# Quantola V1.2 – Assembly Guide

Thank you for purchasing this module!

The Quantola is a variant of the Synthola sequencer which has quantized outputs. The Quantola is a direct replacement for the Synthola main control module and works with all the existing Synthola CV modules.

This is an average build with tightly packed components and some precision integrated circuits. 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 guide is also used for building the Quantola 16X3 with 54hp panel. You can ignore instructions for that product if you are not building the Quantola 16X3 with 54hp panel.
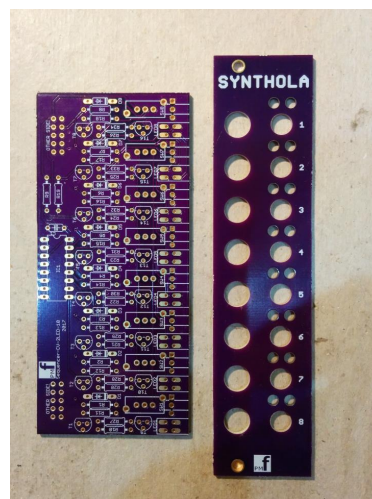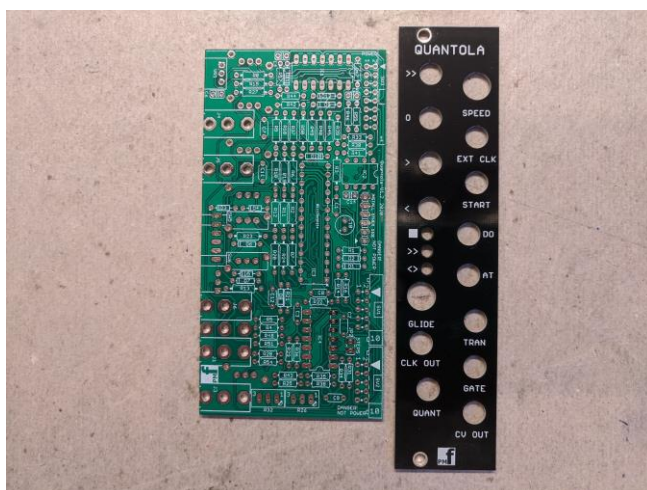
The module is designed and sized for **Eurorack** systems. You will need a 16-16 pin eurorack power ribbon connector with –12/0/+12 and +5V which is connected to a synth power supply.

Alternatively you can build to your own specification using the PCBs and solder wires from the switches, pots, LEDs and jack footprints to your desired front panels.

You will also need a 10-16 pin connector for connecting each (maximum 2) CV board (the one with the 8 steps on it) to the main control board.

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

The sequencer consists of 1 PCB boards and a panel for the main control module and then at least one CV board which is used for setting the steps. One CV board will give you 8 steps and two CV boards will give you 16 steps. You can also have 8 steps with a 2ndRow board which gives you two different CVs for each of the 8 Steps.

There are components installed on BOTH sides of the boards. Please ensure that you place the components on the correct side. When referring to the TOP of a board we mean the side with the **pmF** logo. The BOTTOM has no logo.

You may need to clean up the board edges with wire cutters and/or a file to remove the remains of the tabs from the fabrication process. This is particularly important for the edges containing the jacks. These edges will need to mate flush with the front panel.
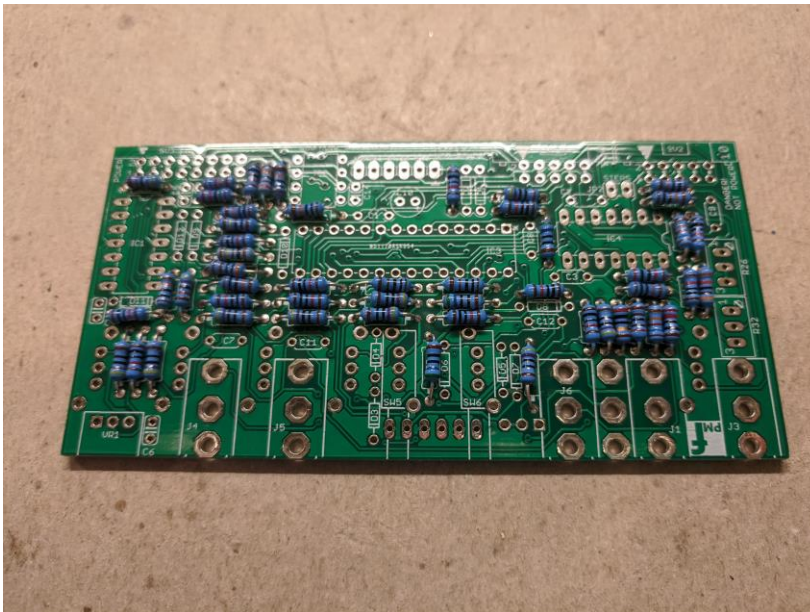
You should follow the order of assembly as described below since some components will be soldered underneath other components.

# Constructing the Main board (labeled Quantola V1.x)
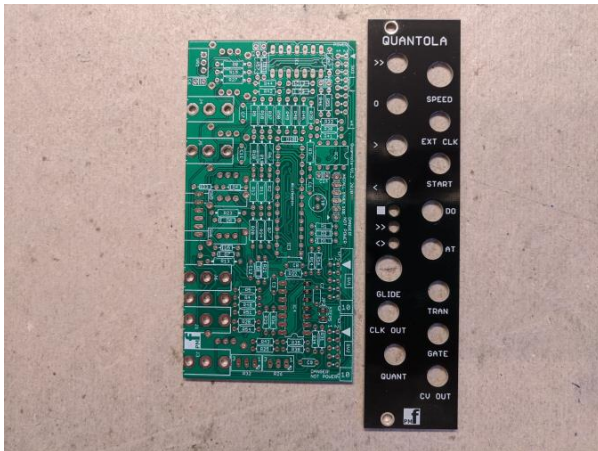
1. Resistors
   Install the flat resistors on the TOP of the board. Solder and clip the leads.

