TRIAD DRONE/NOISE SYNTHESIZER BUILD GUIDE



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This document will guide you through building a Triad drone synthesizer.
This build uses through hole parts and is ideal for beginners.
If you have any questions or are unsure about anything in this guide get in touch at the email addresses above.

PLEASE PAY PARTICULAR ATTENTION TO ANY TEXT IN RED WITHIN THIS BUILD DOCUMENT. THIS WILL MOST LIKELY RELATE TO POLARISED COMPONENTS THAT HAVE BE PLACED IN A CERTAIN WAY IN THE PCB.

Before starting, check that you have all the correct parts for the build against the list below.

Components:-
5 x 1K Resistor
1 x 10K Resistor

1 x 1N4001 Diode
2 x 1N4148 Diode

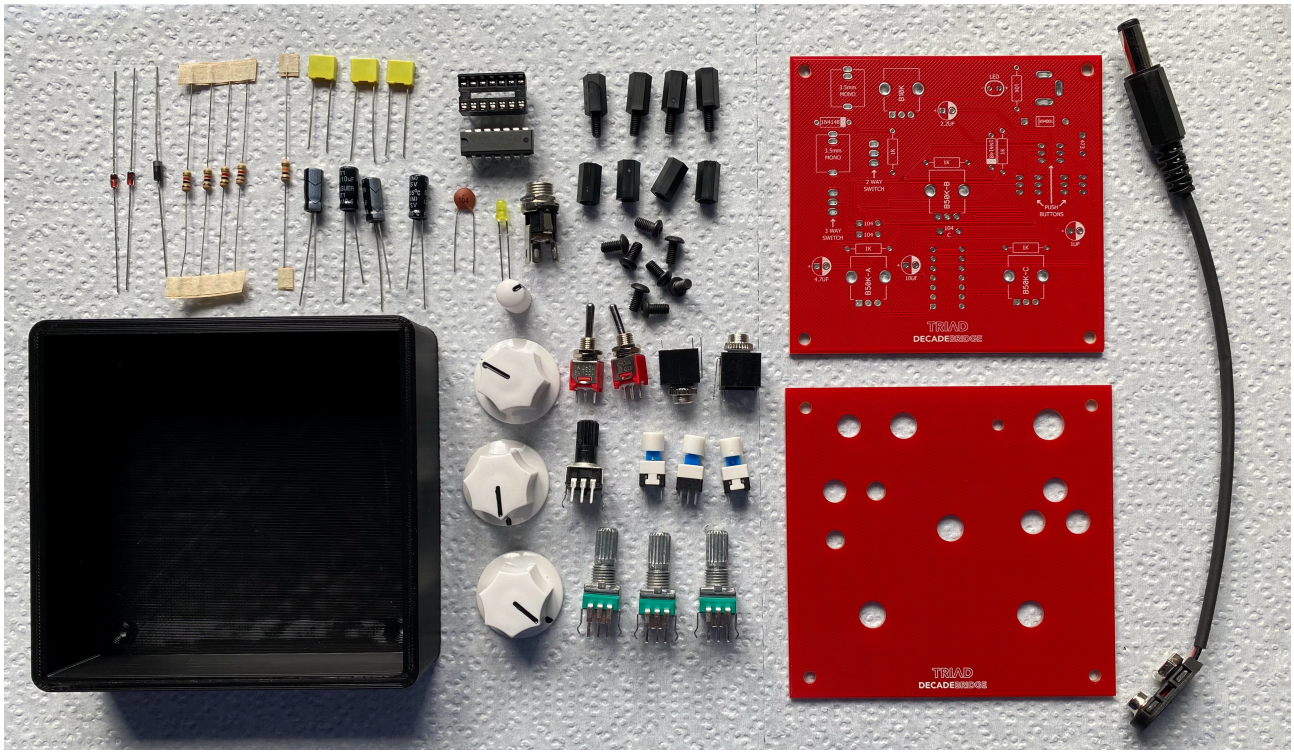
1 x 47nF Box capacitor (473)
2 x 100nF Box capacitor (104)
1 x 100nF Ceramic capacitor (104)
1 x 1uF Electrolytic capacitor
1 x 2.2uF Electrolytic capacitor
1 x 4.7uF Electrolytic capacitor
1 x 10uF Electrolytic capacitor

1 x 14 Pin dip socket
1 x 40106 Schmitt trigger IC

1 x LED

Continued:-
2 x 3.5mm Mono jack
3 x Push button
1 x 5.5 x 2.1mm Power input jack
1 x B10K Trimmer Pot
3 x B50K Potentiometer
1 x SPDT 3 way toggle switch (ON-OFF-ON)
1 x SPDT 2 way toggle switch (ON-ON)

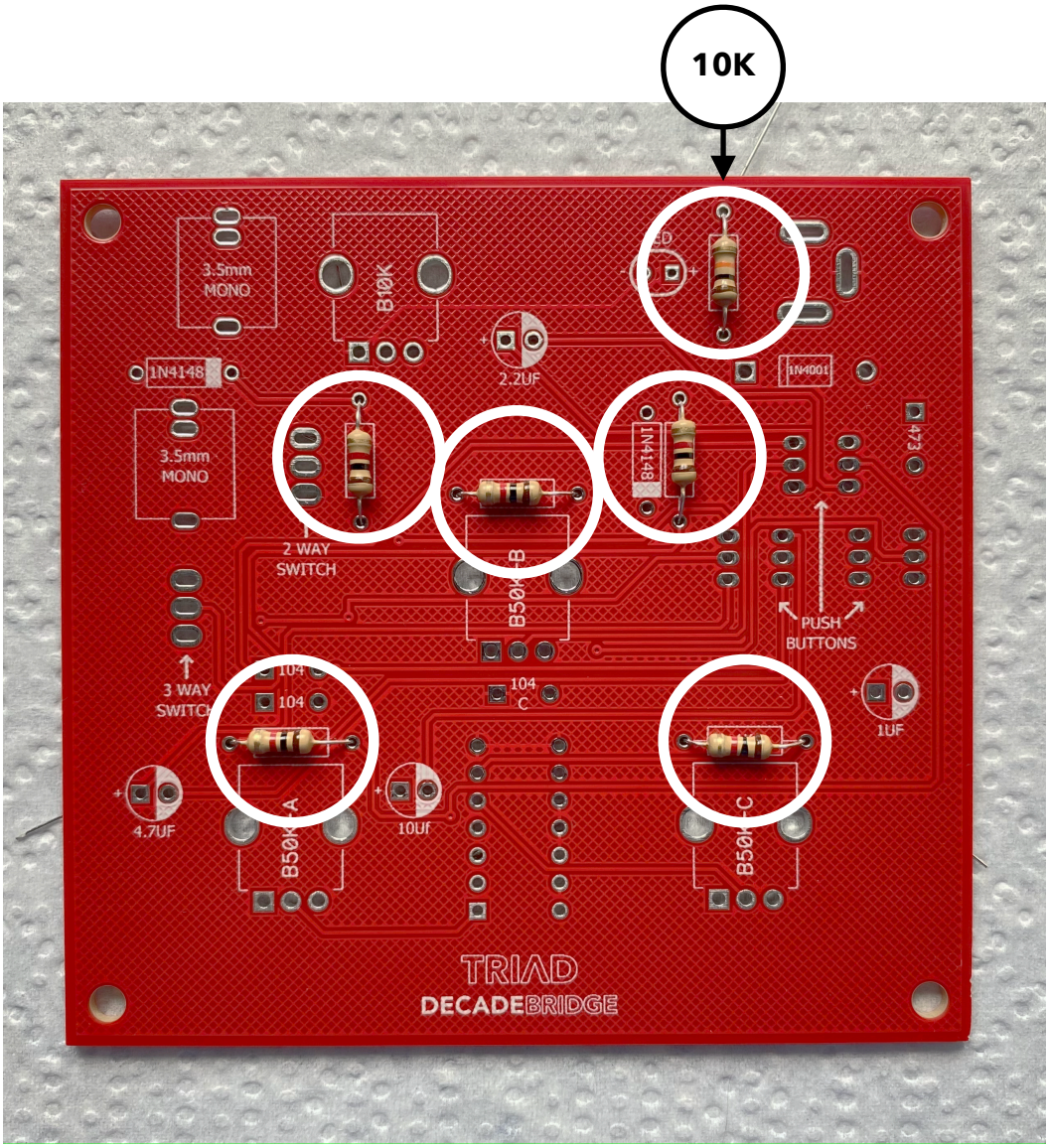
1 x PCB
1 x Faceplate
4 x Female to Female standoff
4 x Male to Female standoff
8 x M3 Hex screws
1 x 3D printed case
3 x Large white knobs
1 x Small white knob



