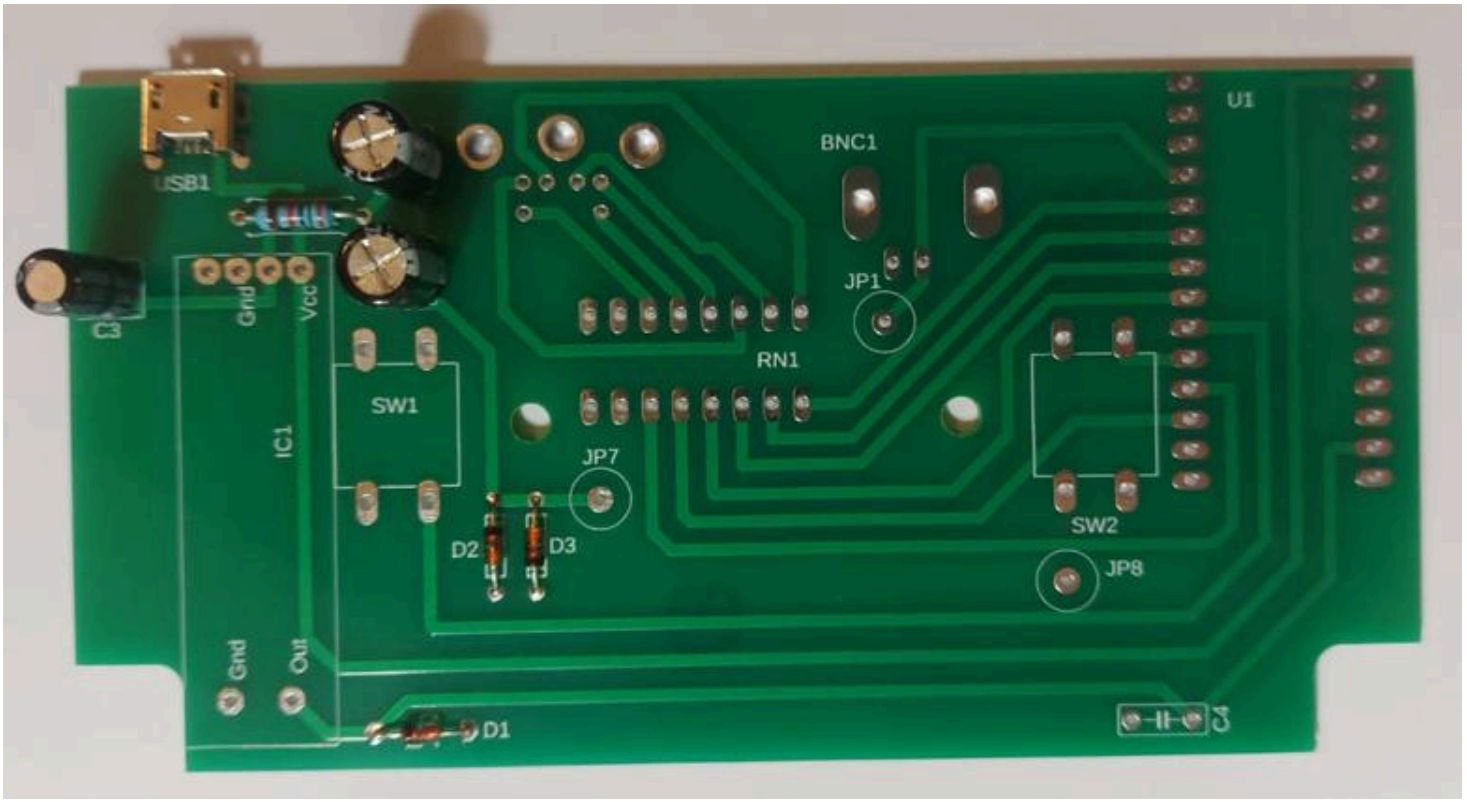
tACS Kit Assembly Instructions

Required: fine tipped soldering iron & solder wire. Small adjustable spanner. Small pliers or grips, acrylate super glue or loc-tite compound.

