

FOUR DRONE SYNTHESIZER/UTILITY BUILD GUIDE

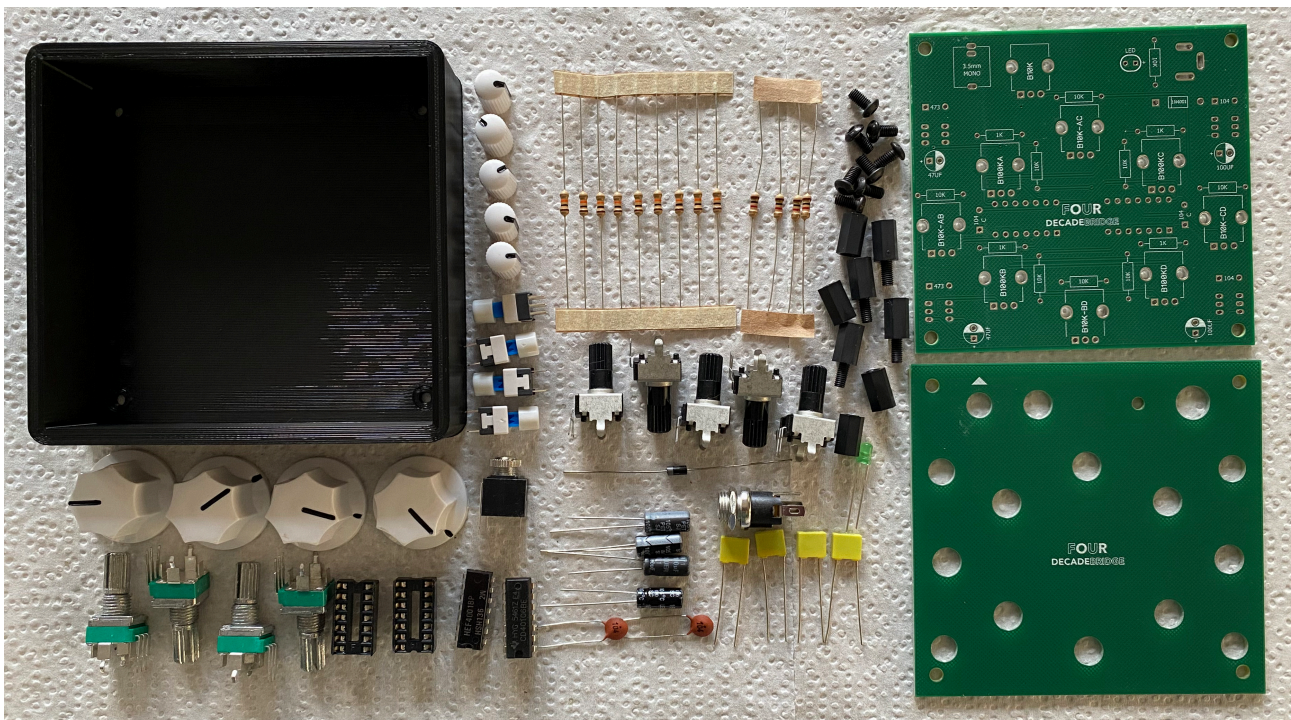


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This document will guide you through building a Four drone synthesizer/utility instrument. This build uses through hole parts and is ideal for beginners. If you have any questions or are unsure about anything in this guide get in touch at the email 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 TO BE PLACED IN A CERTAIN WAY IN THE PCB.

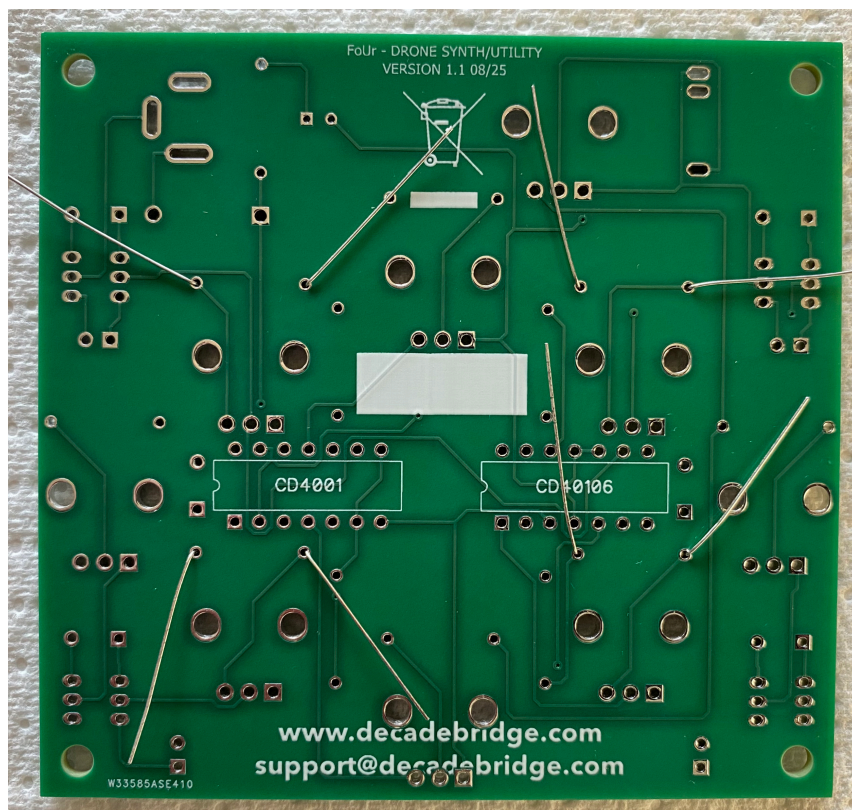
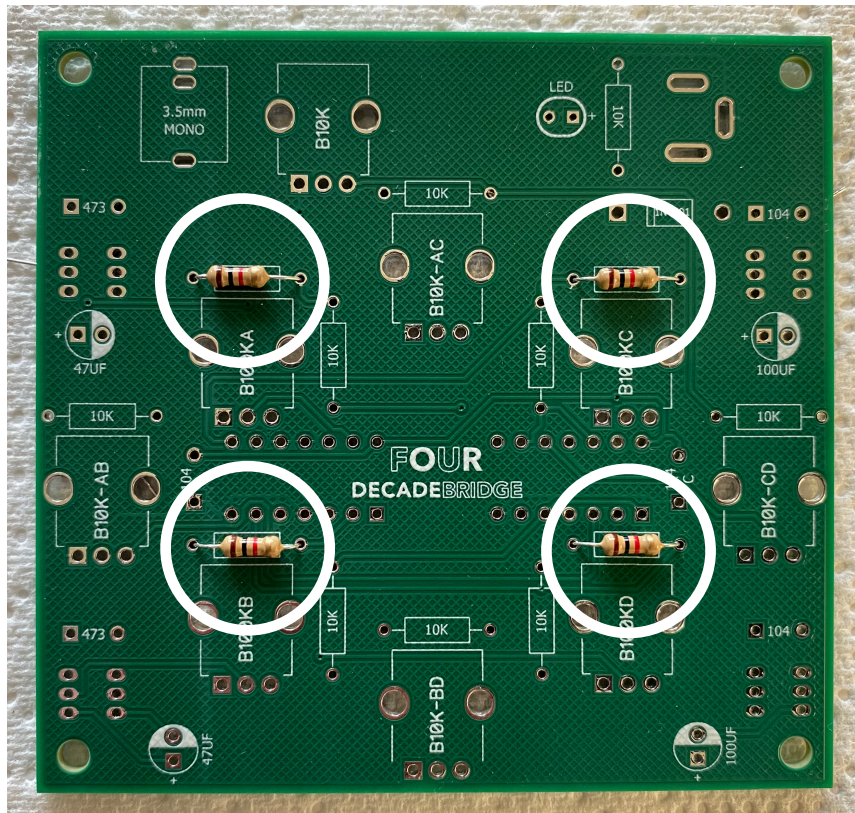
5 x Small white knob



Step 1. 1K Resistors:-

Start by placing all the 1K resistors into the PCB. Pay attention to the resistor values as written on the board. Refer to the image for placement.

