Look Mum No Computer - #1222 Performance VCO
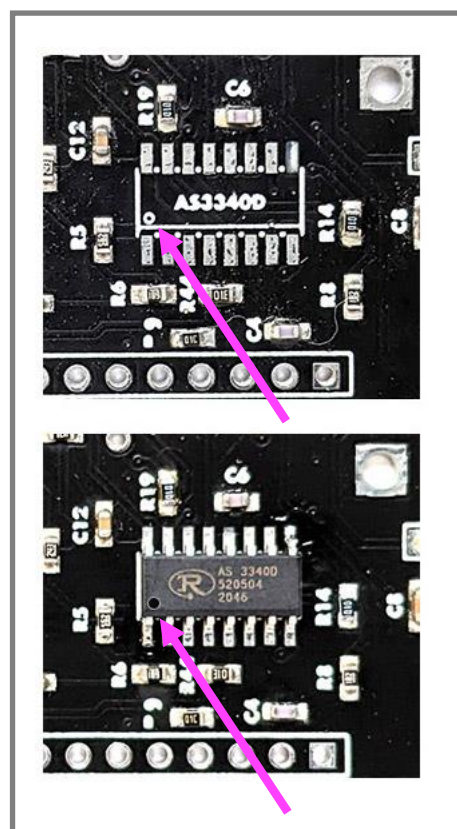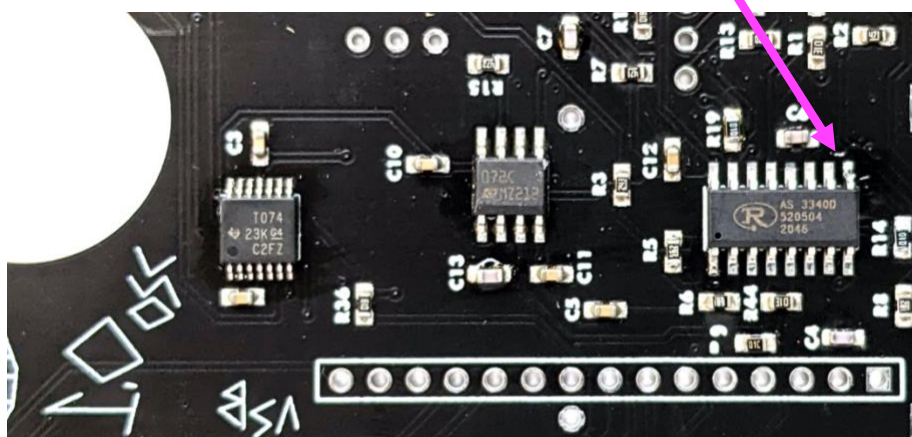Build Document V1 – 21/10/2022

There is only one SMD part to solder in this build, the rest of the SMD is already pre-soldered. The SMD part is the AS3340 IC chip which we'll solder in first. Using a flux pen can make soldering this chip a bit easier, but it's also quite straight forward to solder without any extra flux.

1. Start by heating one of the corner pads with your soldering iron, and then adding a small blob of solder – just enough to cover the entire pad as shown. **Note:** Don't heat the pad for too long, a second or two should be enough to get the solder flowing on it.
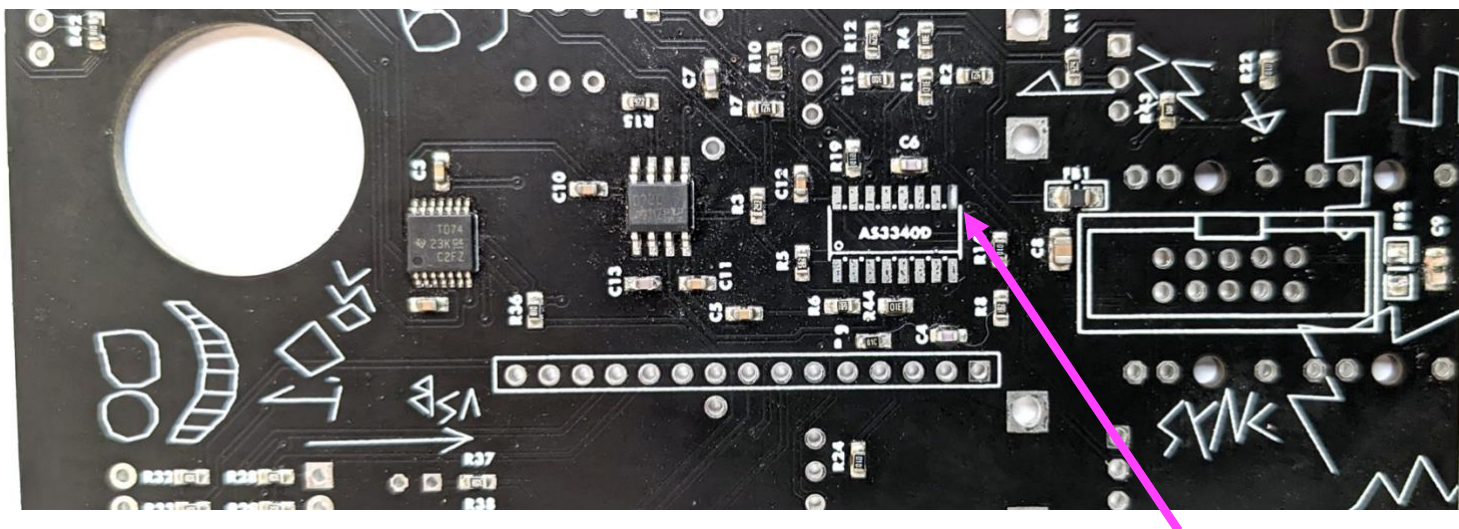