2. Diodes (but not LEDs)
   Install the diodes on the TOP of the board. There are 9 small signal diodes, and 3 zener diodes. Please ensure that you do not mix these, the zeners and the signal diodes look quite similar and the module will not work if you mix these up! Also, these are polarized components. 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.
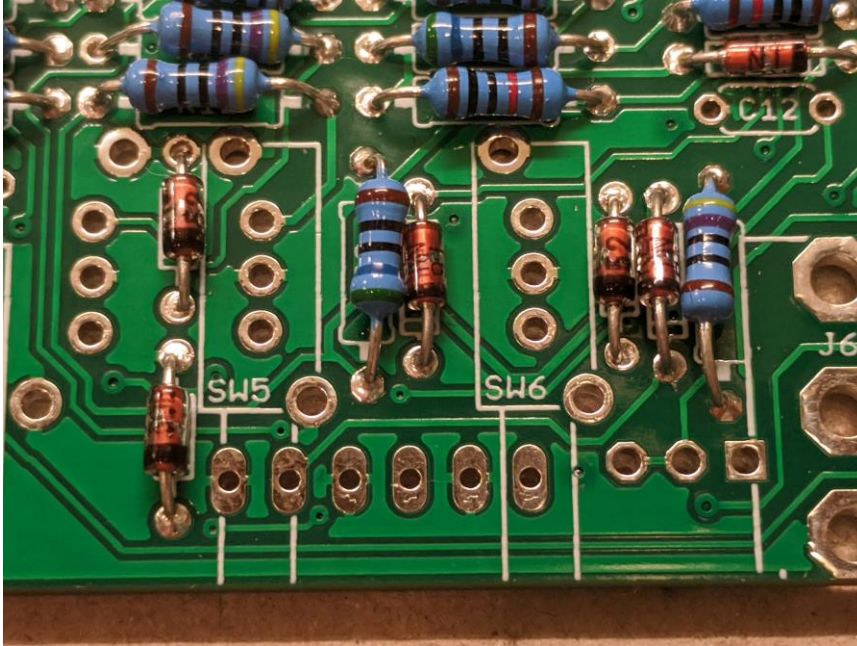
3. IC Sockets
   Install the sockets on the TOP of the board. Observe the notch or mark on the socket and align
   with the notch or mark on the board. Solder.
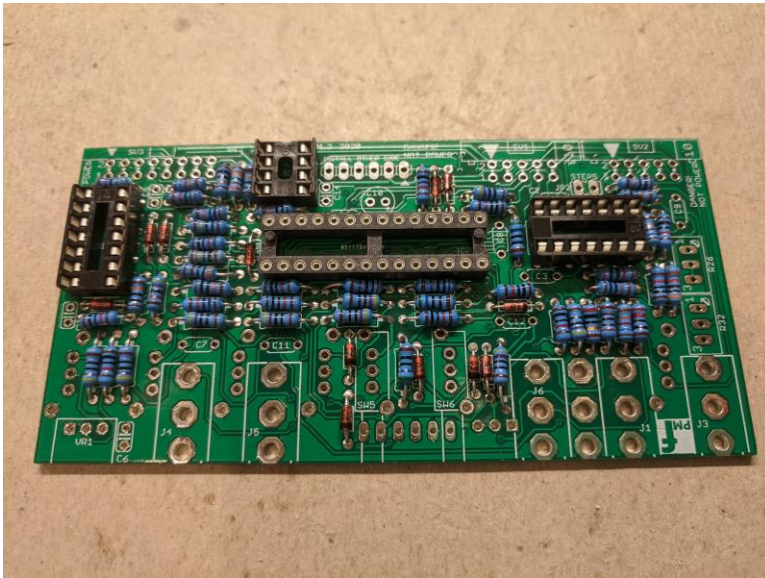
4. Power socket and board interconnect sockets

   Install the 16 pin power socket on the TOP of the board. The socket should face OUT from the board. Solder.

   Install the 10 pin sockets on the TOP of the board. The sockets should face OUT from the board. Solder. If you will only ever need 8 steps, you do not need to install SV2.
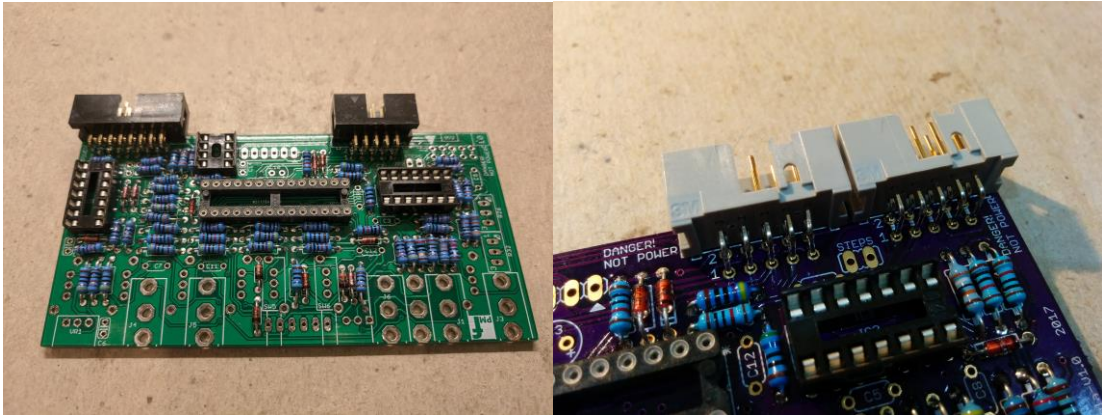