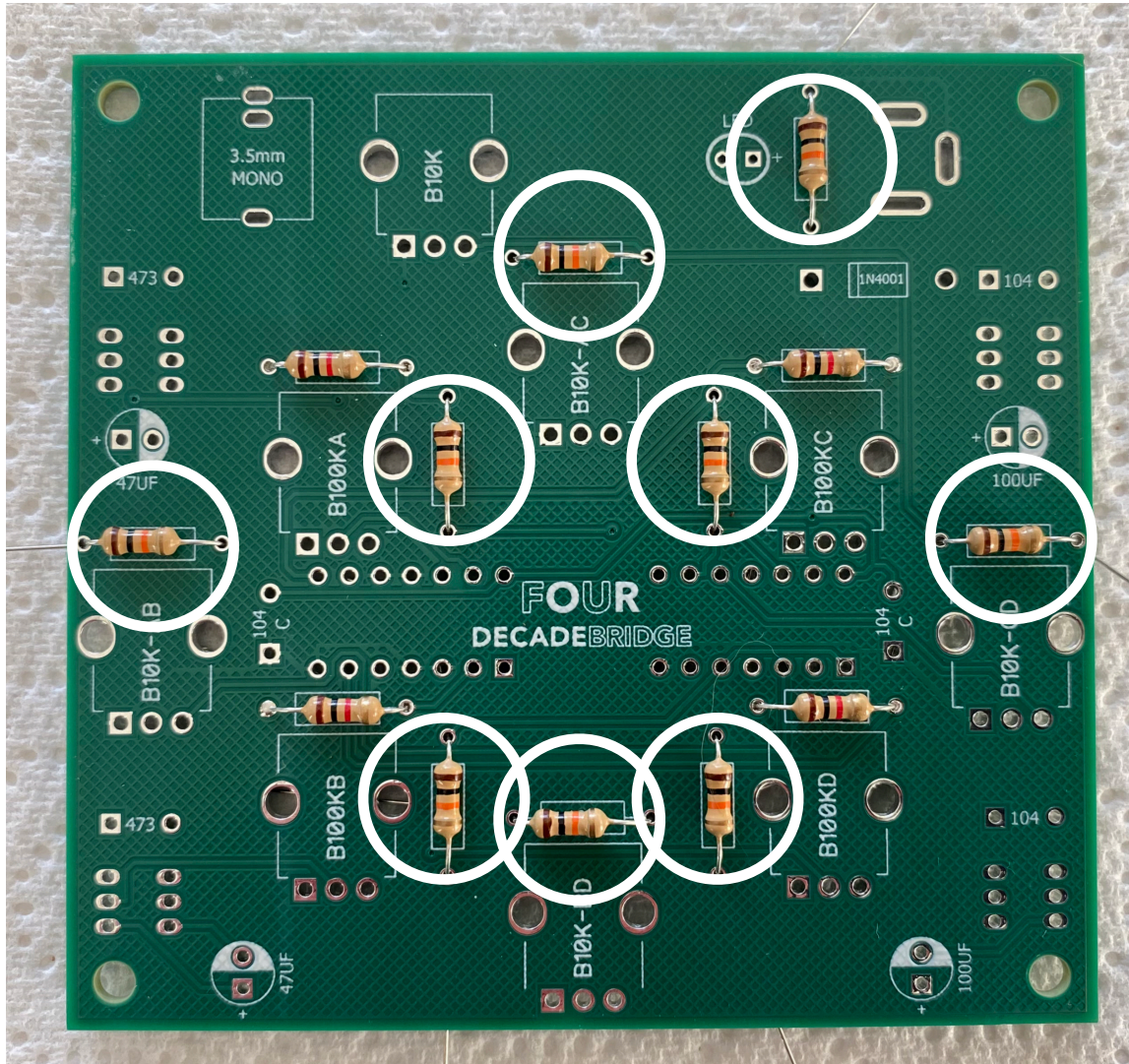
Turn the board over and solder the resistors in place. Cut the legs off with a pair of side cutters.



Step 2. 10K Resistors:-

Place all the 10K resistors into the PCB. Refer to the image for placement.

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

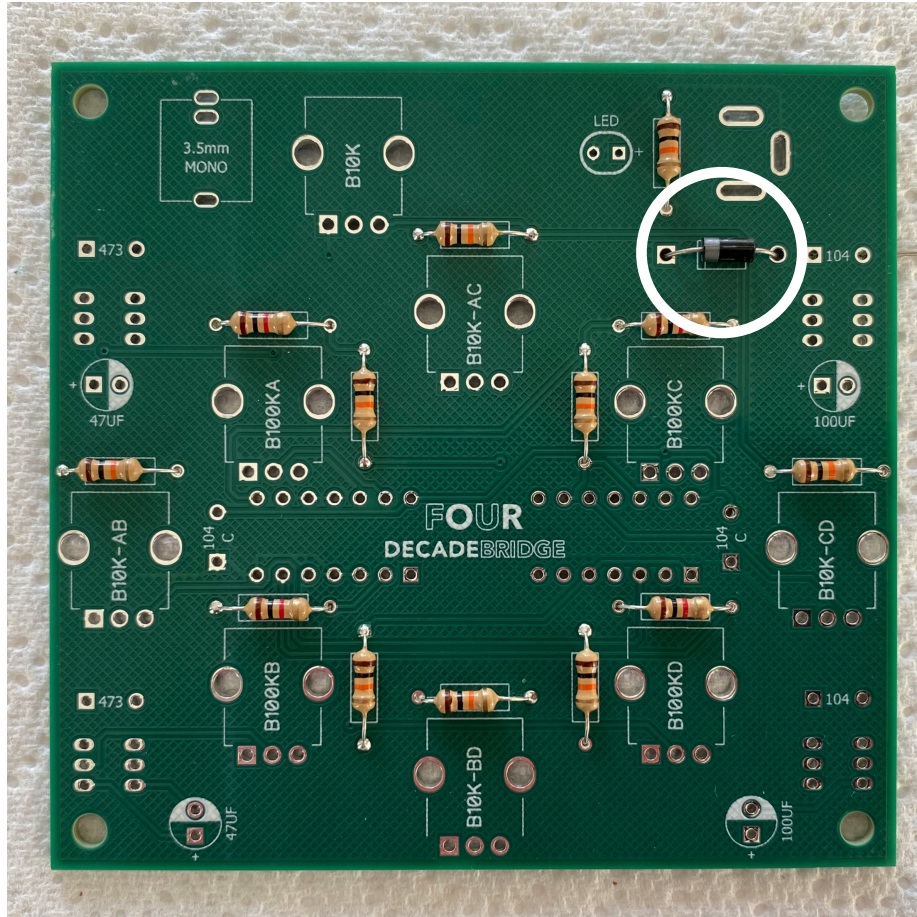


Step 3. Diode:-

THIS COMPONENT MUST BE PLACED INTO THE BOARD THE CORRECT WAY ROUND.

