

NYSTRÖM - Crum Drum Build Document



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

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=lpkkfK937mU> and the **Adafruit guide to excellent soldering** – <http://bit.ly/1177tF4>

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.

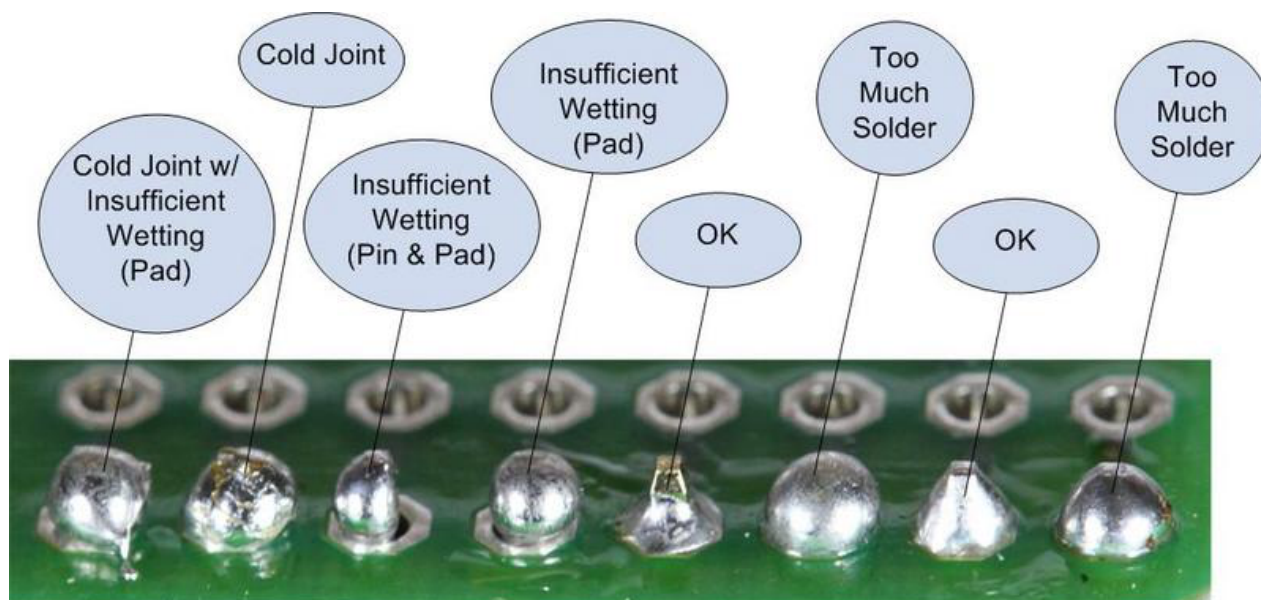
TOOLS REQUIRED

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/1177tF4> 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

A schematic can be found on the last page of this document.