Step 1. Resistors:-

Start by placing all the resistors into the PCB. Pay attention to the resistor values as written on the board. Refer to the image for placement. The single 10K resistor is placed as shown. All the other resistors are 1K.

Turn the board over and solder the resistors in place. Cut the legs off with a pair of side cutters.



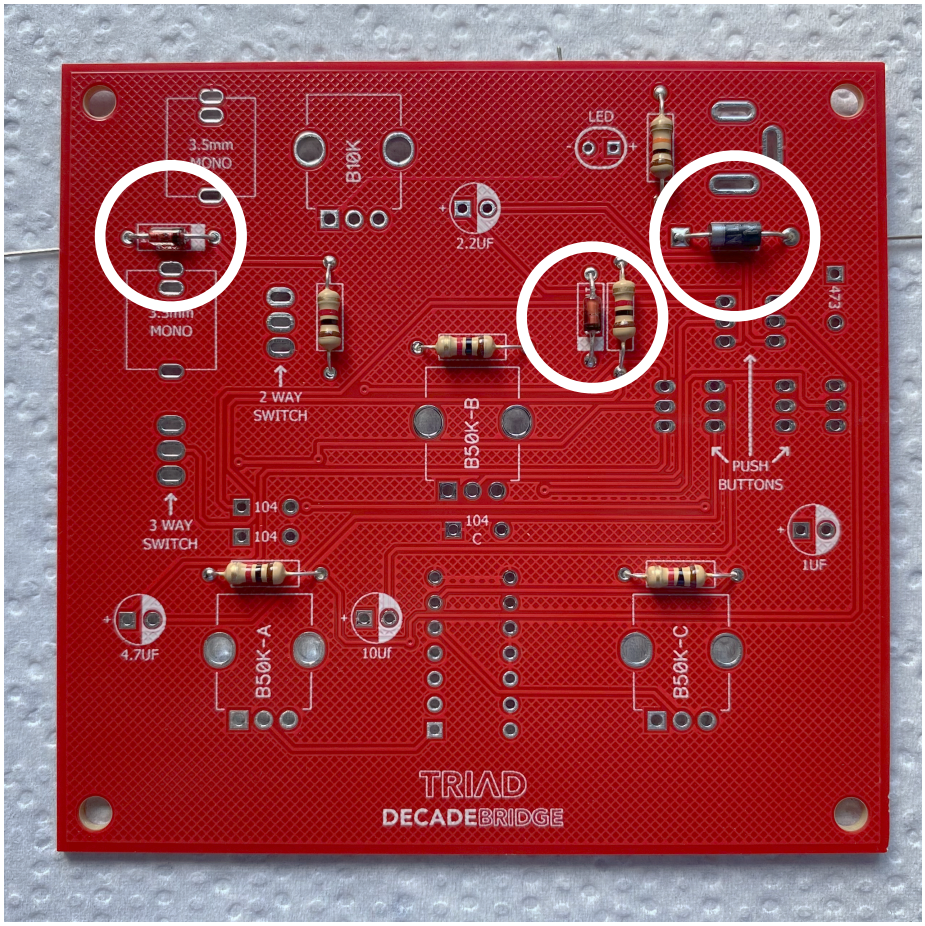
Step 2. Diodes:-

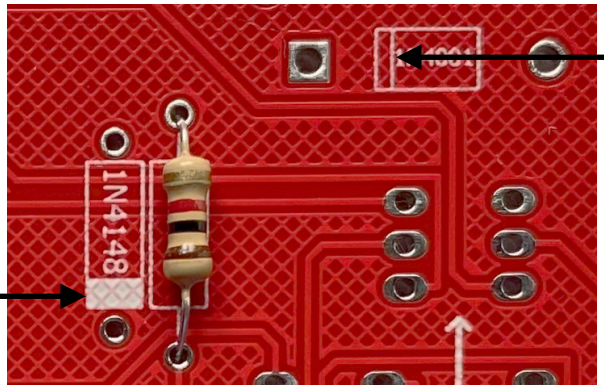
THESE COMPONENTS MUST BE PLACED INTO THE BOARD THE CORRECT WAY ROUND.

Place the 2, 1N4148 diodes into the PCB. These are orange in colour with a small black stripe at one end. Make sure the black stripe matches the white stripe on the PCB.

Place the 1N4001 diode into the PCB. This is black in colour with a white stripe at one end of the diode. Make sure the white stripe matches the stripe on the PCB.

