**SW1, SW3, SV2**



The module is designed and sized for **Euro rack** systems. You will need a 16-10 pin eurorack power ribbon connector with  $-12/0/+12$  which is connected to a synth power supply.

Follow the parts lists, these instructions and the PCB silkscreen text to build the module.

The module consists of 1 PCB board and a front panel.

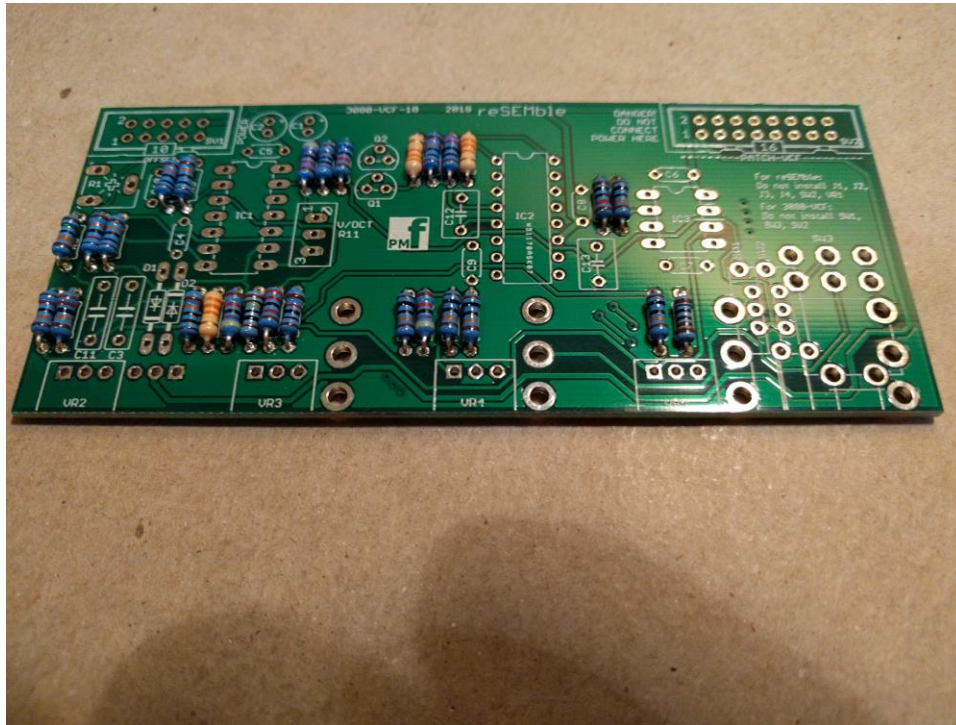
You must follow the order of assembly as described below since some components will be soldered underneath other components.

## Constructing the board

### Resistors

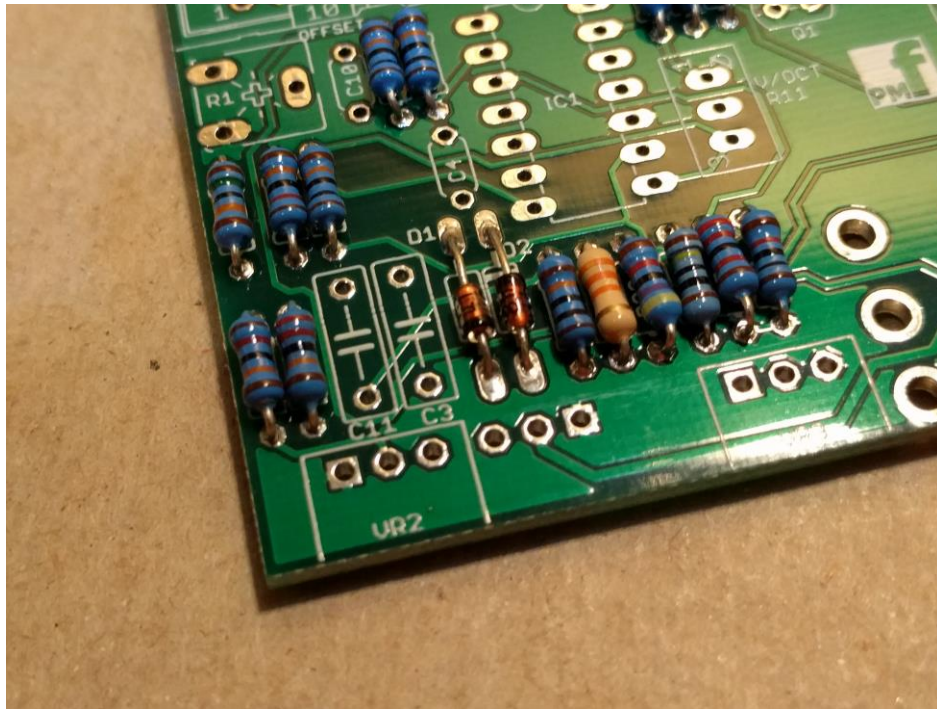
For a self-oscillating resonance control install R14. If you want the resonance control to operate with no self-oscillation, do not install R14.