1. First, using the coloured chart provided, locate the single **620R** Resistor and solder into the position marked.

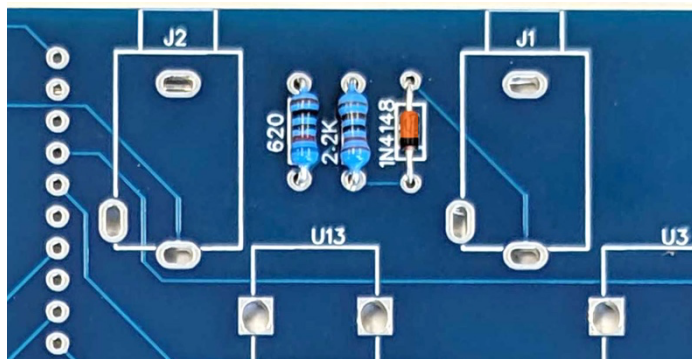
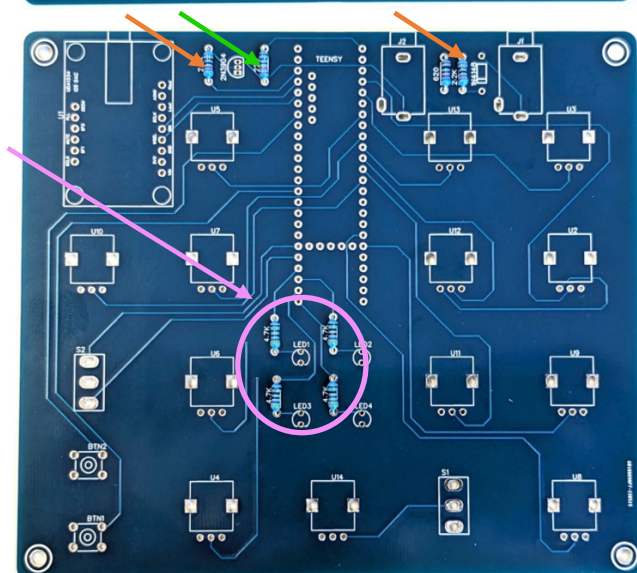
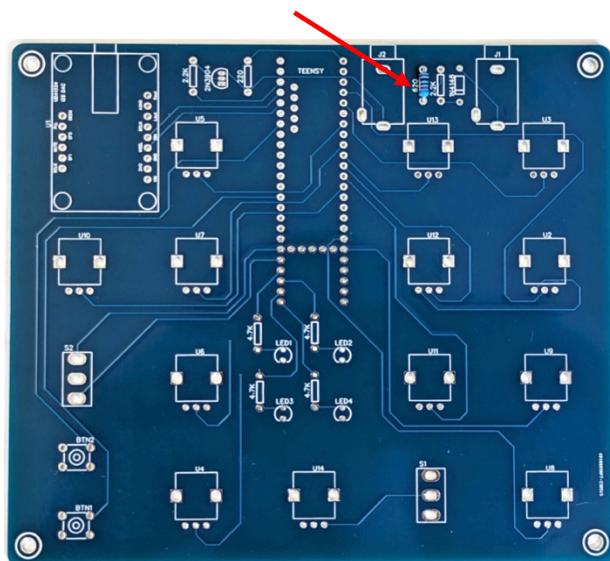
Use the resistor colour bands and quantities to identify the different resistor values.

Repeat the same method for all remaining resistor values, **220R**, **2.2K**, **4.7K**.

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

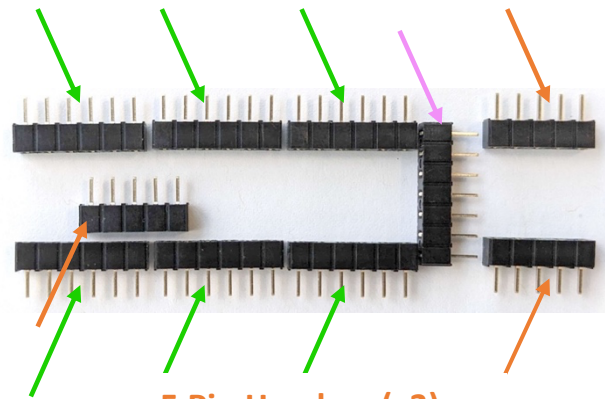
NOTE: ORIENTATION IS VITAL

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



- Next locate all the female sockets. These are used to attach the teensy onto the PCB.

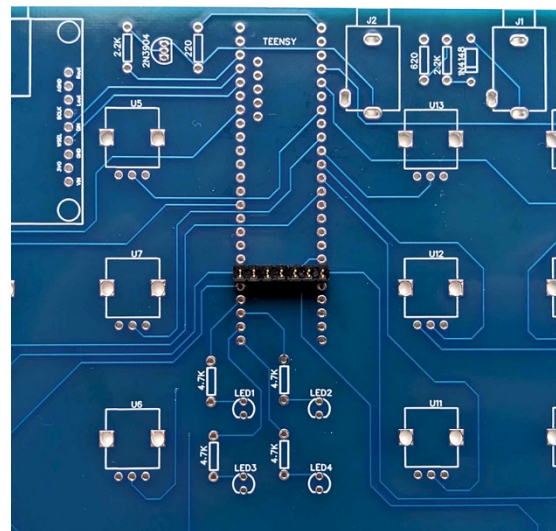
There should be 3 different lengths of socket in the kit bag.



5 Pin Headers (x3)
6 Pin Headers (x6)
7 Pin Headers (x1)

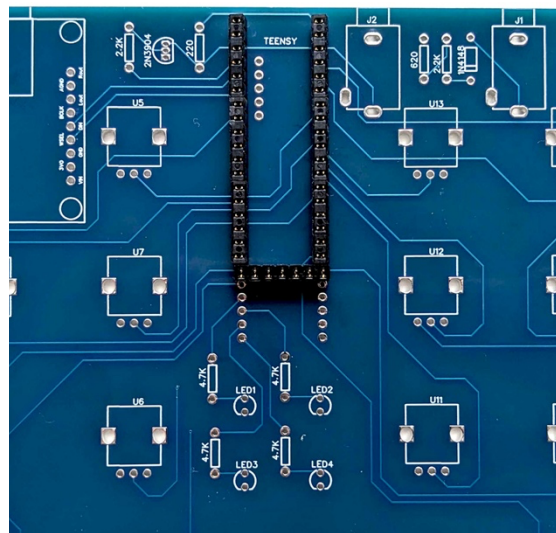
- First place the single 7 pin female socket on the board as shown with the sockets on the same side as the resistors.