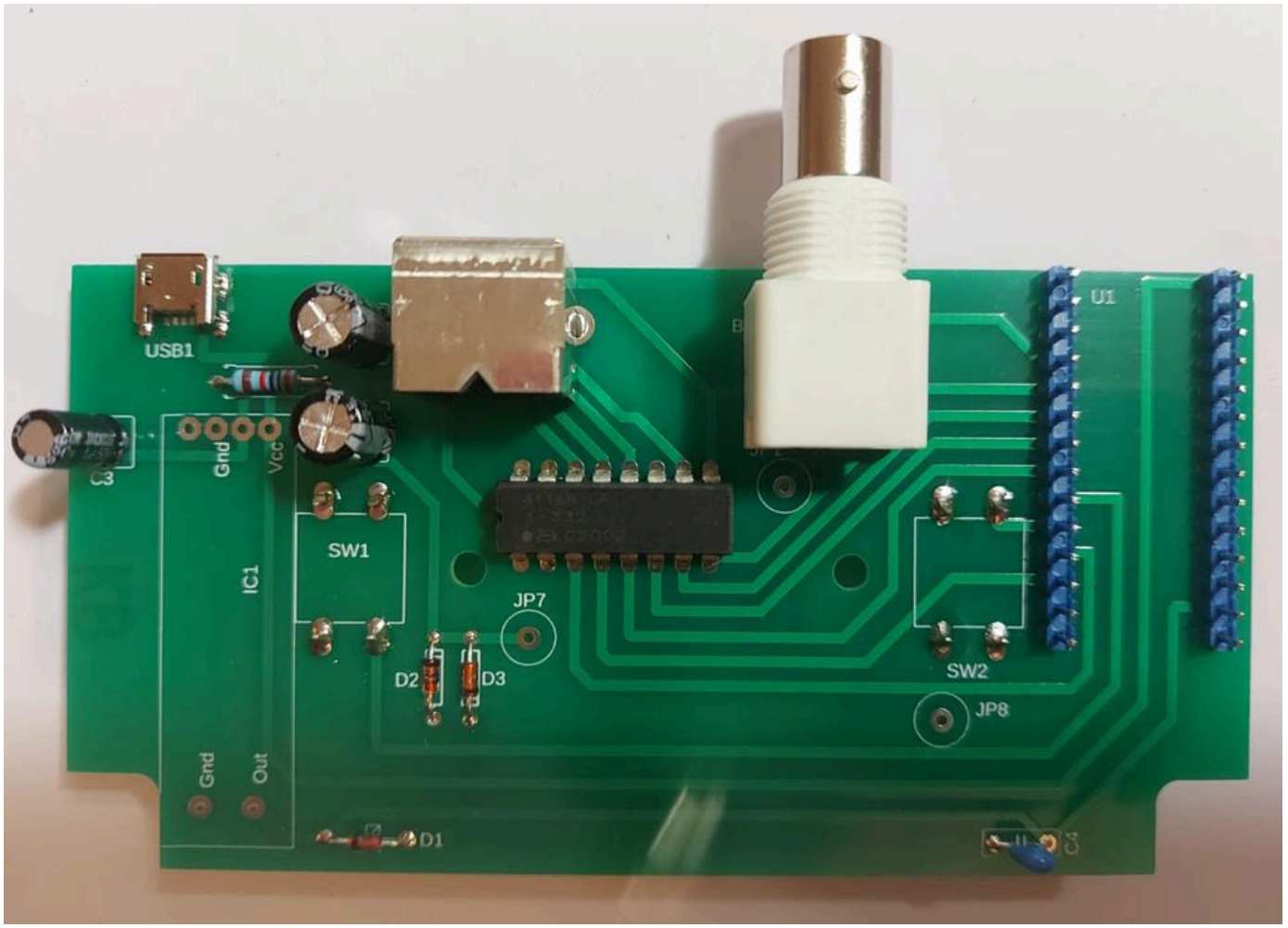
When soldering, it can sometimes help to solder one component junction first, then using one hand to support the component, resolder the same junction again, whilst straightening the component to ensure that it is sitting directly on the circuit board, and is aligned vertically, and perpendicular to the board. When you are happy with the component position and alignment, then proceed to solder the remaining junctions for that component.