Install the flat resistors on the TOP of the board. Solder and clip the leads.



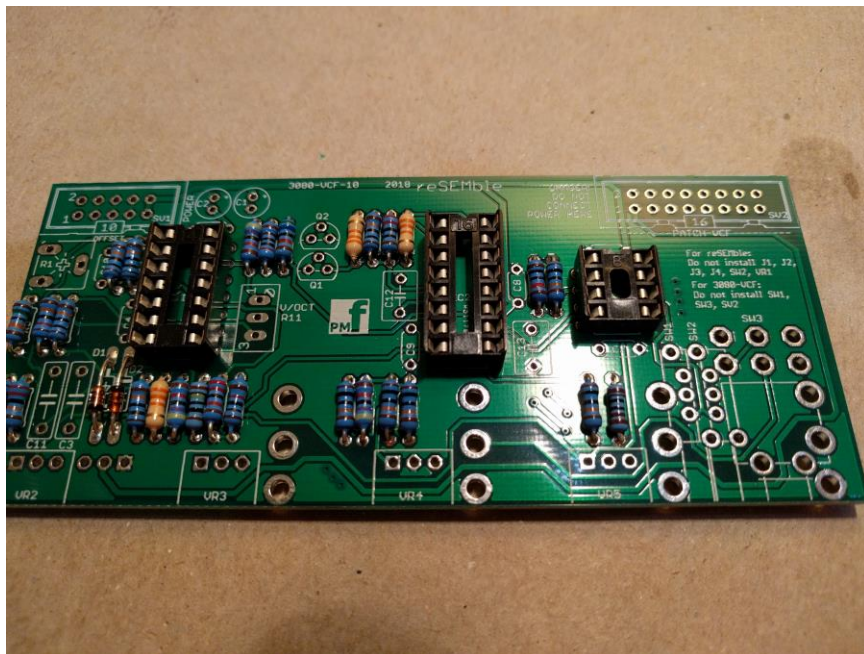
### Diodes

Install the diodes on the TOP of the board. Align the stripe on each diode with the stripe marked on the board. Solder and clip the leads. Now go back and check the polarity against the silk screen for each diode.



## IC Sockets

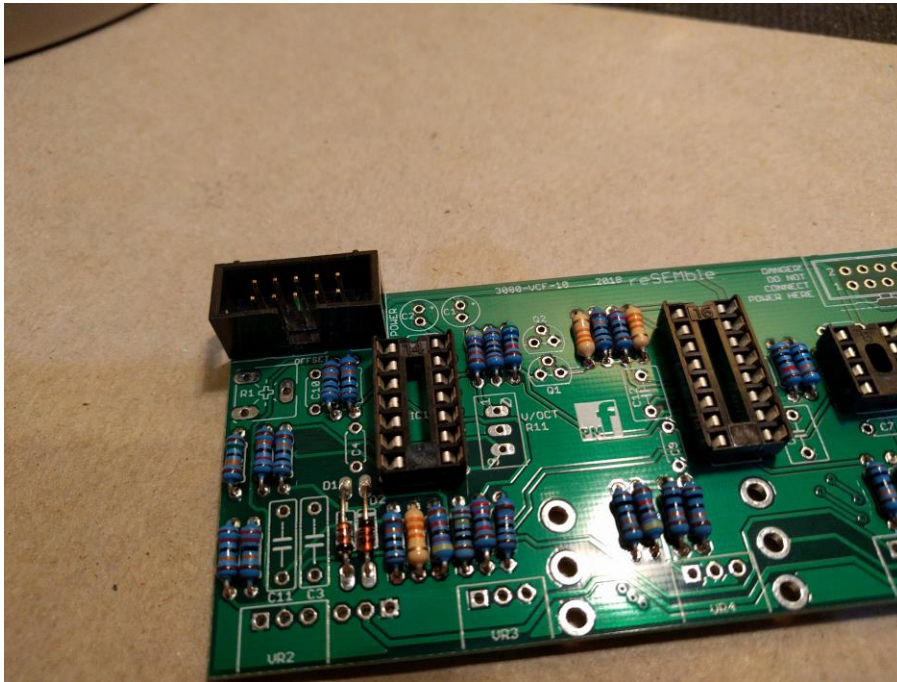
Install the sockets on the TOP of the board. Observe the notch or mark on the sockets and align with the notch or mark on the board. Solder.



