Q2 XBee Handheld Controller Assembly Guide

Parts List:
The kit comes with 14 individual bags.

1. Case Top and Bottom

2. Case Screw Package containing:
   14 X 4-40 1/2" Button Head Screw
   20 X 4-40 3/16" Button Head Screw
   4 X 4-40 3/8" Button Head Screw
   30 X 4-40 1/4" Button Head Screw

3. Case Spacer Package
   10 X 4-40 1/4" Aluminum Spacer
   20 X 4-40 3/16" Aluminum Spacer
   16 X 4-40 1" Aluminum Spacer
   2 x 4-40 1" Modified Aluminum Spacer

4. Delrin Tray Plates
   2 X Plates

5. LCD + 3 Pin 90Degree Header
   Top Battery Plate
   Battery Back Stop Plate

6. 2 X RC Gimbals

7. Main Controller Board w/ JST connecter

8. Push Button Board (PB Module)

9. Toggle Switch Board

10. Potentiometer Package.
    2 X Yellow & Black Cable
    1 X Red and Black Cable
    1 X Piece of Black Wire
    1 X Piece of Red Wire
    4 X Potentiometers (10K)
    2 X Double Hole Spacer

11. Latch Package
    2 X Hooked Front Latch Plate (Slotted)
    2 X Hooked Battery Latch Plate
    6 X Nylon Flat Washer
    4 X Black O-ring

6 X 3/16" Button Head Screw
2 X 1/4" Button Head Screw
2 X Steel 4-40 Washer
2 X 7/16" 4-40 Aluminum Spacer
2 X 1/4" 4-40 Aluminum Spacer
1 X Front Plate
1 X Front Plate With 1/4" Hole

12. 4 X Potentiometer Knob

13. 1 X RC Gimbal Board

14. 9V Battery Clip(included but not used)
1 X .05 Allen wrench
1 X 1/16" Allen Wrench

Step – 1

The controller is built from the bottom case up.
Make sure the hole pattern matches the above picture
Attach 12 X 1/2" screws and 10 X 3/16" spacers to the bottom case.

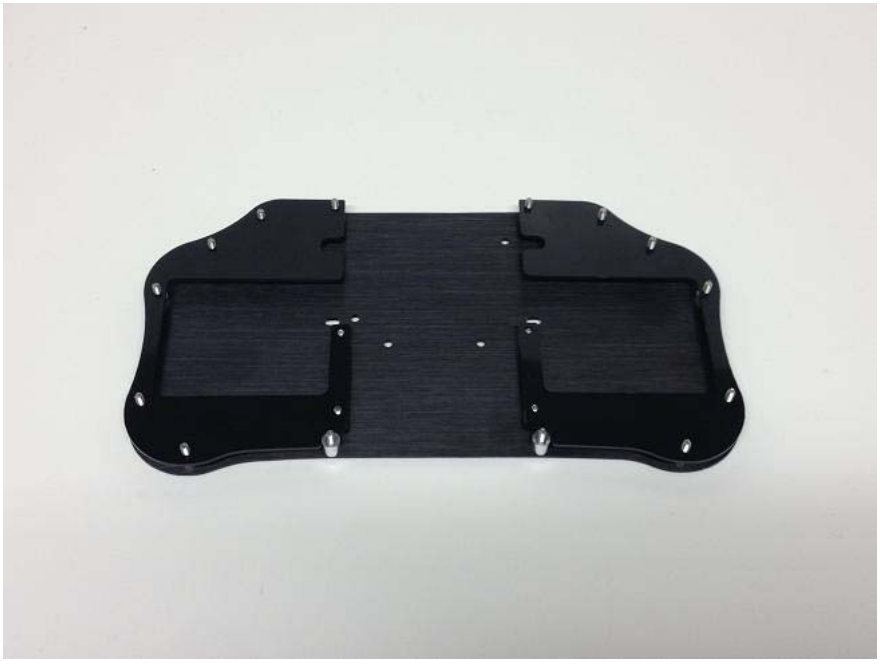
Step - 2

Attach 2 X 1/2" screws and 2 X 1/4" spacers to the bottom case.

Step - 3

Attach 4 X 3/8" screws and 4 X 3/16" spacers to the bottom case.
This area is the battery compartment.

Step – 4



Trim any remaining tabs. Then install both tray plates.

