NYSTRÖM - Crum Hum
Build Document

For the most recent version of this document please visit –
https://www.thonk.co.uk/shop/nystrom-crum-hum/

All Thonk kits are sold under our standard Terms and Conditions -
http://www.thonk.co.uk/faq/

DIY INSTRUCTIONS

This document gives detailed instructions that assume you have purchased a complete Crum Drum kit from www.thonk.co.uk after May 2023, it also assumes no previous knowledge of electronics.

To learn to solder try https://www.youtube.com/watch?v=IpkkfK937mU and the **Adafruit guide to excellent soldering** – http://bit.ly/1l77tF4

Watch and understand that whole YouTube video! If you're not achieving the results shown in the video then you need to buy new tools or seek advice. **You will not end up with a working unit otherwise.**

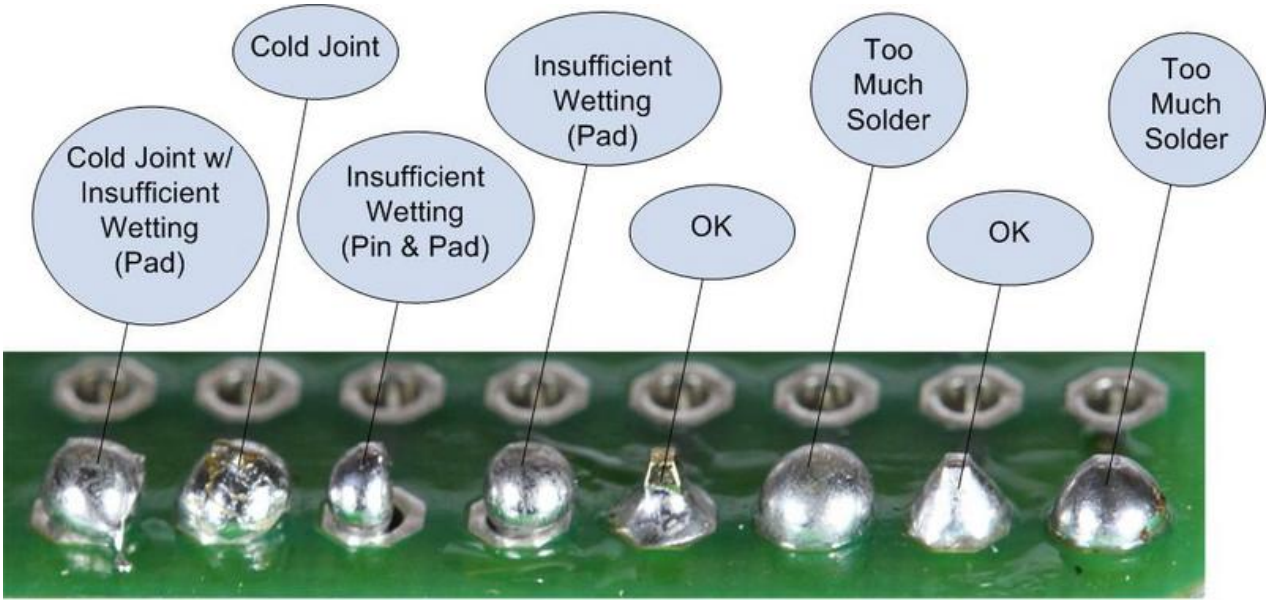
TOOLS REQUIRED

Soldering iron, snipe nose pliers, wire strippers, small flat head screwdriver and diagonal cutters AKA snips AKA side-cutters. A Digital Multimeter is always helpful for checking for bad solder joints and continuity. Thonk sell a range of inexpensive tools here - http://bit.ly/1jxqF3n

SOLDER JOINTS

Your solder joints should look like those shown as 'OK' below, they should have that neat conical shape on BOTH sides of the PCB. If they don't look the same on both sides then stop! Work out why from the soldering guides linked and don't continue until you are getting those results.

