2710QCM ELECTRONIC INSTRUMENTS

ASSEMBLE AND SOLDER HST1D 2018 FERAL TECHNOLOGIES

All of the required parts except the battery should be in your kit. It's best to start with the components that are lowest in height as this makes adding further components easier, also some components have to be added in a certain order as one ends up behind the other, so do follow the step-by-step notes and photographs carefully!

You will need access to:

- soldering iron
- solder
- eye protection
- wire cutters
- wire strippers
- Solder third hand/clamps and solder tip cleaner
- Your own 9v battery

OVERVIEW OF STEPS

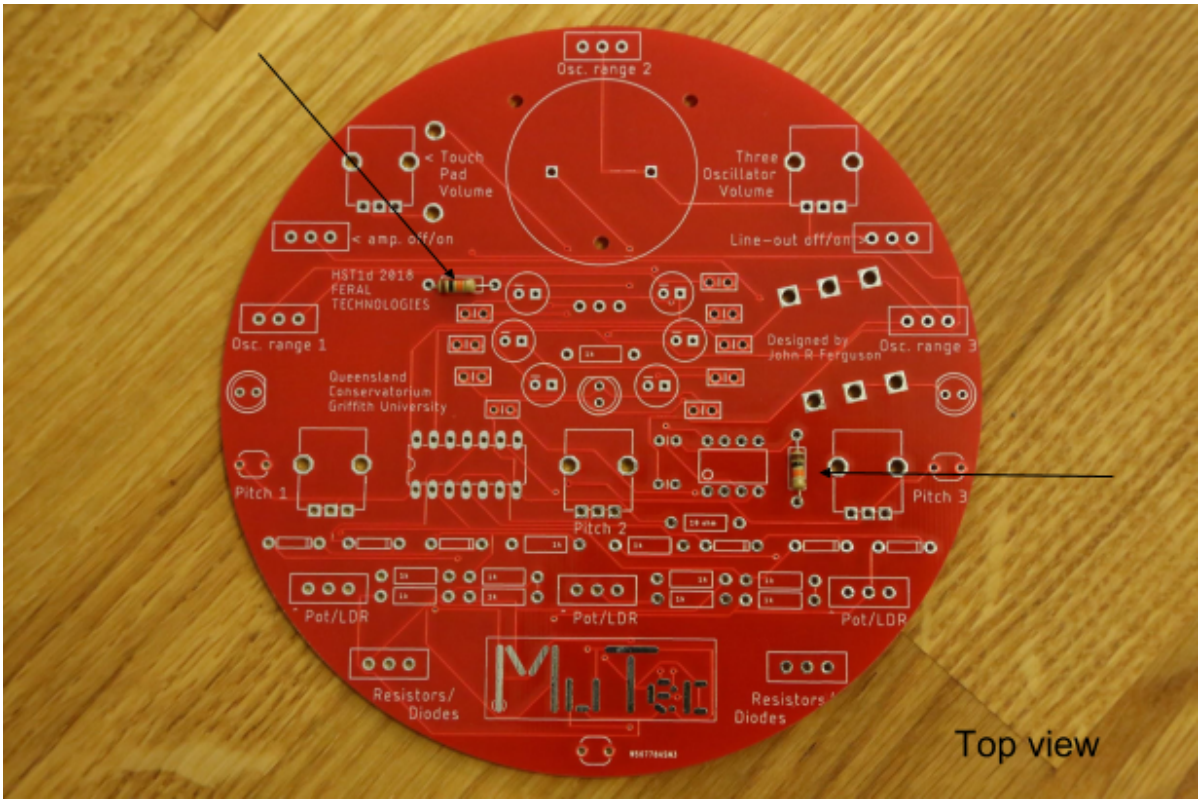
Part 1: Solder the following components to board (complete before week 3 class)

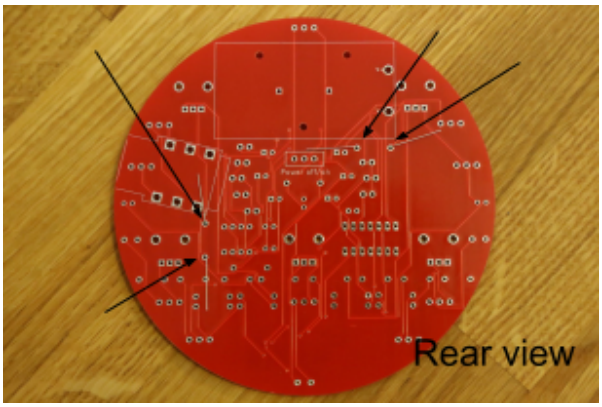
- 2 x 10K resistor
- 11 x 1k resistor
- 6 x diodes
- 3 x photocell
- 2 x IC holders (paying attention to orientation: dimple/spot should line up)
- 11 x Small capacitors
- 10 x top mounted switches (start with 3 arranged in triangle, carefully turn upside so soldering on steady/flat surface, then add the three on one edge, the three on the other, finally the one in the middle)
- 3 x LEDs (make sure flat edge is aligned with flat edge printed on board)
- 1 x Speaker (cut off the wires that stick through after soldering)
- 1 x Rear-mounted power switch
- 1 x Output socket on rear (comes in two halves, remember to screw together)
- 6 x Larger capacitors

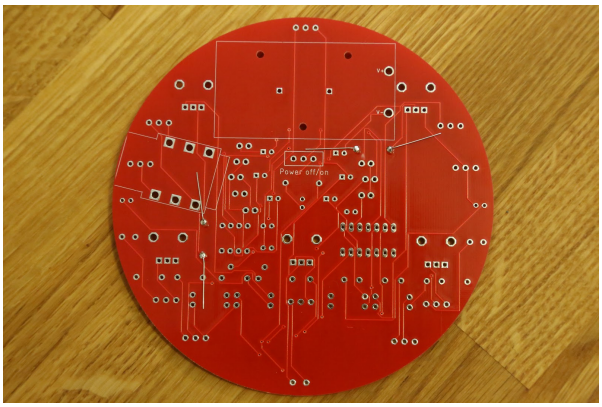
Part 2: if you are not confident or you run into problems please wait until week 3 class to complete the below (I can only help with below if the above is done first)

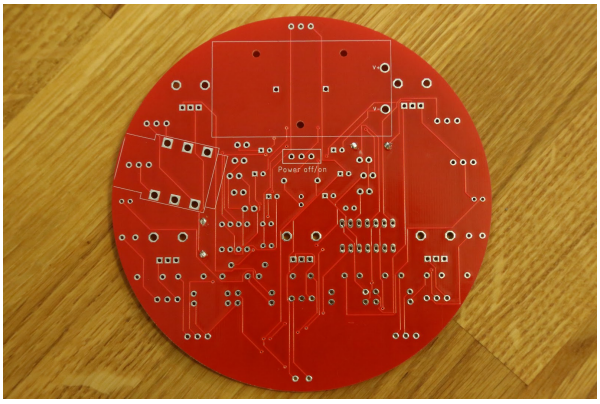
- Rear battery compartment -- push red cable through the + hole and black cable through the - (yes this means the wires will cross). Only two screws are needed (not three), the short screw is for the centre hole directly behind speaker, put this in first but only tighten gently. The second screw is for the left hand side furthest from the battery connections, insert and tighten this fully, then tighten the centre screw if necessary. Wires need to be stripped and then soldered, it's neatest to do this before mounting the battery compartment but short circuits must be avoided i.e. the bare wires must not touch (also, don't solder with the battery in the battery compartment, add battery at very end!)
- 5 x Potentiometers -- it's best to place the three front pins into their holes first then line up and push the springy metal lugs that cause the potentiometer to 'clip' into place second, take care not to bend pins and straighten carefully if you do (or they will break off), it can be helpful to gently squeeze the springy metal lugs a little first….
- Add battery
- Play!!!!