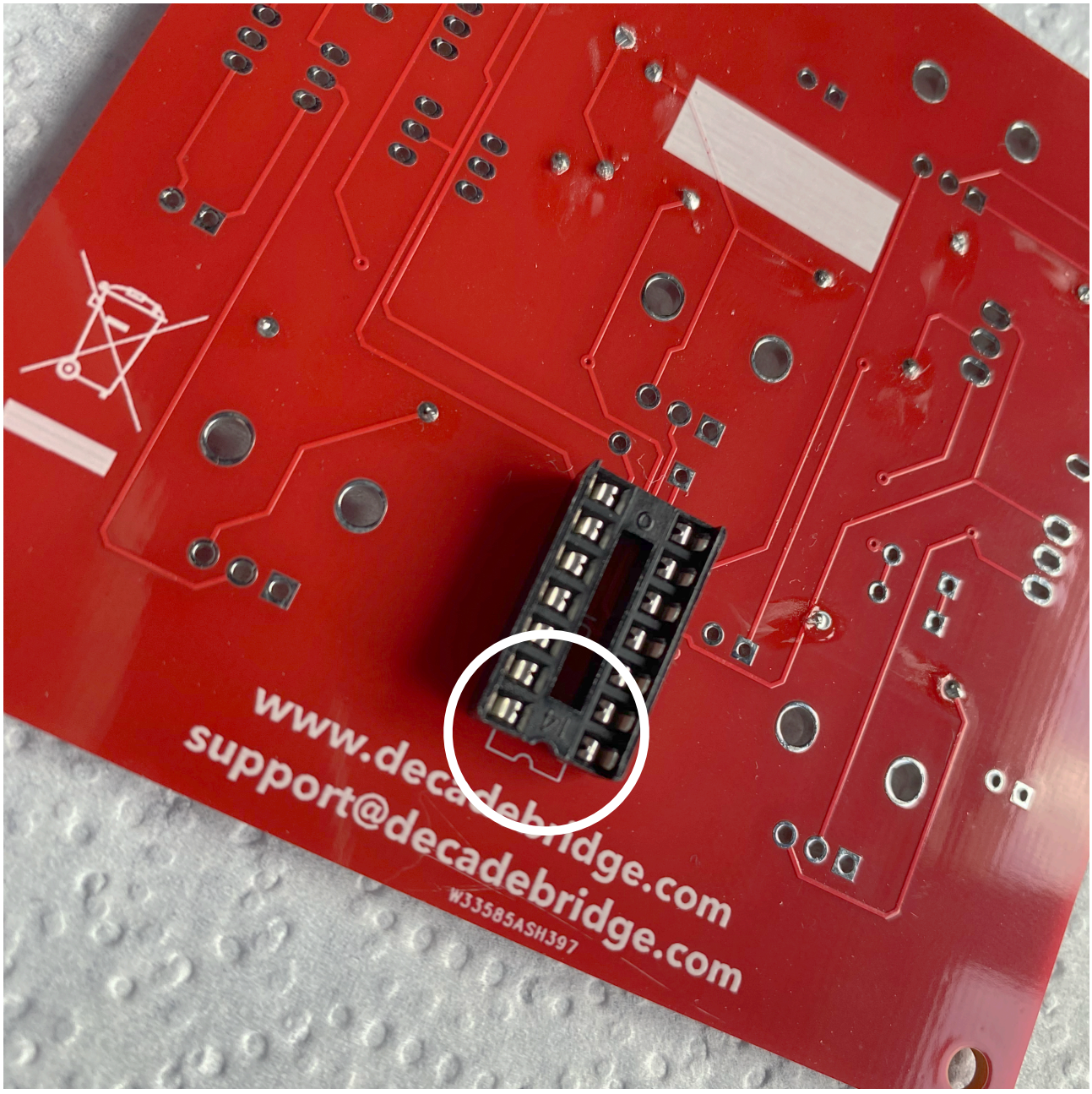
Turn the board over, solder these in place and remove the excess legs with side cutters.





Step 3. DIP Socket:-

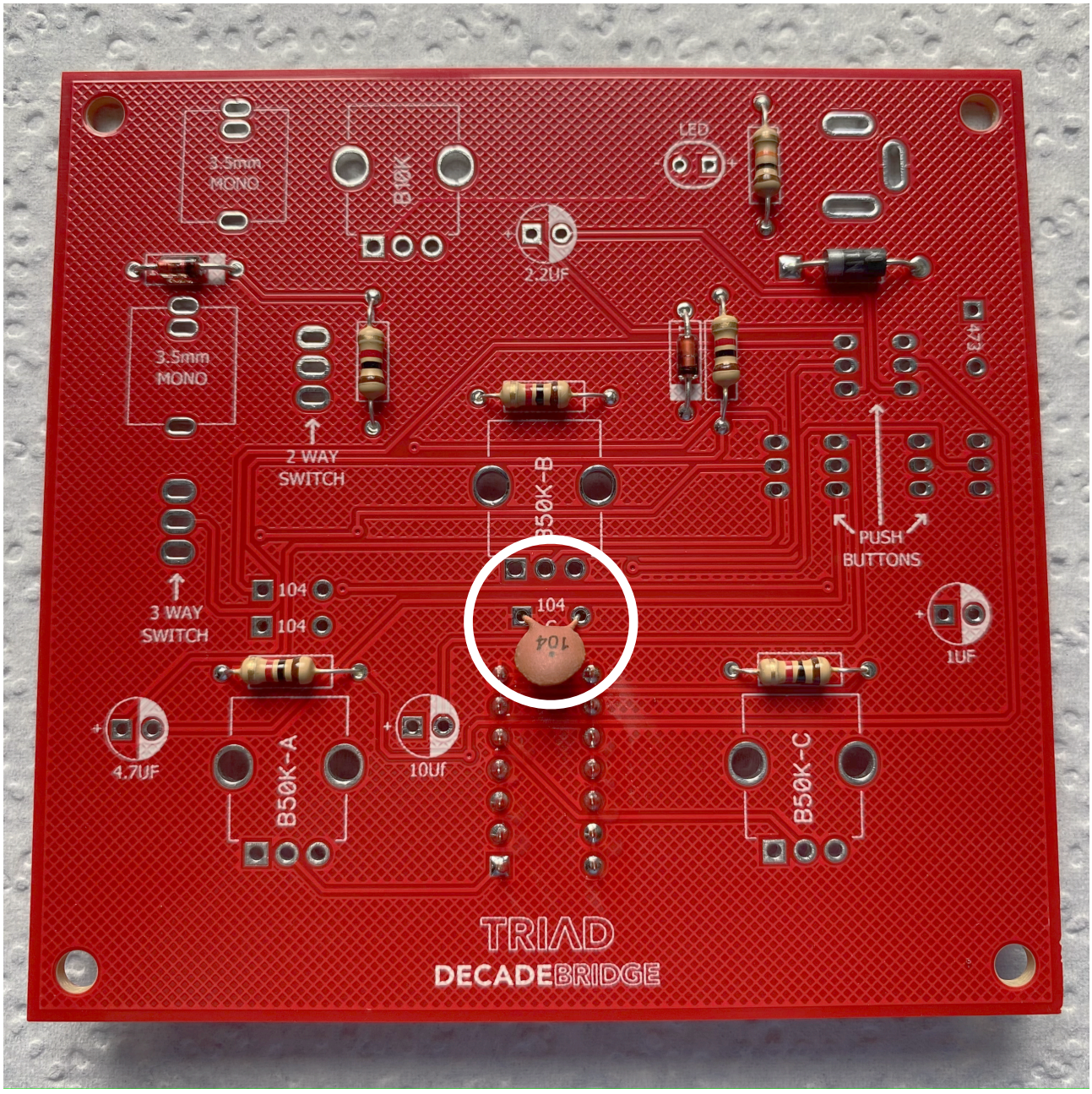
Next place the DIP socket into the back of the board ensuring that the notch at one end of the socket lines up with the notch printed on the PCB. Turn the board over and solder the socket in place.