DO NOT SOLDER YET!



- Find all six 6 pin sockets and place into position as shown.

DO NOT SOLDER YET!

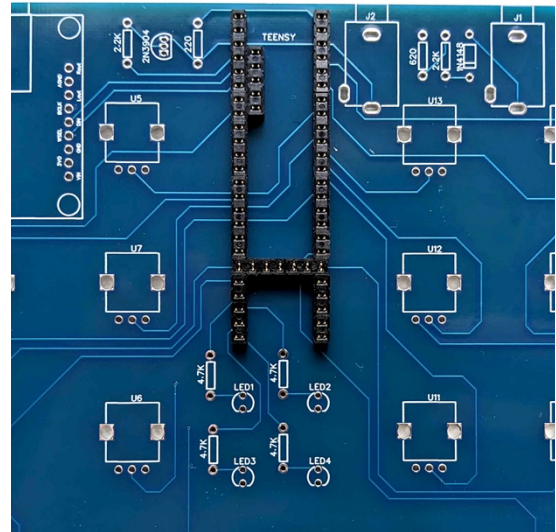


- Place the remaining three 5 pin female headers into position.

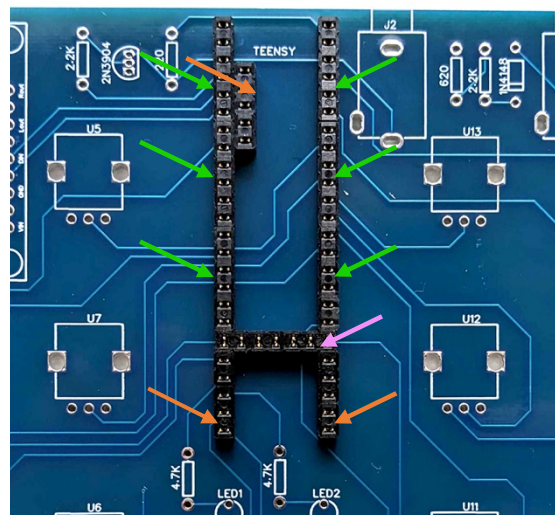
DO NOT SOLDER YET!

Ensure all headers are placed in the correct position as shown.

Note: these headers fit quite tightly next to each other, work slowly and carefully to fit them all in place. Don't solder them yet.



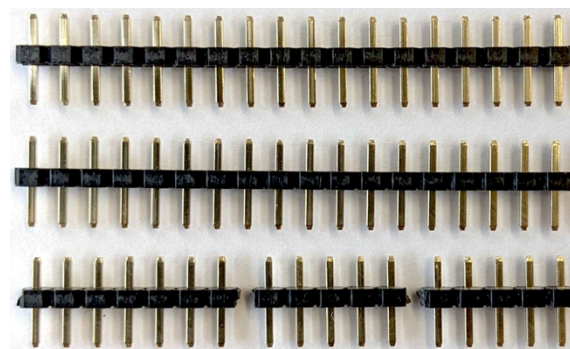
- 5 Pin Headers (x3)
- 6 Pin Headers (x6)
- 7 Pin Headers (x1)



- Now locate the low-profile male headers. The kit includes three lengths of 20 pins and one pre-cut length of 5 pins.



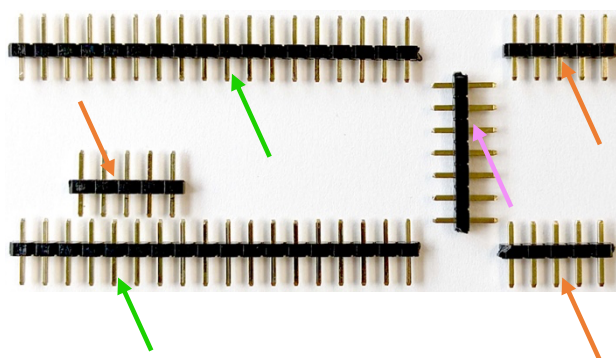
Two of the 20 pin headers need to be split into lengths of 18, while the other 20 pin header should be split into two lengths of 5 and one length of 7.