SEQUENTIAL PHOTOGRAPH OF EACH STEP IN THE BUILD PROCESS WITH NOTES

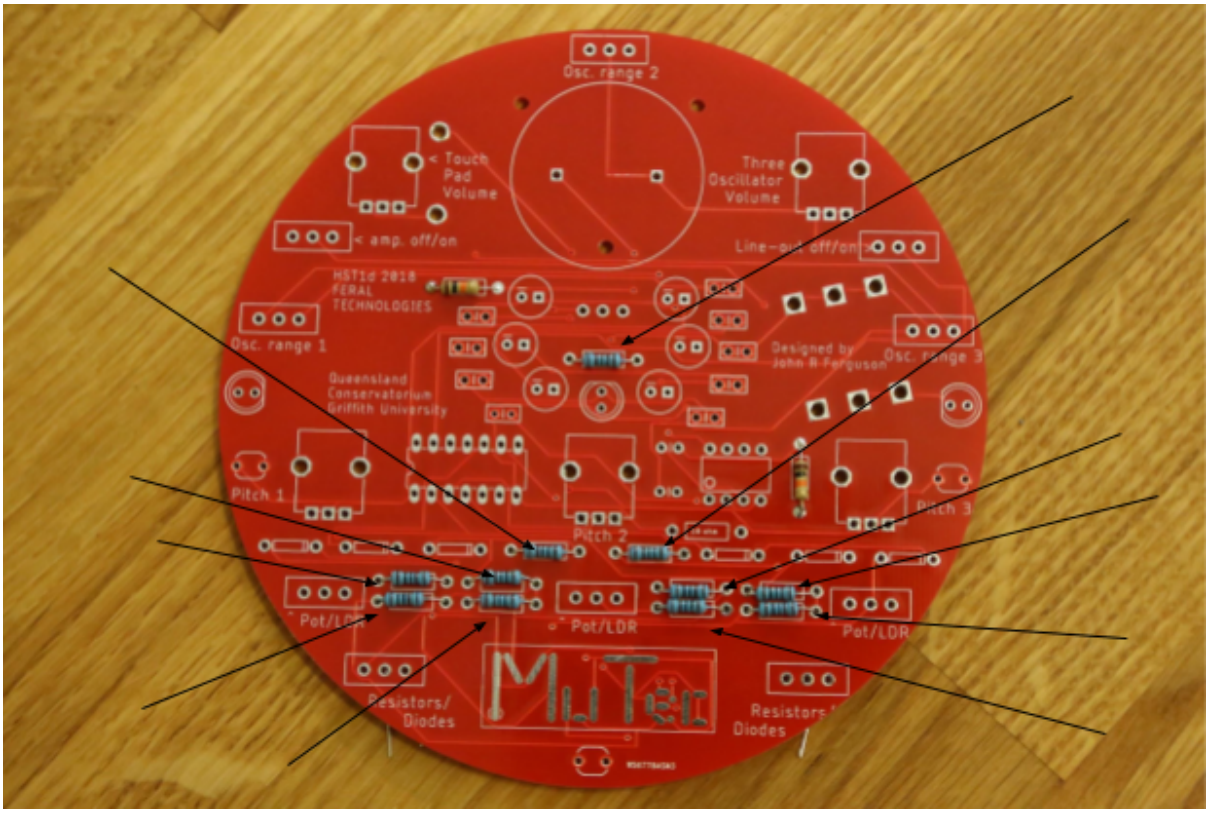


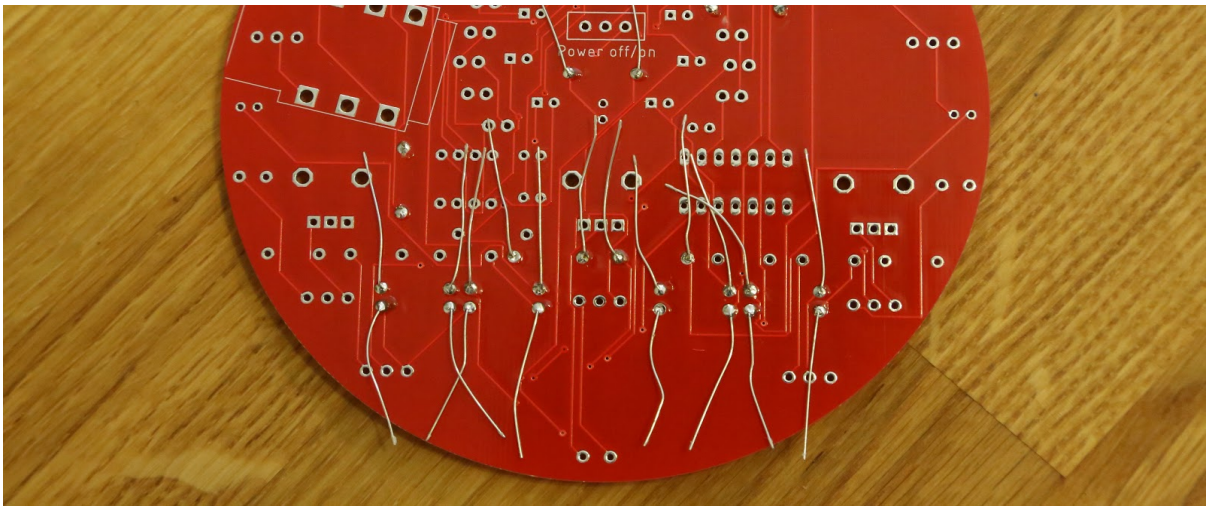


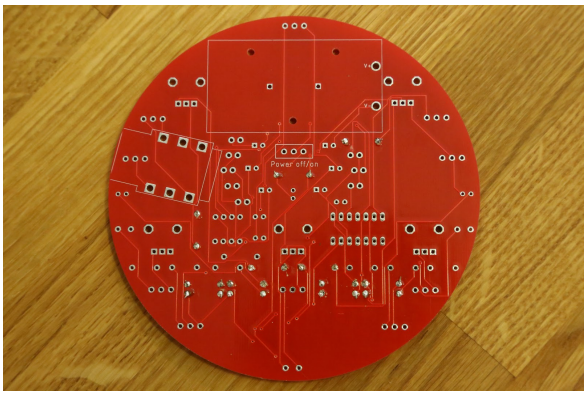




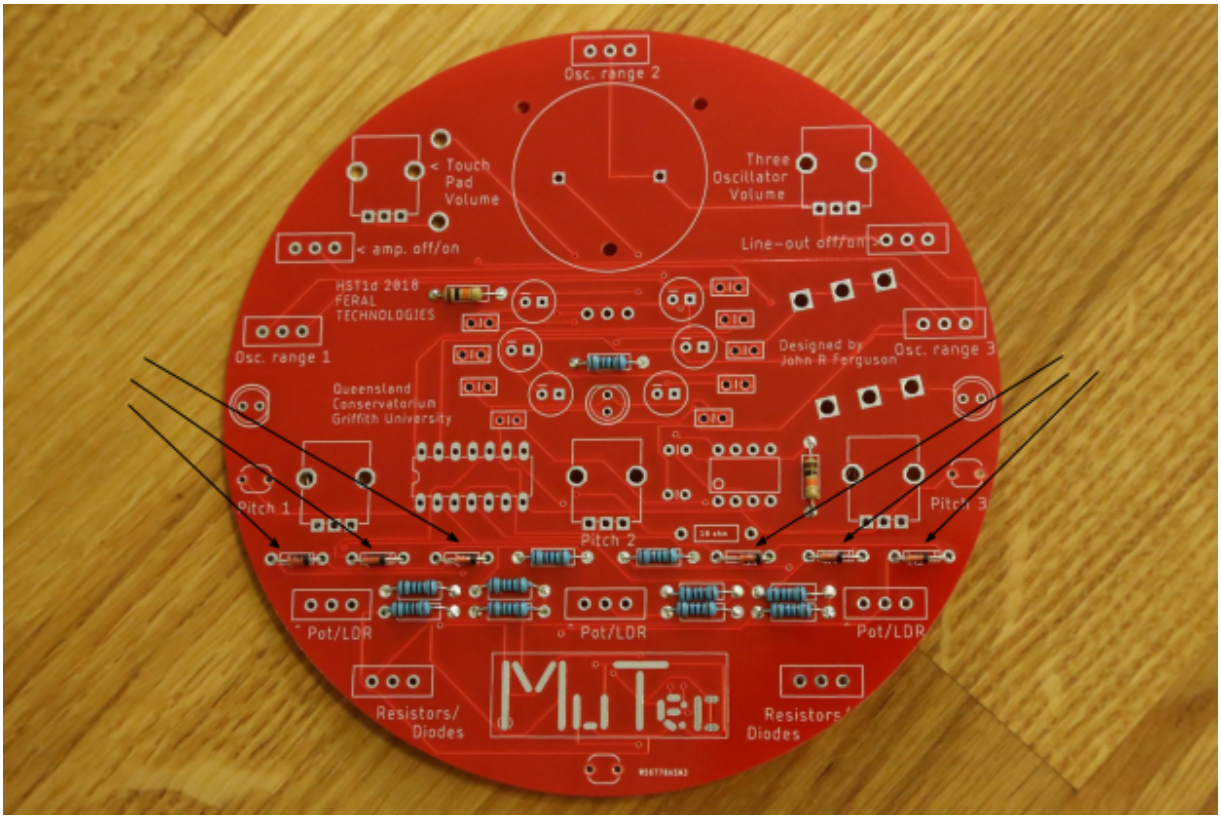
1. Insert 2 x 10K resistor (resistors are not polarized so can go either way around)