3. Now remove the IC from its packaging and position it flat on the surface of the PCB near to its final position. We are going to reheat the pad that already has solder on it and slide the chip into place holding it with tweezers. **Note: Orientation of this part is vital! If you solder it in backwards it will be very hard to remove, so make sure it's positioned correctly!** The dot in one corner of the IC chip must match up with the dot on the PCB silkscreen as shown below

2. Once you are sure that the IC is orientated correctly, re-heat the pad that we already applied solder to, and when the solder has melted - slide the chip into position so that the corner leg is tacked in with solder and all the pins line up with the other pads. Again - you don't want to heat the pad for too long. If you don't manage to line up the IC perfectly on first attempt, you can re-flow the solder again and use your tweezers to gently reposition the chip as required

4. When the IC is sitting correctly with all pins lined up to the pads and sitting flush to the PCB, you can then add solder to the opposite corner pin from the pin that we already soldered. Place the soldering iron so that it's touching both the pad and the pin, and then add a small amount of solder at the point where the pin meets the pad.

5. Once the second corner is soldered you can have a final check that the IC is lined up correctly with all pins aligned. If the alignment needs adjusting, reflow either corner and adjust its position with tweezers. Then go ahead and add solder to all the remaining pads.
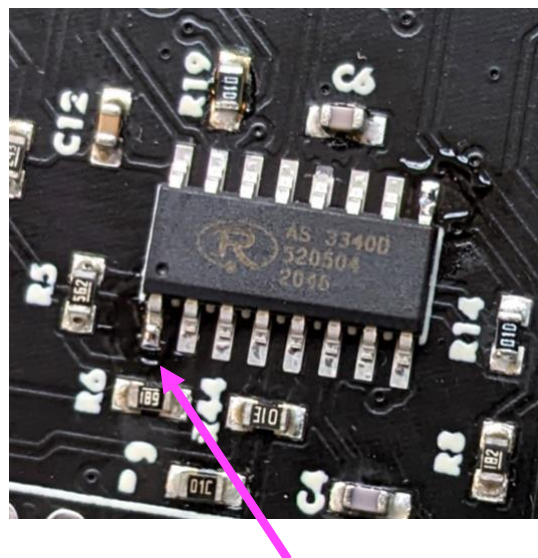
6. Next place and solder the power header. This sits on the same side of the PCB as the IC chip. **Note: orientation is vital!** The slot in the header must match rectangle line on the PCB silkscreen.
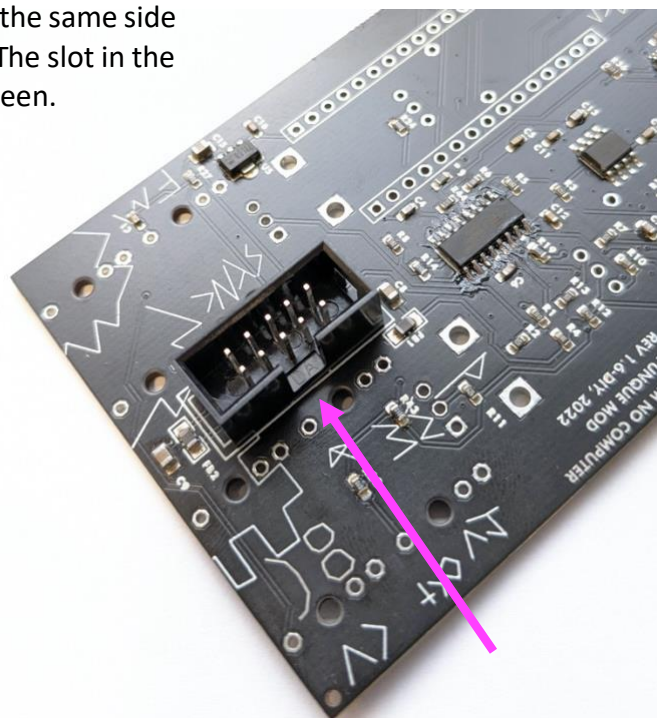
7. Next take the two 15 pin male headers and two 15 pin female headers and attach both sets together as shown below.

