S&T GeoTronics LLC
Open DSKY with AGC
Assembly Instructions

First, make sure you have all the required components:

HARDWARE

| Qty	Item
1	DSKY PCB v1.0D
1	Arduino Nano
1	VA RTC
1	IMU
1	Buck StepDown
1	SKM53 GPS
1	Line Leveler
1	Reed Switch
1	DFPlayer Mini
1	MicroSD Card 2Gig
1	1" 16Ohms Speaker
1	6AA Battery Holder
6	AA Batteries
1	Wire Terminal
1	On/Off Switch
3	Maxim7219
3	Sockets 24pins
2	40 Female Pins
10	10uF Capacitors
1	15 Ohms Resistor
1	100 Ohms Resistor
20	470 Ohms Resistors
22	1K Ohms Resistors
4	10K Ohms Resistors
3	100K Ohms Resistors
18	NeoPixel RGB
19	LED PushButtons
19	LaserCut Button Caps
21	7 Segments 820501G
3	3 Segments STG
1	Set of 3D Printed
1	Frosted Window

ASSEMBLY

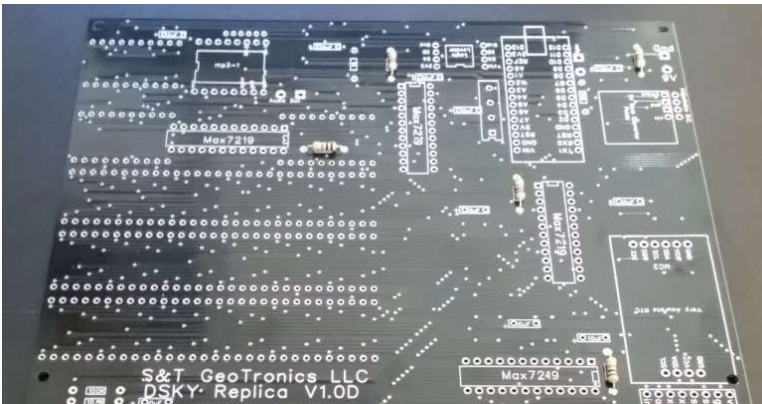Read through the following instructions once completely before starting the assembly.

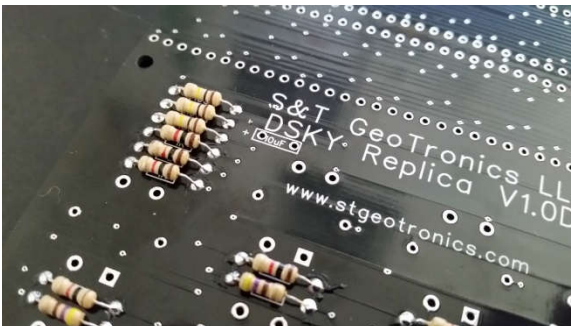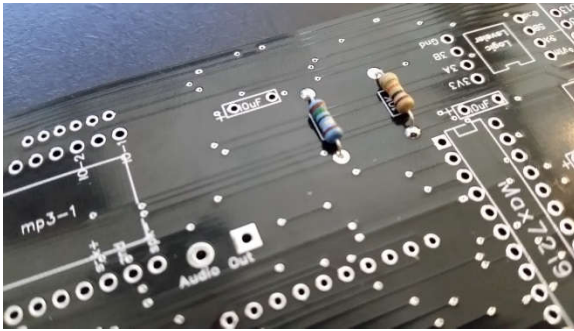1. Solder all 20 470 Ohms Resistors.
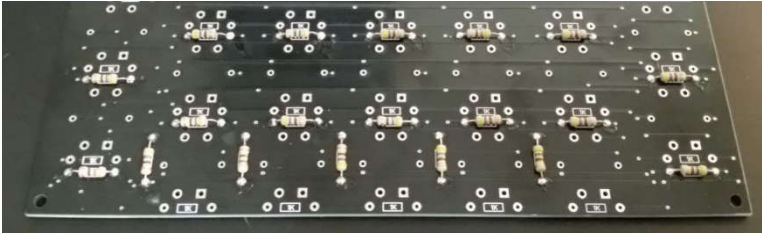
2. Solder all 22 1K Resistors.