## Power socket

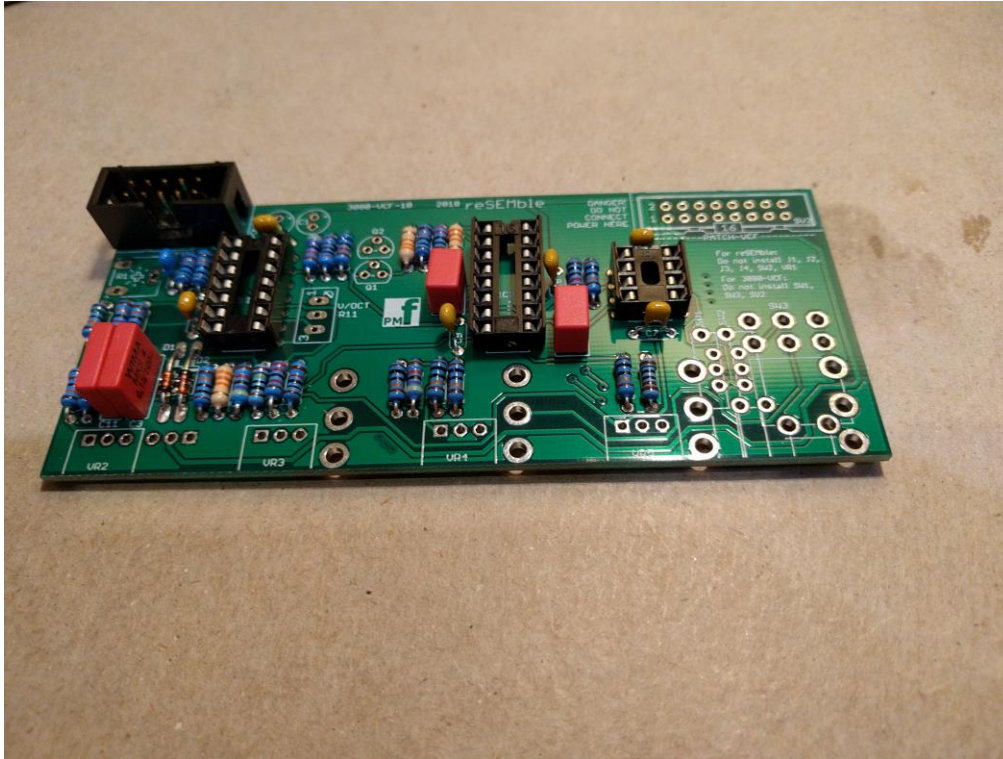
Install the 10 pin power socket on the TOP of the board. This must be installed with the correct orientation or the module will be damaged when the power is connected.

The cut-out in the socket should face the pots, aligning the cut-out with the "10" marking on the board as shown in the photo.