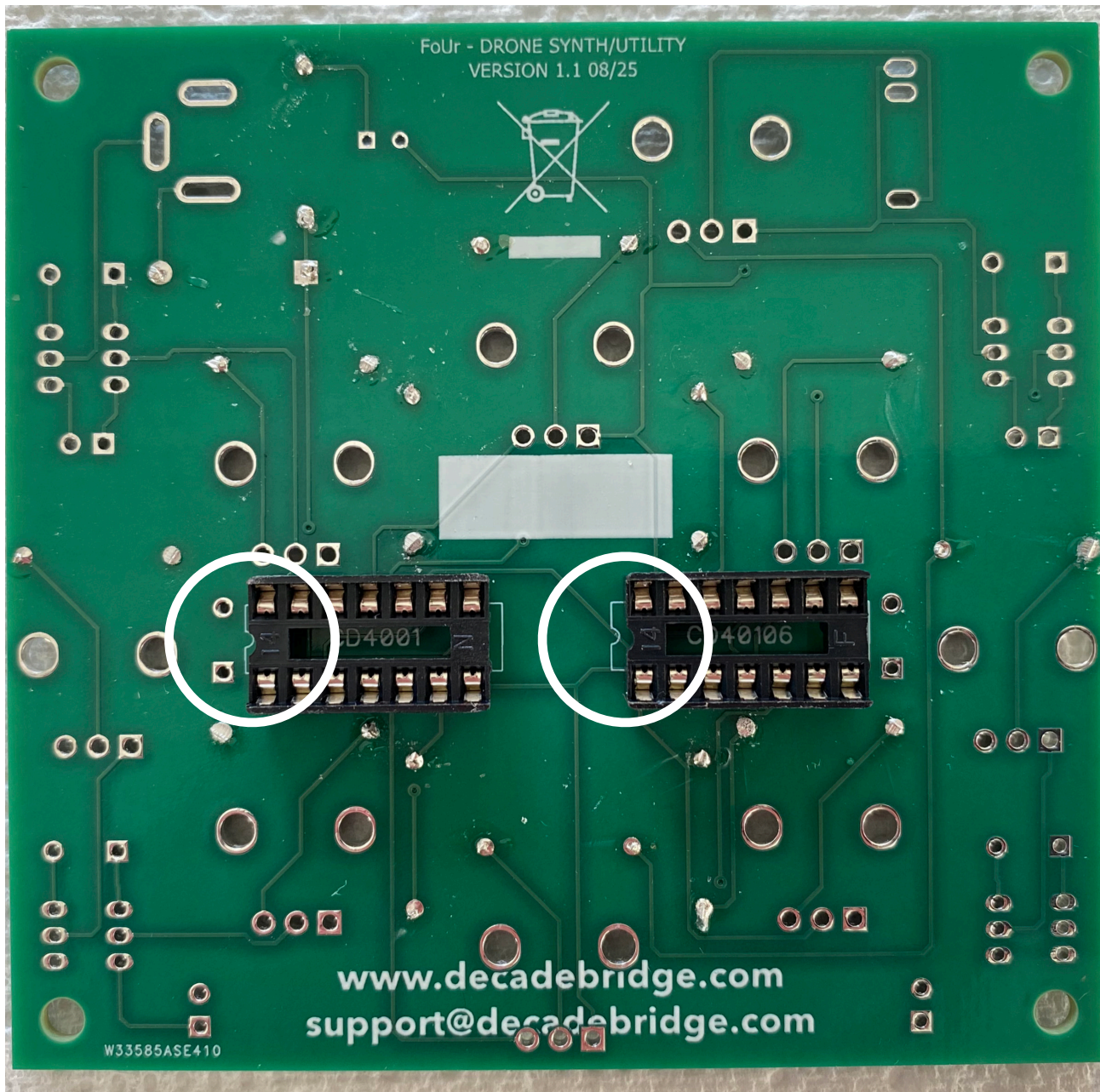
Place the 1N4001 diode into the PCB. This is black in colour with a white stripe at one end of the diode. Make sure the white stripe matches the stripe on the PCB.

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



Step 4. DIP Sockets:-

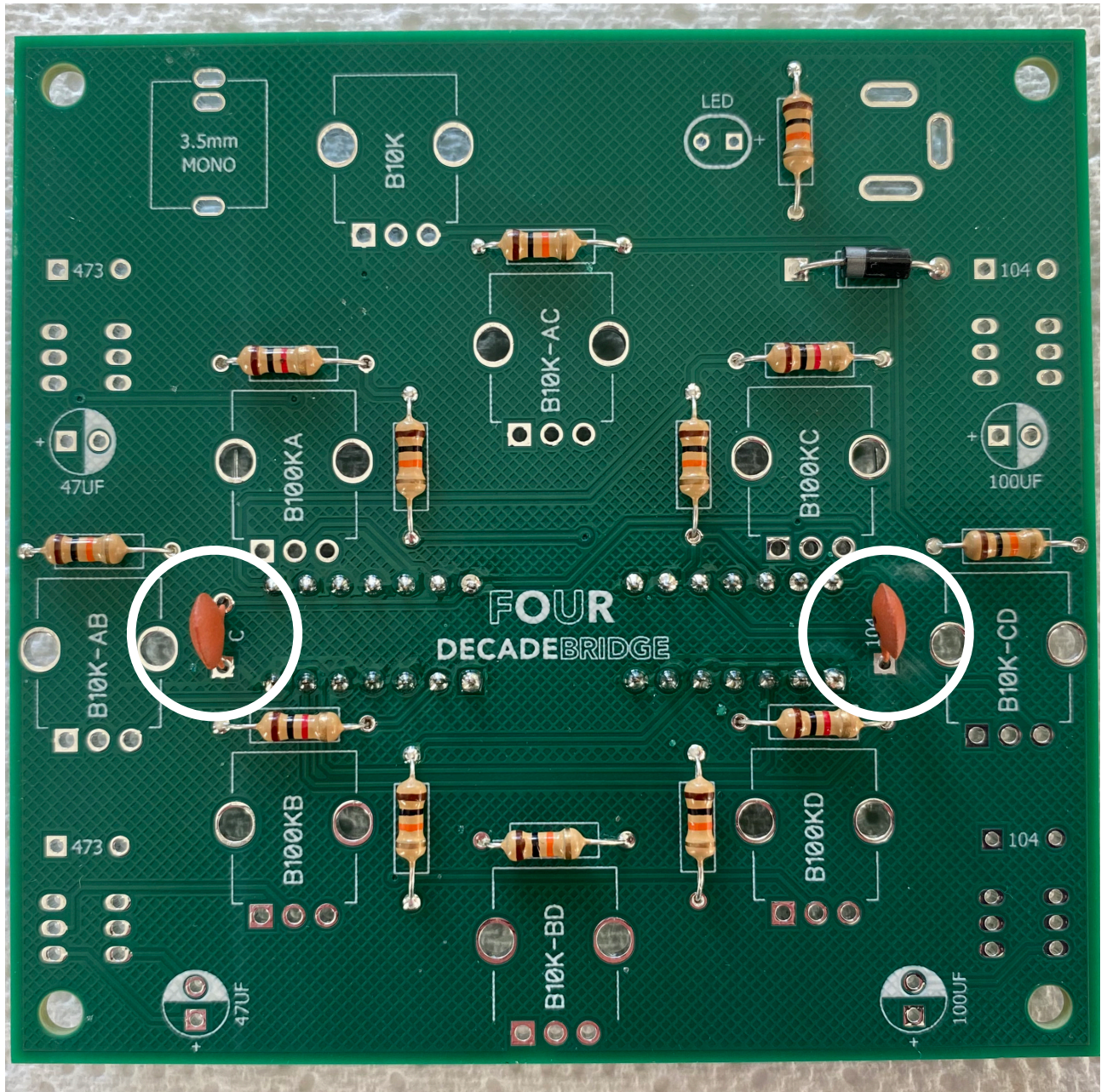
Next place the, 14 pin, DIP sockets into the back of the board ensuring that the notches at one end of the socket line up with the notches printed on the PCB. Turn the board over and solder the sockets in place.