    a. top view
    b. rear view
    c. rear view soldered
    d. rear view soldered and trimmed

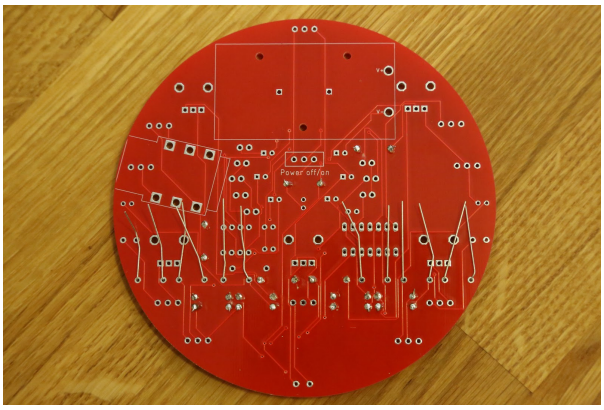


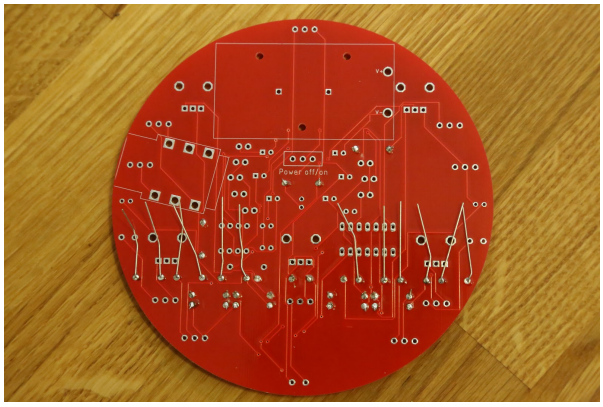


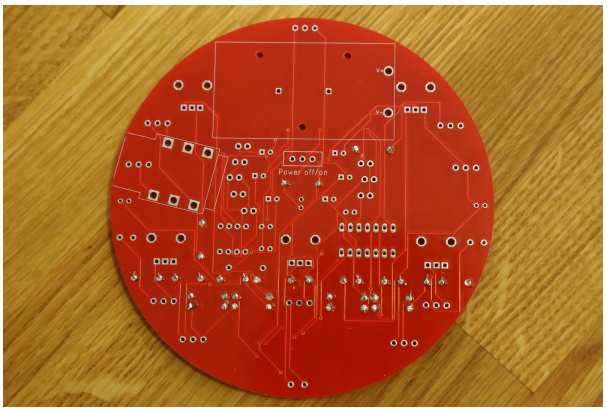


2. 11 x 1k resistor
    a. top view
    b. rear view soldered
    c. rear view soldered and trimmed