Position the following components on the top of circuit board (top is marked with white silkscreen component labels), and solder from underneath:

1) R2 (20k ohm)
2) C1 and C2 (220uF). These are polarised: white stripe (negative) to the right hand hole for both (looking at circuit board from above).
3) C3 (1uF) Also polarised: white stripe (negative) to bottom hole
4) C4 (33nF) This is non-polar (either leg to either hole)
5) D1 (3.3V Zener) black stripe to left hole.
6) D2 (IN4148) black stripe to top hole.
7) D3 (IN4148) black stripe to bottom hole.



8) Resistor Array (4116R chip with 16 legs). Orientation designator dot (pin 1) to bottom left hole.
9) DIN 6 pin, shielded socket to three large holes, top centre of circuit board
10) White BNC socket to BNC1
11) Blue wire to JP1
12) White wire to JP7
13) Green wire to JP8
14) USB1 battery socket is already soldered due to small surface mount pins.



15) Position tactile switches to SW1 and SW2 underneath the circuit board and solder on the top side of the circuit board. These two buttons are the only two components on the reverse side.

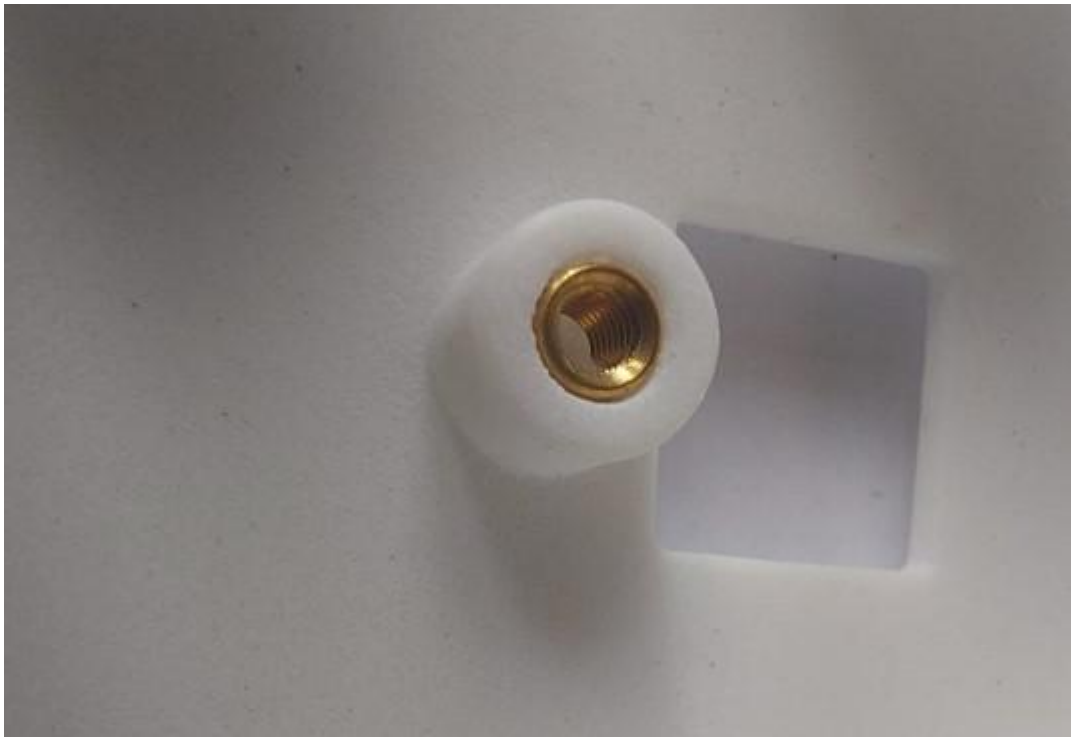
Position the following pin strips on the top of the circuit board, and solder from underneath. It is important to ensure that the pin strips are properly vertical, otherwise they will not line up correctly with the Teensy board and amplifier module solder pads.

16) Cut the pin strip to two rows of 14 pins. Solder two 14-pin strips at U1.
17) Cut the pin strip to one row of 4 pins. Solder 4-pin strip at Gnd, Vcc.
18) Cut the pin strip to one row of 3 pins. Remove the centre pin and solder pin strip at Gnd, Out.

19) Position amplifier module on top of pins at IC1 and solder 6 pins on amplifier board.
20) Position Teensy 3.2 module on top of pins at U1 and solder 28 pins on teensy board. Avoid excessive heat exposure to the Teensy module.

This concludes all response box circuit board soldering.