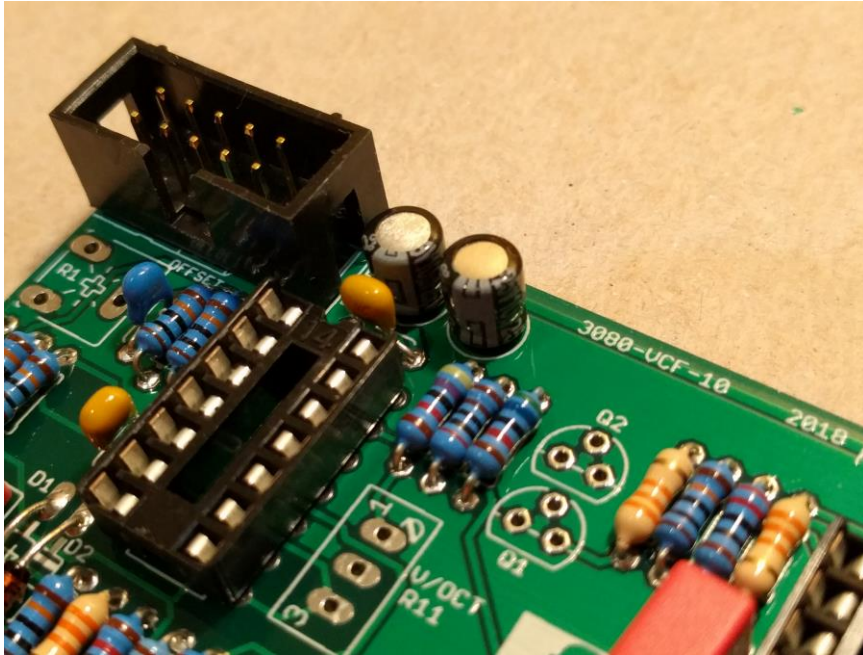
## Ceramic/film capacitors

Install the ceramic/film capacitors on the TOP of the board. Solder and clip the leads.



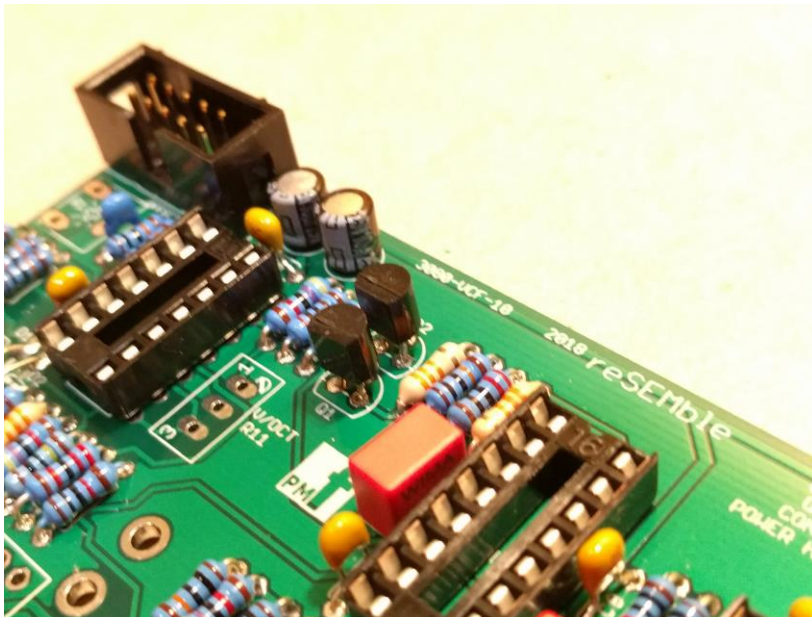
## Electrolytic capacitors

Install these on the TOP. Make sure you orient these capacitors correctly. The longer lead and/or the lead marked with a + needs to be inserted into the hole that has the "+" marking near it. Leads marked with "-" go in the board hole WITHOUT the "+". Solder and clip the leads.



