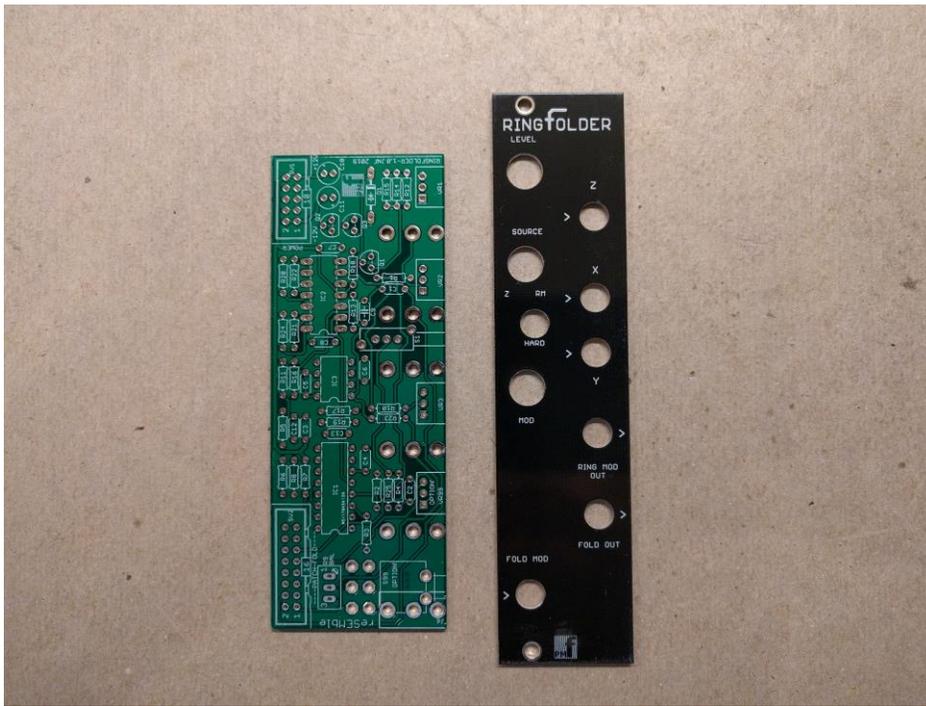


# RingFolder v1.1 – Assembly Guide

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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: S99, VR99, 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.

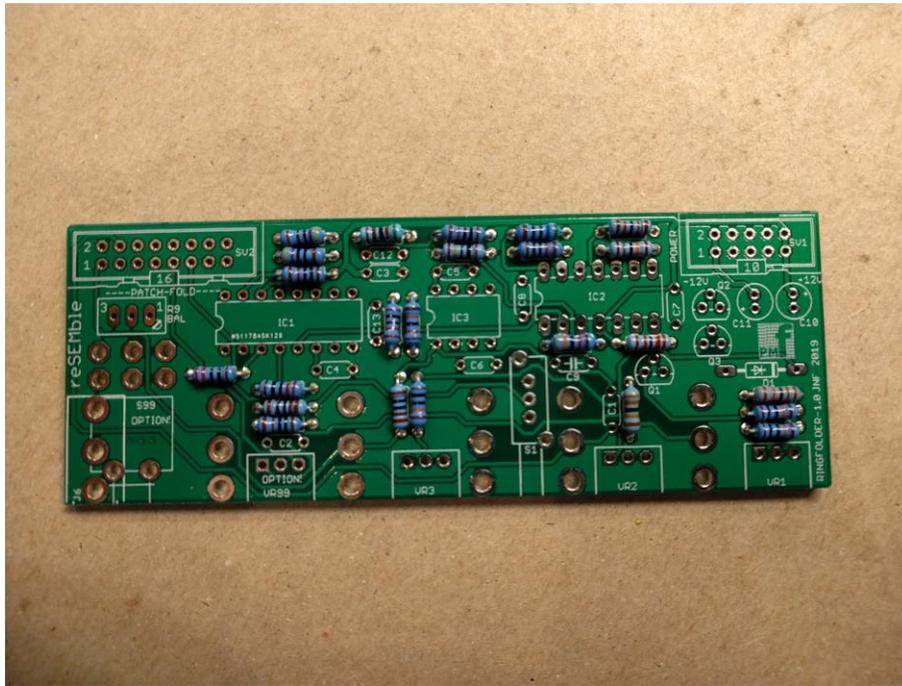
The module consists of 1 PCB board and a front panel.