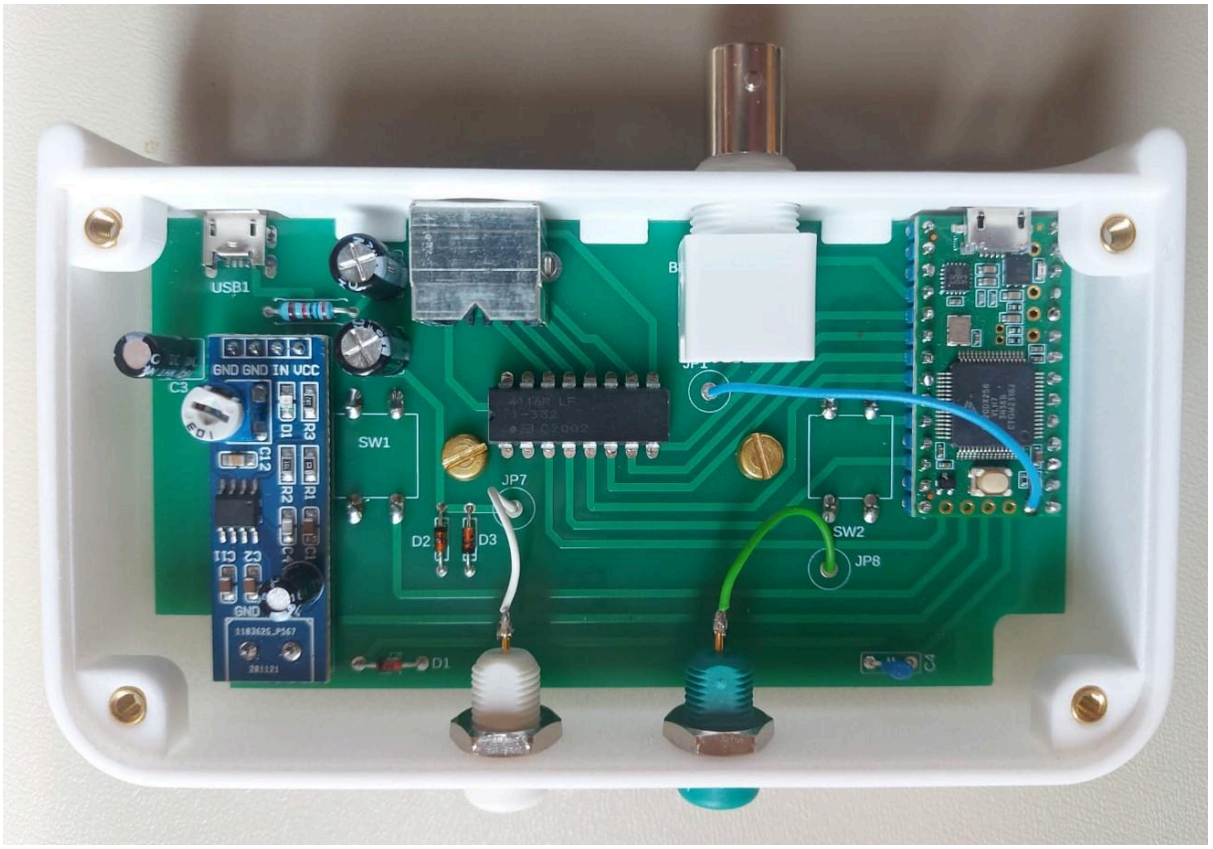
Position the six threaded brass inserts over the holes in the white 3D printed case (slotted side downwards). Using a soldering iron, carefully press the inserts into the holes until they are about 0.5mm to 1mm below the plastic surface. Try to keep the orientation of the inserts directly vertical.