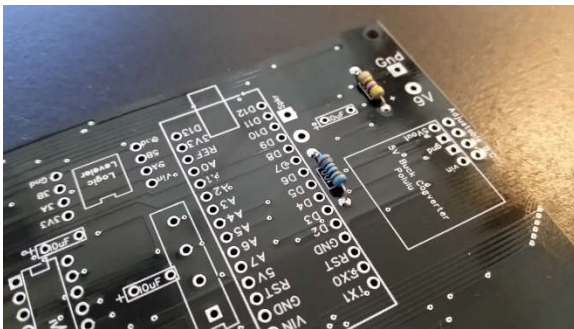3. Solder all 4 10K Resistors.
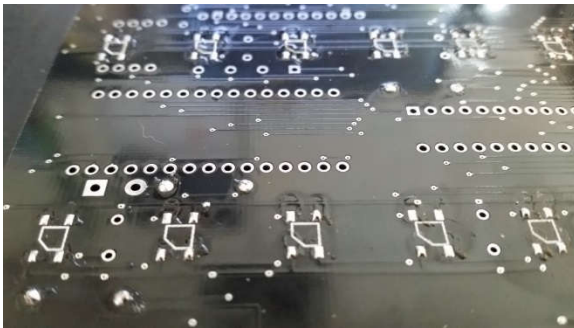

4. Solder all 3 100K Resistors.
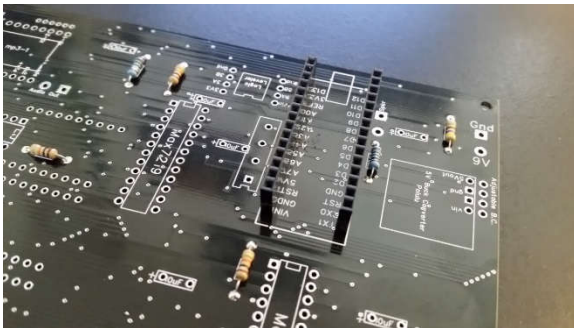
5. Solder the 15 Ohms Resistor.

6. Solder the 100 Ohms Resistor.

7. Optional: To help with soldering the tiny Surface Mount 5050 RGB NeoPixels, I drop a bit of solder on one of the 4 pads for each of the 18 RGB LEDs.