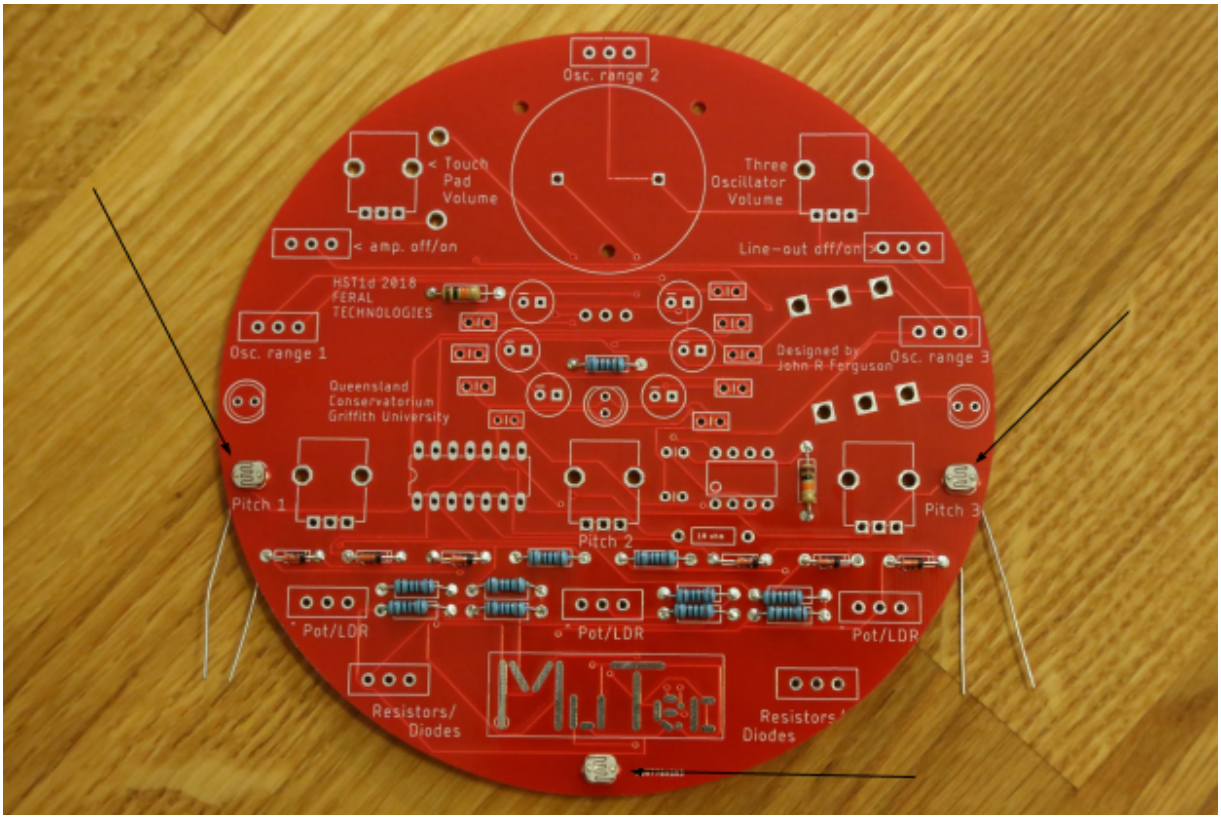




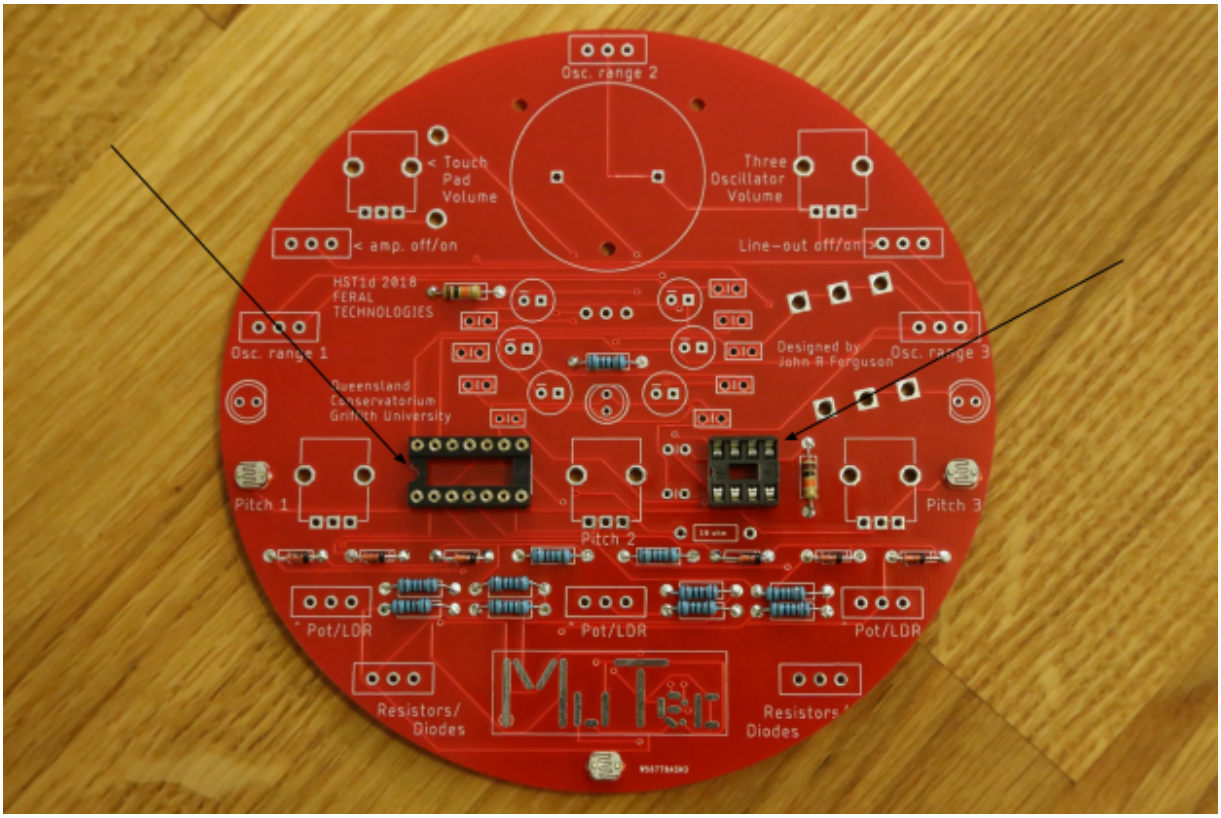




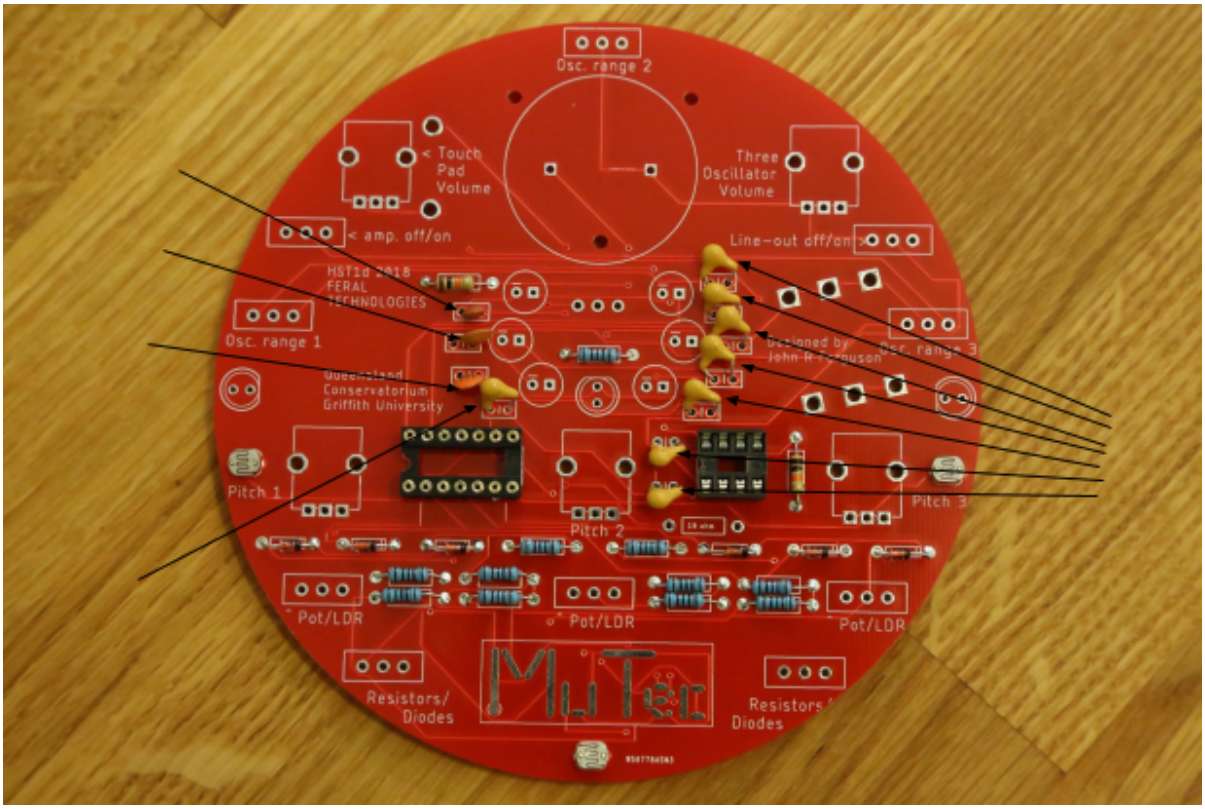
3. 6 x diodes (notice polarity, black stripe goes to right)
    a. top view
    b. rear view
    c. rear view soldered
    d. rear view soldered and trimmed



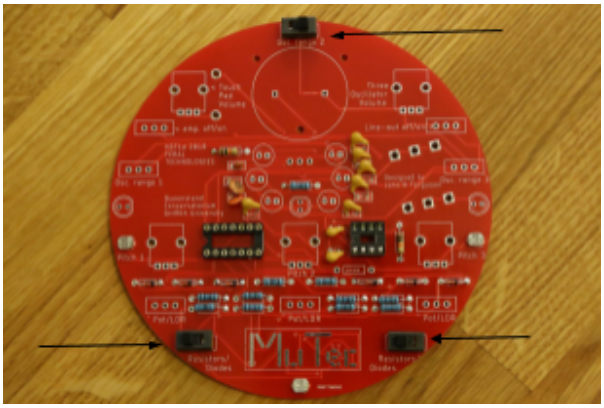
4. 3 x photocell (rear and soldered steps not shown take same approach as steps 1-4)

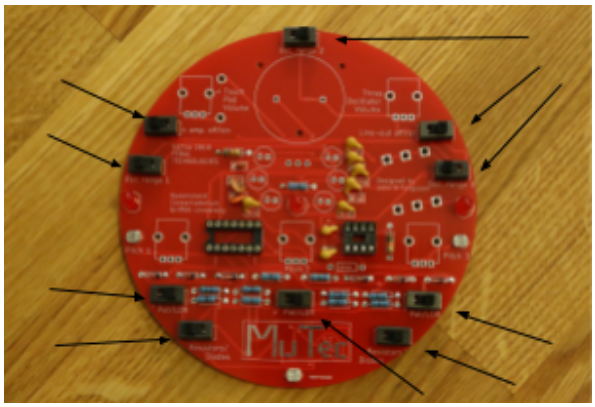


5. 2 x IC holders (paying attention to orientation: dimple/spot that denotes top of IC should line up)



6. 11 x Small capacitors. The capacitors on the right are all the same, the ones on the left are for the touch points and are random in order to provide more varied expression. These capacitors are not polarized i.e. it does not matter which around you place them.