8. Then take the Arduino from its bag and insert the pins of the male headers into the Arduino.
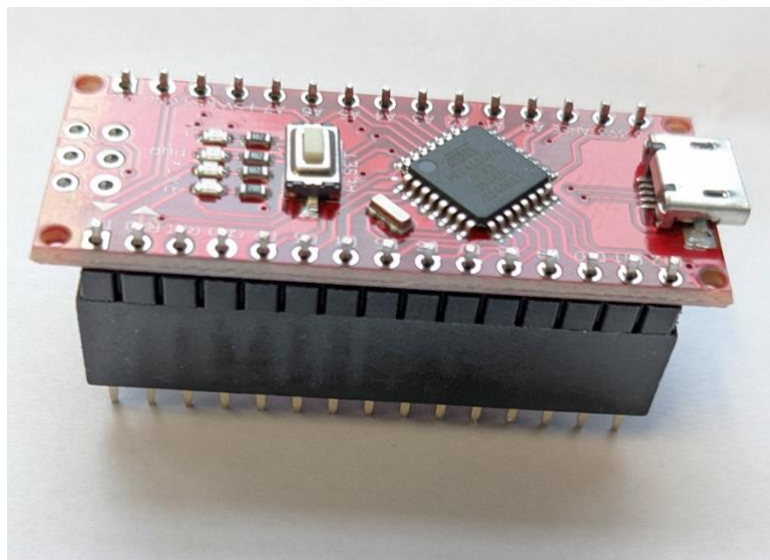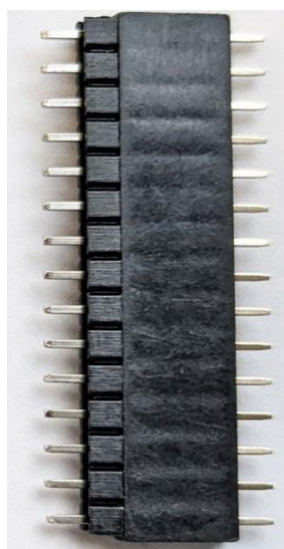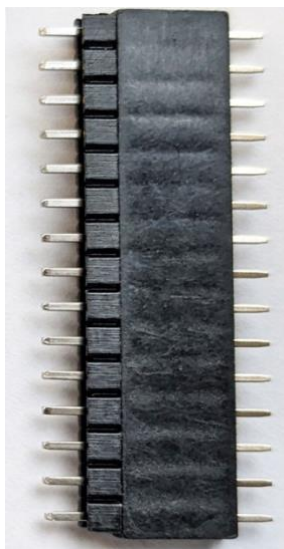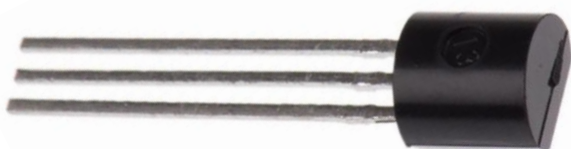
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9. Place the Arduino onto the PCB as shown below (with the USB facing towards the text 'USB' on the PCB silkscreen) then solder the male header pins to the arduino.

10. Next turn the PCB over and solder the female header pins on to the PCB. Once all pins have been soldered, detach the headers from each other and put the Arduino aside for now.
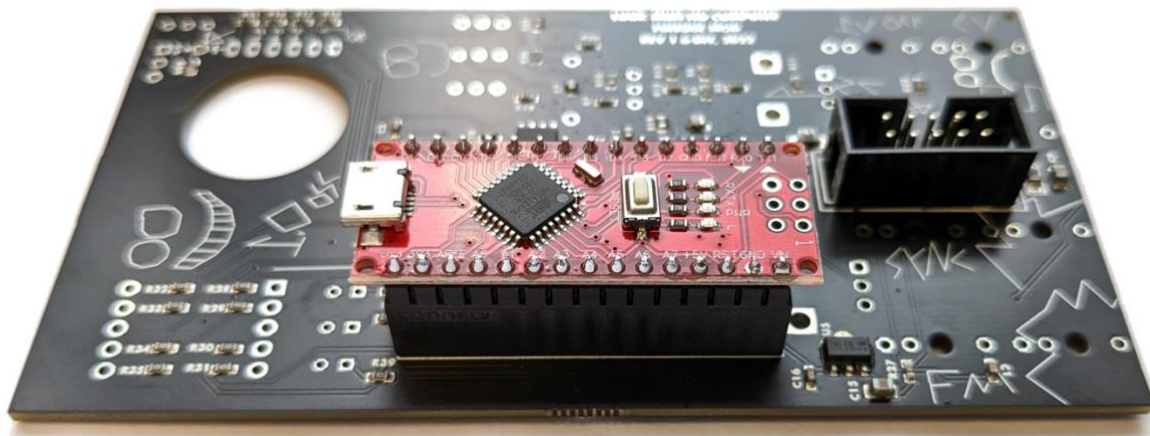
11. Next locate the LM4040 and place it on the side of the PCB without any SMD parts. **Note: Orientation is vital:** make sure that the curved side of the body matches the curve on the PCB silkscreen.