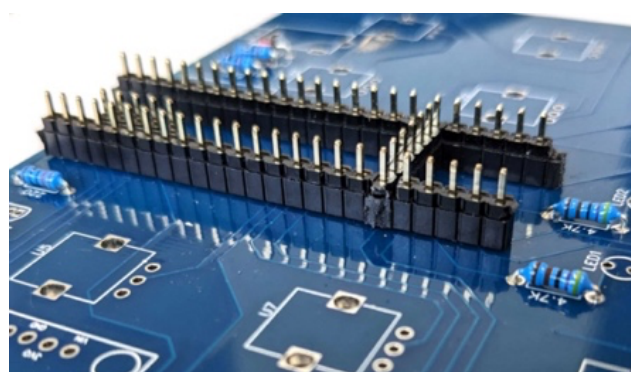
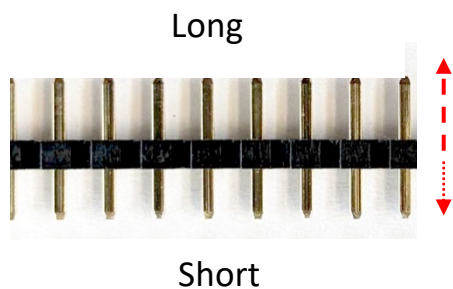
If you are using side cutters to do this, then be sure to use safety goggles.

Once the headers have been split into their correct lengths, they can be placed into the female sockets as shown.

NOTE: ONE SIDE OF THE MALE HEADERS HAS SLIGHTLY SHORTER PINS THAN THE OTHER. THE HEADERS MUST SECURE INTO THE FEMALE HEADERS USING THE SHORTER SIDE OF PINS. THIS ALLOWS THEM TO SIT FLUSH AS PICTURED.



5 Pin Headers (x3)
7 Pin Headers (x1)
18 Pin Headers (x2)



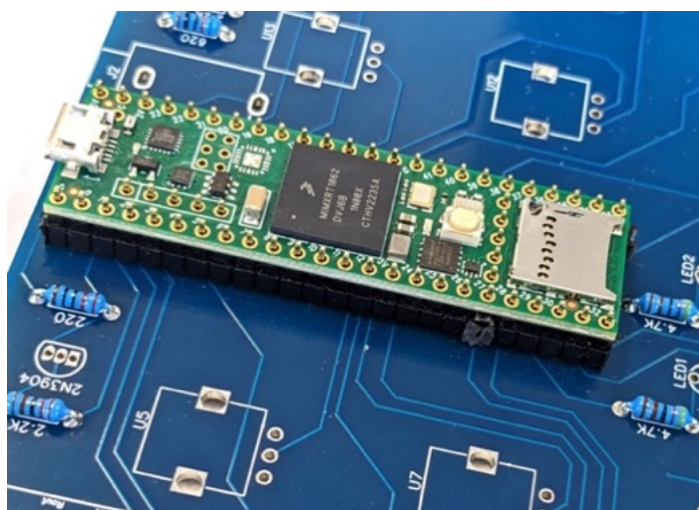
8. Once the above has been checked, carefully place the Teensy onto the headers as shown, ensuring that all headers are inserted fully.

Placing the Teensy on to the pins is quite a delicate task and you might need to nudge the pins ever so slightly to get them to line up properly to the teensy holes. It's easiest to start with the side furthest from the edge of the PCB and then gradually bring the Teensy down over the pins, ending with the USB side.

Do not try to force the Teensy on! If it doesn't fit immediately then locate the pins which need to be nudged and adjust them before attempting to place the Teensy again.

When the Teensy is sitting flush on the male pins, you can proceed to solder the pins from the top to secure the Teensy to the headers.

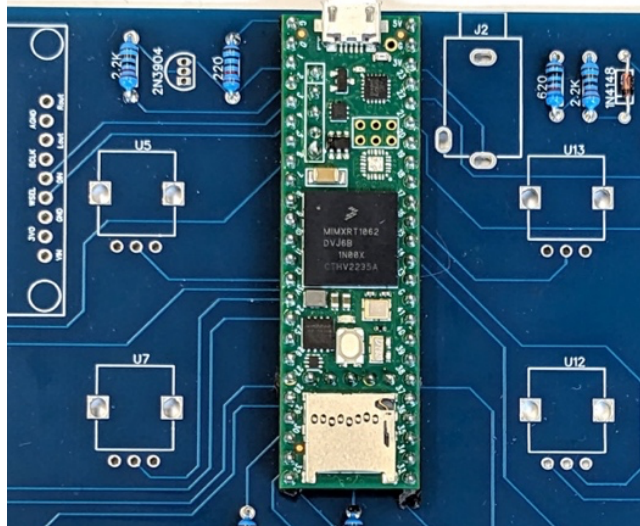
NOTE: Don't attempt to remove the Teensy once it is secured to the PCB. Please contact us first if you need to do this.