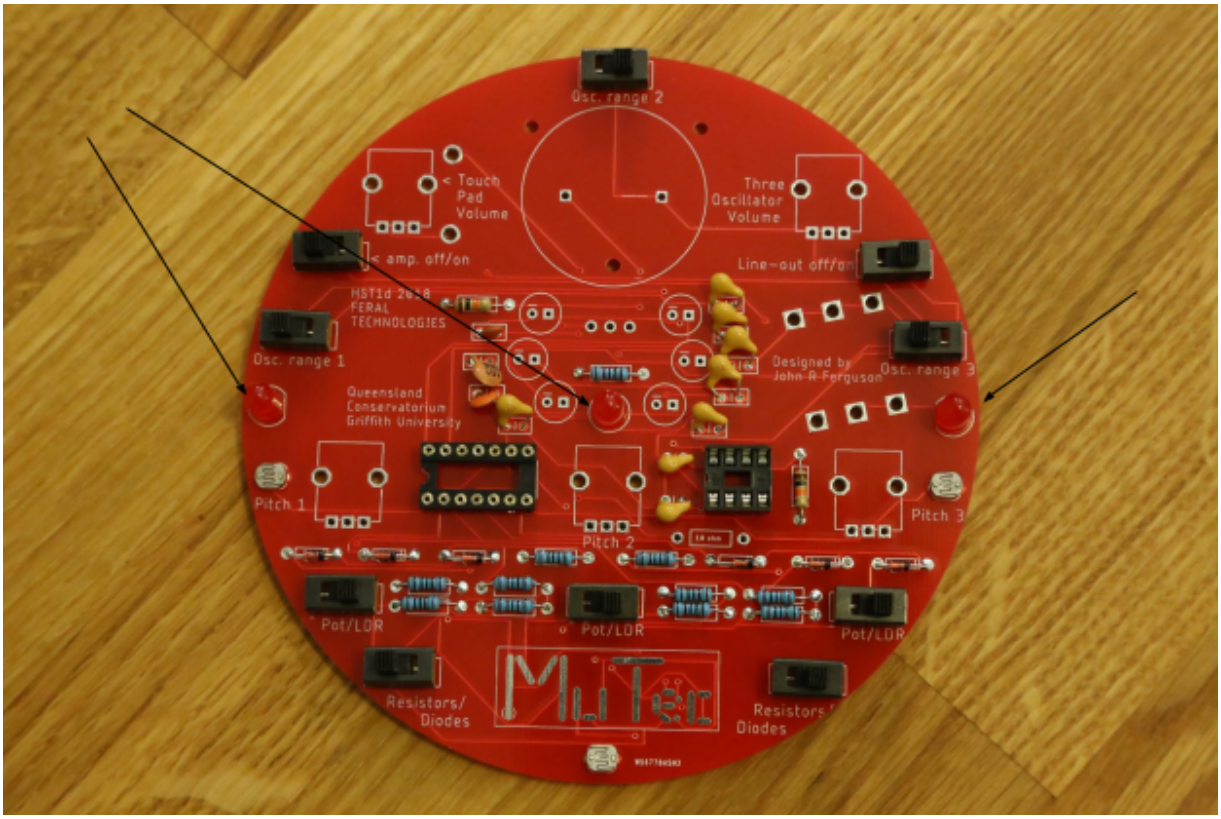




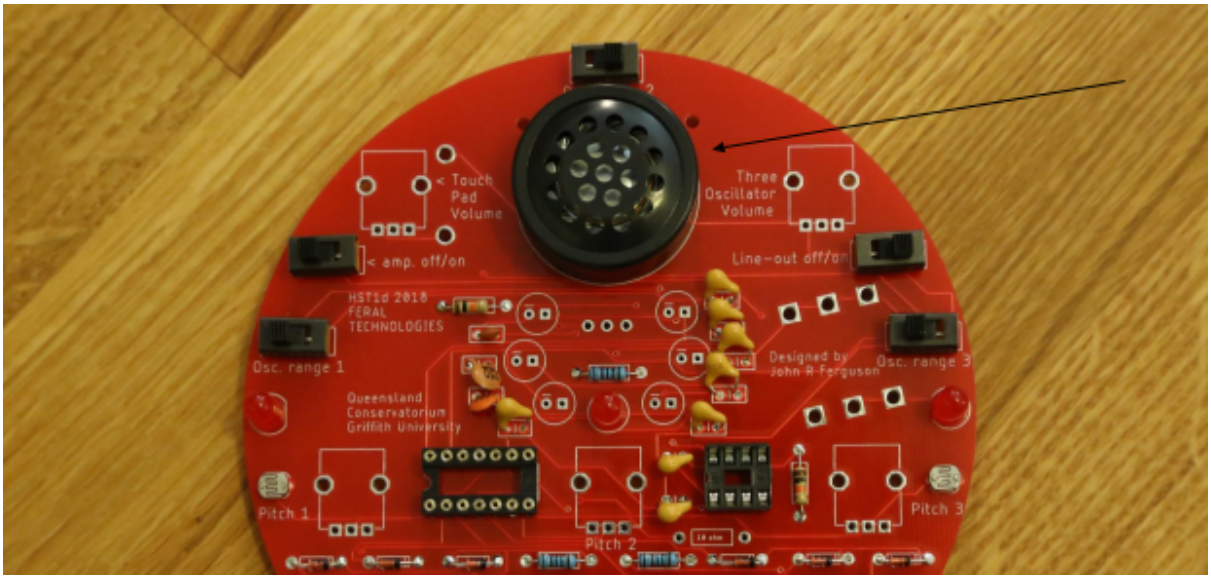
7. 10 x top mounted switches (to make this easy start with 3 arranged in triangle, carefully turn upside so soldering on steady/flat surface, then add the three on one edge, the three on the other, finally the one in the middle -- this should avoid crooked switches).

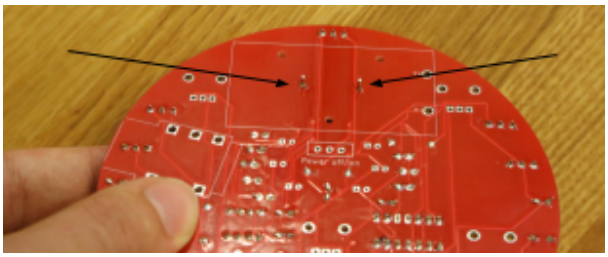
   It can be useful to tape top-mounted components to board before flipping, but be careful to get switches level (using tape can also lead to errors, hence my preferred approach is using three in a triangle on a flat workbench to keep everything level)

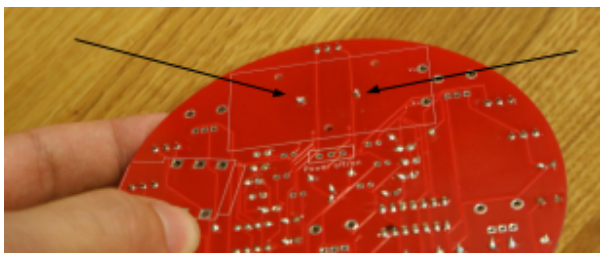
   Switches can be mounted either way around, there's no polarity!



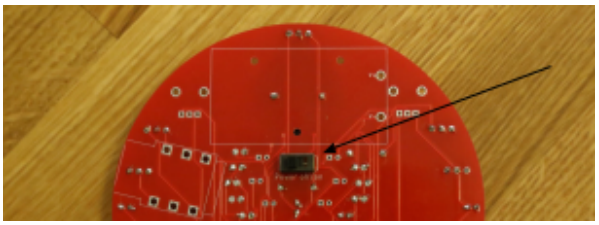
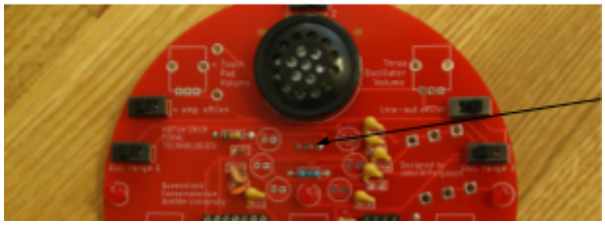
8. 3 x LEDs (make sure flat edge is aligned with flat edge printed on board)