Step 4. Ceramic capacitor:-

Insert the single, 100nF ceramic capacitor (104) into the circuit board. Its placement on the PCB is marked as '104 C'.

Turn the board over. Solder the capacitor in place and remove the excess legs.

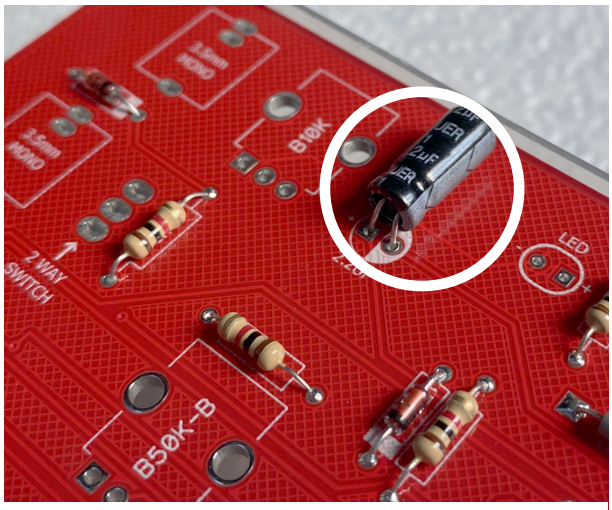


Step 5. Electrolytic capacitors:-

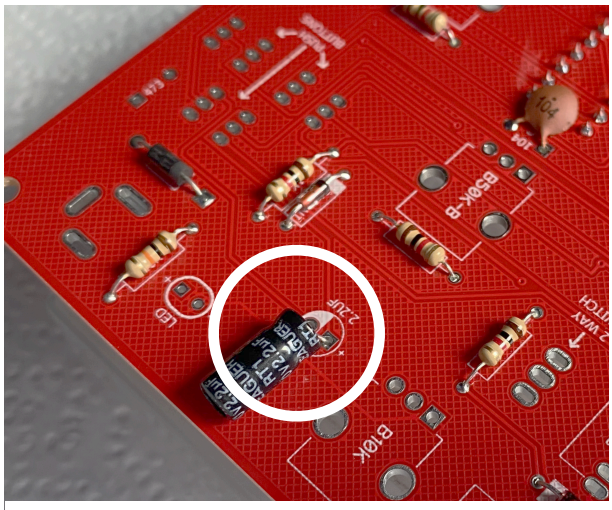
THESE COMPONENTS ARE POLARISED AND MUST BE PLACED INTO THE PCB THE CORRECT WAY ROUND.

These capacitors have a white stripe and shorter leg on one side which indicate the negative side of the capacitor and must be lined up with the white side of the circle printed on the PCB. Make sure you have these the correct way round. The PCB has been marked with the capacitor values. You can find these values printed on the side of the component. Make sure that you place them in the correct positions.

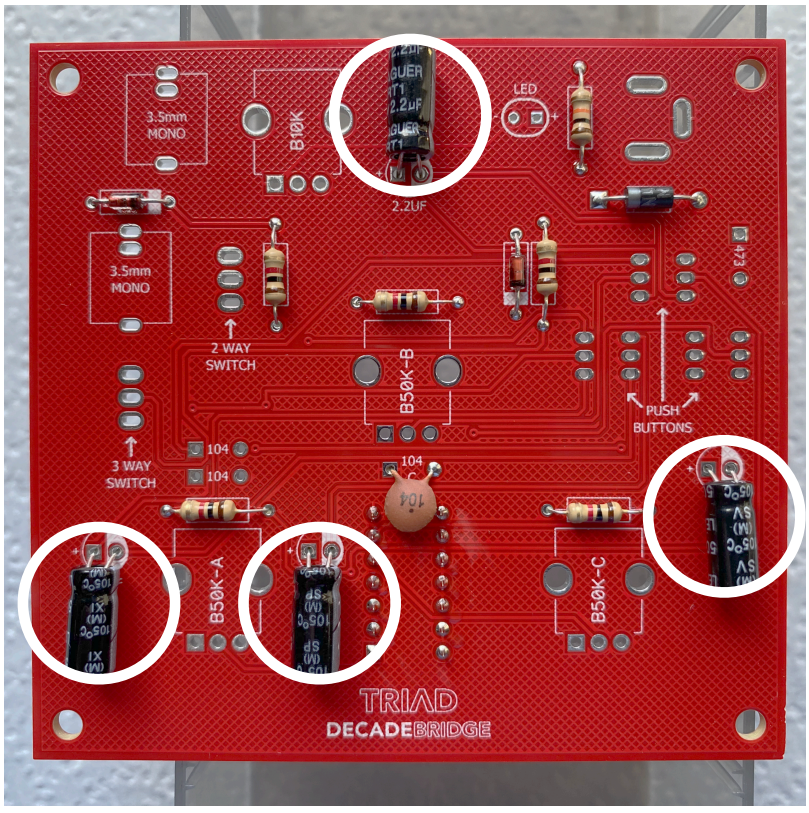
Once they are in place, turn the board over and solder them. Remove the excess legs.



Match the white stripe with the white part of the circle on the PCB.

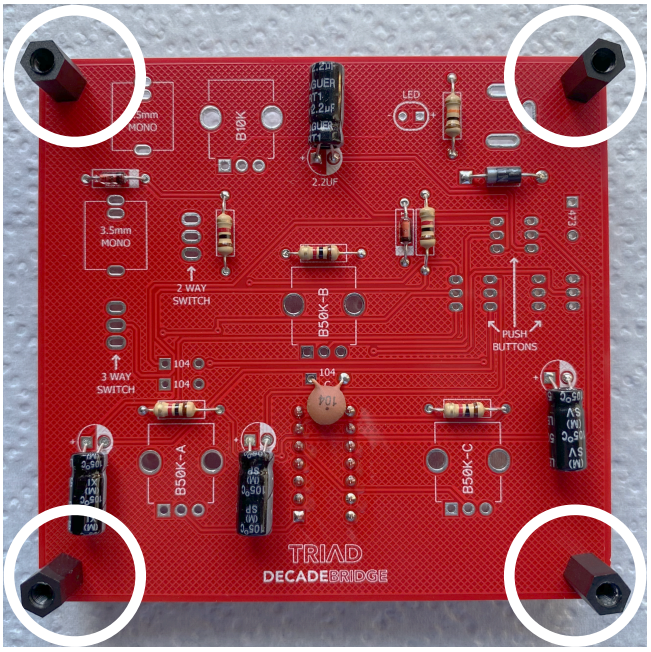


Match the capacitor value with the value shown on the PCB. Here the value is 2.2uF