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

## Constructing the board

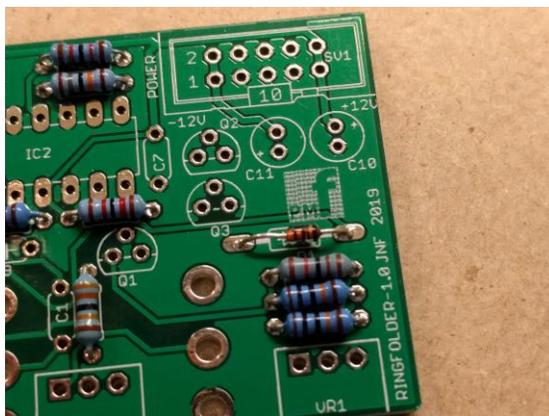
### Resistors

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



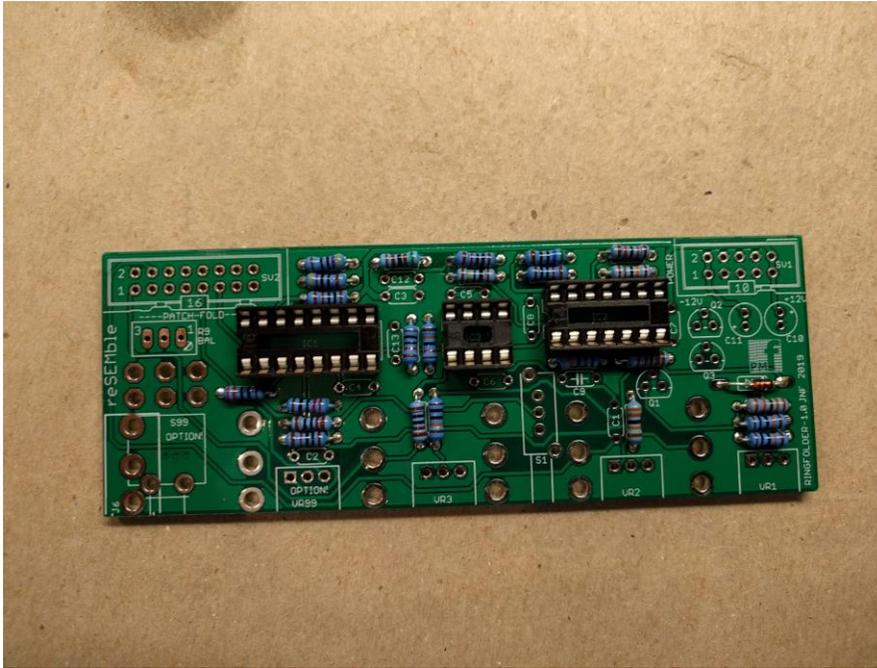
### Diodes

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

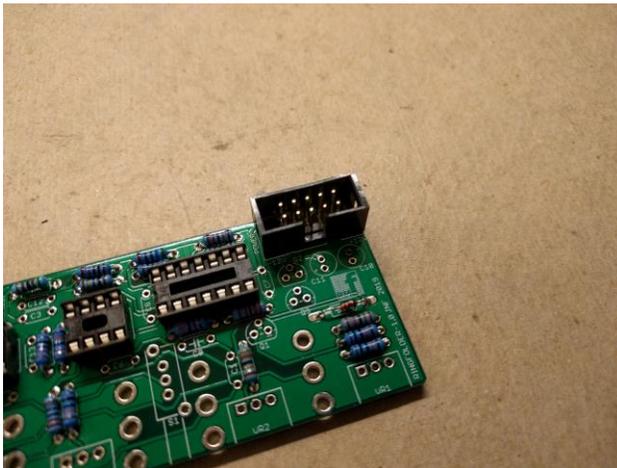
Install the sockets on the TOP of the board. Observe the notch or mark on the sockets and align with the notch or mark on the board. Solder.