8. Cut 2 strips of female pin connectors and solder them to Arduino Nano location on back of PCB.

9. Carefully solder all 18 Surface Mounted NeoPixels in the proper sequence, making sure to not short with nearby vias. After assembling many units, we have discovered that it is more efficient to solder 1 Neopixel, power the Arduino (via its USB port) with the strandtest.ino to verify that it lights up, power off Arduino, solder the next Neopixel in the sequence, test it and repeat for all 18 Neopixels. As you troubleshoot issues, keep in mind that a problem with a Neopixel can be a result of the prior Neopixel NOT being soldered properly (Output pin). I found that 680 degrees is too hot (and kills red & or green sometimes), 518 degrees seems much better.
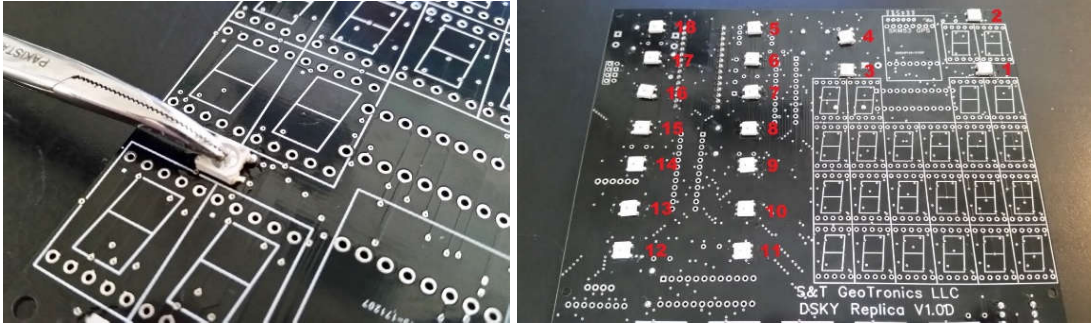
10. Cut a strip of 4 female pins and solder it to Buck Converter location.
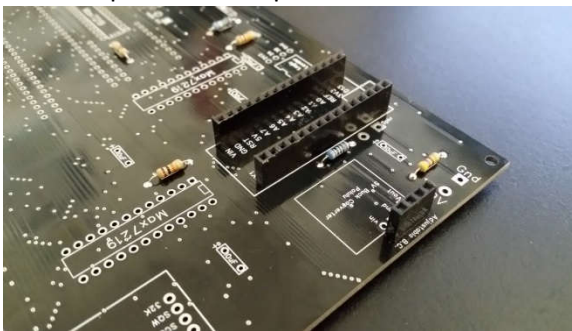

11. Insert Arduino Nano and Buck Converter now if you want to test the RGB LEDs using strandtest.INO NOTE: Current buck converters require you to jump the 5V underneath.
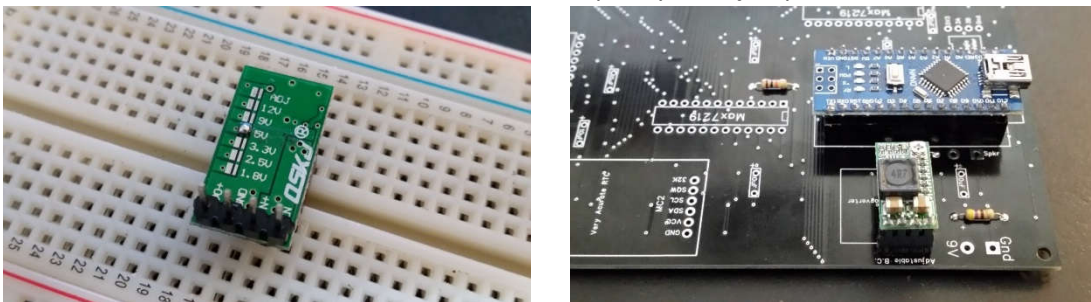
12. Flush cut both black spacers under each of the 19 lighted pushbuttons to allow the buttons to fully rest on PCB.


13. Insert, then solder all 13 Lighted push buttons, making sure all the red dots (Cathode) are on the left side. Once all buttons are inserted, I power up the Arduino via its USB port to test that all 19 button LEDs turn on BEFORE I solder them…
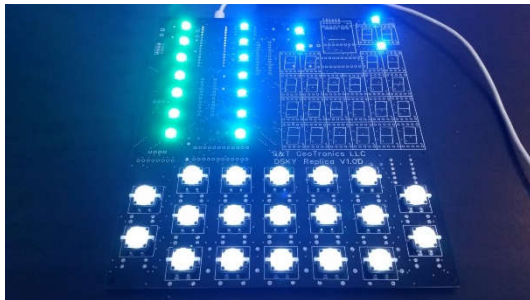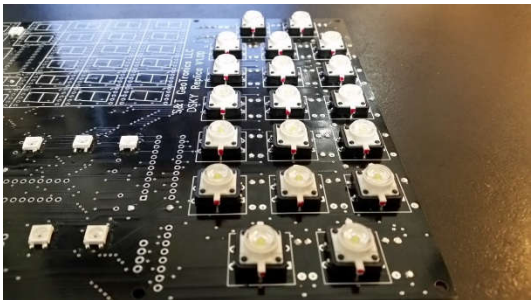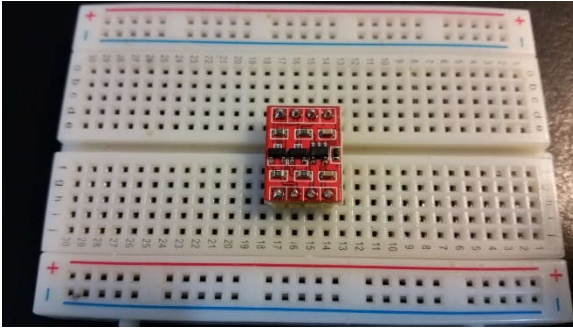