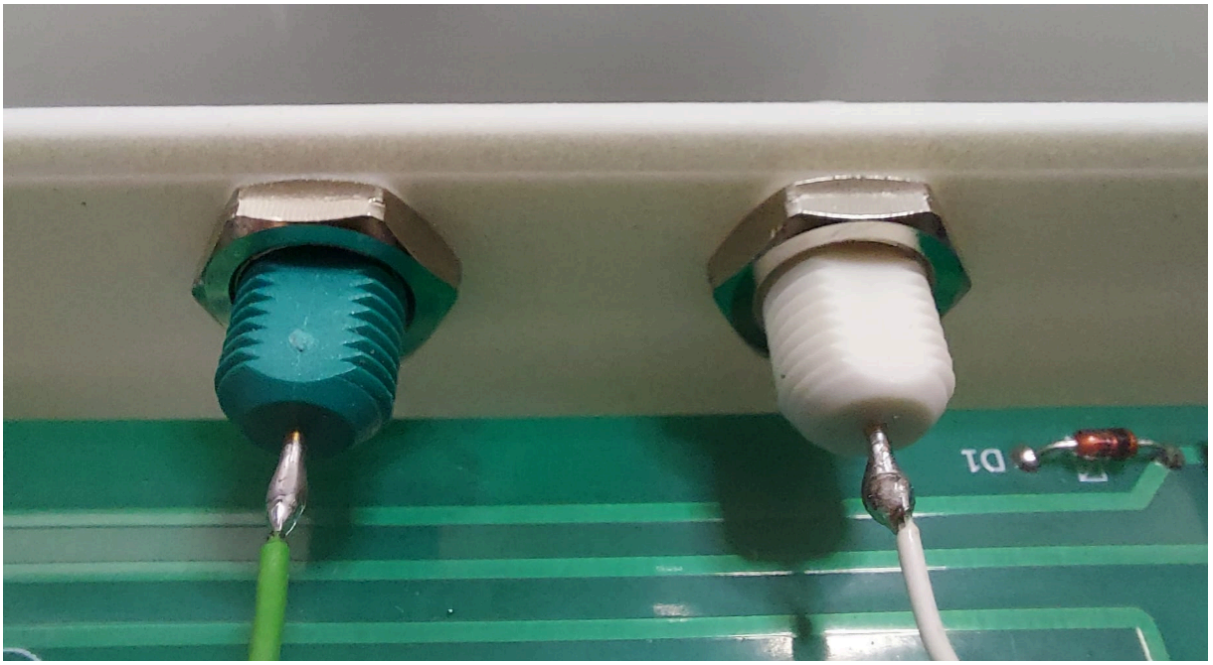
Place the completed circuit board into the white 3D printed enclosure and gently screw in the two M3 screws to hold the board in position. Do not overtighten.

Screw the nut onto the white BNC socket. Only tighten gently. Do not distort the plastic case. Optionally place one small drop of super glue or loc-tite compound onto the thread, once the nut is in position.

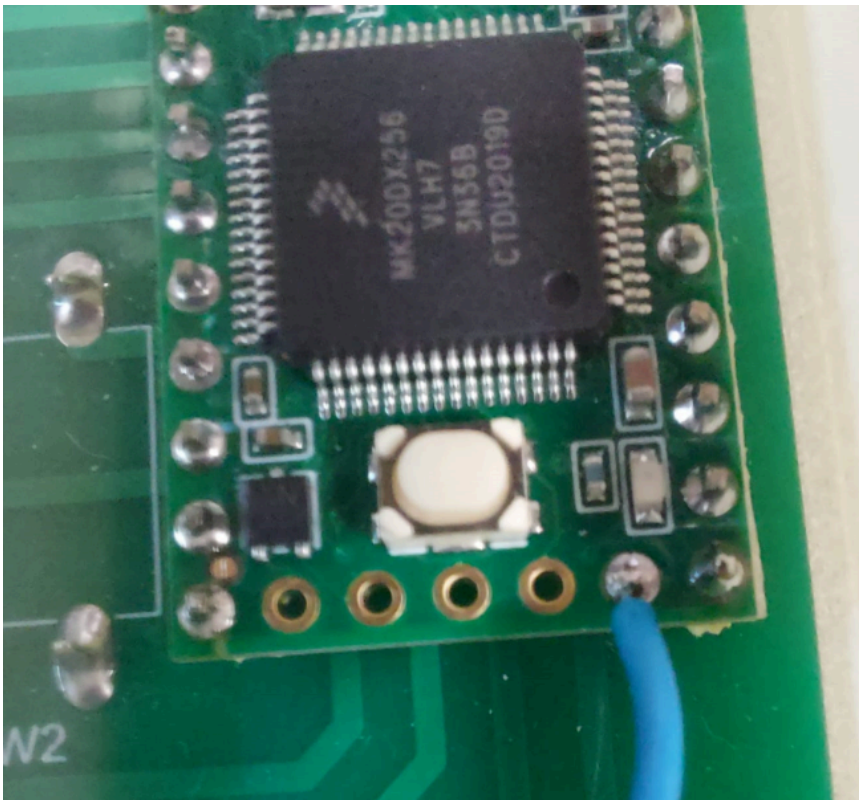
Insert the two touchproof sockets (one white and one green) as shown in the image below, and secure them with nuts provided. Likewise place one small drop of super glue or loc-tite compound onto the threads, once the nuts are in position