- With the above steps complete - flip the board over and solder two opposite corner pins of the female sockets.

Check the female headers are sitting flush to the PCB and reflow and adjust if they are not completely flush. Then proceed to solder all remaining pins of the sockets.

NOTE: Don't attempt to remove the Teensy once it is secured to the PCB, if for any reason you require to do so then contact us first.

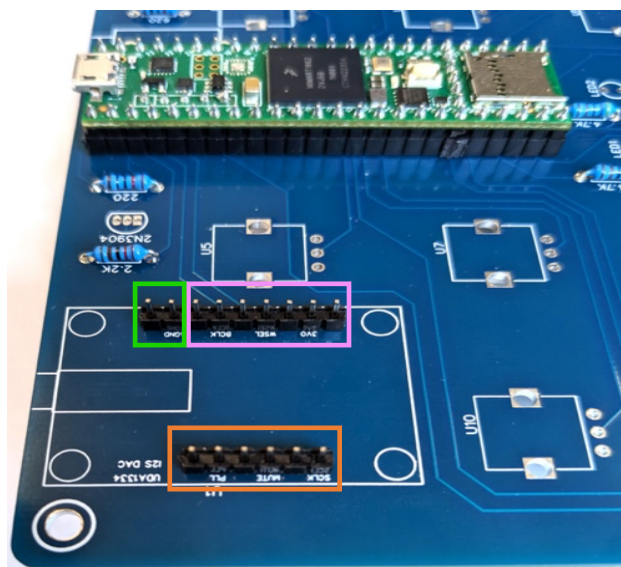
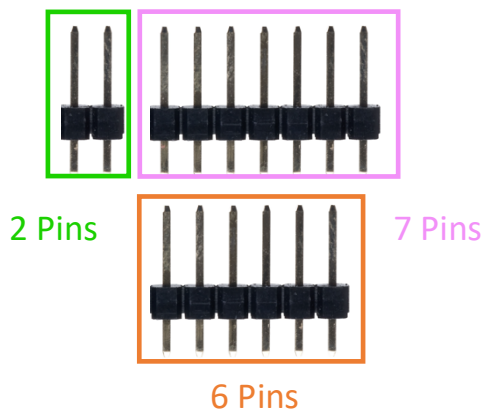


- Next locate the purple DAC PCB inside its own bag. This is provided with two strips of 8 pin headers that must be split and combined to make a row of 6 and a row of 9.

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.

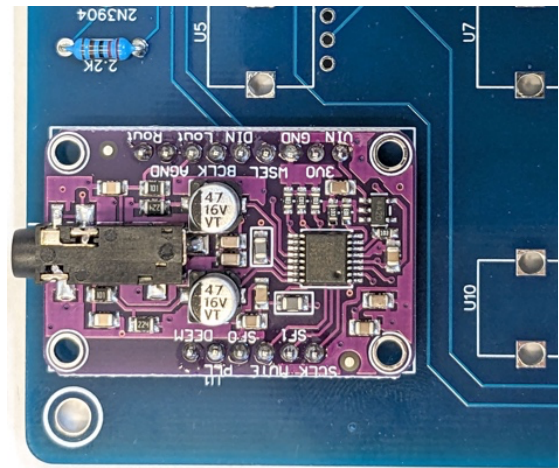
It doesn't matter if the longer pins face up or down.



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

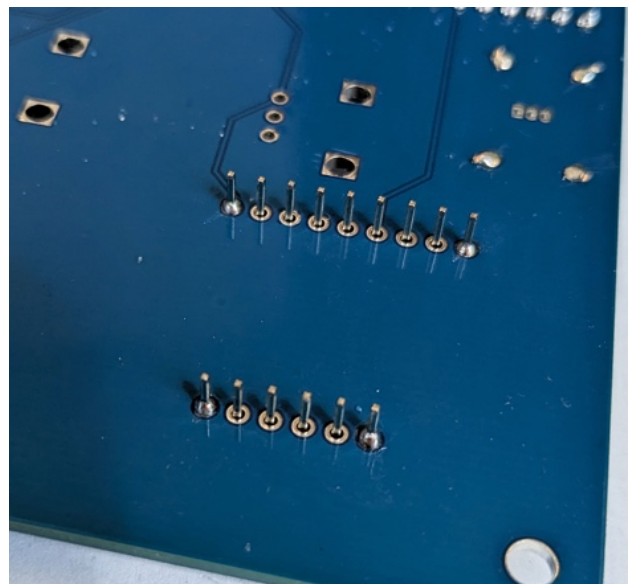
Ensuring the pins are flush with the board, first solder the DAC Board onto the pins from the top side.