12. Now locate the rotary switch. It needs to have the small plastic tab cut off as shown below. Cut it as close to flush as possible. There will still be a tiny bit sticking up which is fine.
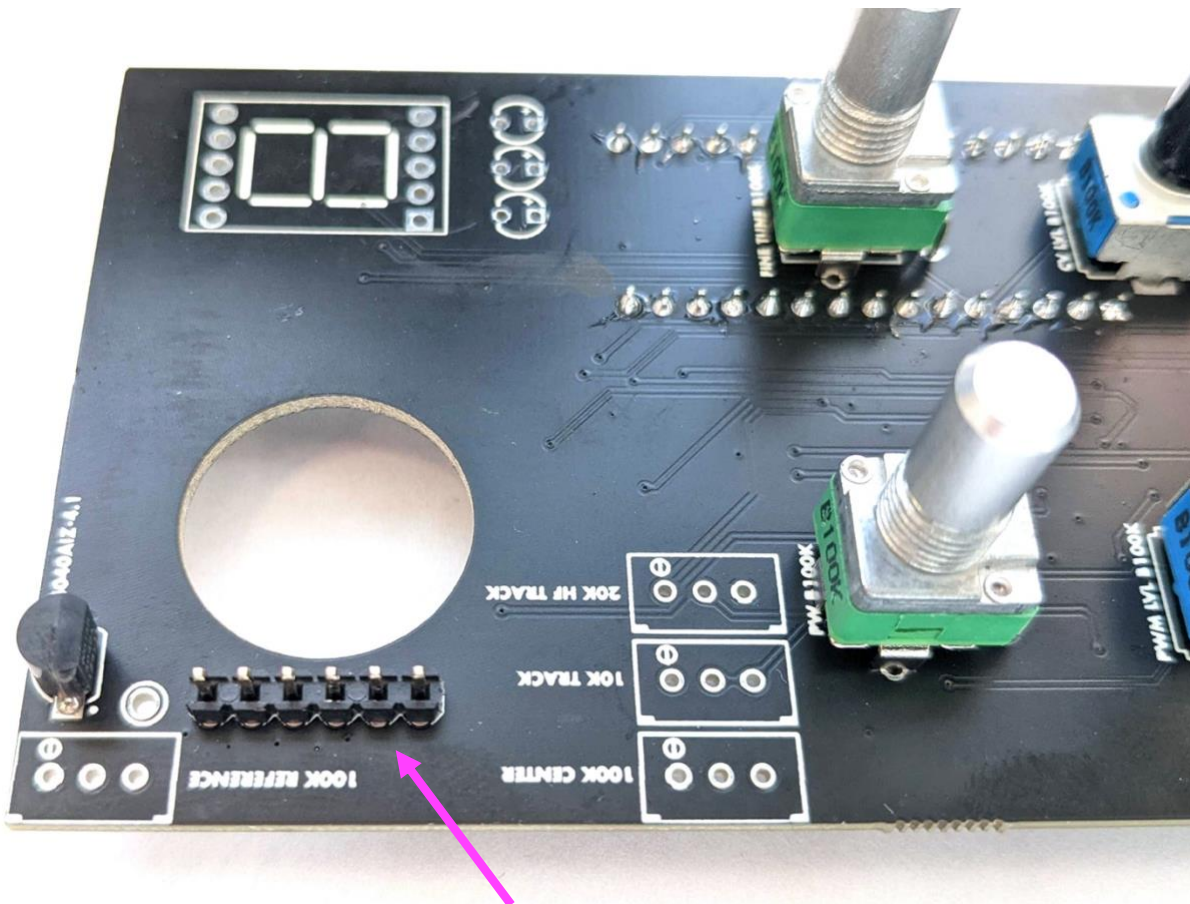
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13. Next place but **do not solder yet** the pots and jack sockets on the PCB (remove the nuts from the jack sockets if you haven't already).
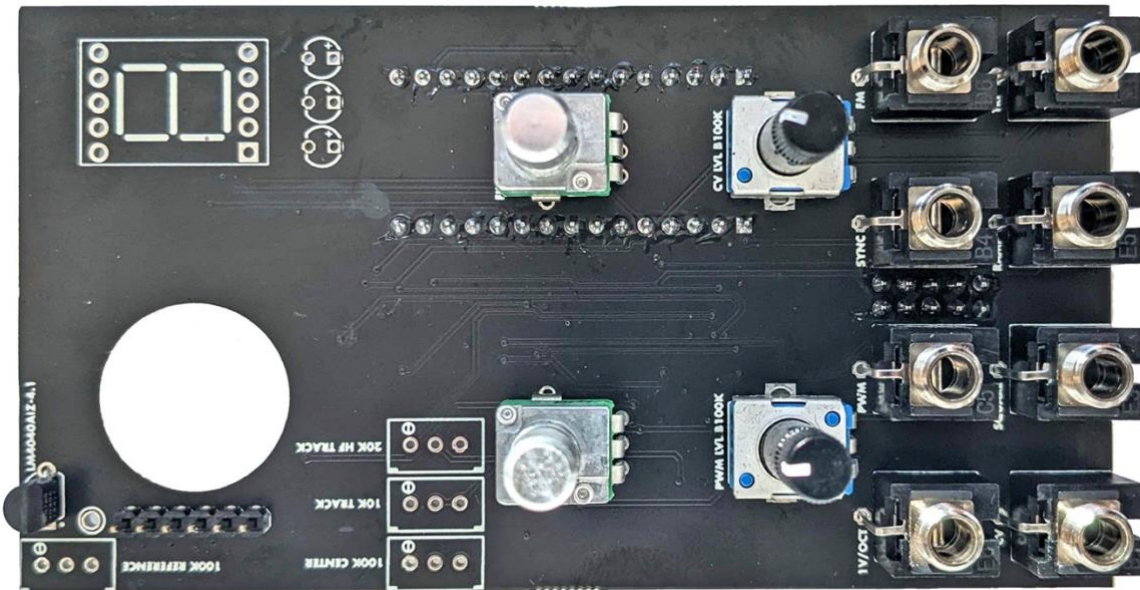