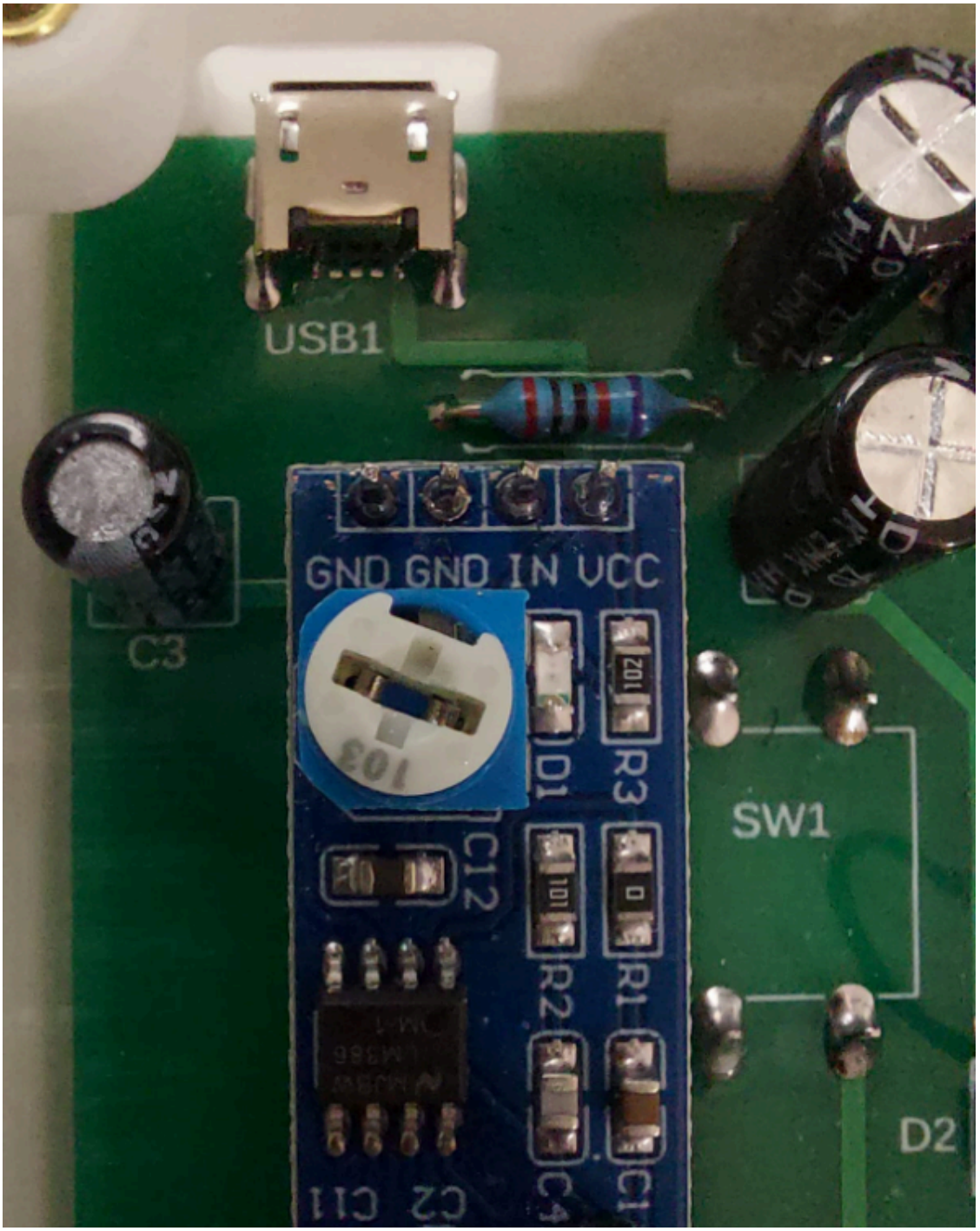


Solder the white wire from JP7 to the white socket and the green wire from JP8 to the green socket. Make sure that the surface of the nuts are level and parallel with the edge of the case.