## Power socket

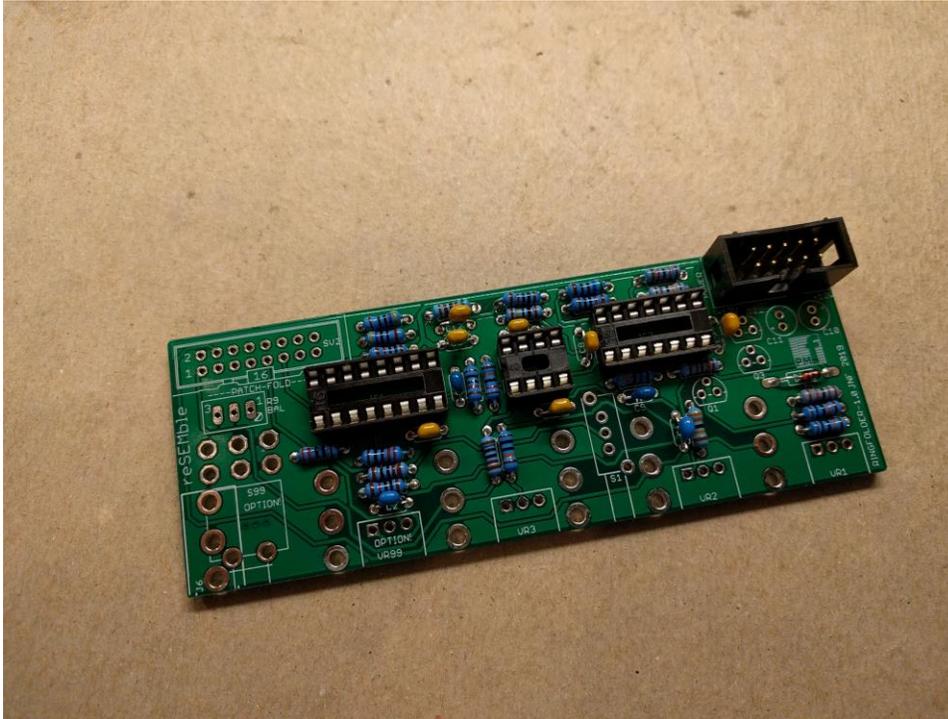
Install the 10 pin power socket on the TOP of the board. **This must be installed with the correct orientation or the module will be damaged when the power is connected.**

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.



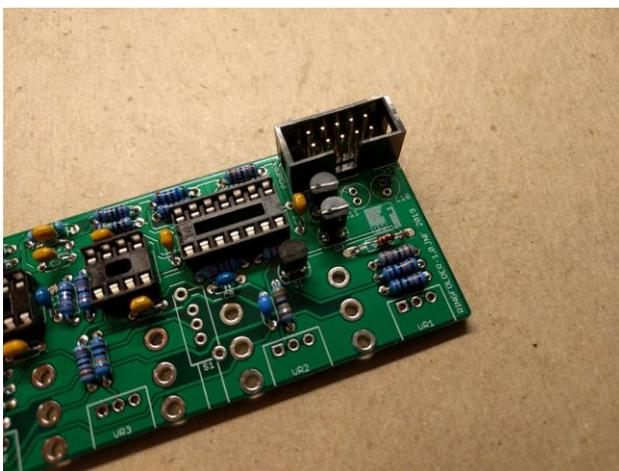
## Ceramic/film capacitors

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



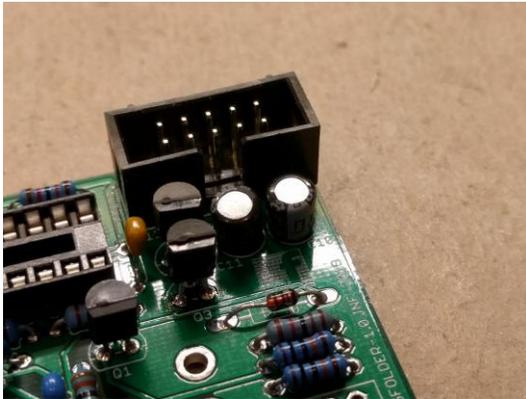
## Bipolar Transistors

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.



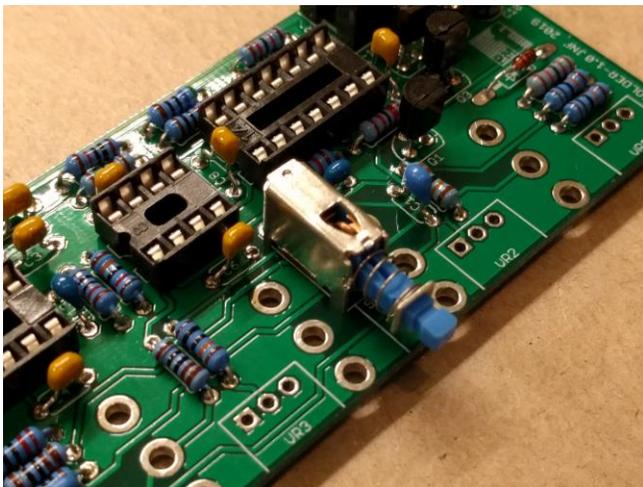
## Electrolytic capacitors

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.