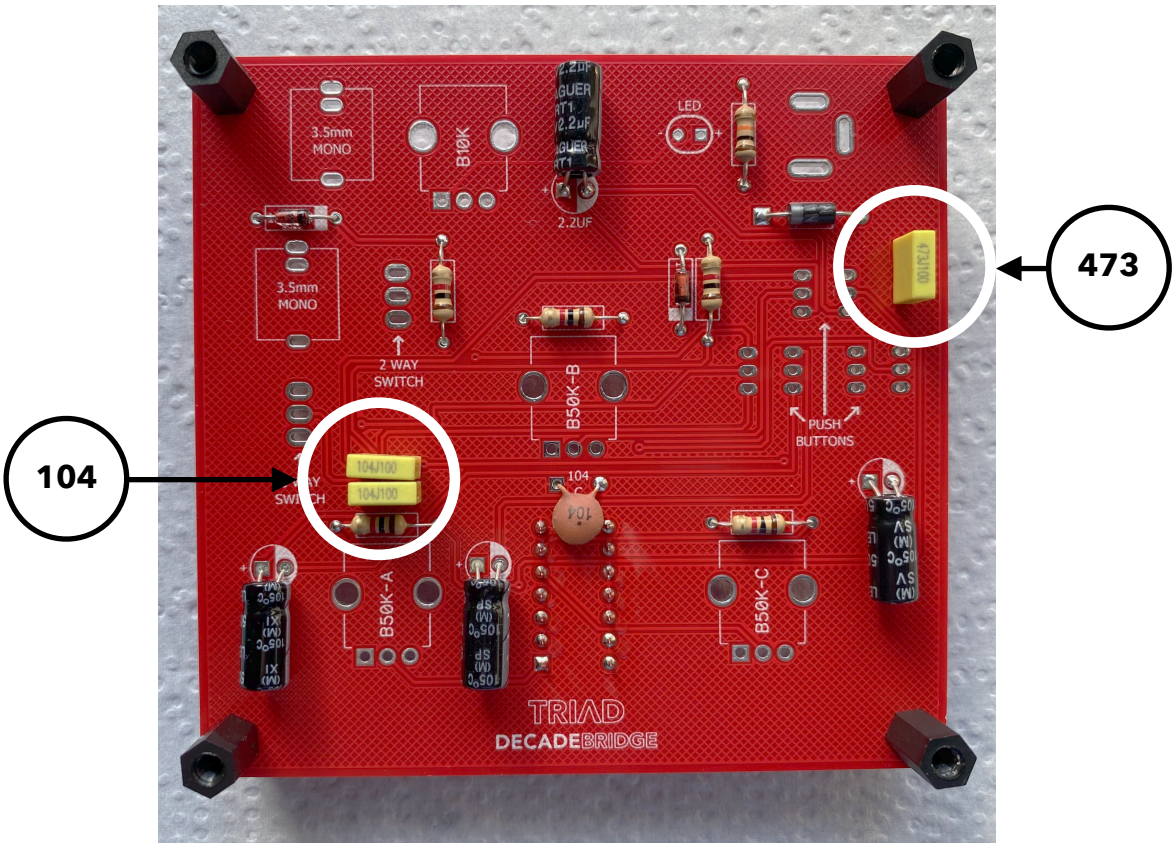


THIS KIT COULD INCLUDE THE SHORTER OR TALLER ELECTROLYTIC CAPACITORS. IF YOU RECEIVE THE SHORTER ONES YOU CAN PLACE THEM STRAIGHT INTO THE BOARD. IF YOU RECEIVE THE TALLER ONES THEN YOU WILL NEED TO LIE THEM DOWN ON THE BOARD. SPACE HAS BEEN MADE ON THE PCB TO ACCOMMODATE THIS AND THIS BUILD USES THE TALLER CAPACITORS TO DEMONSTRATE.

Step 6. Standoffs:-
Add the 8 standoffs to the four corners of the PCB.



Step 7. Box capacitors:-
Add the remaining capacitors to the PCB. The values of these have been clearly marked on the board. You can find the value on top of the capacitor. 473 = 47nF. 104 = 100nF. Turn the board over and solder these in place. Remove the excess legs.

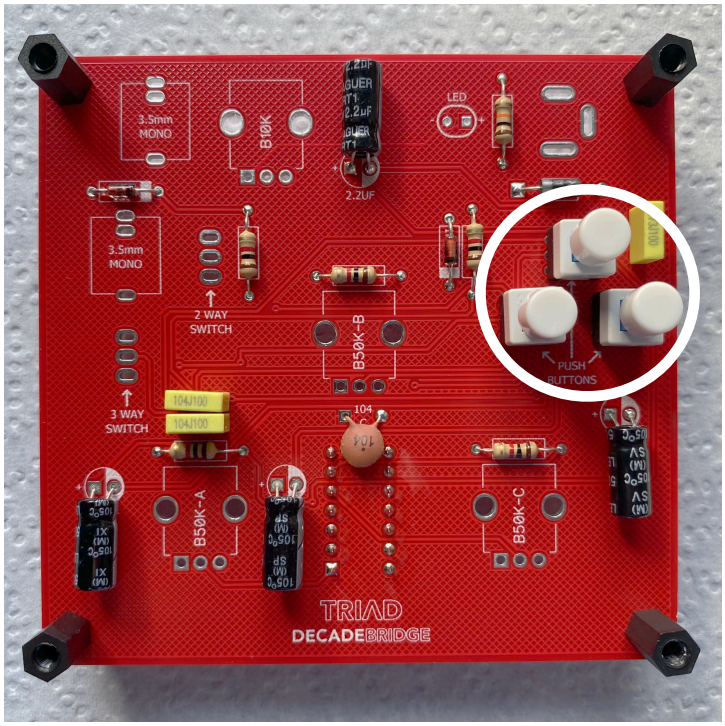


Step 8. Push Buttons:-

Look at the blue shaft on the push buttons and you will see a small spring on one side. I place the buttons so that the spring is facing the top of the PCB.



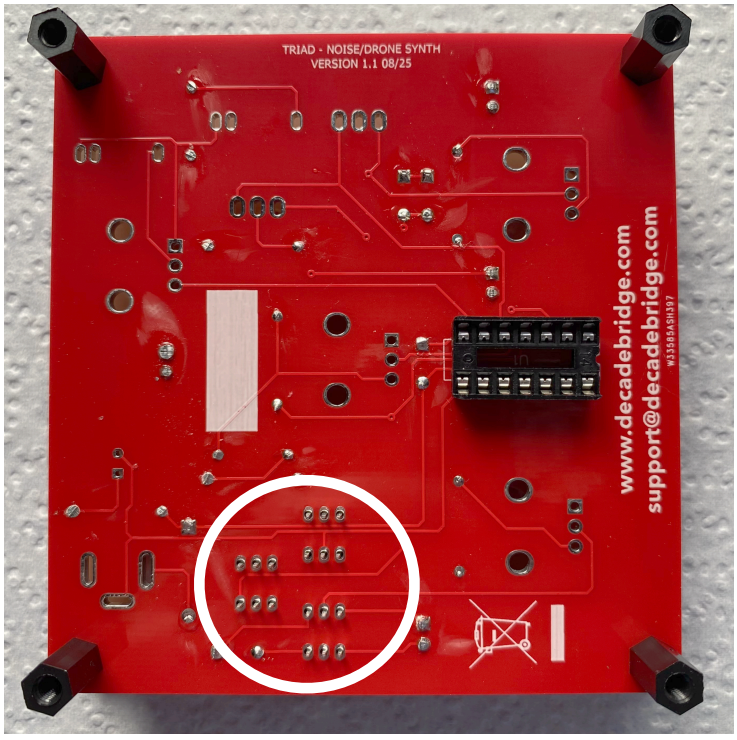
Insert the 3 push buttons into the board. Ensure that they are all in the same position (UP) so that when you solder them they will be at the same height.
We will now use the faceplate to keep them aligned whilst we solder.