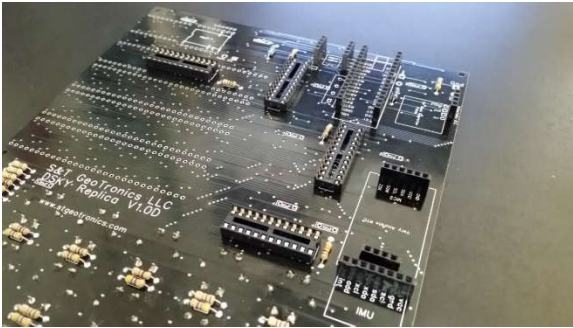14. Solder all 4 Maxim sockets, making sure to respect orientation.
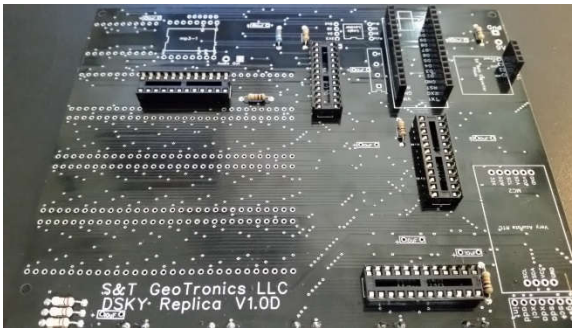
15. Prepare the IMU by soldering his male pins and jumping his ADO pin to his VCC.
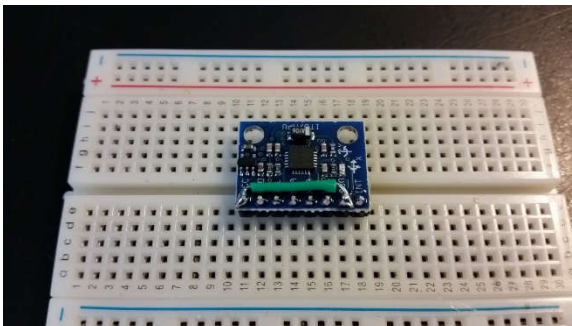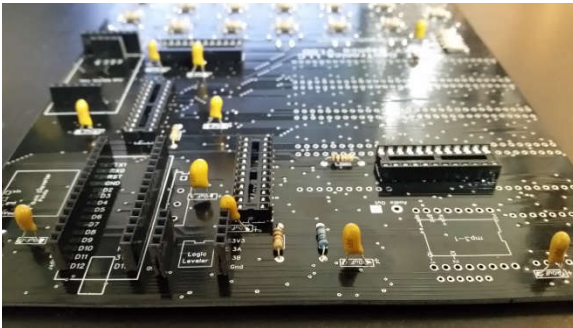
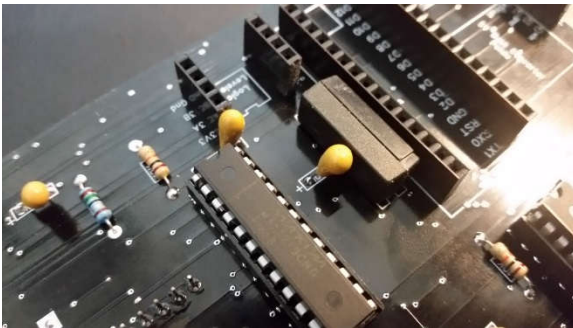16. Prepare the Line Leveler by soldering his male pins on Low side and High side.