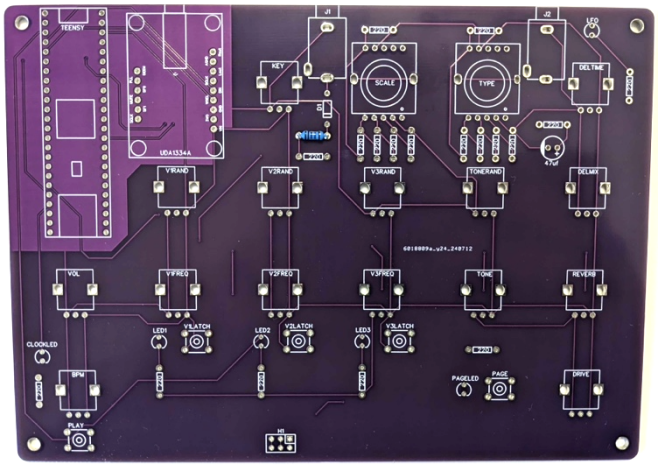
This isn't about perfectionism, you are very likely to end up with a destroyed, damaged or defective unit if you're not hitting that standard.



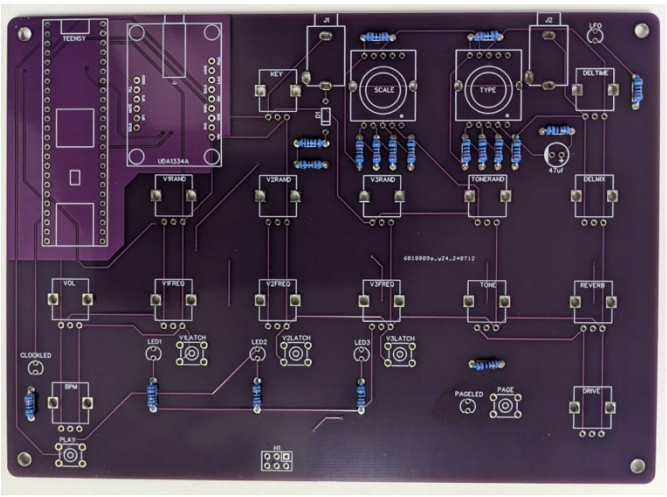
This photo is from the **Adafruit guide to excellent soldering** - http://bit.ly/1l77tF4 and is reproduced under an Attribution-Sharealike creative commons license - http://creativecommons.org/licenses/by-sa/3.0/

This document has hi-res images.
ZOOM IN for a closer look

1. First locate the single 1K Resistor and solder into the position marked on the side of the PCB with the footprint markings.



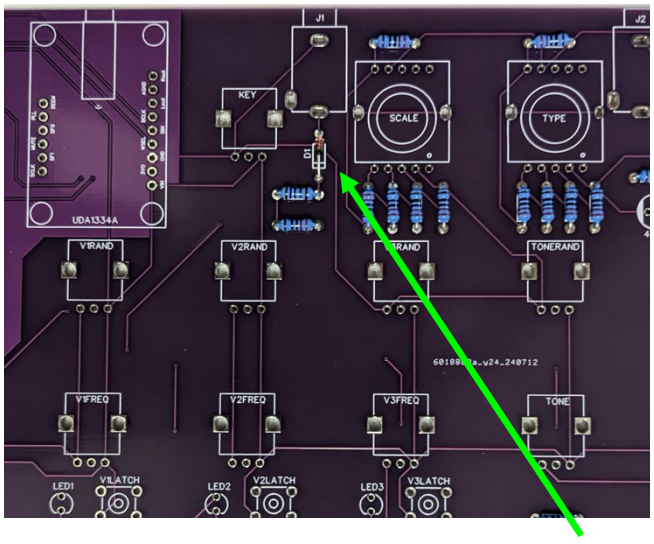
Find the remaining 18 x 220R Resistors and solder into the positions shown.



2. Locate the single 1N4148 diode and solder into the position shown.

NOTE: ORIENTATION IS VITAL

Ensure the black line on the diode lines up with the white line marked on the PCB, the device will not function correctly otherwise.