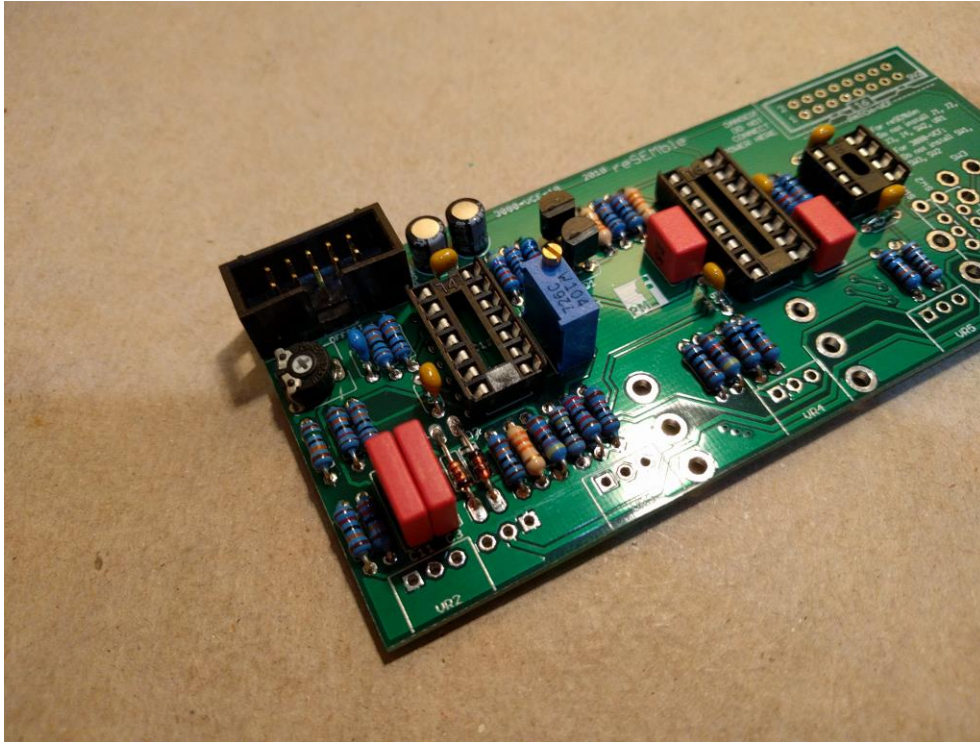
## Bipolar Transistors

Install the transistors on the TOP of the board. Do not mix up the NPNs with the PNPs. These are polarized components. Align the outline with the outline on the board. They should be raised off the board surface slightly and at the same height. Solder and clip the leads.



## Trimmer resistors

Now populate the trimmer pots on the PCB. Make sure they are oriented so that the screw is above the circle on the silk screen.

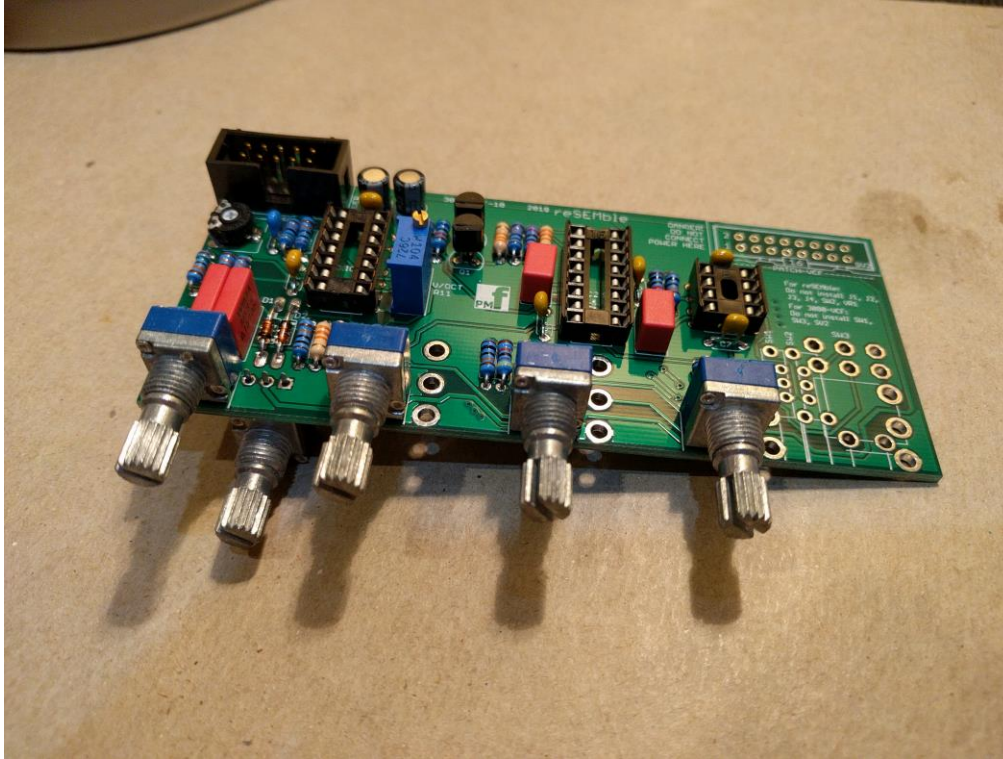


## Potentiometers

If the pots have positioning lugs on the front, cut these off with a sharp pair of flush cutting pliers. The front of the pot (where the shaft protrudes) needs to be flat.