5. Ceramic/film capacitors

   Install the ceramic/film capacitors on the TOP of the board. Solder and clip the leads.
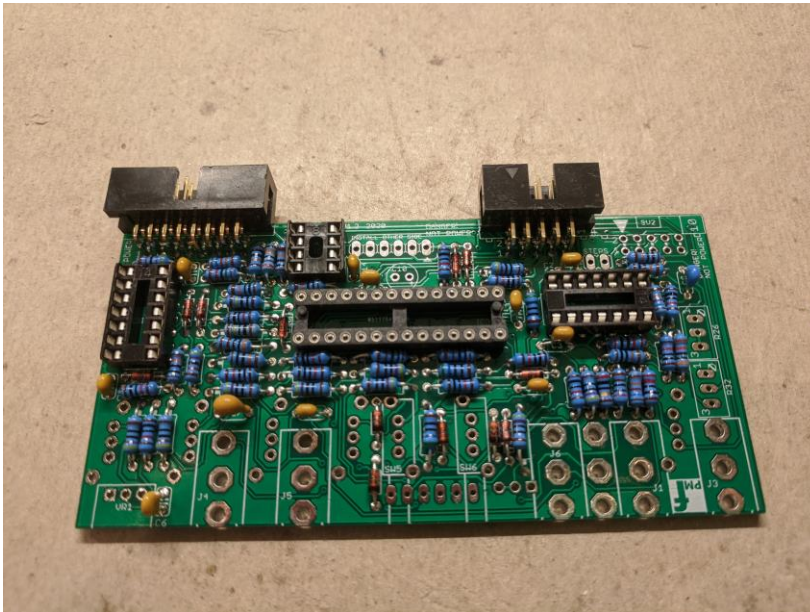
6. 2 pin jumper (JP2)

   If you are only using 8 steps (one CV board and possibly an optional 2ndRow board), put a wire link in JP2 marked STEPS and solder. You can cut this later if you expand to 16 steps with a second CV board. Alternatively, you can use a proper two pin jumper and clip.
   Do not install any kind of jumper if you are building the Quantola 16X3 with 54hp panel.
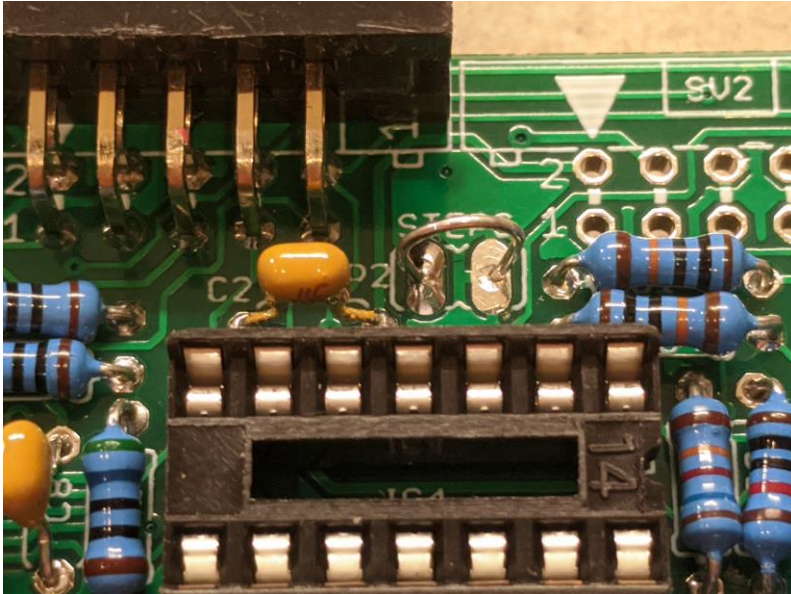

7. ICSP connector

   If you are using a preprogrammed PIC24 chip and NEVER intend to or do not have the facilities to do in circuit programming of the PIC24, you do not need to install this connector.
   Otherwise: Install the 6 pin ICSP connector on BOTTOM. Orient so the black shroud faces out with the pins and the short, bent pins go into the board. See photos. Solder.
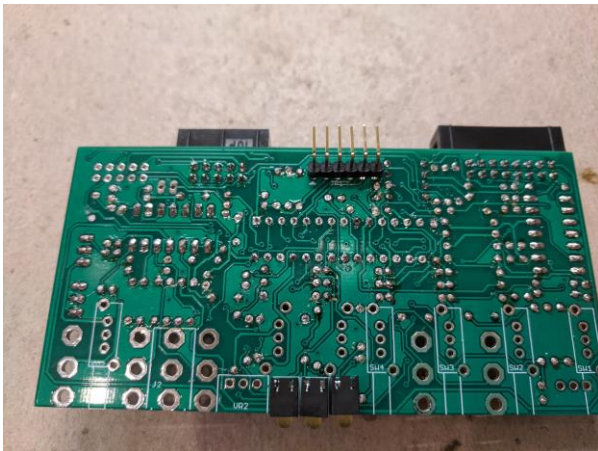
8. Tantalum capacitors

   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.
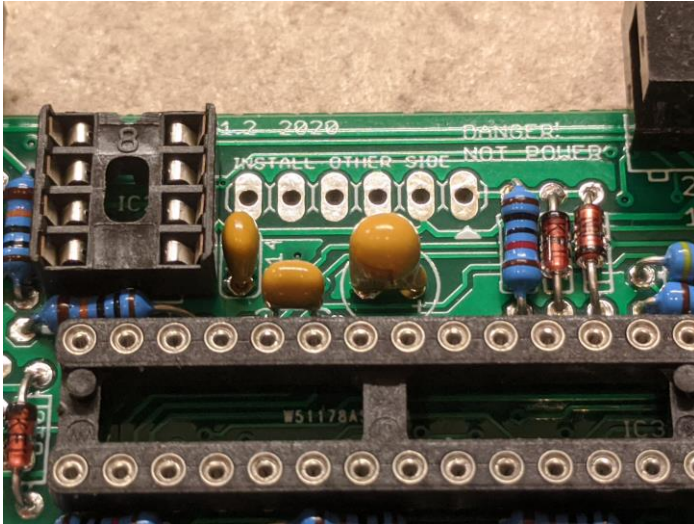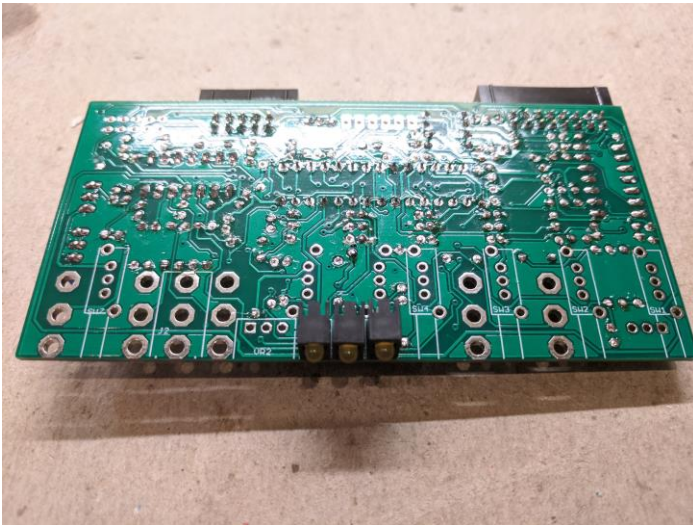
9. Trimmers