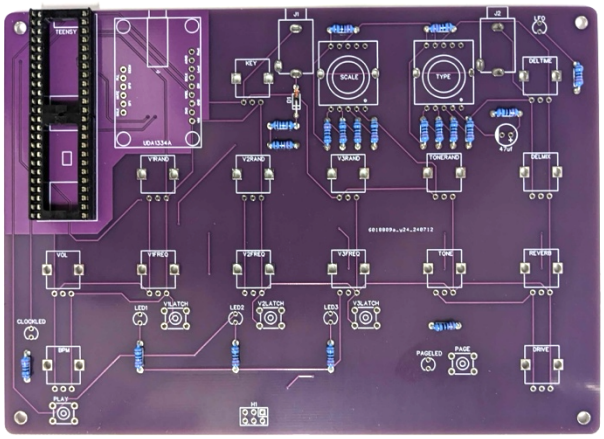


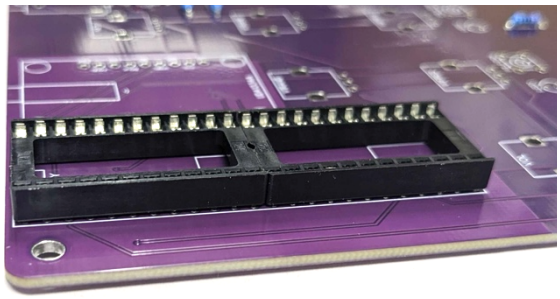
3. Next locate the two 24 pin IC Sockets and place them as shown.

   These are used to connect the teensy PCB to the main board.

   Lay the PCB onto a flat surface and first solder just 2 pins on the bottom of each IC socket ensuring they lay flush to the PCB.

   Reflow the joints and adjust the sockets if necessary to ensure they are flush to the PCB surface. Then continue to solder all remaining joints.





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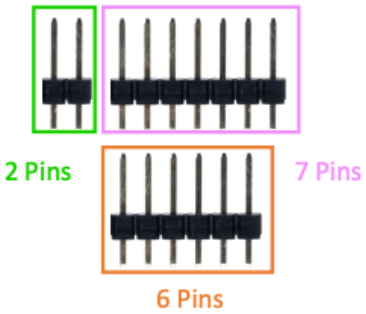
4. Next locate the purple DAC PCB inside its own bag. This is provided with two strips of 8 pin headers that must be split and combined to make a row of 6 and a row of 9.

   DO NOT SOLDER YET

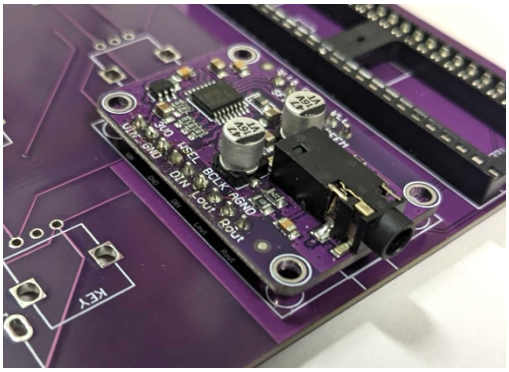
   We suggest breaking off two pins from one header to form a 6 pin row. Then break a single pin off the other 8 pin header to form 7 pins to be added to the leftover 2 pins as shown. It doesn't matter if the longer pins face up or down.



5. Place the DAC board on top of the headers as pictured.

   Ensuring the pins are flush with the board, first solder the DAC Board onto the pins from the top side.

   TIP: Place a pair of objects under the PCB to create a small platform and raise the PCB slightly to enable all the pins to sit through the holes.



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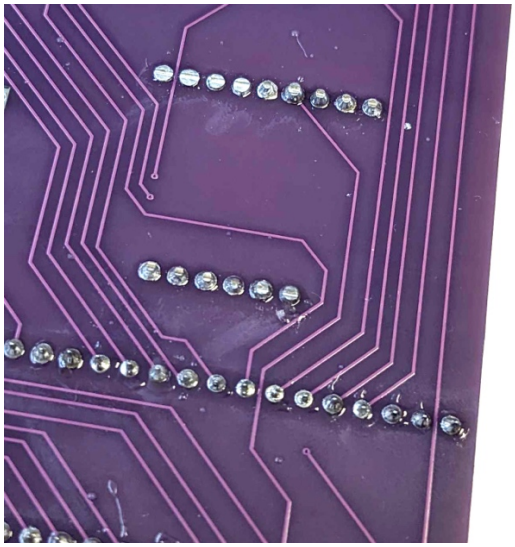
6. With the DAC Board secured to the headers you can now solder the pins on the reverse of the PCB.