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.



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

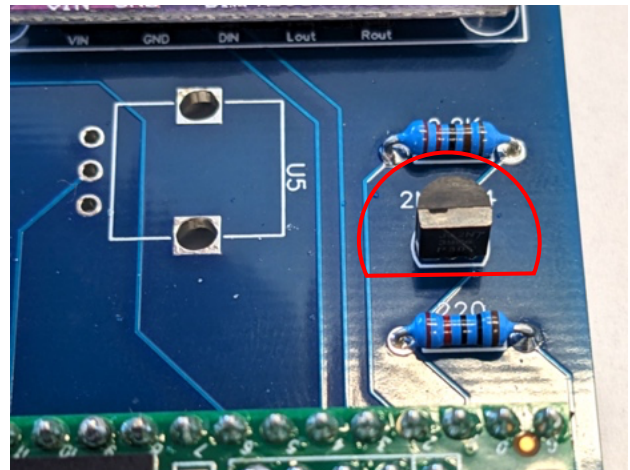
Start by soldering just two opposite corner pins from each header. Then turn over the PCB and check that the headers are sitting flush to the PCB. Adjust if required and then solder all the remaining pins and then cut off the excess length from the side with longer pins.



13. Next locate the single 2N3904 transistor from the components bag.

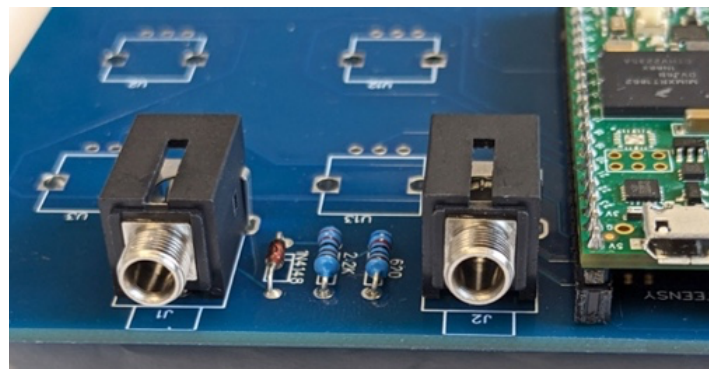
NOTE: ORIENTATION IS VITAL

Solder into the position shown ensuring the flat edge of the body lines up with the flat edge on the PCB silkscreen.