Step – 5

Attach 14 X 1” spacers along the case perimeter.

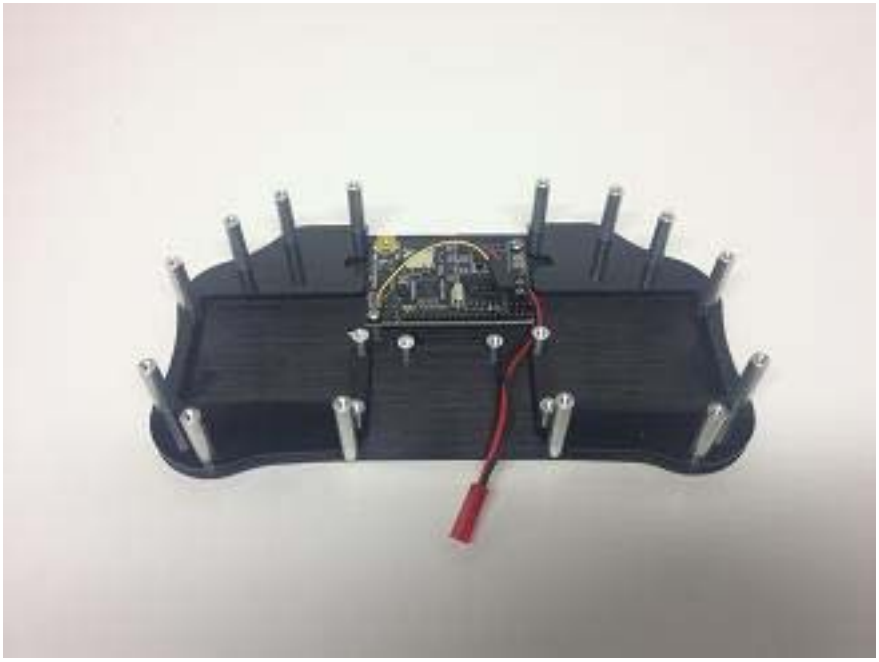
Step - 6

Attach 4 X 3/16” spacers.

Step – 7

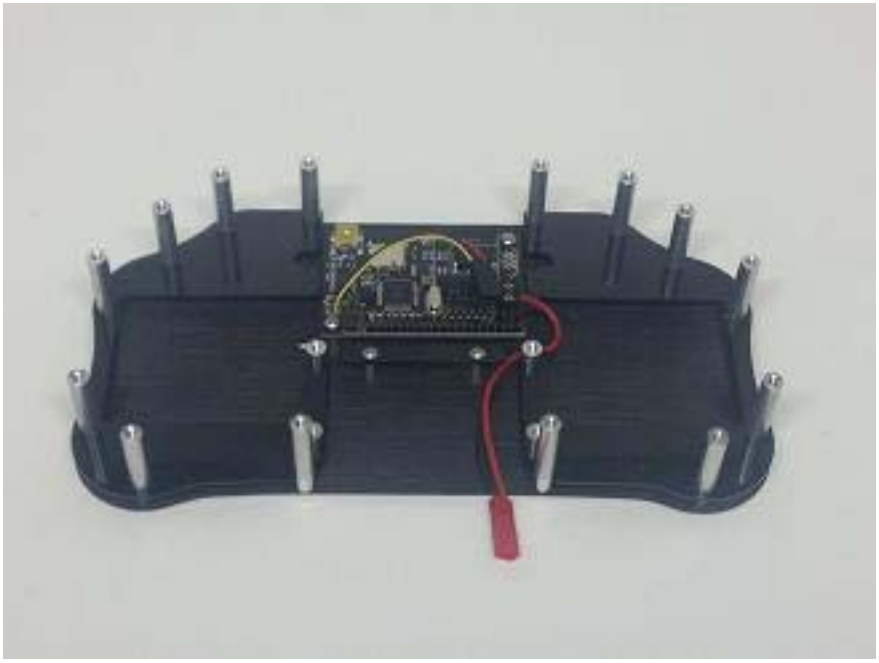
Attach 4 X 1/4” spacers using 4 X 3/16” screws.