   Start by soldering just two opposite corner pins from each header. Then turn over the PCB and check that the headers are sitting flush to the PCB.

   Adjust if required and then solder all the remaining pins. Cut off the excess length from the side with longer pins.



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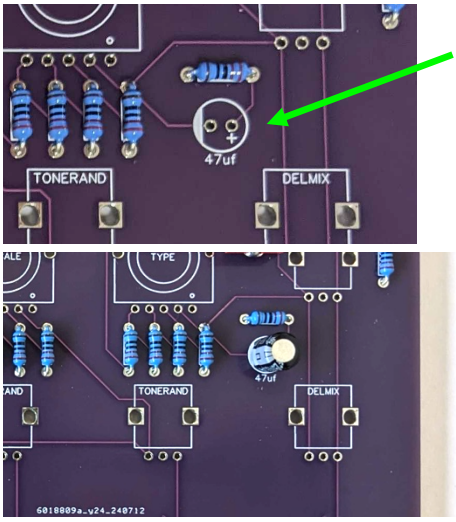
7. Next locate the single 47uF Electro Capacitor from the components bag.

   NOTE: Orientation is vital

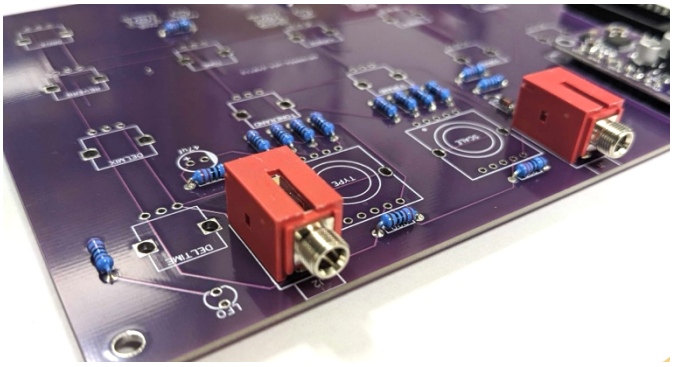
   Solder into the position Shown ensuring the grey stripe on the capacitor lines up with the white edge side on the PCB.

   The longer leg should also go into pad marked with a '+'.



8. Next locate the 2 x red jacks and place on to the board as shown.

   Solder one pin of each jack and check they sit flush to the PCB before soldering the remaining pins.



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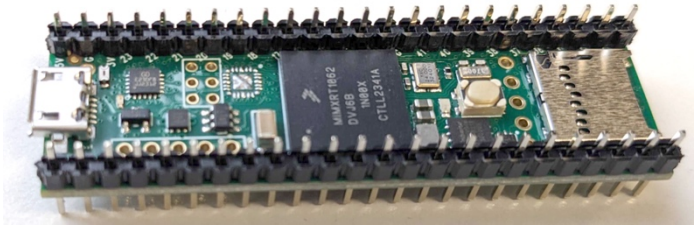
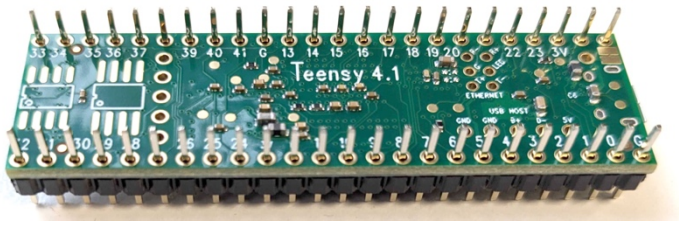
9. Now locate the teensy board from your kit along with two strips of 36 pin headers.

   Split both sets of pins so that you have 2 strips of 24 pins remaining.

   Place the pins into the top of the teensy as shown with the black plastic sitting on the same side of the PCB as the USB socket.