   Install the trimmers on the TOP of the board. Solder and clip the leads.

10. LEDs

   Install the LEDs on the BOTTOM of the board and solder on the underside. The LEDs should face
   the edge of the board. Trim the pins so they do not interfere with the installation of the
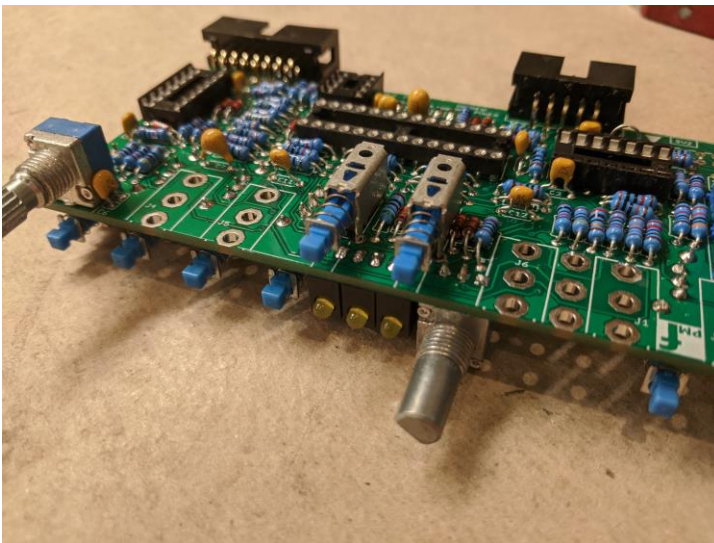
switches.

11. 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.

Install one pot (10K) on the top and one (1M) on the bottom. The speed pot is 10k and the glide pot is 1M.

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. See Photo.


12. Switches

Tack one pin of each switch, and when all are tacked, align with the front panel, then solder all

the remaining pins and the locating lugs. Some switches are on the TOP and some are on the BOTTOM. Do not bridge the contacts to nearby components.

The recommended order for installation of the switches is: SW 6, SW 5, SW 4, SW 3, SW 2, SW 1, SW 7.

Cut the pins of SW7 flush with the board so that it will not interfere with the jack that will be installed next.
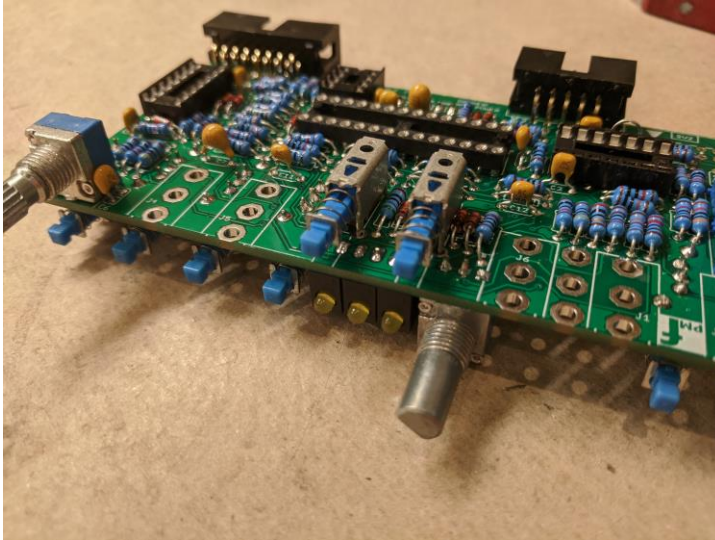
13. 3.5mm Jack Sockets

   Install the jacks on the TOP and the BOTTOM and fully solder each one as you install it. The best sequence is J6, J2, J1, J3, J5, J4. Do not bridge the contacts to nearby components.
   Do not install J3 or J6 if you are building the Synthola 16X3 with 54hp panel.
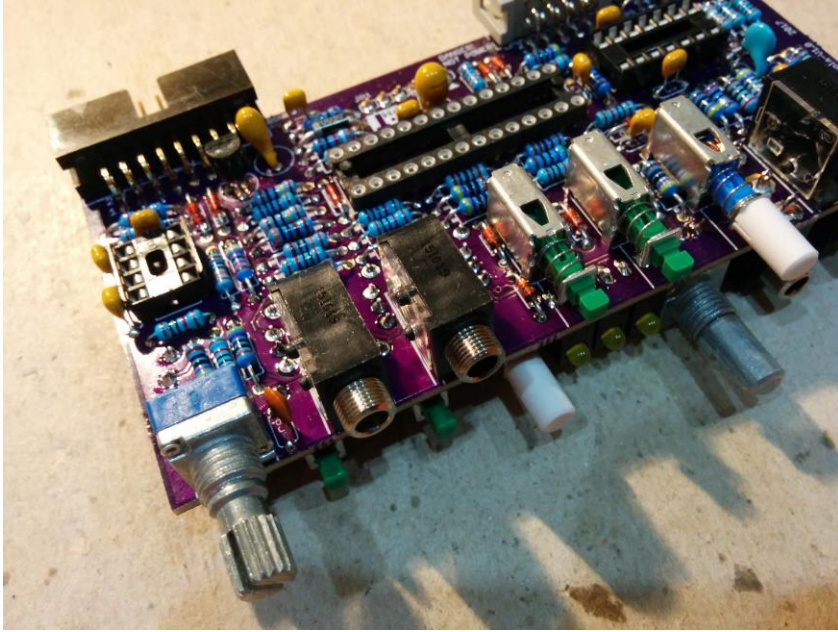
Voltage tests