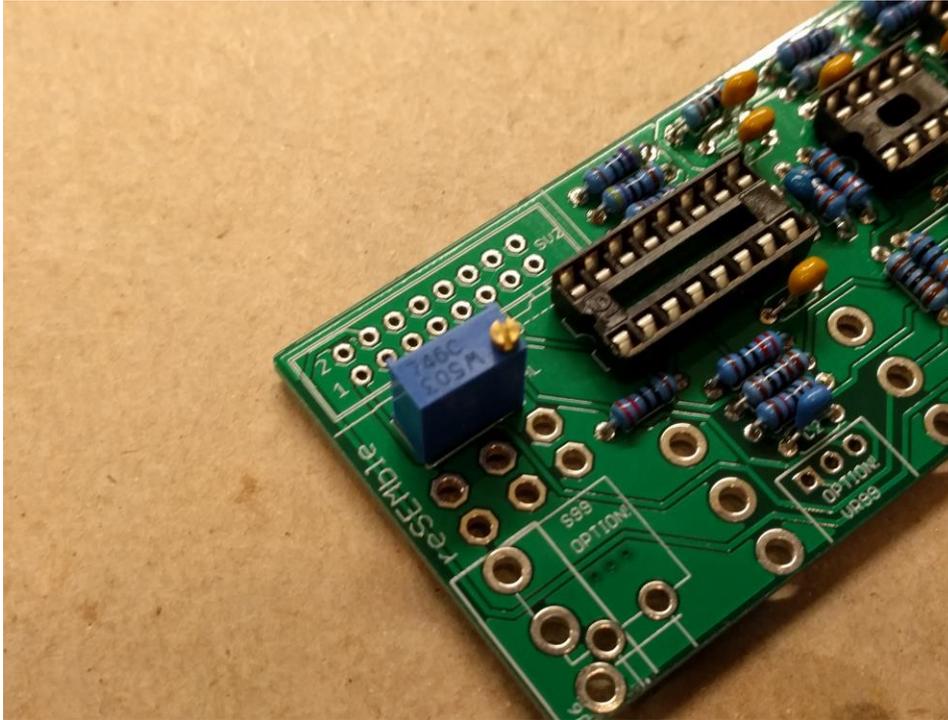
## Switch

Insert the switch on the TOP so that the plunger faces the front of the PCB. Tack one pin of the switch, then solder all the remaining pins and the locating lugs. The switch is on the TOP. Do not bridge the contacts to nearby components. Finally trim the leg that is next to the center pad of the nearby kack location so that it is flush with the board.



## Trimmer resistors

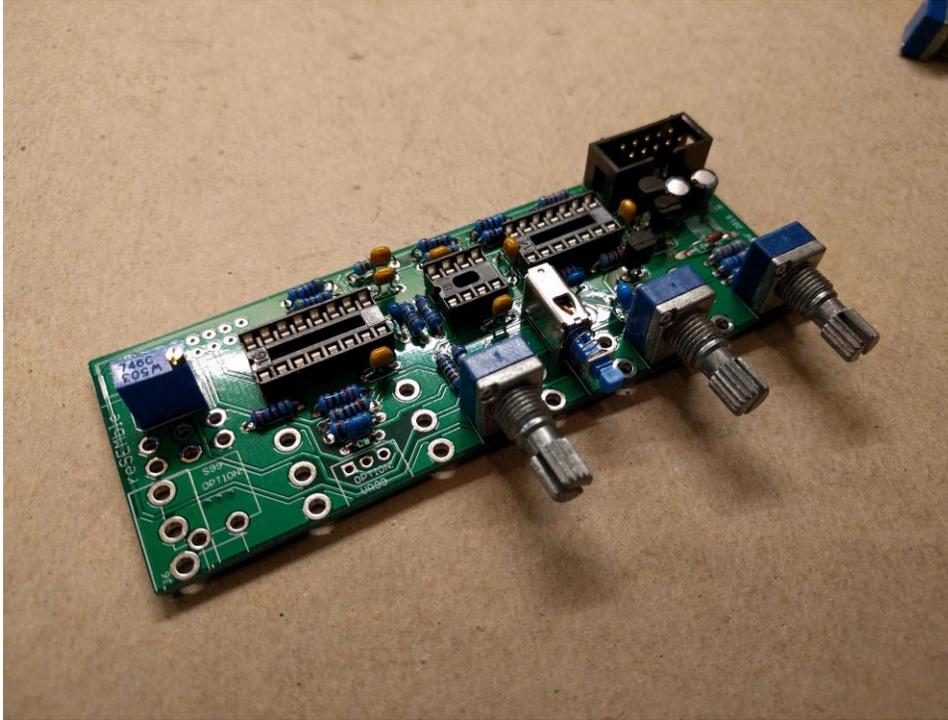
Now populate the trimmer pots on the PCB. Make sure they are oriented so that the screw is above the circle on the silk screen.