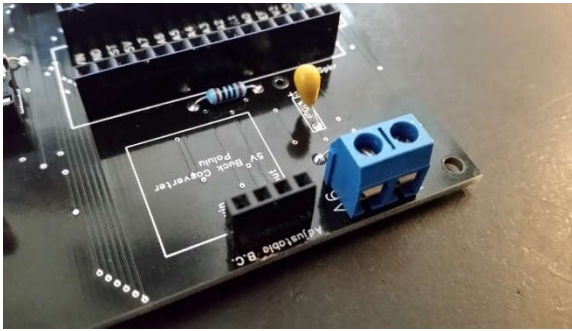17. Cut and Solder the female pins to receive the IMU, the VA RTC and the Line Leveler.

18. Solder all 10 caps respecting polarity. The longer pin is positive.
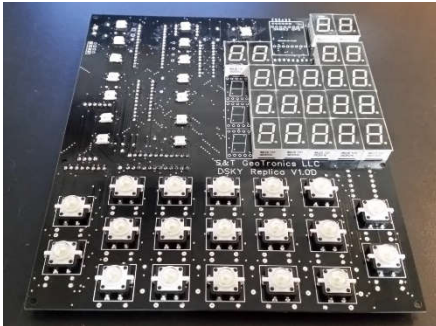

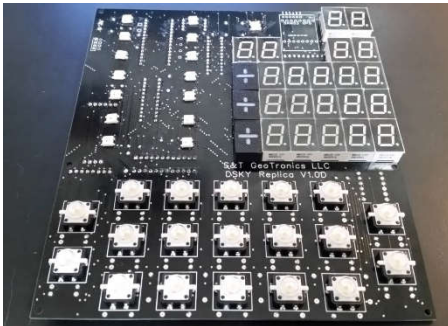19. Solder the Reed Relay, making sure to respect orientation.
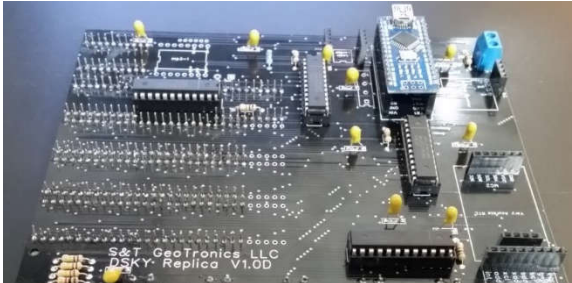
20. Solder the wire terminal.

21. Solder all 21 7 Segments, making sure the dots (decimal point) are on the bottom right.
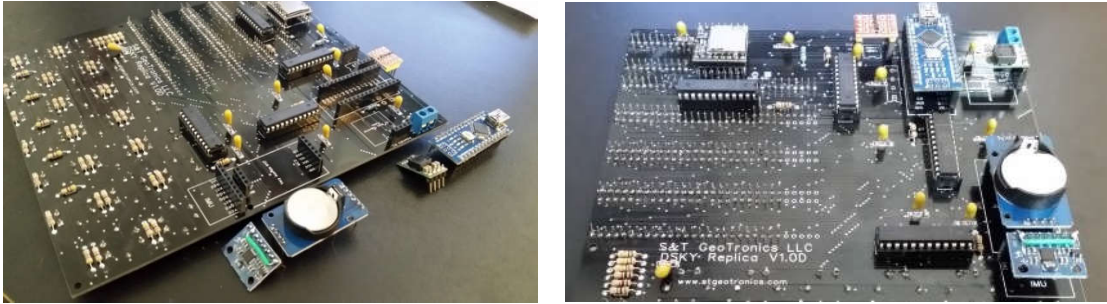