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 range to a suitable GND pin somewhere on the board.
3. Check the voltage at the following points on the board:
    a. At IC1 pins 3,5 = 0V
    b. IC1 pin 4 approx = +12 V
    c. IC1 pin 11 approx = -12 V
    d. IC1 pin 9 approx = +1.6V
    e. IC2 pin 7 approx = +5 V
    f. IC2 pin 4 approx = 0 V
    g. At IC3 pins 13,28 = +5V
    h. At IC3 pins 8,19,27 = 0V
    i. At IC4 pins 5 = 0V
    j. IC4 pin 4 approx = +12 V
    k. IC4 pin 11 approx = -12 V
    l. SV1 pin 2, = +12V
    m. SV1 pin 4, = +5V
   n. SV1 pin 6, = 0V
    o. SV2 pin 2, = +12V

p. SV2 pin 4, = +5V

q. SV2 pin 6, = 0V

4. If any of these tests fail to match the readings given, you should check the components and soldering before progressing

5. TIP: If there are no shorts, missing components or unsoldered joints, the most likely cause for a voltage discrepancy is one or more resistors in the wrong place. You will need to check the value of each resistor against the BOM and the layouts shown in the photos of the unpopulated boards.

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. Put the caps on the switches by pushing until they click.

3. Place the front panel over the PCB so that the pots, switches and 3.5mm jacks align with the holes in the panel. Skip this step if you are building the Quantola 16X3 with 54hp panel.

4. Put nuts on the pots and jacks and FULLY TIGTEN all of them. Do not over tighten! Skip this step if you are building the Quantola 16X3 with 54hp panel.

5. Install the knobs. Skip this step if you are building the Quantola 16X3 with 54hp panel.
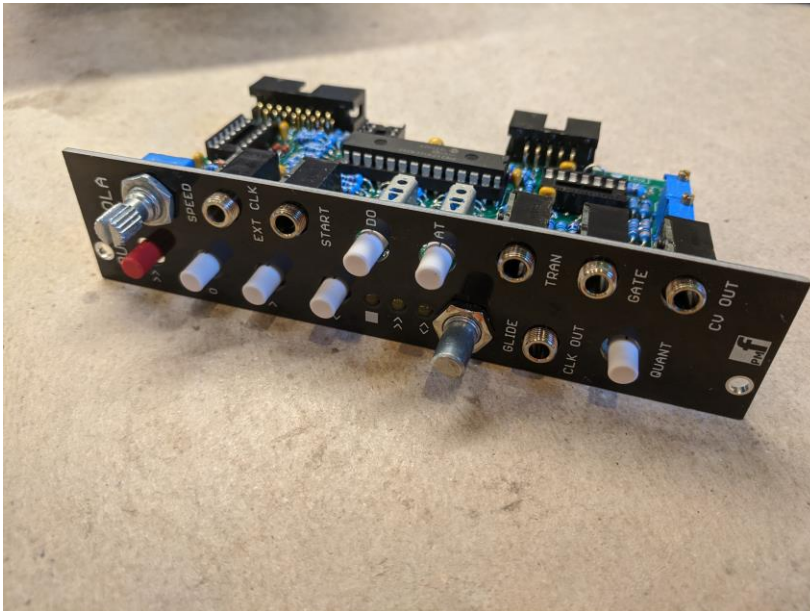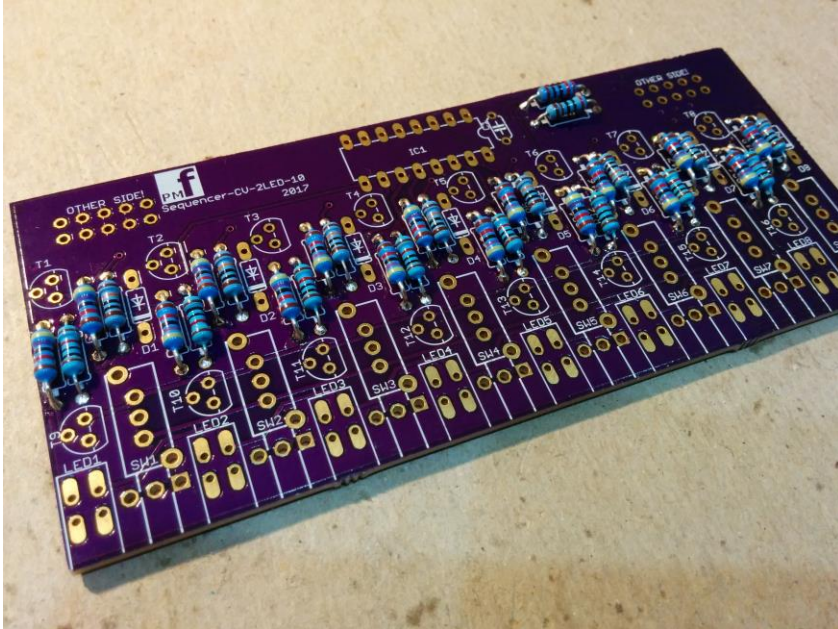
# Constructing the CV board (labeled Sequencer-CV-2LED-1x)
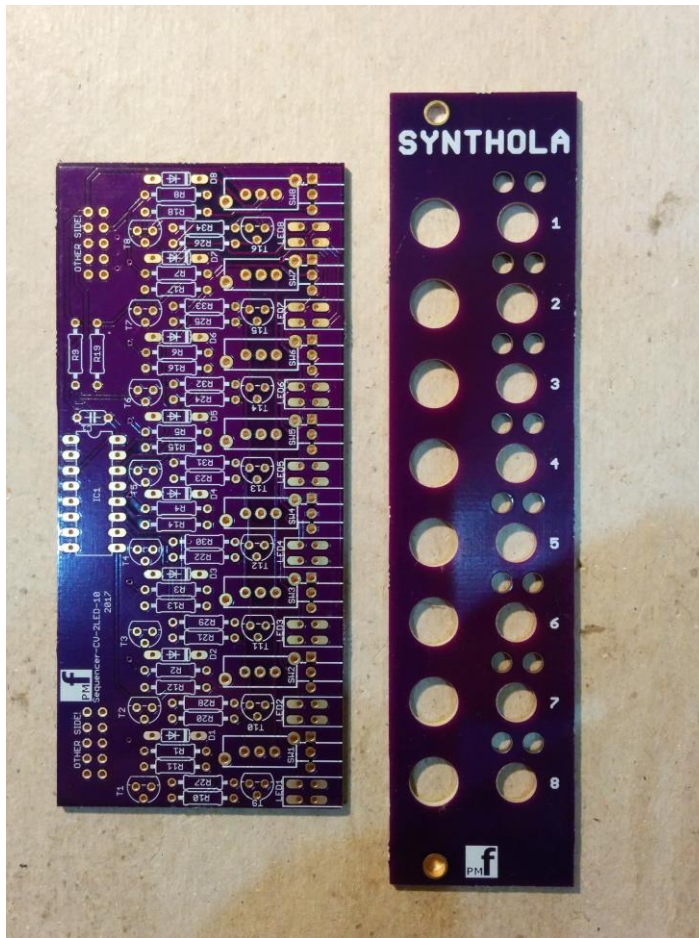
1. Resistors
   Install the flat resistors on the TOP of the board. Solder and clip the leads.