   DON'T SOLDER PINS YET





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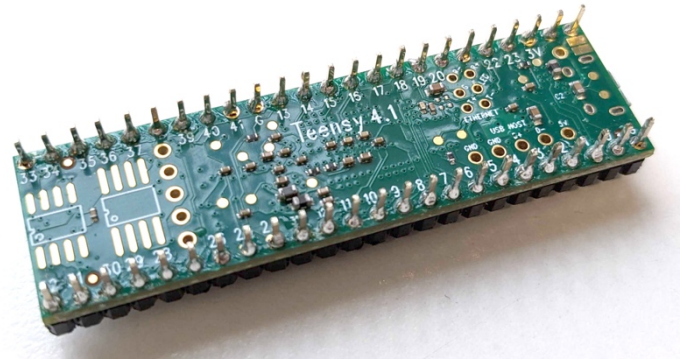
10. With the teensy flipped upside down solder just two pins from at the end of each strip.

    NOTE: Don't apply too much solder as this will prevent the teensy from sitting well in the sockets.

    Check that the black body of the headers is flush to the top of the teensy board.

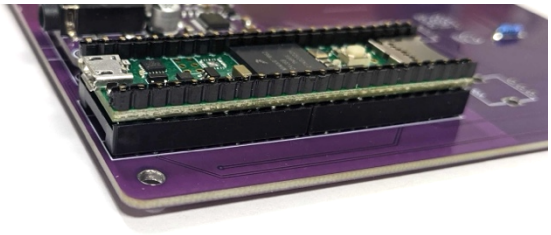
    Reflow the joints and adjust if necessary before proceeding to solder the remaining points.



11. Before placing the teensy you must trim the headers next to the plastic on the USB side of the board.

    Trim these pins so they are flush to the black plastic on the headers.

    Please wear eye protection when trimming these pins.



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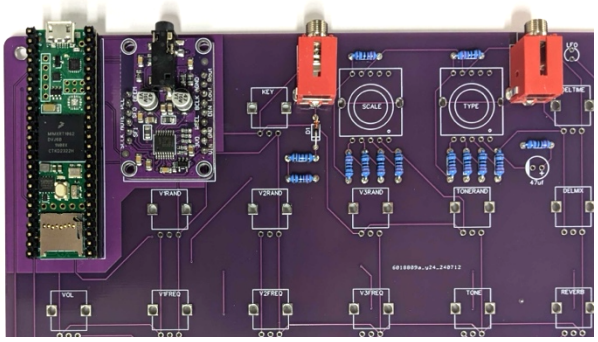
12. Now place the Teensy with the USB socket facing the edge of the PCB as shown, and gently press the Teensy pins down into the sockets until it's sitting as far down as it can go.



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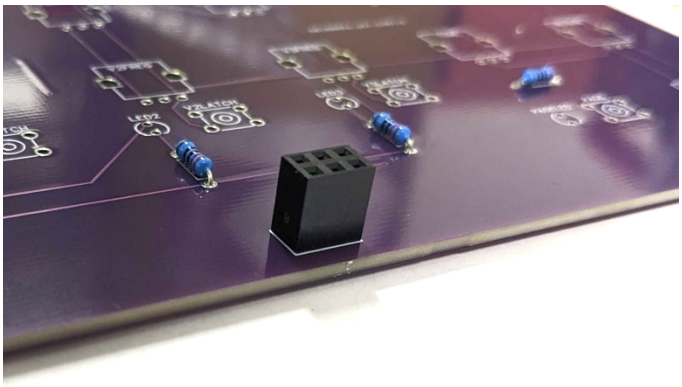
13. Next find the single 2x3 socket header and place into the board as shown on the same aide as all the other components.

    Flip the PCB and solder just one of the pins first.

    Check that the socket is sitting flush agaisnt the PCB and within the footprint on the PCB, reflow this pin and adjust the socket if necessary.

    Continue to solder all remining joints when you are happy with the placement.