## 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.

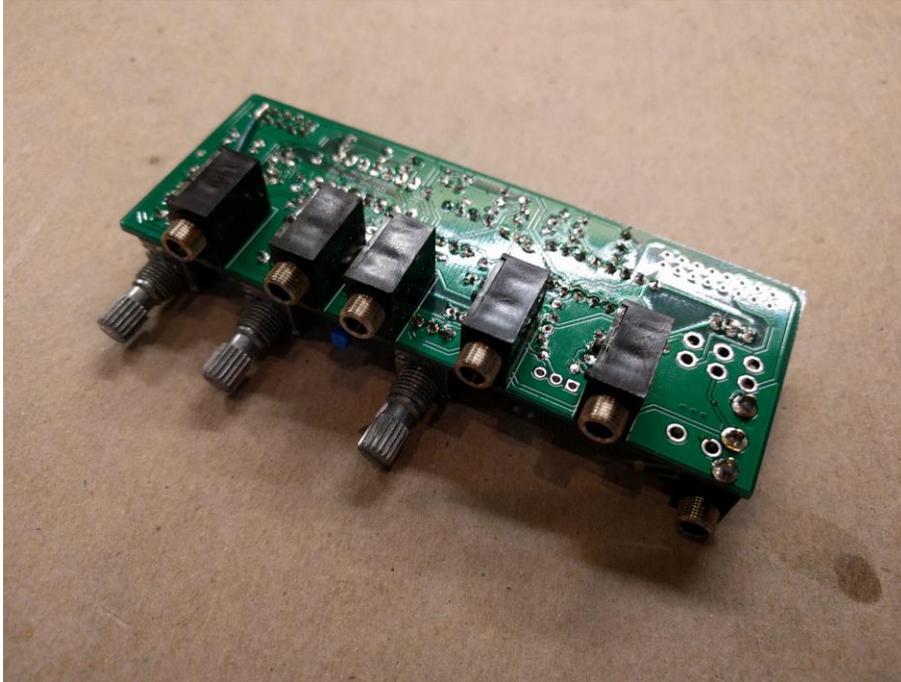
Carefully align the pots so they are flush with the edge of the board and perfectly upright and tight to the board surface. Please ensure they are on the CORRECT SIDE OF THE BOARD before soldering otherwise PCB tracks and pads may be damaged if they are desoldered. See Photo.



### 3.5mm Jack Sockets

Install the jacks on the TOP and BOTTOM and fully solder each one as you install it. J6 is on top and J1-J5 are on the bottom. 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 6 approx = -12V
  - b. At IC1 pin 11, 15 approx = +12V
  - c. At IC1 pin 3, 14 = 0V
  - d. At IC2 pin 4 approx = +12V
  - e. At IC2 pin 11 approx = -12V
  - f. At IC2 pin 3, 5, 10, 12 = 0V
  - g. At IC3 pin 8 approx = +12V
  - h. At IC3 pin 4 approx = -12V
  - i. At IC3 pin 5 = 0V
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 and the switch cap.



## Calibrating the Ring Modulator

1. Double check again that you have installed the power socket the correct way around.
2. Connect the power supply from the synth.
3. Connect the Ring Mod out jack to a mixer or other output device.

4. Supply an approximately 200Hz sine wave into the X IN input.
5. Turn up the mixer until you hear the sine wave.
6. Adjust the Balance trimmer left and right until the signal volume is minimized. There should be very minimal feedthrough when there is no signal on Y IN.