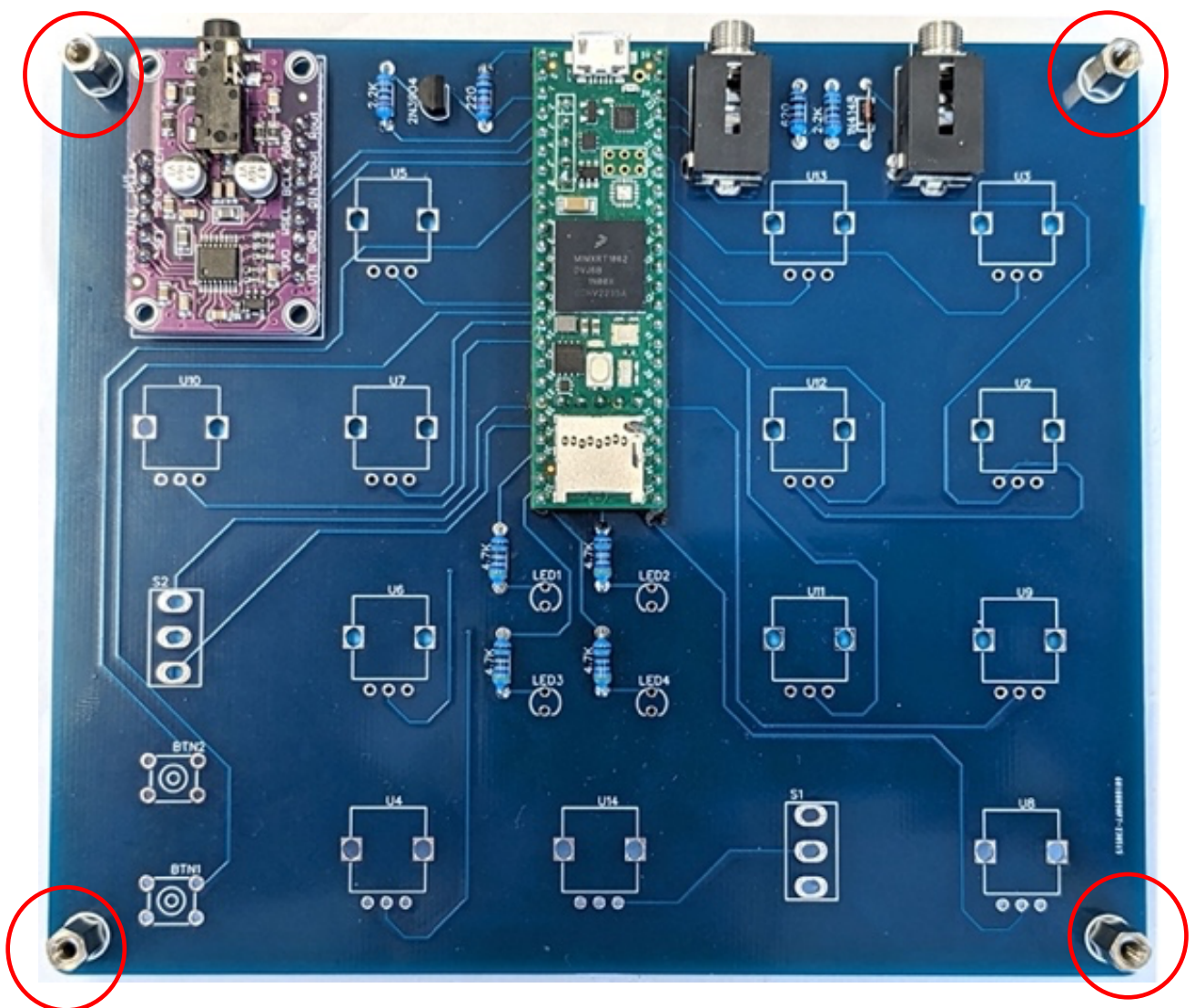
14. Place the 2 x jacks on to the board adjacent to the teensy as shown.

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



15. For the next stage secure the 11mm spacers to the PCB as pictured, using any four of the screws provided.

These will be removed again before the final assembly but are necessary at this stage to ensure the remaining mechanical components sit correctly.



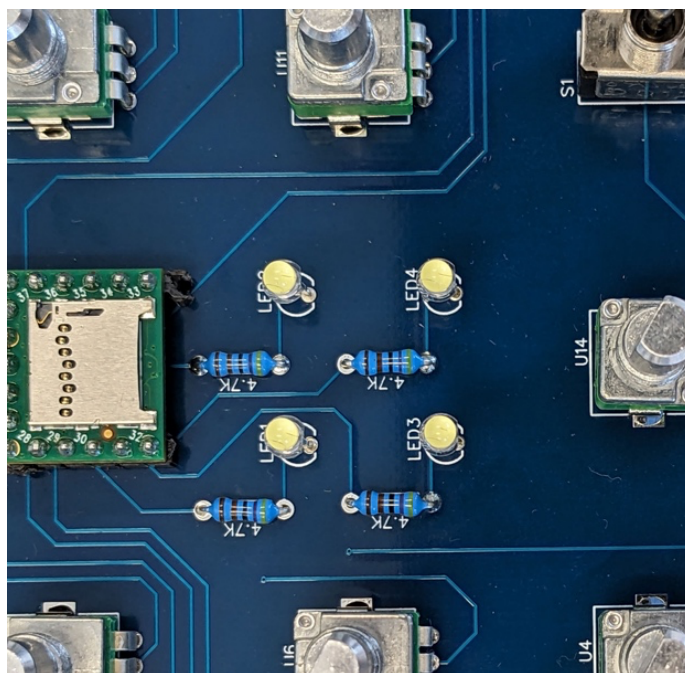
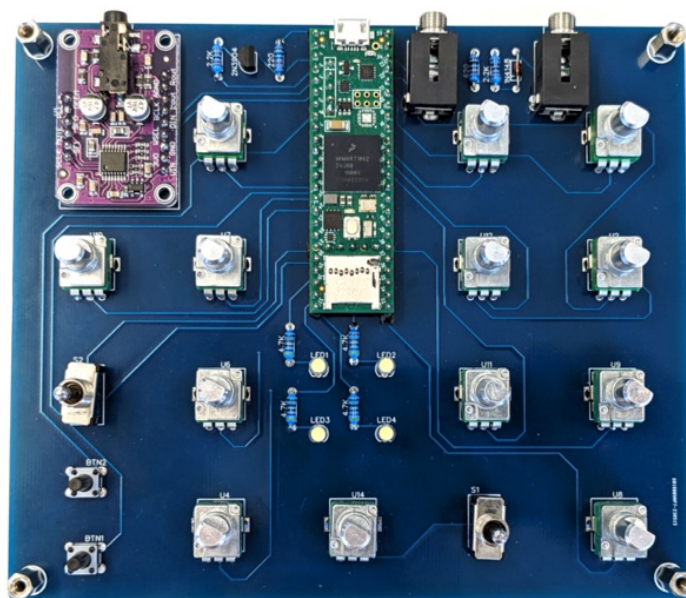
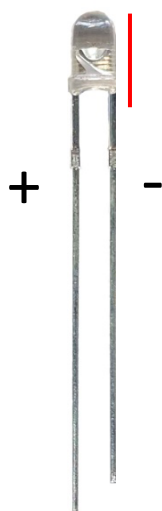
16. With the spacers in position locate the following parts and place but don't solder yet on the PCB.