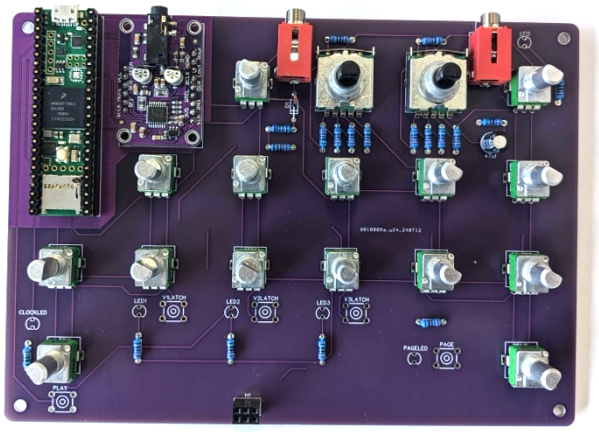


14. Locate all 15x B10K metal potentimoeters and 2x rotary switches.

    Place these components onto the board as shown.

    DON'T SOLDER YET

    Continue reading to step 20 before resuming soldering.



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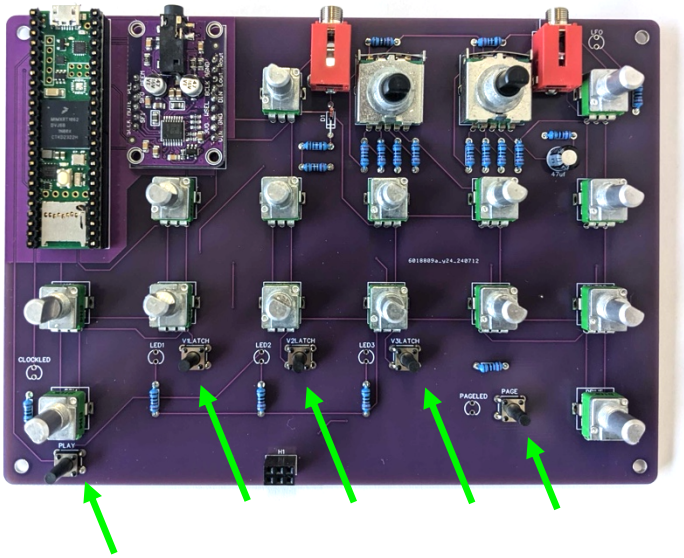
15. Place the five small black tact switches into the positions shown.

    These should click firmly in place but don't apply too much pressure when placing them to prevent bending the legs.

    DON'T SOLDER YET

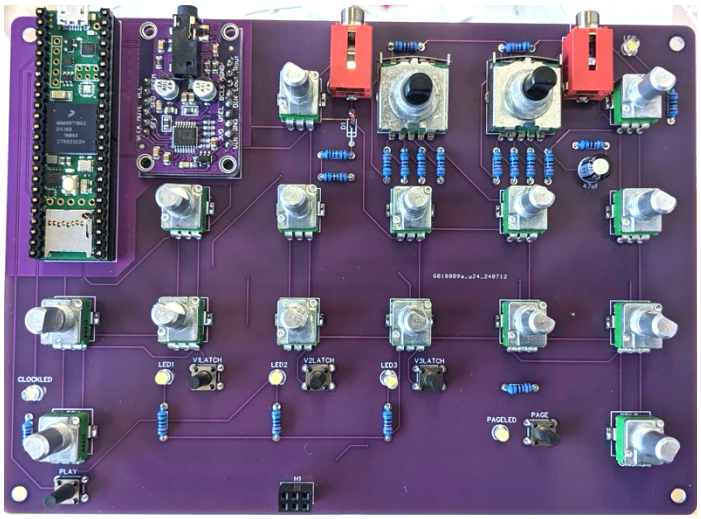
    Continue reading to step 20 before resuming soldering.

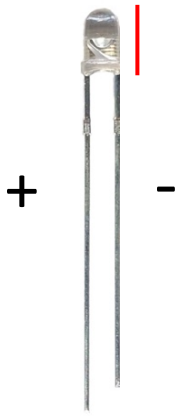


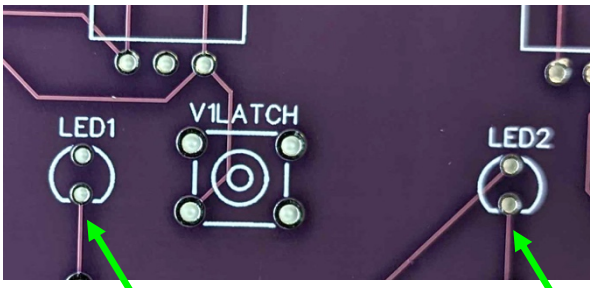
16. Find all 6x LEDs from the component bag and place in the positions shown on the board.