Some pots are on the top and some are on the bottom of the PCB.

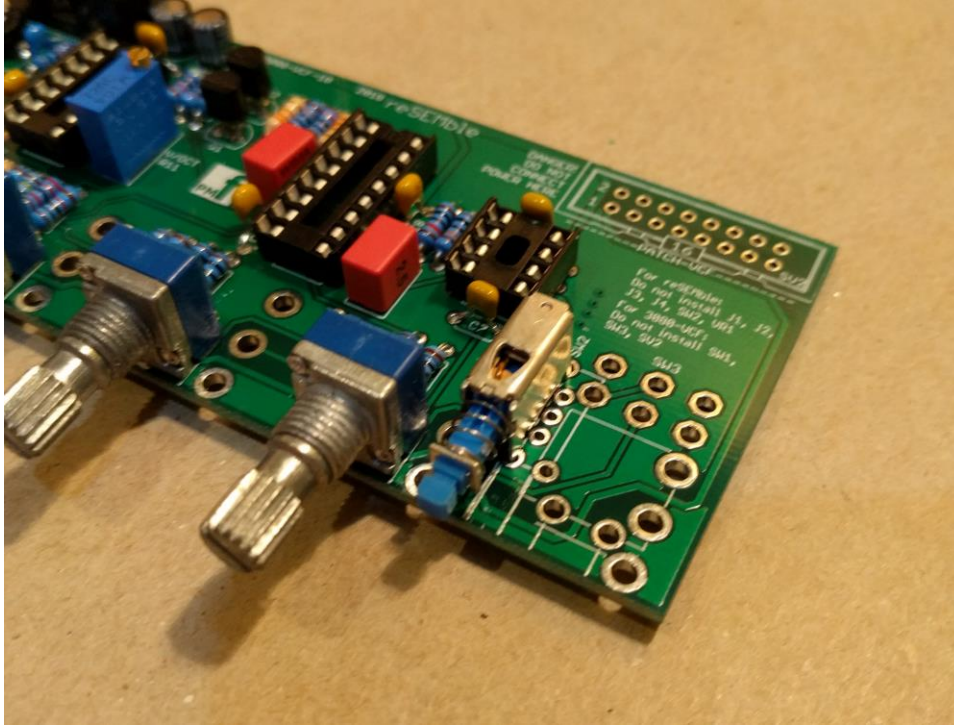
Carefully align the pots so they are flush with the edge of the board and perfectly upright and tight to the board surface. Please ensure they are on the CORRECT SIDE OF THE BOARD before soldering otherwise PCB tracks and pads may be damaged if they are desoldered. See Photo.



## Switch

Insert the switch on the TOP so that the plunger faces the front of the PCB. There are two unused location holes and three unused pin holes which are offset. Before soldering check that the switch is in the correct position by aligning the PCB with the front panel to ensure the switch plunger can be seen. Tack one pin of the switch, align with the front panel, then solder all the remaining pins and the locating lugs. The switch is on the TOP. Do not bridge the contacts to nearby components.