Place the faceplate onto the standoffs and screw it in place using 4 of the hex screws. They do not need to be tight, just secure.



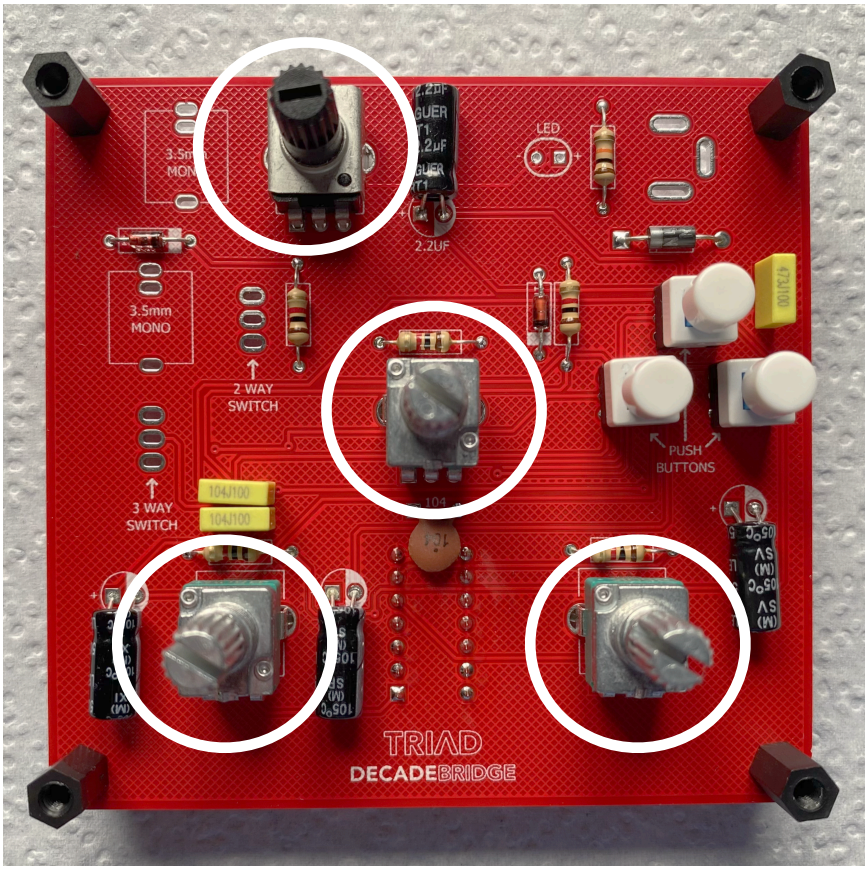
You can now turn Triad over to solder the buttons in place. I place a piece of kitchen towel on top of the faceplate and hold it in place then turn Triad over and place it down on the work surface. Solder the buttons in place. Turn Triad back over and remove the faceplate.



Step 9. Controls:-

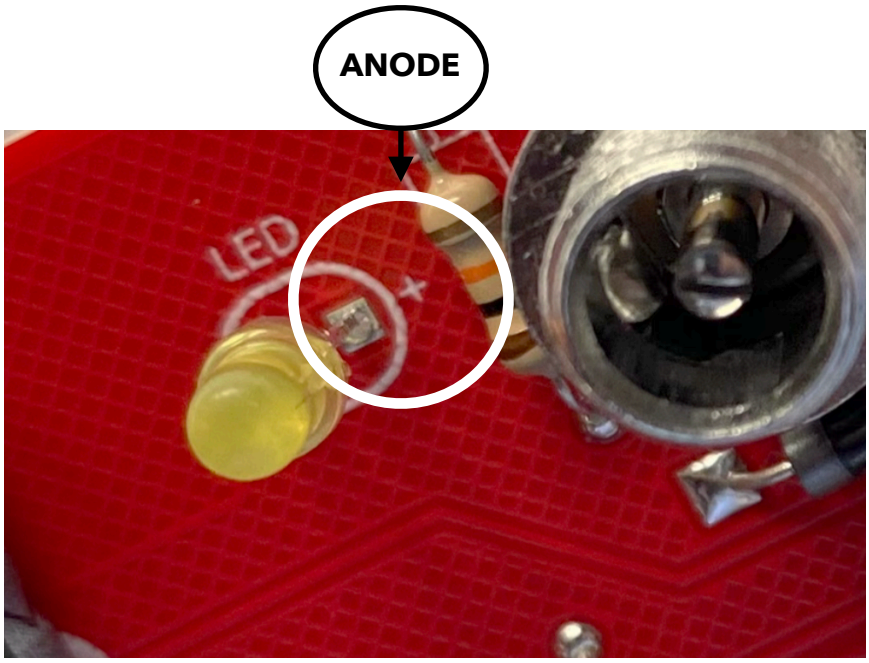
You can now populate the PCB with the other controls.

Start with the 3 B50K potentiometers and the B100K trimmer pot.

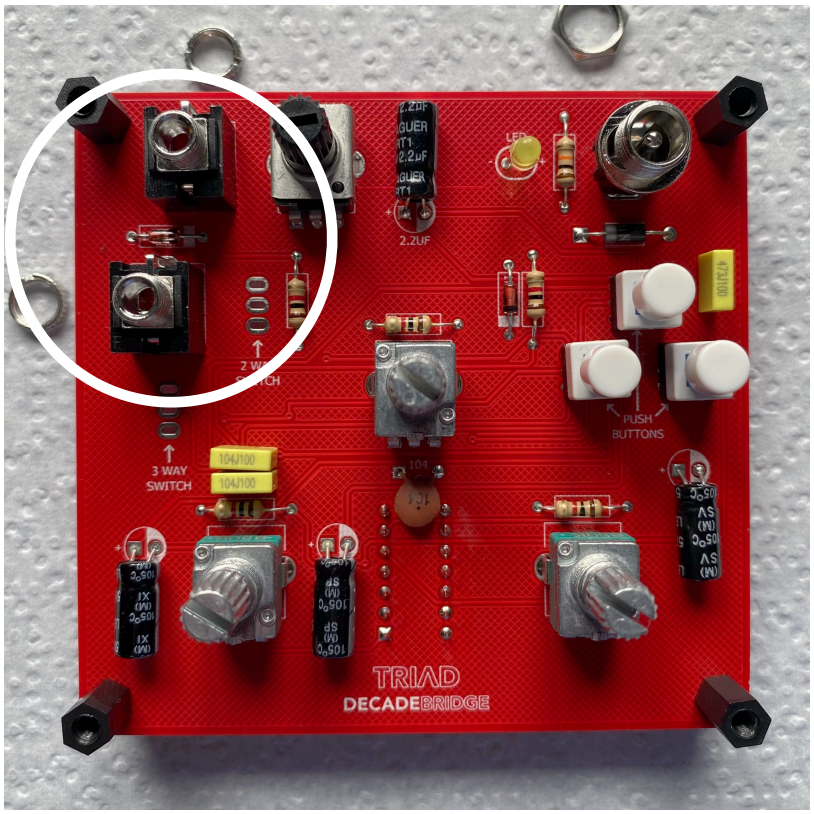


Next remove the nut from the power input socket and place the socket into the top right of the board. This has 3 terminals and can only go one way round. Place the LED next to this.