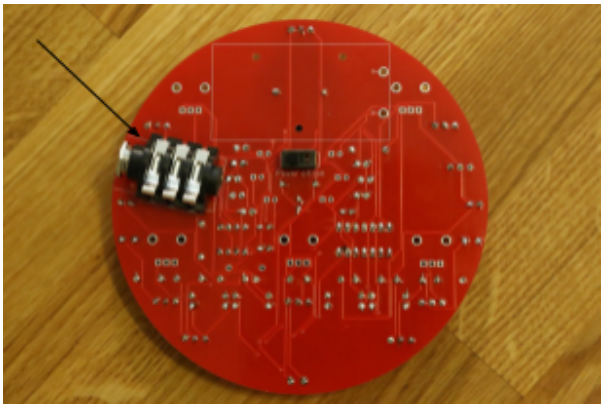




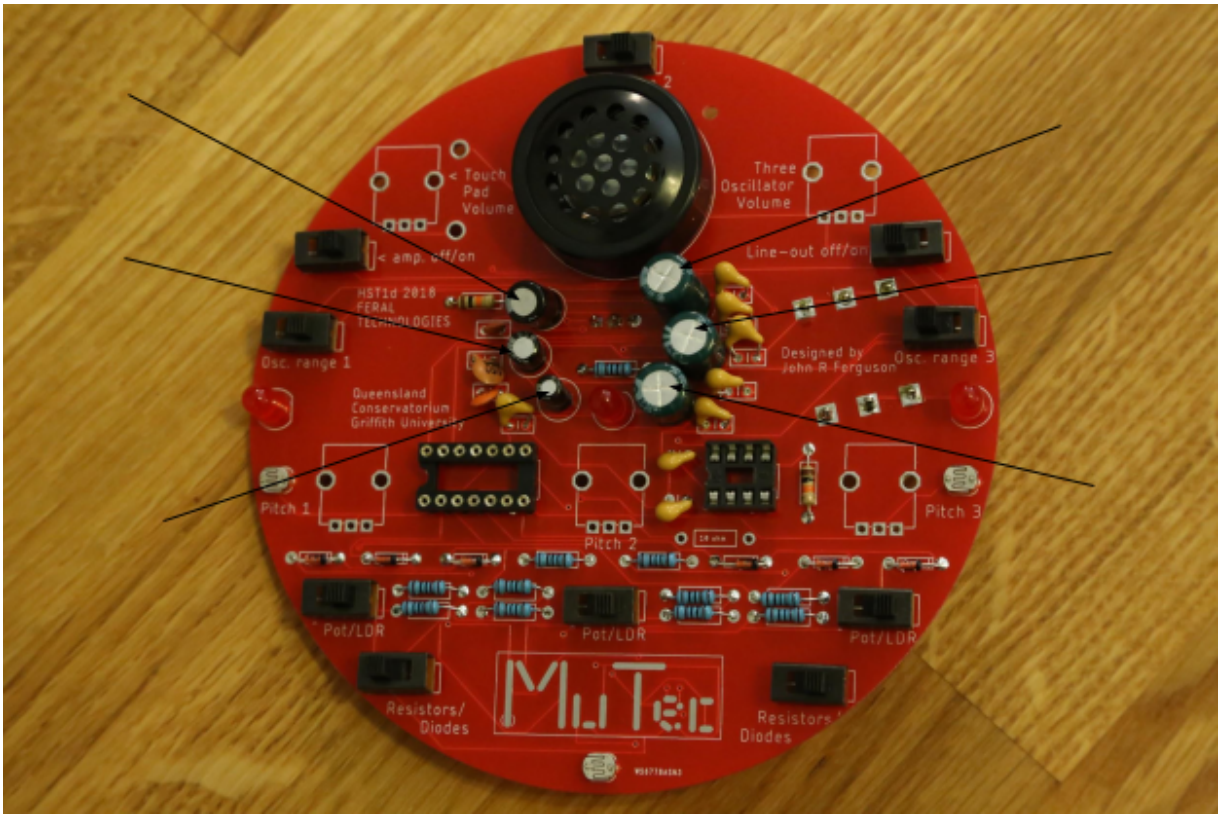
9. 1 x Speaker (cut off the wires that stick through after soldering)

10. 1 x Rear power switch



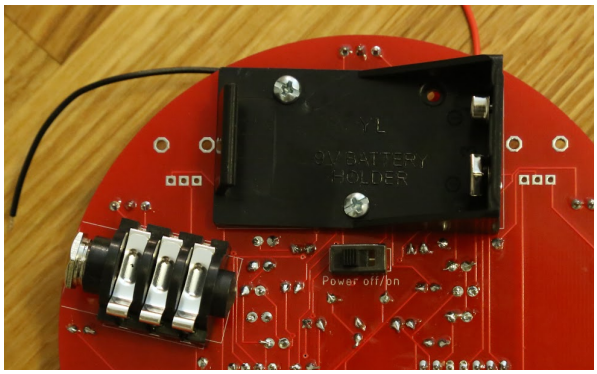

11. 1 x output socket on rear (remember to also screw in silver colour threaded input socket)

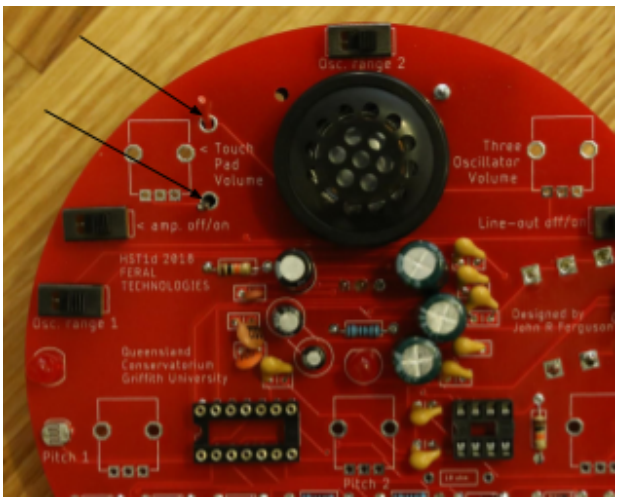


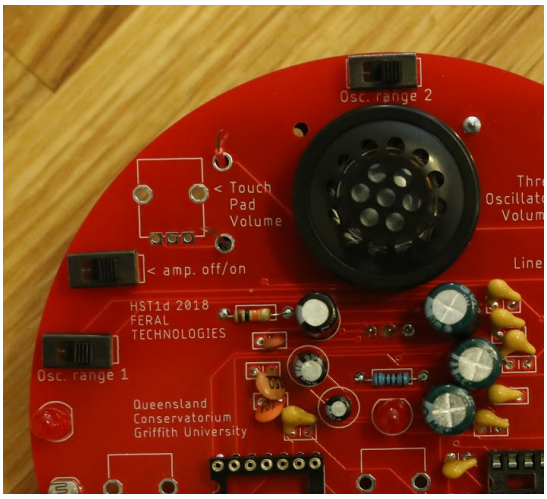
12. 6 x top mounted capacitor. These capacitors are polarized i.e. the - sign on the board (above the printed metal circle) needs to be lined up with the stripe on the capacitor.

    The 220uf (likely green) capacitors go on the right, the ones on the left (likely black) control the overall rage of the slow pulses, I suggest ordering these in order of size (top to bottom), but it's up to you.