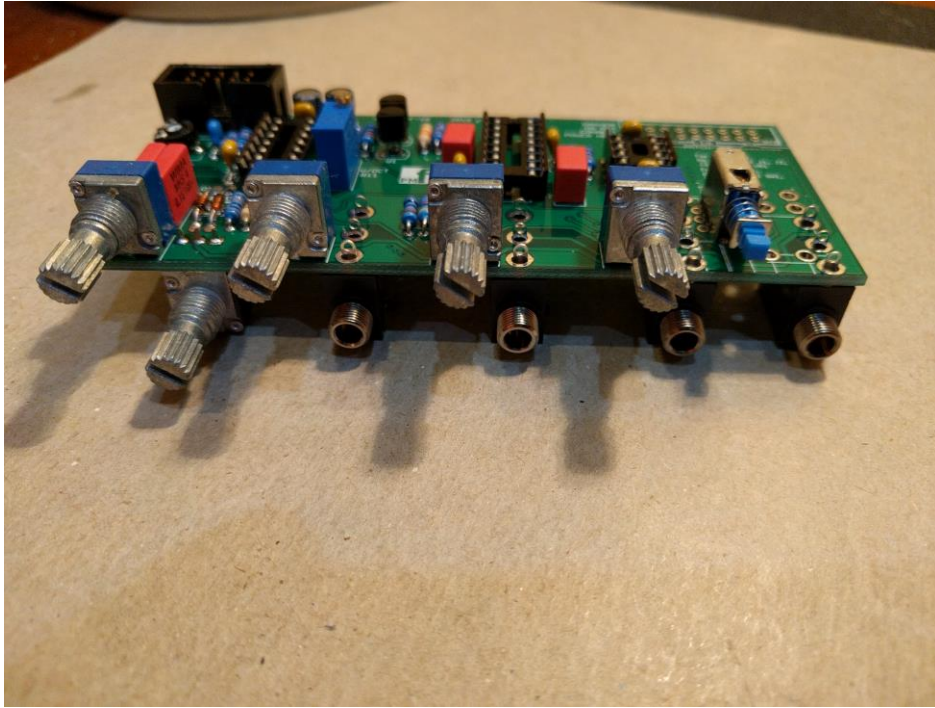




### 3.5mm Jack Sockets

Install the jacks on the BOTTOM and fully solder each one as you install it. Make sure they are perfectly aligned and tight to the board. Please ensure they are on the CORRECT SIDE OF THE BOARD before soldering otherwise PCB tracks and pads may be damaged if they are desoldered.

Do not bridge the contacts to nearby components.



Do not install the ICs until the voltage tests are complete.

If you do not trust all your soldering and connections, carry out the voltage tests below before installing the ICs

## Voltage tests

1. You do not have to do these tests if you are completely happy with your soldering and are sure there are no bridges or incorrectly placed components. However, these tests will ensure that the correct power supplies are sent to the IC pins to ensure they will not be damaged on power up.
2. Plug in the power supply and connect the –VE probe of a multimeter (set to the 20V DC range) to one of the GROUND pins of the jacks. The GROUND pin is nearest to the edge of the board.
3. Check the voltage at the following points on the board:
  - a. At IC1 pin 4 approx = +12V
  - b. At IC1 pin 11 approx = -12V
  - c. At IC1 pin 10, 10, 12 = 0V
  - d. At IC2 pin 6 approx = -12V
  - e. At IC2 pin 11 approx = +12V
  - f. At IC2 pin 3, 14 = 0V
  - g. At IC3 pin 4 approx = -12V
4. If any of these tests fail to match the readings given, you should check the components and soldering before progressing and/or check with us for further analysis.

## Final Assembly

1. Place the ICs in place by aligning the notch with the notch graphic on the PCB Silk Screen and notch on the sockets.
2. Place a washer over each pot shaft.
3. Place the front panel over the board so that the pots and 3.5mm jacks align with the holes in the panel.
4. Put nuts on the pots and jacks and fully tighten.

5. Install the knobs.



## Calibrating the FREQUENCY RANGE

1. Disconnect all CV sources from the inputs.
2. Turn Notch to LP and ensure BP is off
3. Observe the filter output on an oscilloscope
4. Set the resonance to 0
5. Set the Frequency control to 0
6. Set the level control to FULL
7. Patch a pulse wave from a VCO set at its center frequency into the INPUT jack
8. Adjust the offset trimmer until the desired lowest frequency of the filter is achieved. The higher the frequency, the smaller the range of the filter.

## Calibrating the FREQUENCY tracking

1. R14 must be installed temporarily for this calibration even if you do not want a self resonating filter. It can be removed after the calibration is complete.
2. Disconnect all inputs.
3. Patch a control voltage source (e.g. keyboard) to the FCV2 input.
4. Apply 1V to FCV2
5. Turn the resonance to full
6. Observe the frequency output from the filter with a frequency counter
7. Turn the V/OCT trimmer fully CCW
8. Alternate 1V and 2V into FCV2 and adjust the trimmer until the frequency at 2V is twice the frequency at 1V