22. Solder all 3 S&T GeoTronics 3Segments (Custom Plus/Minus).
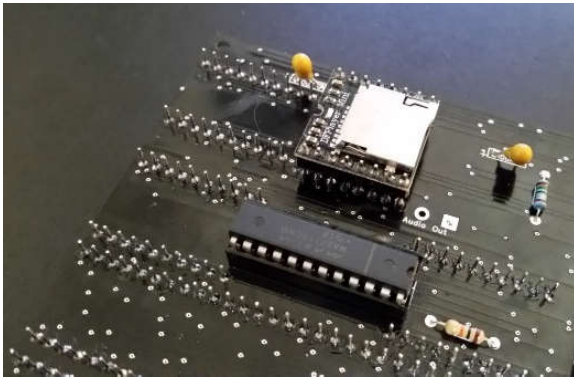

23. Insert all 4 Maxim 7219 Chips in their sockets, again, making sure to respect orientation.

24. Insert the IMU, RTC, Buck, Arduino Nano and Line Leveler.

25. Solder the Speaker and MP3 Player/SD card making sure to respect orientation AND keeping as high up on the PCB because the GPS on the other side will need to be flush with PCB to fit properly.

26. Solder the GPS after applying a layer of electric tape underneath to prevent potential shorting of pins.
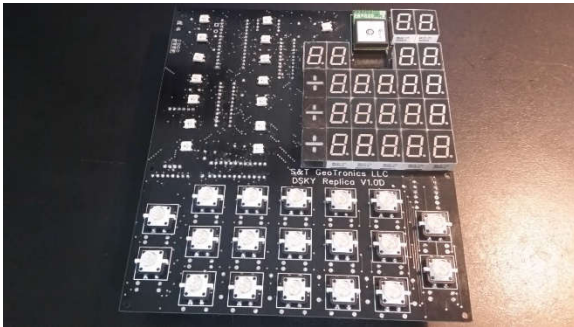
27. Connect the 9Volt battery pack and test the completed electronics assembly.

CONGRATULATIONS! You are done with the electronics assembly.

ENCLOSURE ASSEMBLY (Optional)

BILL OF MATERIALS

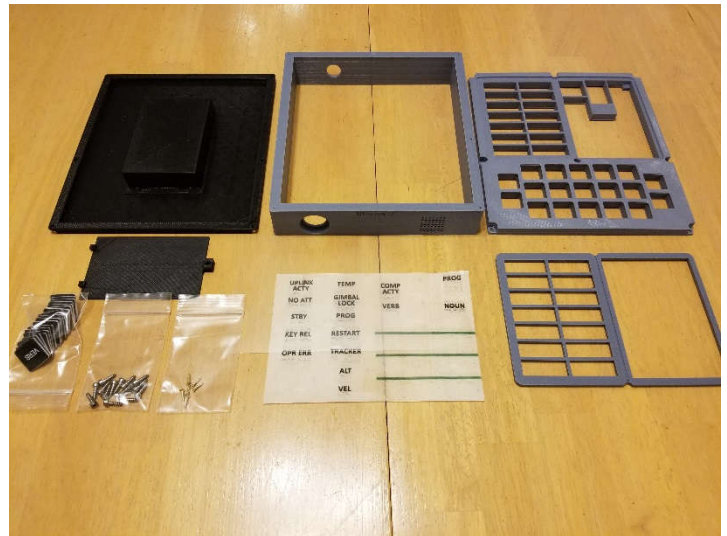| Qty	Item
1	3D Printed Bezel
1	3D Printed Top Plate
1	3D Printed Mid Section
1	3D Printed Bottom
1	3D Printed Battery Door
1	Printed Frosted Window
1	Acrylic Window
19	Laser Cut Button Caps
15	Socket Head Wood Screws (M3-6mm)
6	Tiny wood screws

Once electronics assembly is fully tested, please proceed with the following steps:

1. Position all 19 Button caps at their proper location following picture below.

2. Carefully insert assembled PCB in Top Plate. It may be a tight fit and may require a little sanding of the 3D printed component.