    NOTE: Orientation is vital

    The LED's must be placed with the negative short '-' leg going to the flat side of the diagram on the PCB. The positive '+' leg of the LED should be noticeably longer.







flat side (short leg)

flat side (short leg)

DON'T SOLDER YET

Continue reading to step 20 before resuming soldering.

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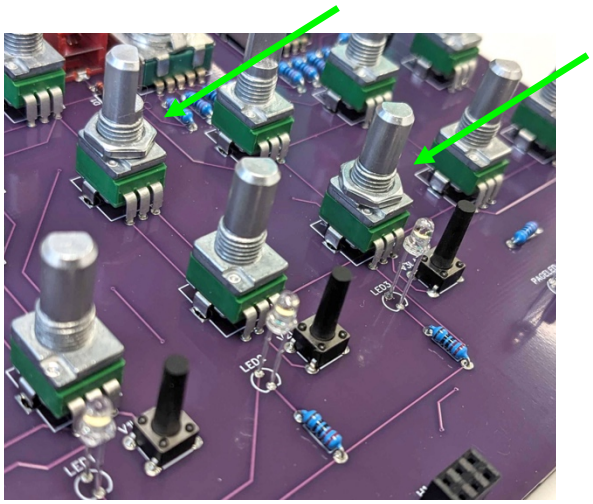
17. Next place two of the included pot nuts underneath two of the central pots and tighten them right down.

    These are placed to help support the centre of the panel when it comes to securing the boards together.



    DON'T SOLDER YET

    Continue reading to step 20 before resuming soldering.

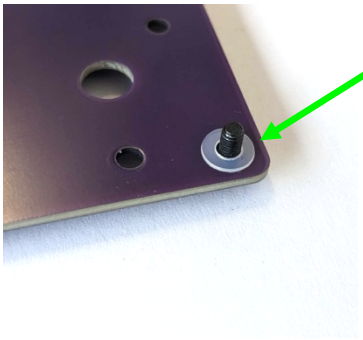
18. Locate the front panel, four longer metal standoffs, four of the black screws (either size for now) and the four small washers. Your kit may have metal washers but will be the same size as the nylon washers pictured.

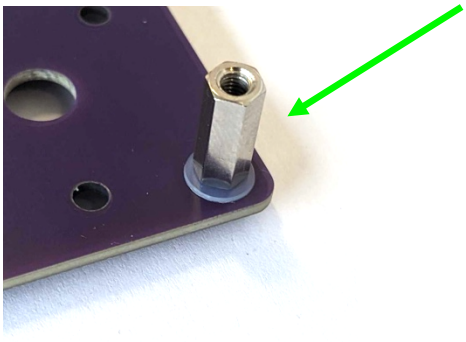
    Place each of the four screws into the corner holes on the front panel before adding a washer to the underside of the panel at each screw as shown.

    Then secure a standoff onto each of the four screws as pictured.

    DON'T SOLDER YET

    Continue reading to step 20 before resuming soldering.





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19. Take the front panel with standoffs secured and place it over the components on the PCB.

    It might take some wiggling to get all the parts lined up and through the panel holes, particularly the switches and LED's.

    Secure the Panel with two nuts on the same two pots that had nuts placed on them before in step 17.

    DON'T SOLDER YET

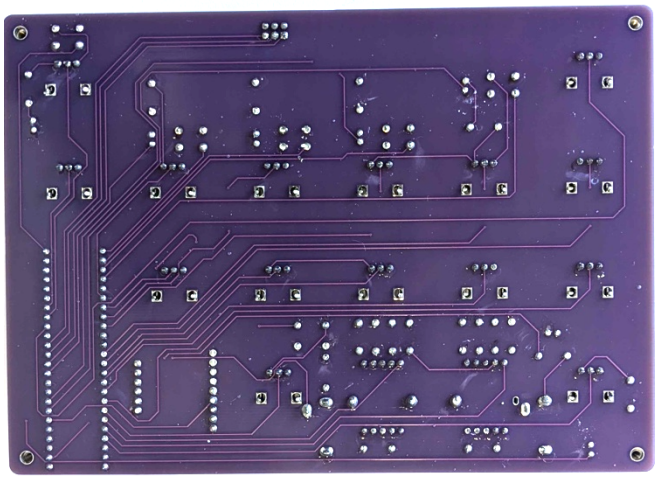
    Continue reading to step 20 before resuming soldering.