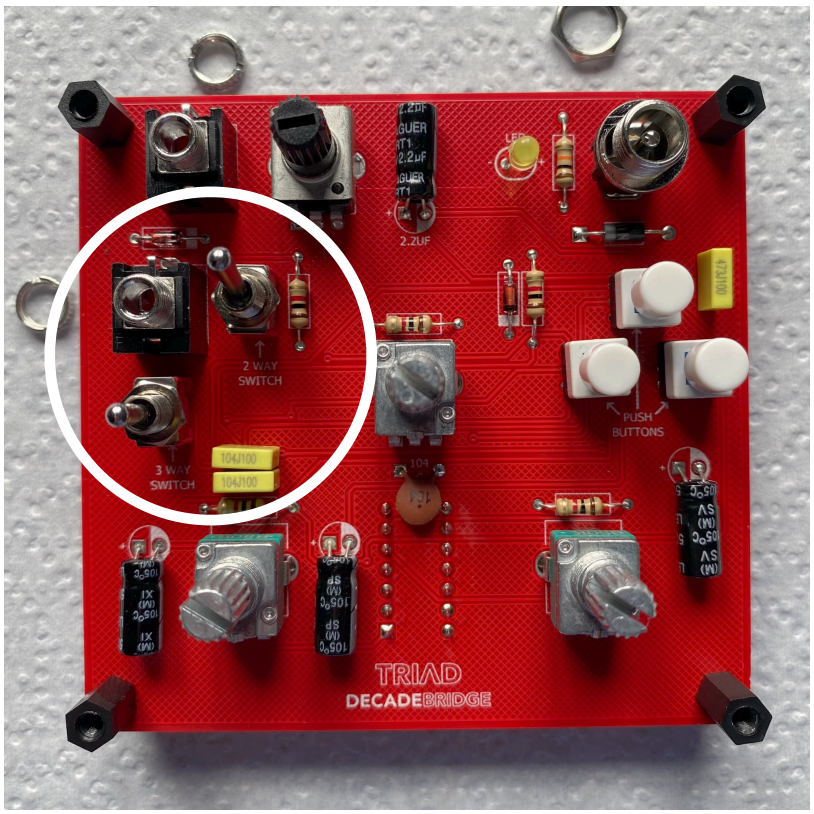
THE LED NEEDS TO BE PLACED THE CORRECT WAY ROUND. ENSURE THAT THE LONG LEG (ANODE) IS PLACED INTO THE SQUARE HOLE MARKED '+'.



Remove the nuts from the 3.5mm mono sockets and place them into the top left of the board.



Before adding the 2 toggle switches remove one of the nuts from each and place them to one side. Check that you place them in the correct positions. The 3 way switch (ON-OFF-ON) is placed below the mono jack. The 2 way switch (ON-ON) is placed to the right of the input jack.



Now carefully place the faceplate onto Triad.
Secure the faceplate in place, screwing 4 of the 8 hex screws into the standoffs.

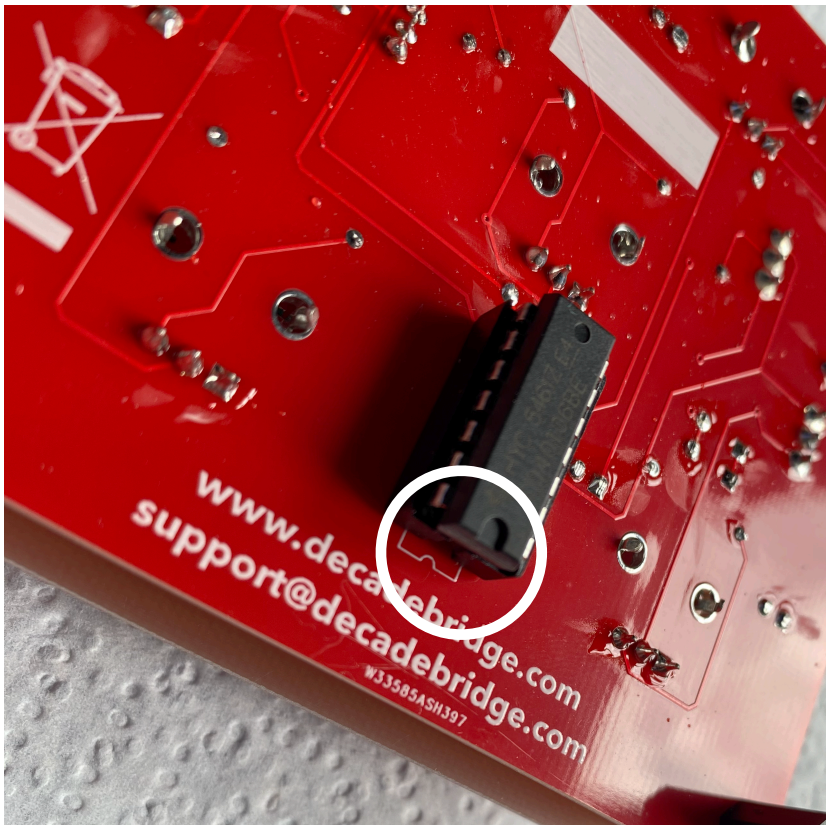
BE CAREFUL NOT TO BEND THE LED. YOU MIGHT NEED TO HOLD THE BOARD UP SLIGHTLY TO LET THE LED DROP THROUGH THE BOARD.



Turn Triad over and make sure that the LED has dropped into the hole on the faceplate.
Solder all the parts into place before cutting the excess off the LED legs.

Step 10. 40106 IC:-

Place the 40106 IC into the DIP socket on the bottom of the board. Make sure you place the IC the correct way round. The notch on the IC has to match the notch on the PCB.



Step 11. Test:-

It is best to test Triad at this point and make sure it is working correctly before placing Triad in its case and adding the nuts and knobs. Use the included battery clip and a 9V battery to test. Alternatively you could use a DC power supply however it is recommended you test first with a battery. I use a rechargeable, 9V, 600mA battery.

IF YOU USE A POWER SUPPLY ENSURE THAT IT IS 9V DC, CENTRE POSITIVE, WITH A MINIMUM OUTPUT OF 70mA.