Step 5. Ceramic capacitor:-

Insert the 2, 100nF ceramic capacitors (104) into the circuit board. The placement of these on the PCB is marked as '104 C'.

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

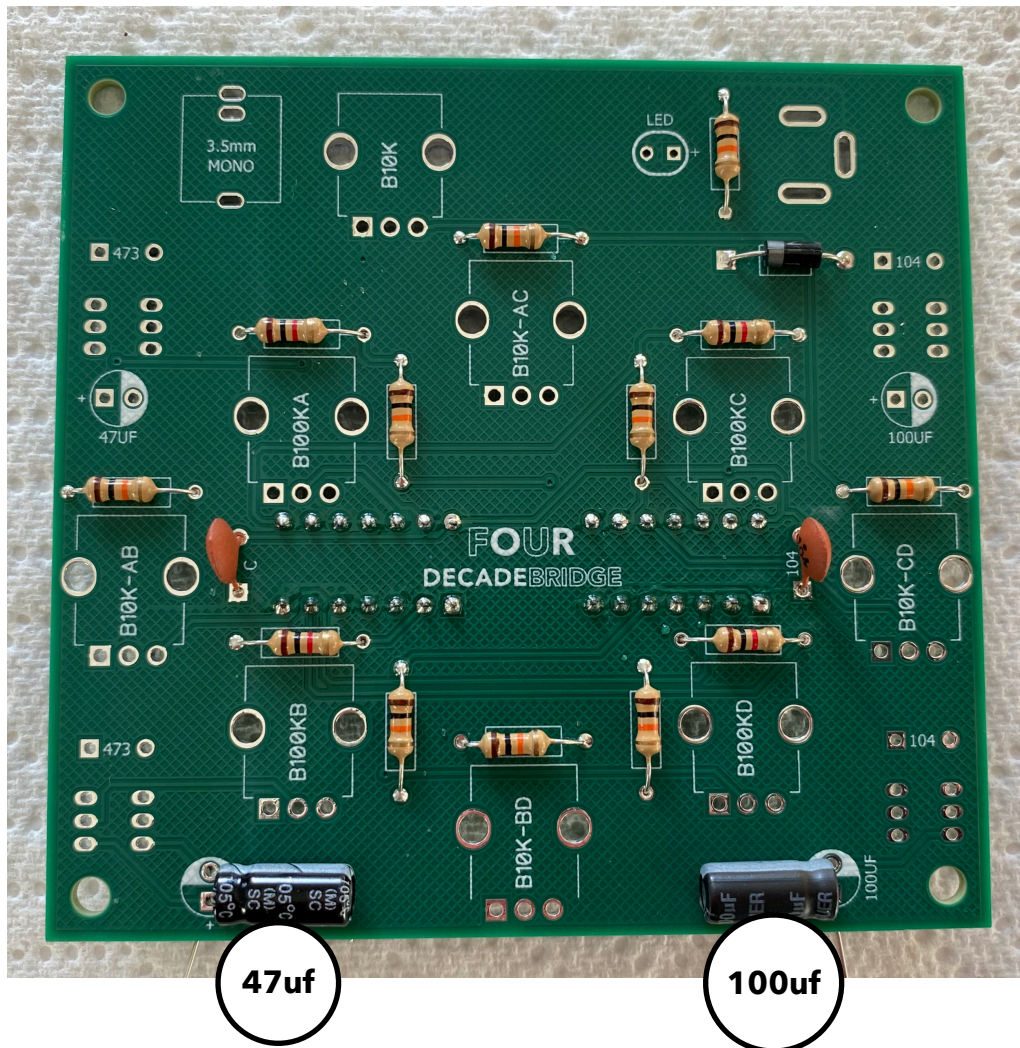


Step 6. Electrolytic capacitors:-

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.

Place the 2 capacitors at the bottom of the board as shown in the image below.



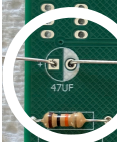
THE WHITE SIDE OF THE CAPACITOR SHOULD LINE UP WITH THE WHITE SEMI CIRCLE PRINTED ONTO THE PCB. THE VALUE OF THE CAPACITOR IS PRINTED ONTO THE BOARD. CHECK THE SIDE OF THE COMPONENT FOR THE CORRECT VALUE.

The two electrolytic capacitors at the top of the board need to be installed on the back of the PCB.