14. Do not solder anything yet. Place the 1 x 5 pin male header, with the black plastic part on the same side as the pots and jacks as shown below.

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15. Now place the frontpanel over the pots and jacks and attach a couple of nuts and washers to hold it in place. Attach the rotary switch onto the panel and hand tighten the rotary nut and washer all the way down. **Do not solder anything yet.**

16. Turn over the PCB and adjust the rotary switch so that the single middle pin is furthest away from the 5pin header holes as shown below

17. Now locate the small rotary PCB

18. Push the pins of the 5 pin male header through the PCB from below and then place the small rotary PCB onto the 5 header pins, and then onto the rotary switch pins as well. **Note: PCB orientation is vital!** The PCB side with the numbers must face inwards towards the switch itself, and the PCB side with a single white circle must face outwards as shown. This step can be a little bit fiddley, be patient and gentle when pushing the PCB onto the rotary pins, it can take a bit of wiggling around and a few attempts before it slots on. You shouldn't need to use any great force.
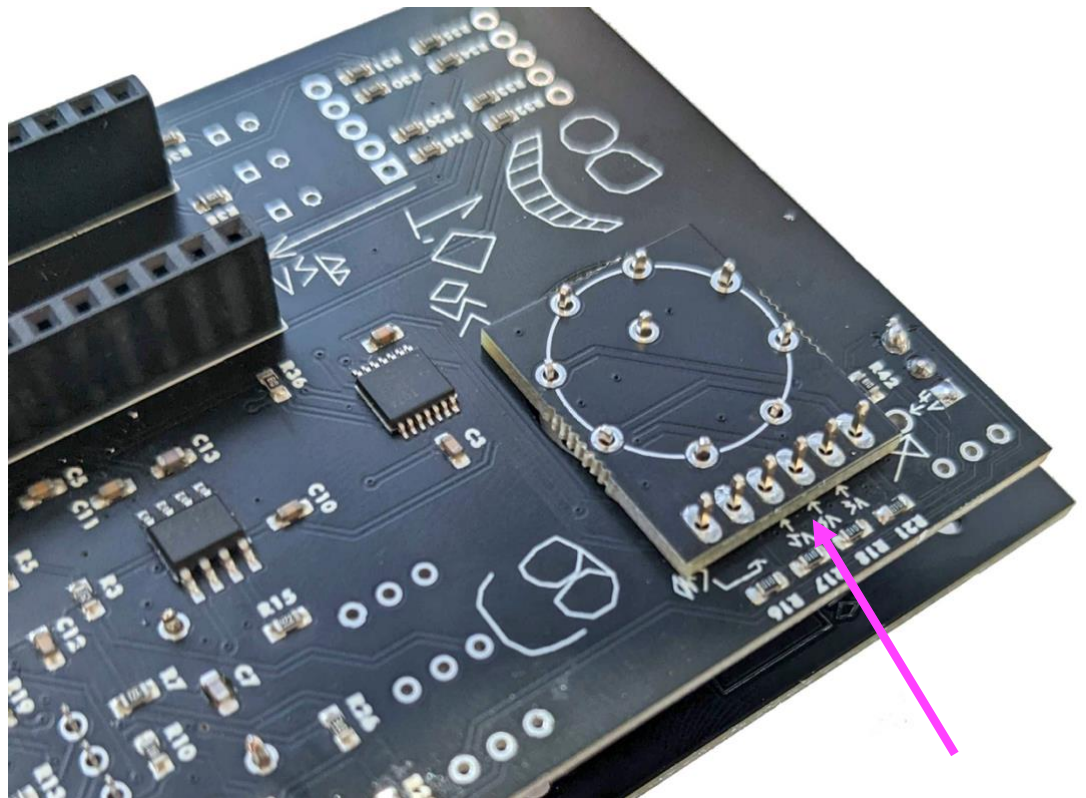
19. When the PCB is fitted, adjust the 5 pin header to make sure the black plastic is sitting flush to the PCB as shown below. The base of the rotary switch should be sitting just above the main PCB, and the small PCB should sit flush to the main PCB.
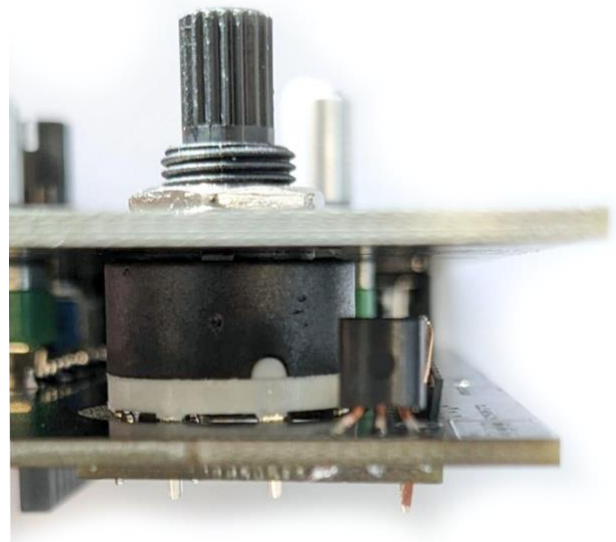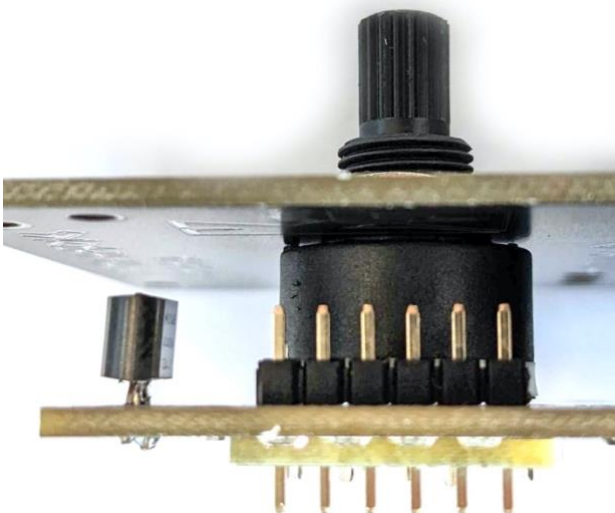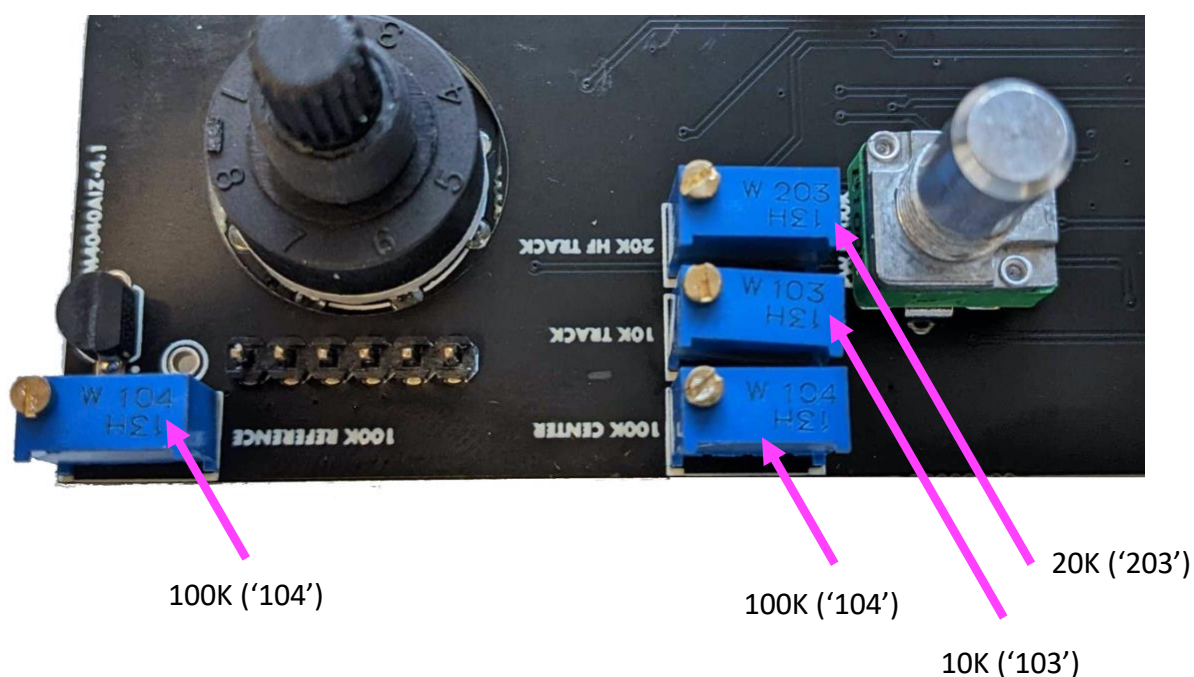
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20. When everything looks like the images above, you can solder the rotary switch and the 5 pin header onto the small PCB and then solder all the pins for the pots and jacks as well. Note: Be careful when soldering the pins which sit in-between the two Arduino headers – rotate the PCB so that the soldering iron can reach the pads without touching the plastic headers.