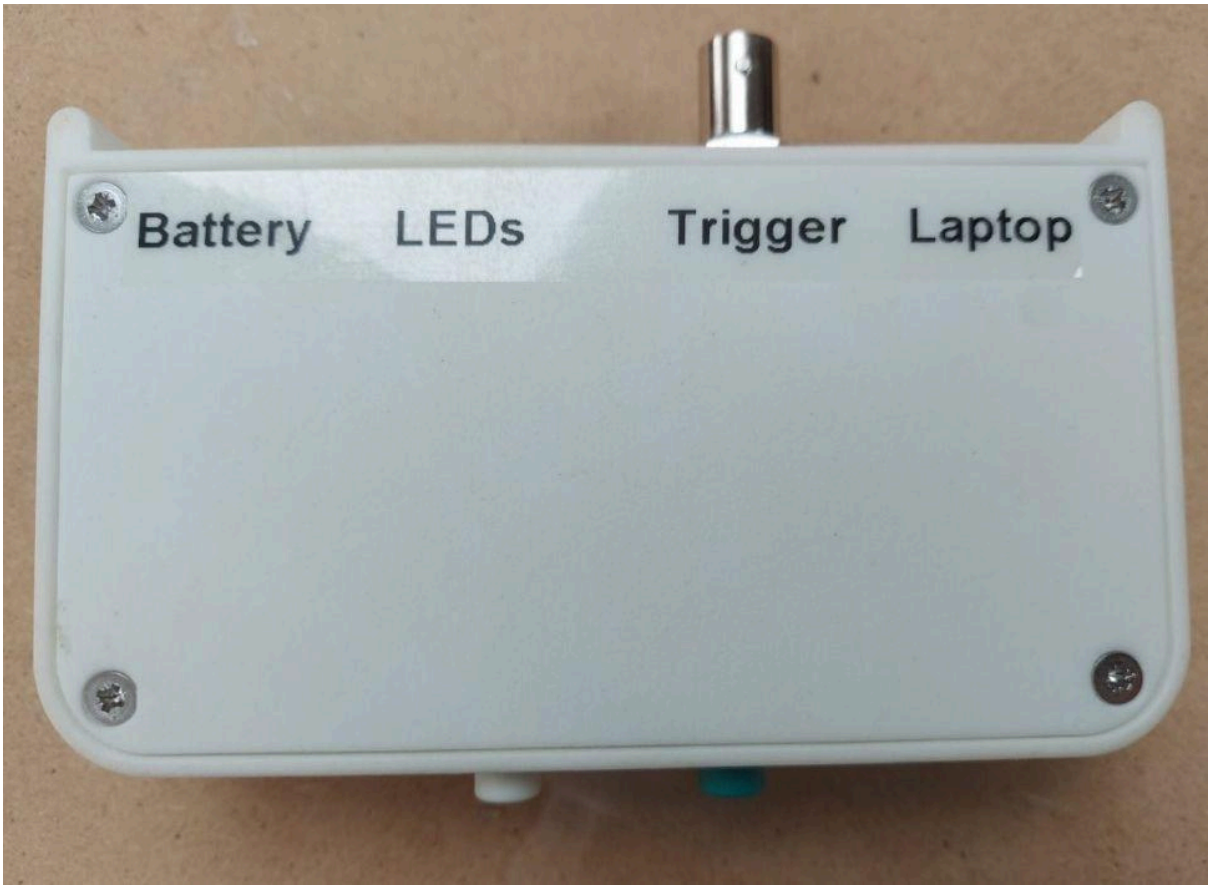
Carefully solder the blue wire from JP1 to the solder pad on the Teensy that is immediately to the left of the bottom-right pin as shown below:





Ensure that the trim potentiometer adjustment on the amplifier is positioned approximately as shown. This is close to, but not fully anti-clockwise.

Close the lid using the four M3 screws provided, and carefully position the adhesive label.



This completes the assembly of the Stimulus-Response unit.