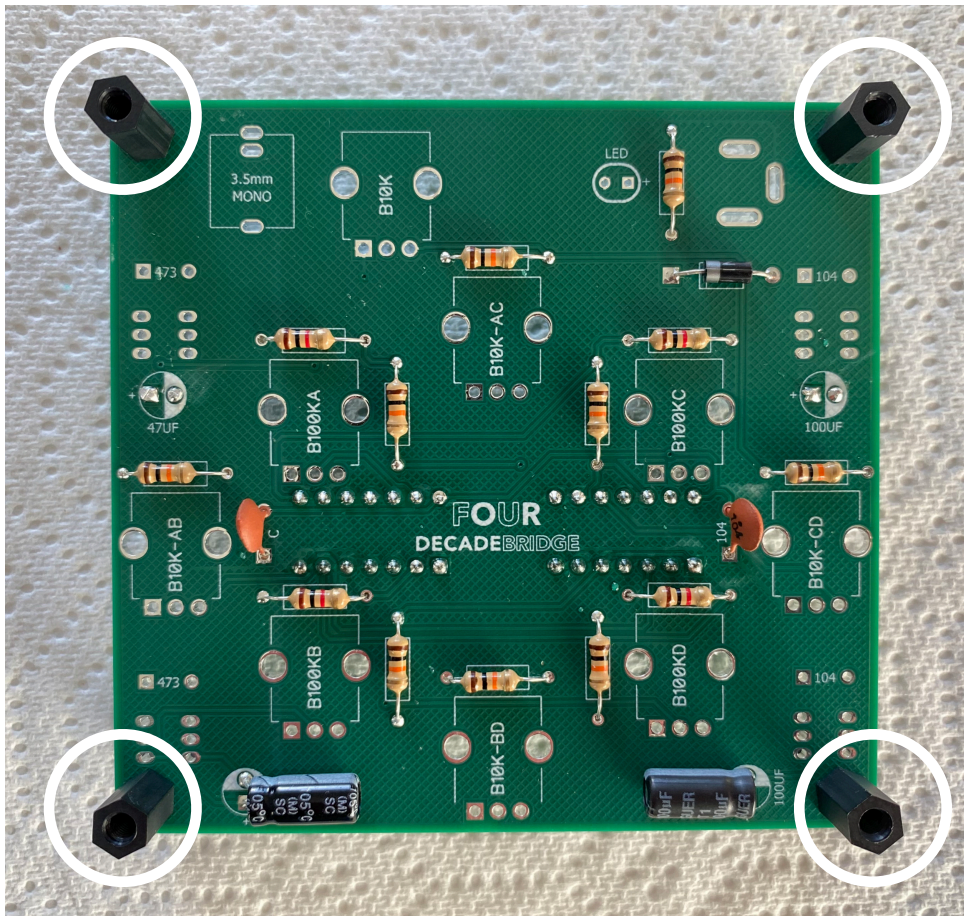
47uf

Turn the PCB over and solder the capacitors in place. Remove the excess legs.



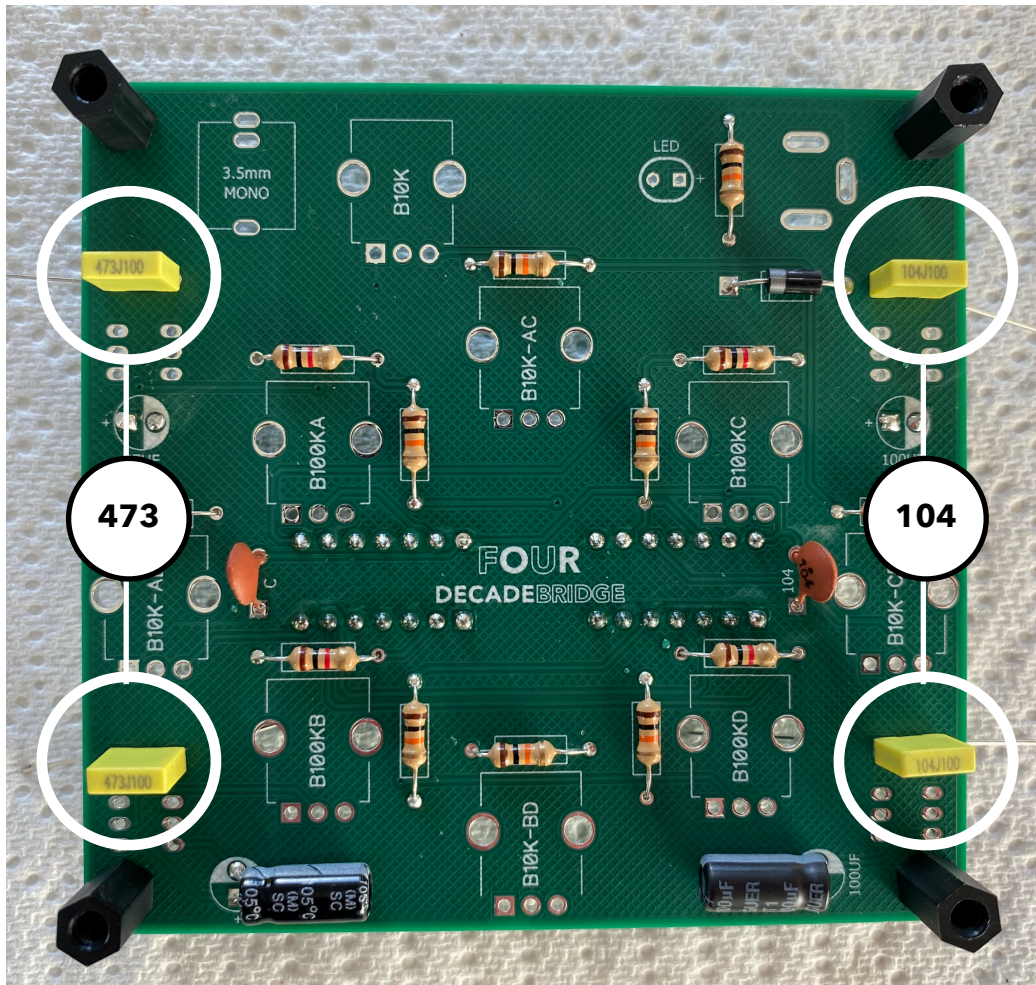
Step 7. Standoffs:-

Add the 8 standoffs to the four corners of the PCB.



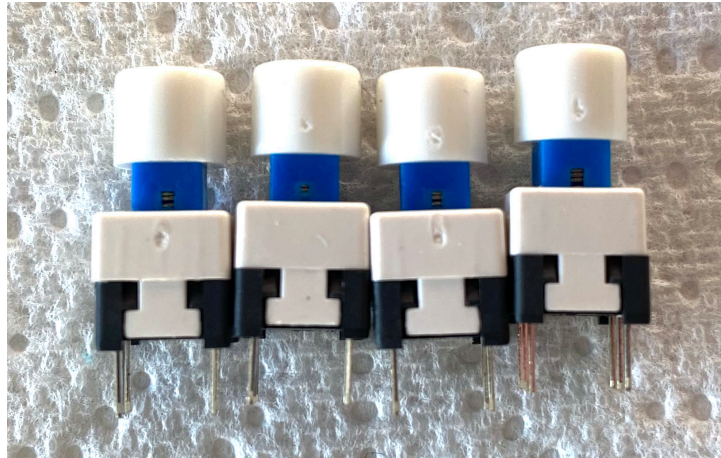
Step 8. Box capacitors:-

Add the box 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.