Email:- support@decadebridge.com if you are unsure or have any issues or questions.

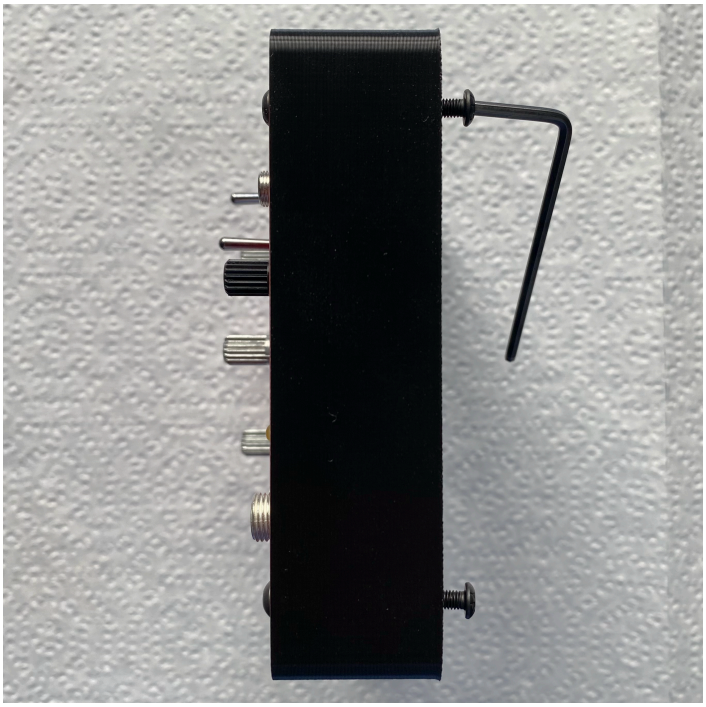
Step 12. Case:-

Once you are happy that Triad is working properly you can place the synth into the 3D printed case. It is best to start the remaining 4 hex screws off before screwing it all together. Place Triad to one side.

Turn the case over so you are looking at the bottom. Screw the hex screws into each of the 4 holes at the corners of the case so that they take. Do not screw them all the way through.



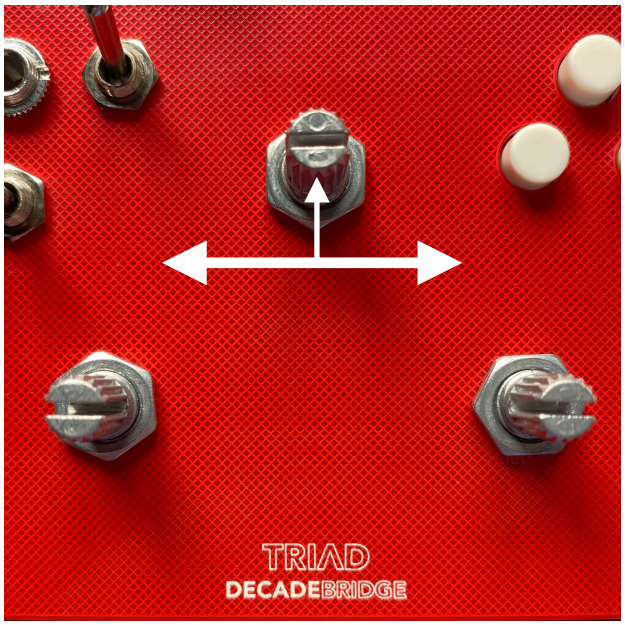
Now you can insert Triad into the case. Holding it firmly in place, continue to screw the hex screws so that they feed into the standoffs. If they do not take, back them off slightly and slowly try them again. You may need to screw each one in gradually to start with before going around and tightening them all up.



Step 13. Dressing:-
Now you can add the nuts to the power input, potentiometers, mono jack sockets and the toggle switches.

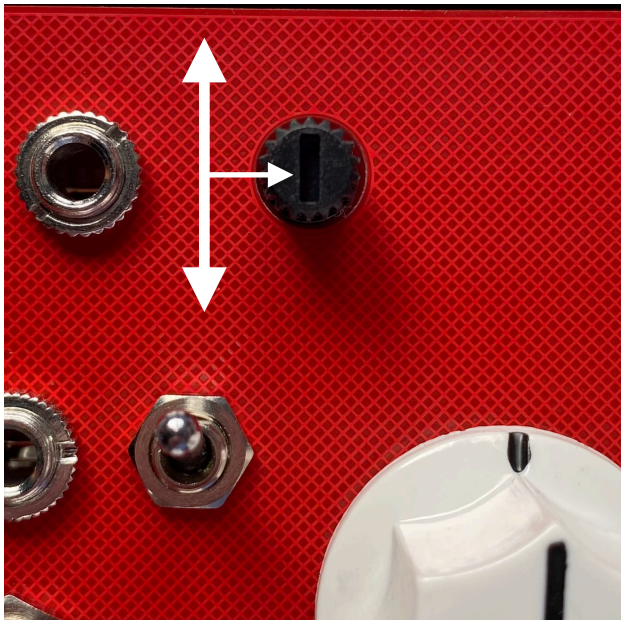


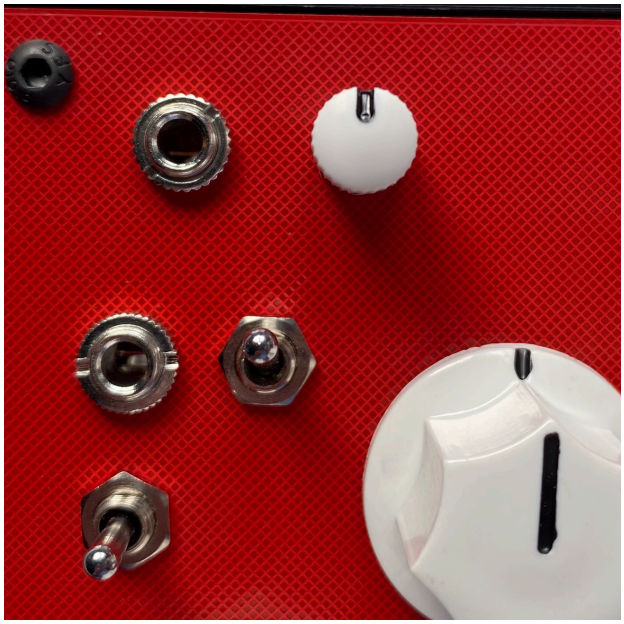
The last thing to do is add the knobs. Set the 3 pitch potentiometers so that the gap in the shaft is horizontal. This is the midway point of the turn. Place the large white knobs so that the marker is pointing directly up.





Set the trimmer, volume pot so that the gap is vertical. This is the midway point. Push the smaller white knob on to the pot so that the marker is pointing directly up.





Your Triad is now complete and ready to make some noise. Enjoy!



Download the operating manual for TRIAD here:-
https://www.decadebridge.com/Downloads/Manuals/Triad%20Manual.pdf

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TRIAD demo video:-



Oscillator Sink walkthrough video:-