2. Diodes (but not LEDs)

   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.
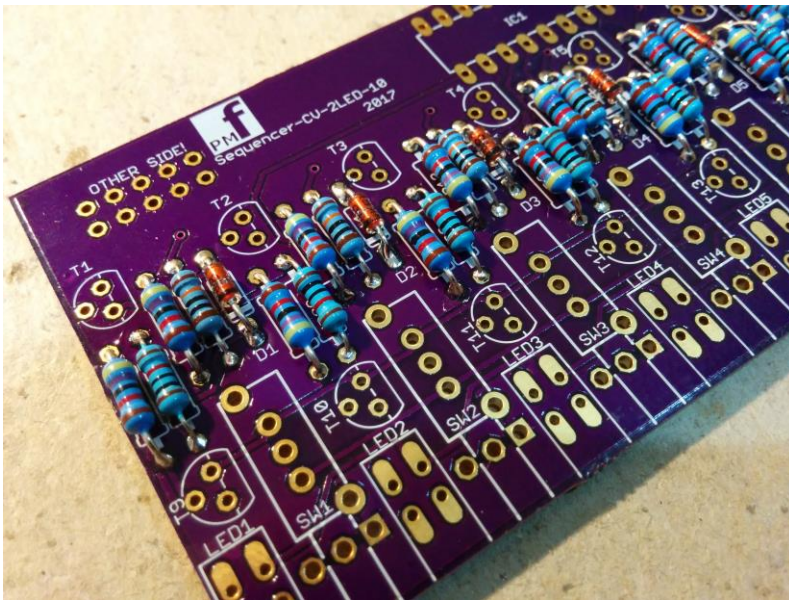

3. IC Socket

   Install the IC socket on the TOP of the board. Observe the notch or mark on the socket and align with the notch or mark on the board. Solder.
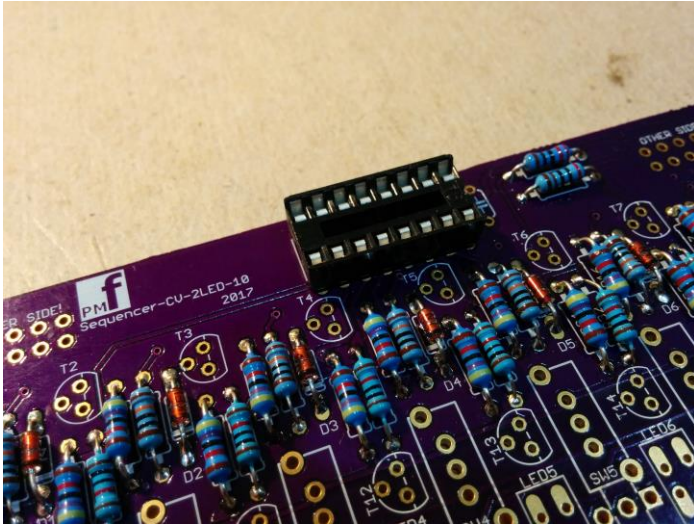
4. Interconnect socket