21. Next remove the frontpanel again and place but **don't solder yet** the 4 x blue trimmers. **Note: orientation is vital!** The brass screws on each trimmer must line up with the screw indicators on the PCB silkscreen. Match each value of trimmer according to its PCB designator. **Before soldering** – place the frontpanel again and nudge the trimmers so that each brass screw goes through the holes in the panel as shown below. When each screw is in its hole you can secure the panel by screwing a few nuts and washers onto the pots and jacks, then flip the PCB over and solder in the trimmers.

100K ('104')

100K ('104')

20K ('203')

10K ('103')

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22. Now remove the frontpanel again and locate the digit display and 3 x LEDs. Place the display and LEDs onto the PCB as shown below, but **don't solder yet**. **Note: orientation is vital for all these parts** – The digit display must be placed with the dot on the display facing towards the LEDs. For each LED, the long leg must go to the sqare pad with the '+' sign next to it. Read the next steps before soldering.
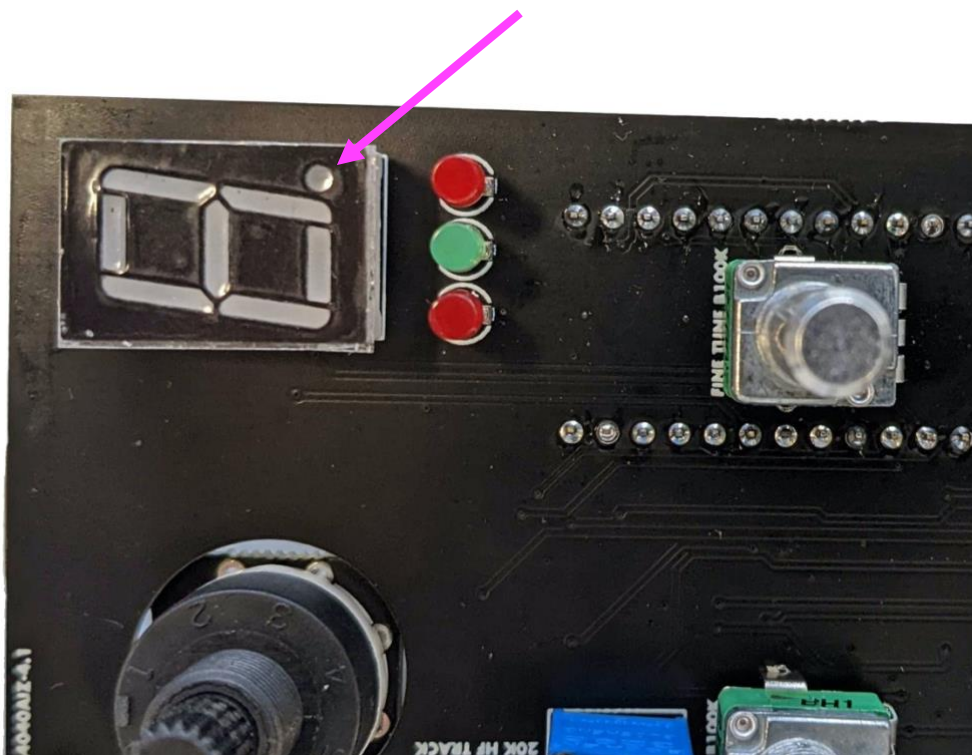