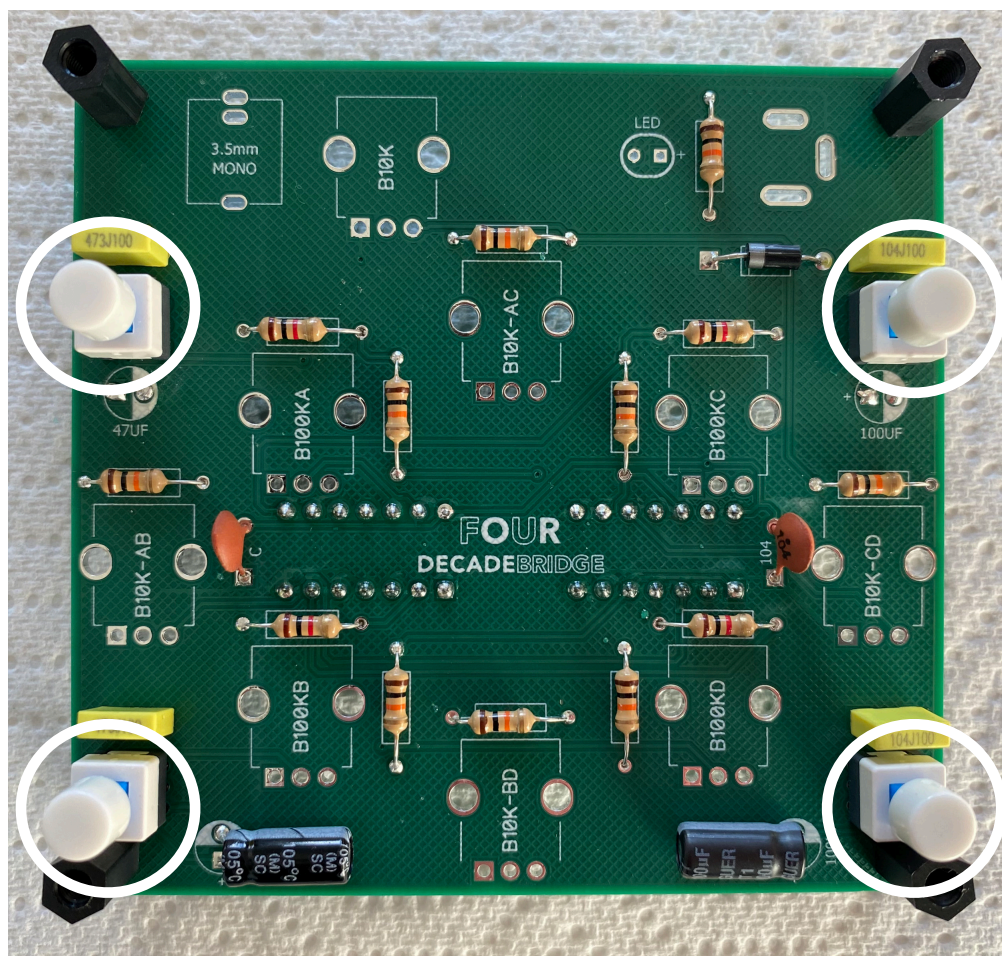


Step 9. Push Buttons:-

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.



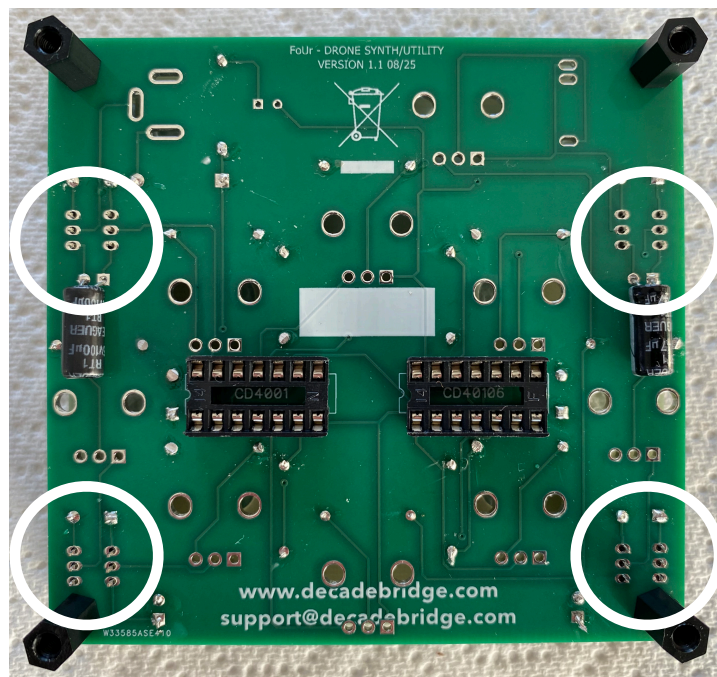
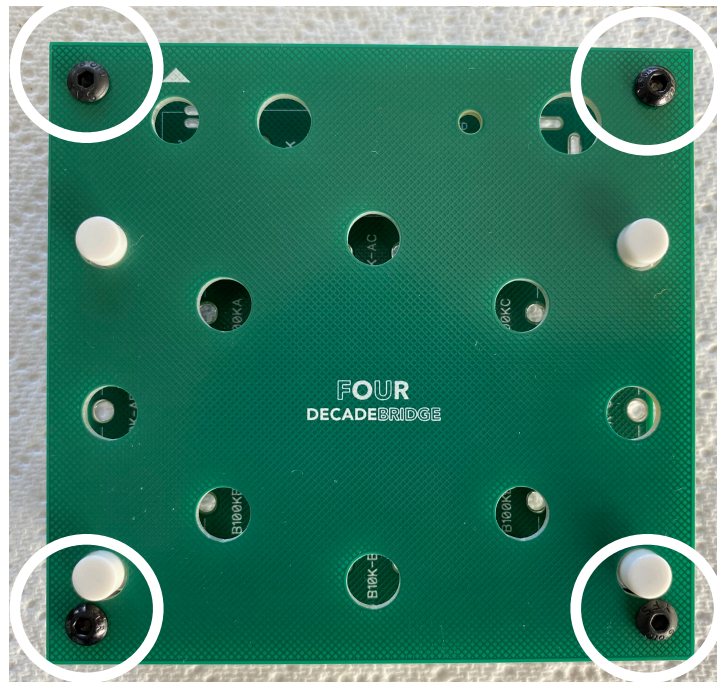
Insert the 3 push buttons into the board. Ensure that they are all in the same position (UP) so that when you solder them they will be at the same height.



We will now use the faceplate to keep them aligned whilst we solder them in place.

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 Four 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 Four over and place it down on the work surface. Solder the buttons in place. Turn Four back over and remove the faceplate.