Install the 16 pin interconnect socket on the BOTTOM of the board. The socket should face OUT from the board. Solder. There is also a provision for a 10 pin socket to correctly directly to the power supply. You DO NOT need to install this unless you want to get an improved ground.
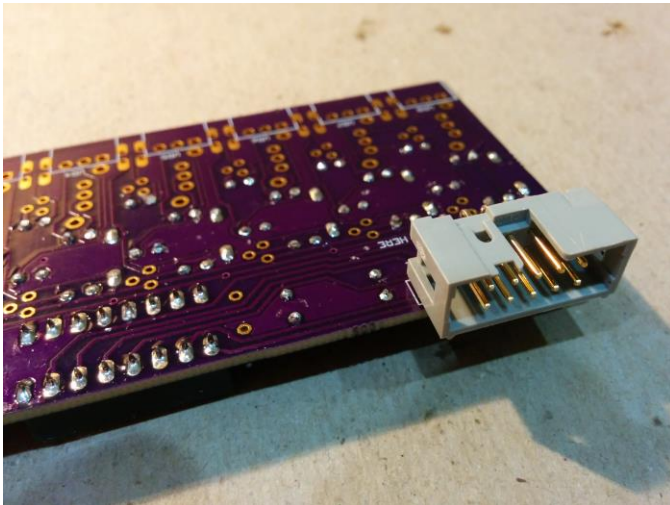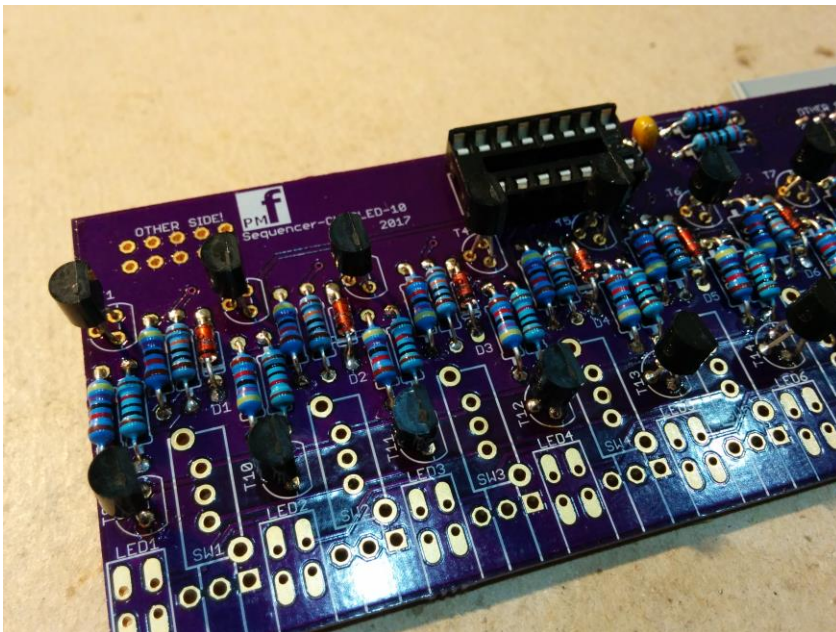

5. Ceramic/film capacitor

Install the ceramic/film capacitor on the TOP of the board. Solder and clip the leads.
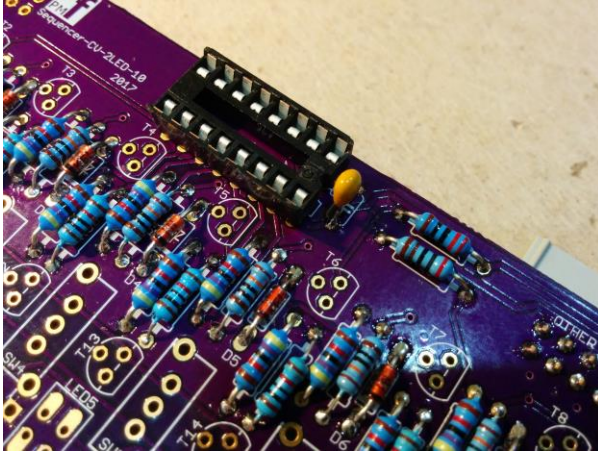
6. Install the transistors on the TOP of the board. These are polarized components. Align the outline with the outline on the board. Solder and clip the leads.

7. Install the LEDs on the TOP of the board and solder on the underside. The LEDs should face the edge of the board.

8. 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.

Install on the bottom. Carefully align the pots so they are flush with the edge of the board and perfectly upright and tight to the board surface. Tack one pin only of each pot with solder. Please ensure they are on the CORRECT SIDE OF THE BOARD. See Photo.


9. Alignment

Place the front panel over the board so that the LEDs and pots align with the holes in the panel.
Put nuts on the pots and FULLY TIGTEN all of them. Do not over tighten!
Now fully solder all the pins of the pots. You can pass the solder through the unoccupied switch