3. Using 6 Tiny copper screws, screw the PCB to the Top plate. Do NOT Overtighten.

4. Using 2 of the Socket Head screws, mount the Speaker and then the On/Off switch to the 3D Printed Mid Section by pushing it in.

5. Using 8 of the Socket Head screws, screw the assembled Top Plate to the Mid Section, making sure that the On/Off switch and speaker hole is in front.


6. Solder a jumper wire to each side of the speaker, jumping them to each Audio Out hole next to SD Card.
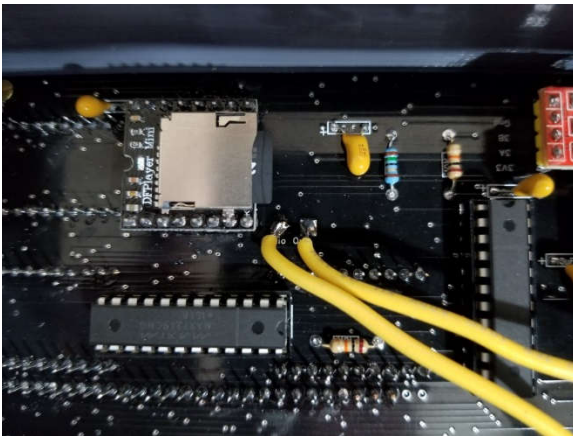
7. Using double sided tape, mount the battery box inside the battery compartment, making sure that both red and black wires are inserted in the hole.

8. Screw the Black wire from battery box in the Gnd position of Blue Screw Terminal and Solder the Red wire from battery box to either pins on On/off Rocker switch.
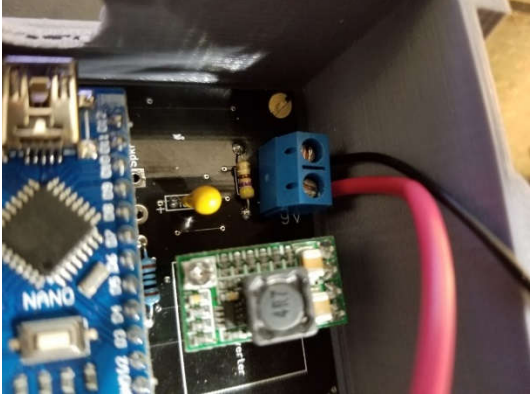
9. Screw a Jumper wire to 9V side of Blue Screw Terminal and solder the other end to the available pin on On/Off Rocker switch.
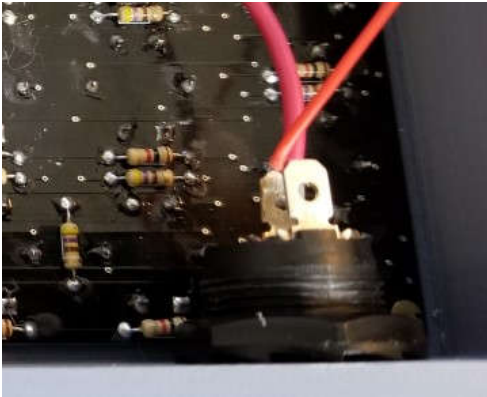
10. Close Back cover and Using 8 of the Socket Head screws, screw the assembled Back Cover to the Mid Section. Do NOT Overtighten.
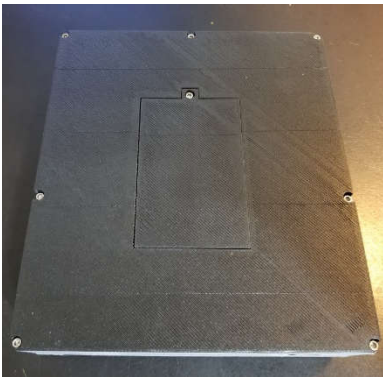
CONGRATULATIONS! You are done with the enclosure assembly and you now have a complete DSKY!