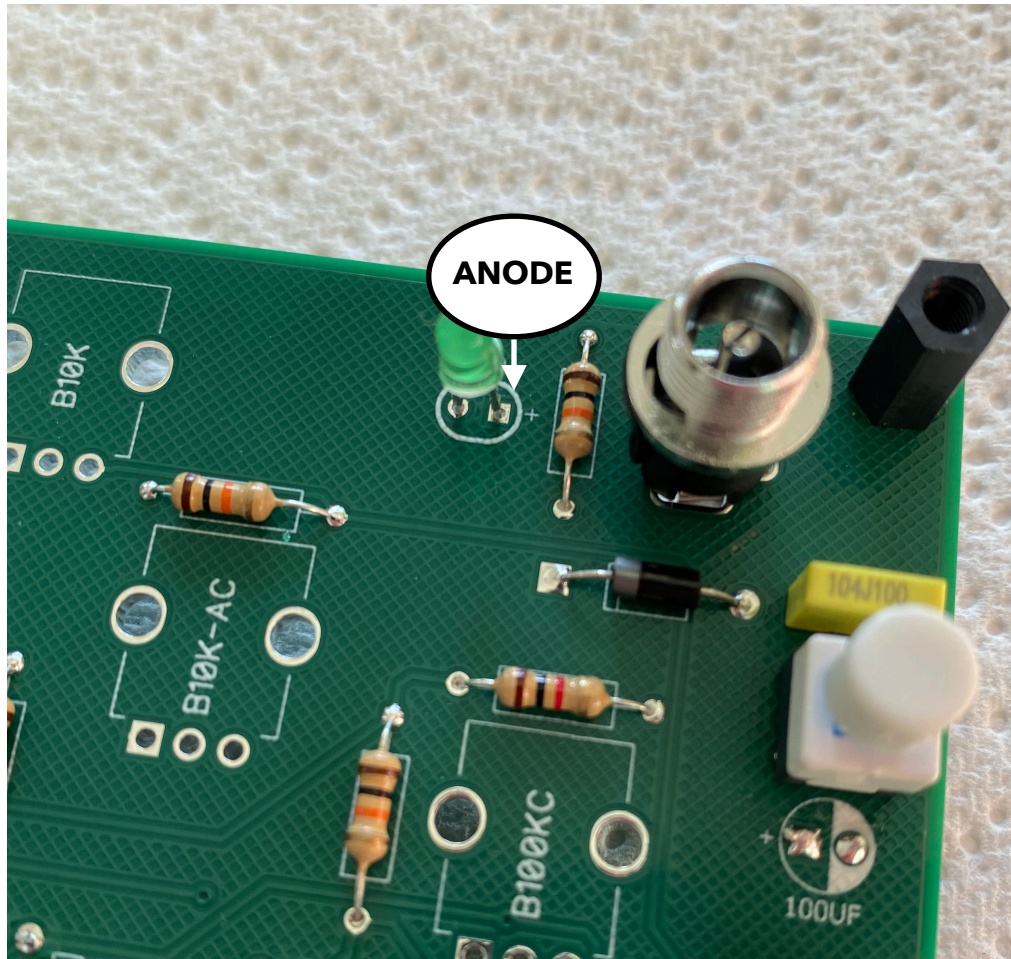


Step 10. Controls:-

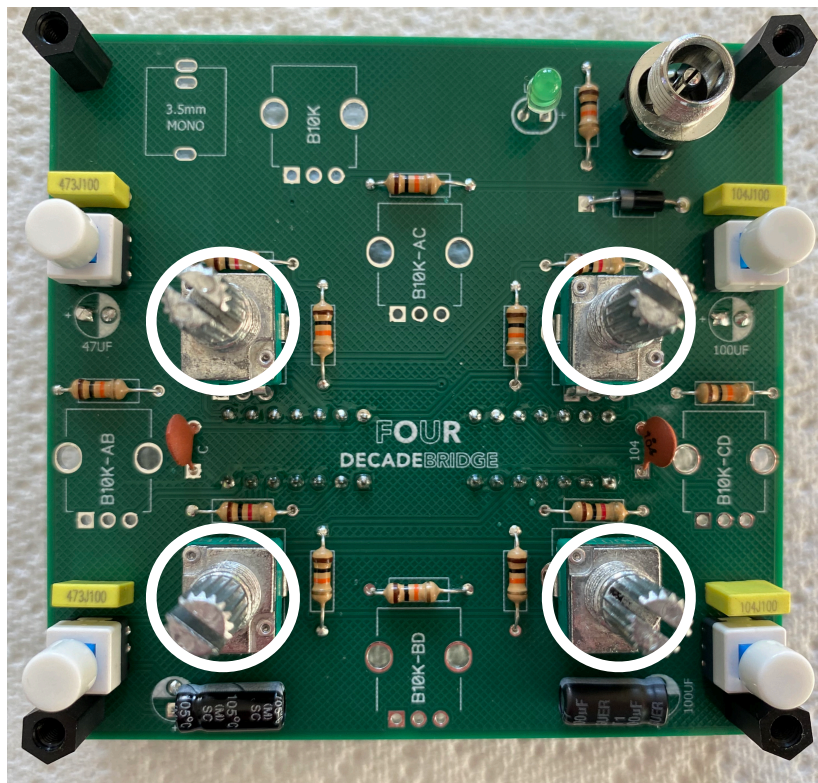
You can now populate the PCB with the other controls.

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.

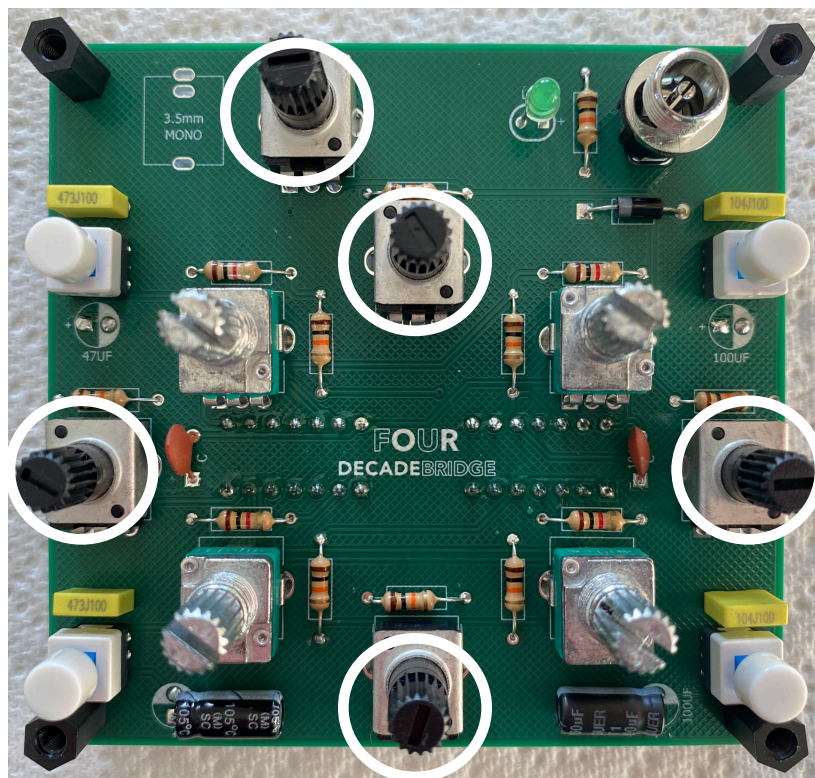
THE LED NEEDS TO BE PLACED THE CORRECT WAY ROUND. ENSURE THAT THE LONG LEG (ANODE) IS PLACED INTO THE SQUARE HOLE MARKED '+'.