holes in the panel!
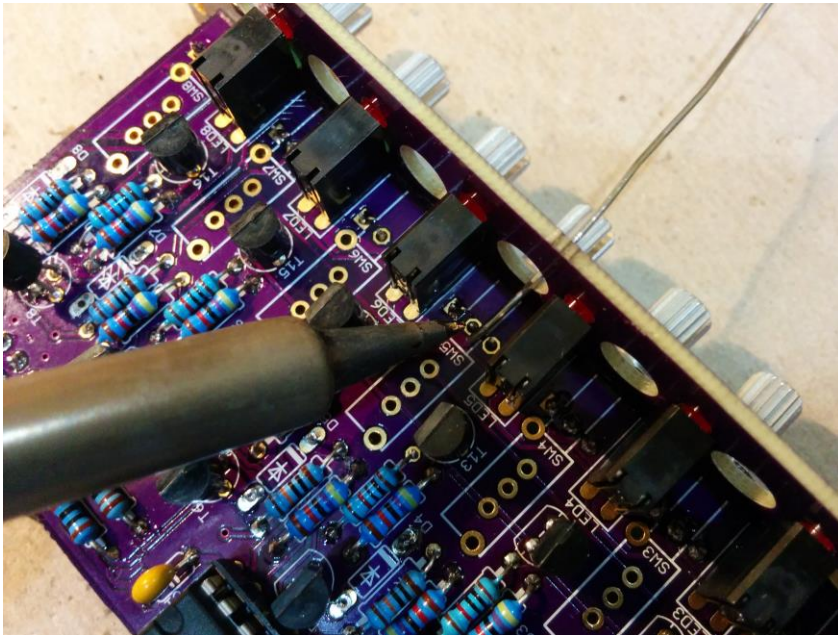
10. Switches

Tack one pin of each switch, and when all are tacked, align with the front panel, then solder all the remaining pins and the locating lugs. All switches are on the TOP. Do not bridge the contacts to nearby components or burn the plastic of the nearby potentiometers.
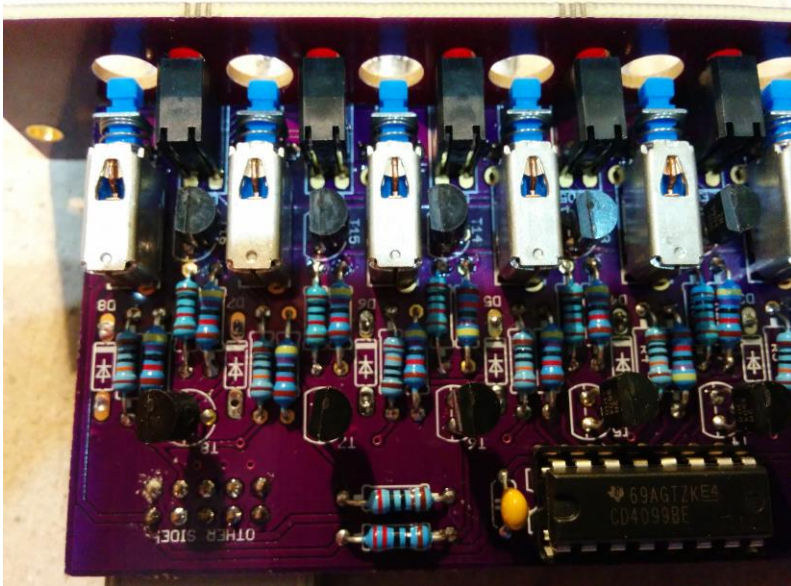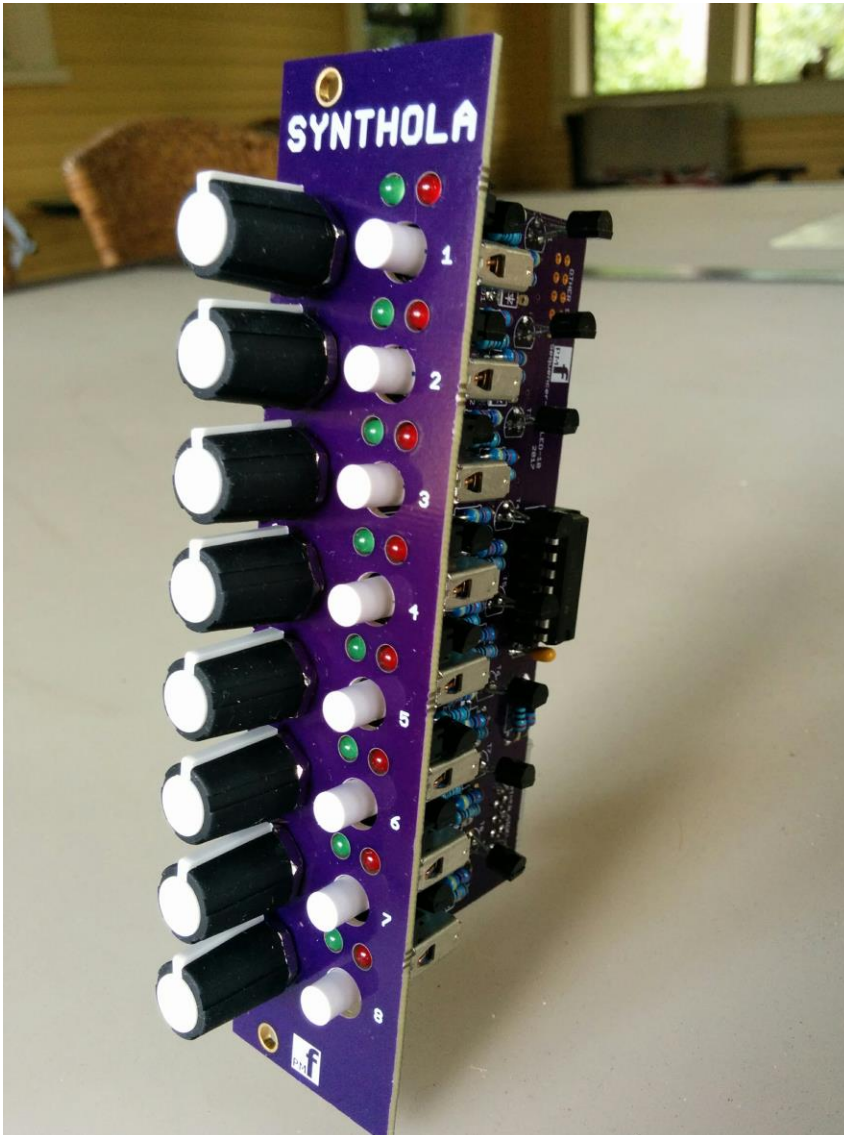

Voltage tests

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. Connect the Control board to the CV board using the 10-16 pin connector.
3. Connect the power of the CONTROL BOARD (previously constructed).
4. DO not connect this CV board directly to power! Take care to read the silk screen next to the ribbon cable connectors on both boards to ensure the power connectors and interconnects are connected to the correct sockets.
5. Connect the –VE probe of a multimeter set to the 20V range to a suitable GND pin somewhere on the board.
6. Check the voltage at the following points on the board:
    a. At IC1 pins 16 = +5
    b. IC1 pin 3 approx = +5
    c. IC1 pin 8 = 0 V
7. If any of these tests fail to match the readings given, you should check the components and soldering before progressing.

Final Assembly
1. Place the IC in place by aligning the notch with the notch graphic on the PCB Silk Screen and notch on the socket.
2. Put the caps on the switches by pushing until they click.
3. Place the front panel over the PCB so that the pots, switches LEDs align with the holes in the panel. Skip this step if you are building the Quantola 16X3 with 54hp panel.
4. Put nuts on the pots and jacks and FULLY TIGTEN all of them. Do not over tighten! Skip this step if you are building the Quantola 16X3 with 54hp panel.

5. Install the knobs. Skip this step if you are building the SQuantola 16X3 with 54hp panel.

6. **NOW READ THE USER GUIDE.**