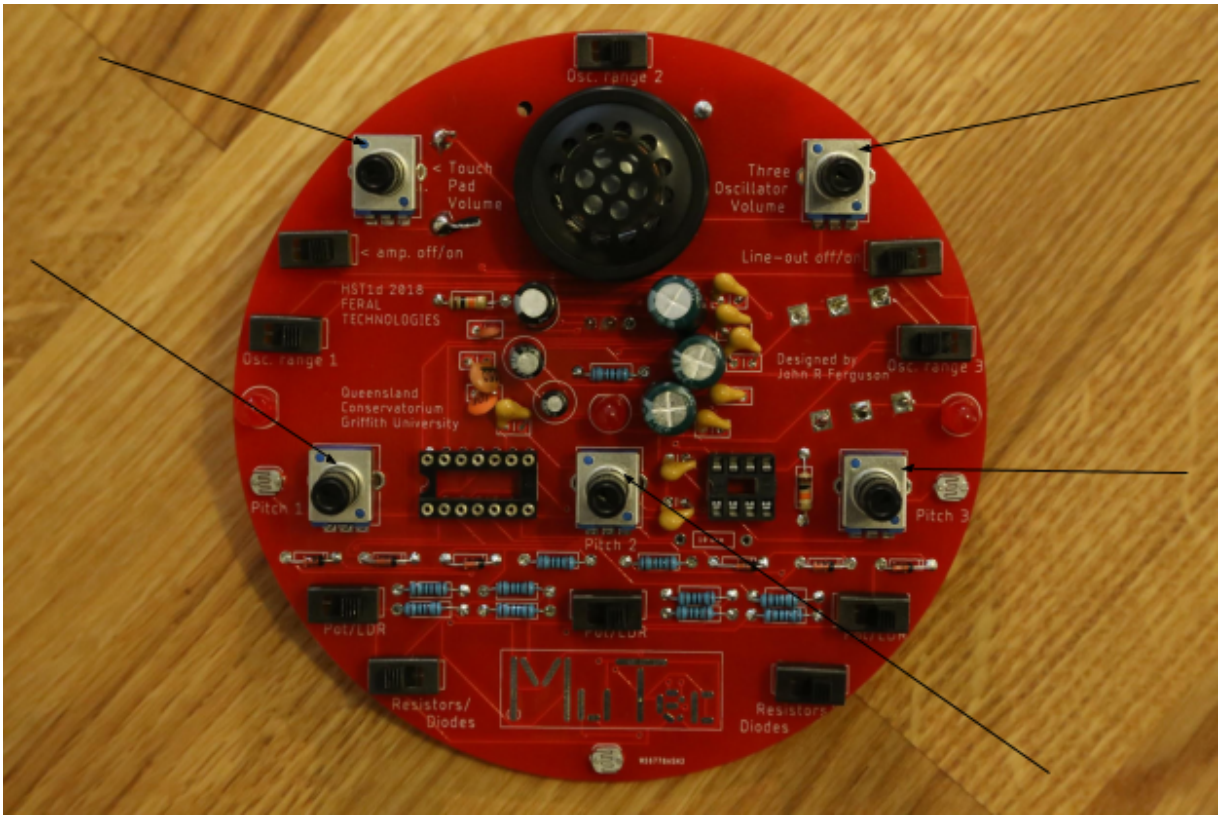
*****the next part is 'fiddly', if not confident/you run into problems please do up to here but leave the below until week 3 class (I can only help with the below if steps 1-12 are done)**



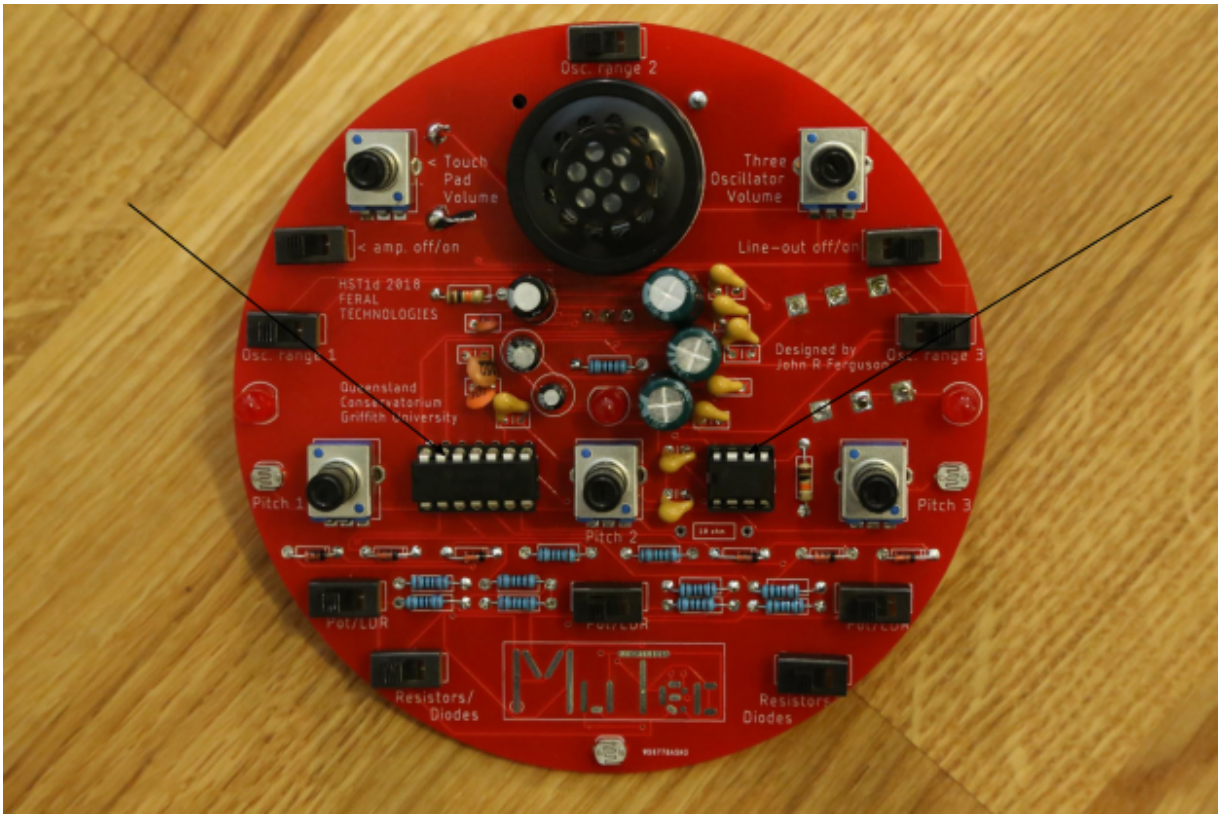




13. Rear battery compartment -- push red cable through the + hole and black cable through the - (yes this means the wires will cross). Only two screws are needed (not three), the short screw is for the centre hole directly behind speaker, put this in first but only tighten gently. The second screw is for the left hand side furthest away from the battery connections, tighten this fully, then further tighten the centre screw if necessary. Wires need to be stripped and then soldered, it's neatest to do this before mounting the battery compartment but short circuits must be avoided i.e. the bare wires must not touch.
    a. top view: wires fed through from rear (notice colour/placement!)
    b. rear view: correctly mounted battery compartment
    c. top view: wires trimmed with wire cutters
    d. top view: wires stripped with wires strippers
    e. top view: Wires soldered



14. 5 x Potentiometers -- it's best to place the three front pins into their holes first then line up and push the springy metal lugs that cause the potentiometer to 'clip' into place second, take care not to bend pins and straighten carefully if you do (or they will break off), it can be helpful to gently squeeze the springy metal lugs a little.



15. Careful add integrated circuits (ICs) x 2. You will likely need to (gently) bend/straighten IC legs to fit into the socket, this is normal.

16. Add battery -- this is quite tight; you may need to gently pull the spring-loaded plastic backwards gently with a pair of pliers/screwdriver or similar.

17. Turn on, test that everything works and check the temperature of the ICs, warm is OK but too-hot-to touch, smoking, or ‘very hot’ means there's a problem -- if this happens turn off and consult with course convenor ASAP

18. Figure out how to play it -- have fun!