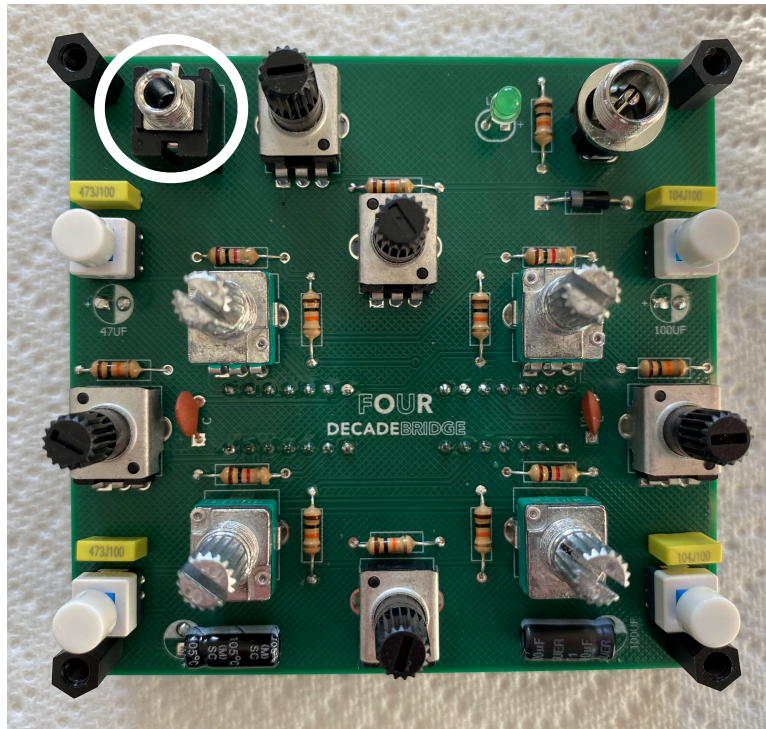
Next, place the 4 B100K potentiometers into the PCB ensuring they are placed in the correct positions as shown in the image.



Now, place the 5 trimmer pots into the PCB ensuring they are placed in the correct positions as shown in the image.



Remove the nut from the 3.5mm mono socket and place it into the top left of the board.



Now carefully place the faceplate onto Four.

Secure the faceplate in place, screwing 4 of the 8 hex screws into the standoffs.

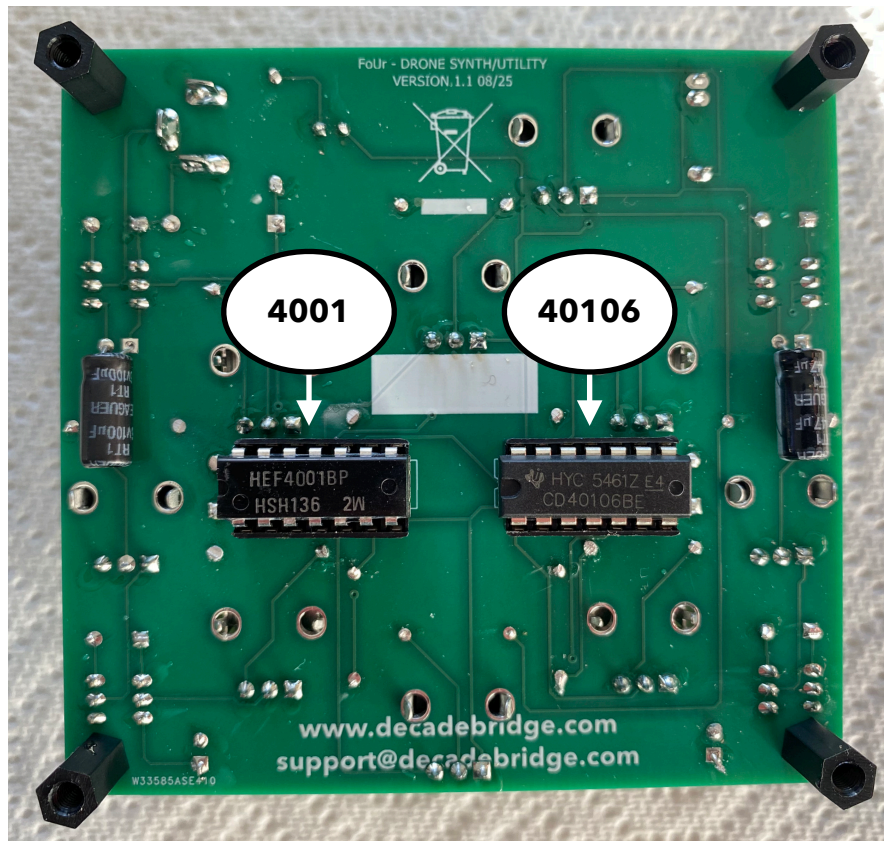
BE CAREFUL NOT TO BEND THE LED. YOU MIGHT NEED TO HOLD THE BOARD UP SLIGHTLY TO LET THE LED DROP THROUGH THE BOARD.



Turn Four 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 11. 40106 and 4001 ICs:-

Place the 40106 and 4001 ICs into the DIP sockets on the bottom of the board. The placement of these has been printed onto the PCB. Make sure you place the ICs the correct way round. The notch on the IC has to match the notch on the PCB.



Step 12. Test:-

It is best to test Four at this point and make sure it is working correctly before placing Four 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.

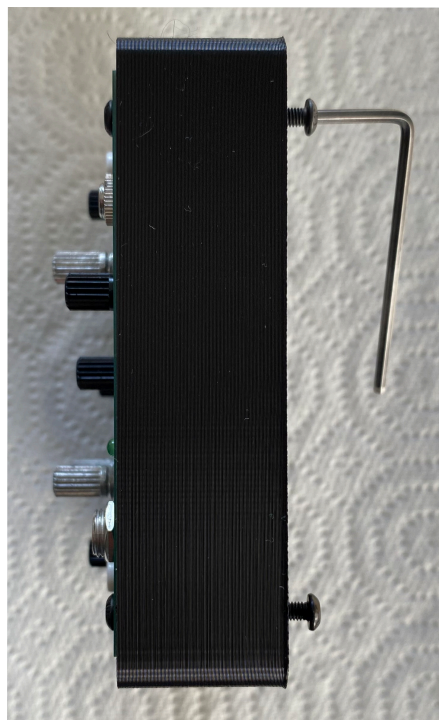
Step 13. Case:-

Once you are happy that Four 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 the synth 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 Four 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.

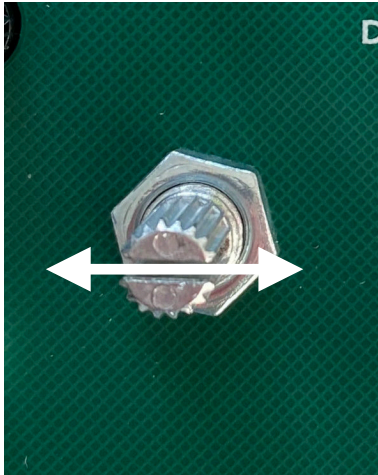


Step 14. Dressing:-

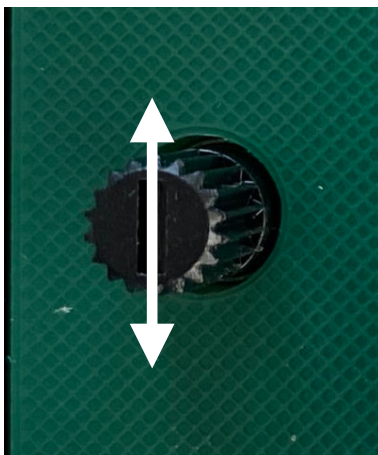
Now you can add the nuts to the power input, potentiometers and mono jack socket.



The last thing to do is add the knobs. Set the 4 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 markers are pointing directly up.



Set the trimmer pots so that the gap in each pot is vertical. This is the midway point. Push the smaller white knobs on to the pots so that the markers are pointing directly up.



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



Download the operating manual for FOUR here:-

<https://www.decadebridge.com/Downloads/Manuals/Four%20Manual.pdf>

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