- 13x B10K Pots
- 2x On-Off-On Toggle Switches
- 2x Button Switches
- 4x LEDs

IMPORTANT: DON'T SOLDER YET

ORIENTATION OF LEDs 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.



- Place the frontpanel over the top of the components ensuring all parts are inserted fully through the holes.

Secure both toggle switches against the panel with the nuts provided and use the pot nuts and washers to secure a few of the pots as pictured.

Check the 2 x small button switches are sat flush to the PCB and make sure they can be depressed without any obstruction.

The four LED's should be pushed fully through their panel holes.



- Once everything is lined up and secure you can now proceed to solder all points on the reverse of the PCB.

- The final stages involve the assembly of the front and back panels.

For this you must first remove the nuts/washers, panel, and 11mm standoffs. Set these aside for the moment.

Take the back panel and find the 4 longer 10mm screws and mini 3mm standoffs, secure to the back panel as shown.



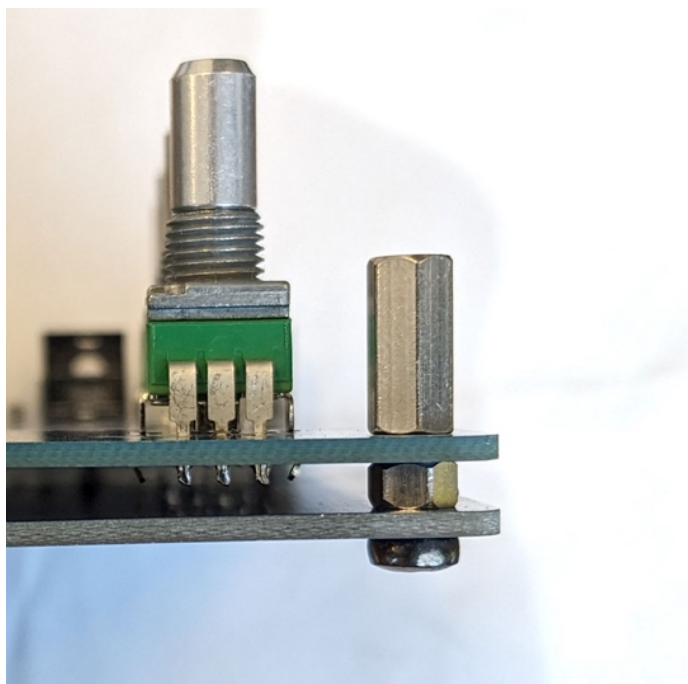
Ensure you use the long screws at this point otherwise the next stage will not work.
Repeat for each corner of the back panel and then apply the four sticky feet as pictured.

- Next place the PCB onto the back panel inserting the four screws through their holes.

If the PCB does not sit flat against the mini standoffs, you may need to use side cutters to trim down any large solder joints in the way.

It's not crucial, but you might want to check the back panel and PCB are oriented correctly with the panel text facing the same way before moving to the next step.

- With the PCB sat flush on top of the mini standoffs take the longer 11mm standoffs and screw onto the four screws of the PCB as pictured.



22. For the final step replace the front panel lining up all components and securing in place with the 4 x remaining 6mm black screws. Secure all pots and switches with their nuts and washers, and finally add the knobs and yellow switch caps. The build is now complete!