23. Attach the panel again and screw on the nuts and washers onto all the pots, jacks and rotary switch. Place some masking tape on the front of the panel over the 3 LED holes, and then push the LED bulbs through their respective panel holes so that they sit flush with the front panel and solder them in place.

24. The module looks much nicer when the digit display is soldered flush to the front panel, so make sure the display sits away from the PCB and rests directly on the back of the panel. Start by soldering two opposite corner pins, and then check that the display is lined up straight before proceeding with the rest of the solder joints.
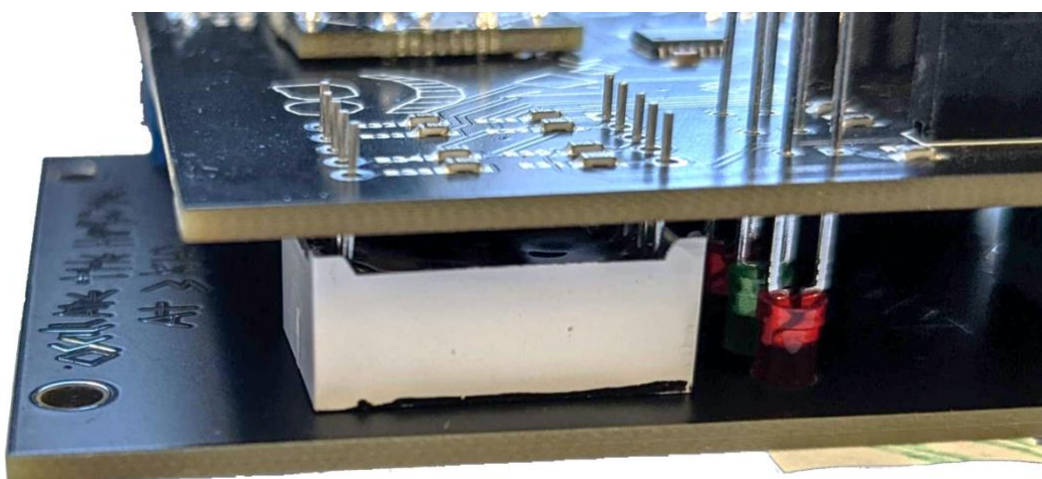
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25. Now re-attach the Arduino board. **Note: orientation is vital!** Make sure the USB socket lines up with the PCB silkscreen text saying 'USB' as shown below. **If you plug it in backwards you could kill the Arduino!**
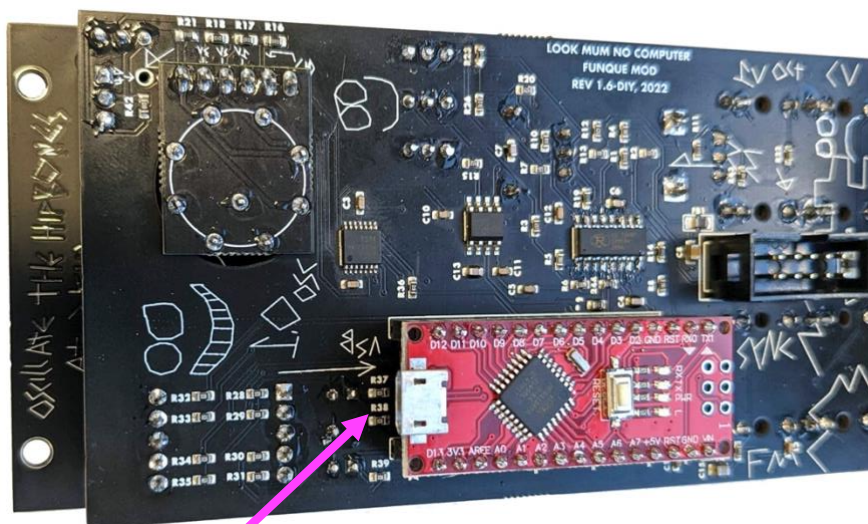
USB this side

26. Next place the brass adaptor onto the rotary switch, then screw on the three knobs and finally attach the power cable. The build is now finished!

27. Calibration instructions can be found here: https://youtu.be/RlDgEwjelfA?t=233 (starting at 3:53)