20. Flip the PCB over. It is now time to solder all the placed components. First make sure that the LEDs are all poking through their panel holes and then solder them in.

    Then we recommend soldering one joint of each of the pots and switches first, before checking that each component is sitting flush to the PCB.

    Re-adjust any pins if necessary before soldering the remainder of the joints.

    Once you are satisfied with the soldering and position of all components trim the legs of the LEDs.



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21. Now take off the front panel and find the 1x3 SMD header pins. Place them into the header socket as shown.

    NOTE: These pins must be placed in the inner row of the socket as pictured, the outer row of the socket closest to the edge of the PCB will remain empty.

    DON'T SOLDER YET

    Continue reading to step 26 before resuming soldering.

22. Remove the screws and standoffs from the front panel and then locate the remaining black screws and four 3mm small standoffs.

    In total you should have the folowing:

    4x 6mm Screws
    4x 10mm screws
    4x washers
    4x long (12mm) standoffs
    4x short (3mm) standoffs

    DON'T SOLDER YET

    Continue reading to step 26 before resuming soldering.

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23. First take the back panel and take the longer 10mm screws and smaller (3mm) standoffs.

    Place them as pictured with the screws secured at each corner by the standoffs.

    Now place the PCB over the top of the back panel with the four 10mm screws going through the corner holes on the PCB.

    DON'T SOLDER YET

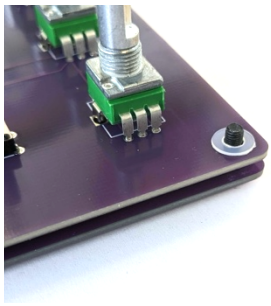
    Continue reading to step 26 before resuming soldering.

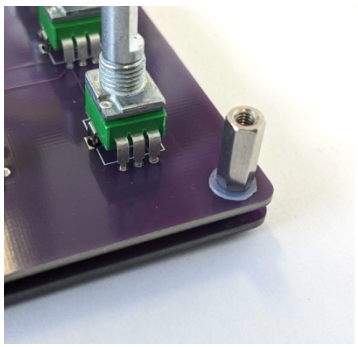
24. Next take the 4 washers and place these over the 10mm screws so that they are sitting on the PCB as pictured.

    Then secure the longer standoffs on top of the washers as pictured.

    DON'T SOLDER YET

    Continue reading to step 26 before resuming soldering.





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25. Place the front panel again over the components and secure to the PCB using the 15x pot nuts provided.

    NOTE: Don't overtighten these nuts. Tighten just enough so that they feel secure and won't rattle.

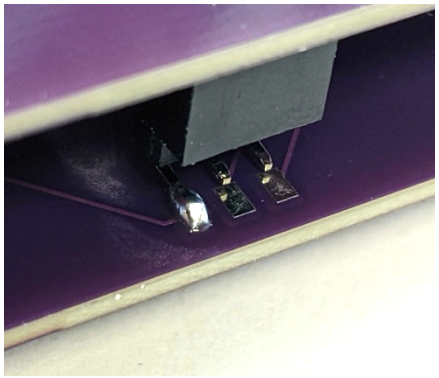
    DON'T SOLDER YET

    Continue reading to step 26 before resuming soldering.

26. Flip the synth over so that it is resting on the pots and locate the SMD pin header that was placed in step 21.

    Make sure the pins are touching each pad on the panel below and then solder each pin to its corresponding pad. The soldering iron should make contact with both the pin and pad to allow for quick heat transfer and clean solder joints.

    Once the first joint is secured properly then proceed to solder the other two pins.



27. Finally you can place all of the sixteen knobs onto the synth, and stick the four feet on the bottom panel.

    The build is now complete! You can go ahead and power up via USB.