Step – 8



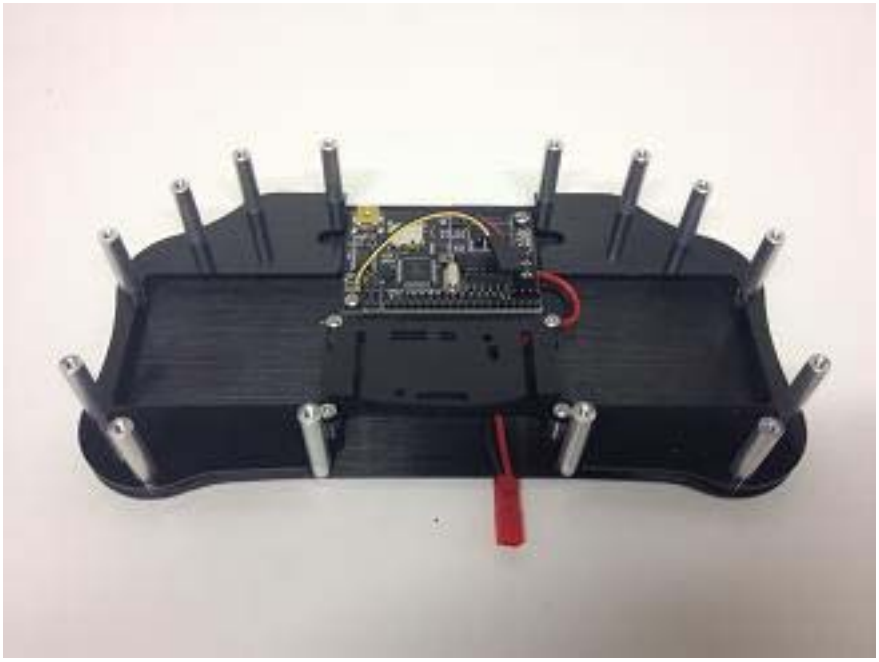
Attach the Main controller board to the case with 2 X 3/16” screws and 2 black nylon washers. Connect the battery connector to the main controller board.

Step - 9



Attach the battery back stop using 2 3/16” screws.

Step - 10



Attach the Battery Top Plate using 4 X 3/16” screws.
****Matching the hole patterns to the picture.****

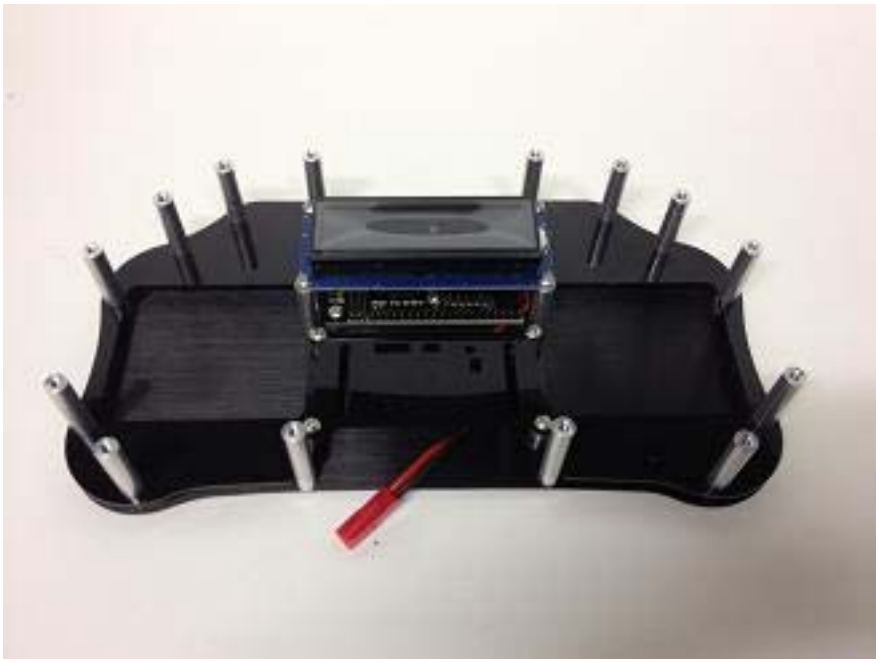
Step – 11

Solder the 3 pin 90° header as shown.

Step – 12

The existing holes on the LCD board are slightly smaller than the 4 X 1/4” screws used in this step. Screw the 4 X 1/4” screws into the LCD and continue to screw them in. This will cause the hole to strip out. The screw will then spin with a small amount of friction. Once this is completed attach 2 X 1” spacers to the bottom two holes. Attach 2 X 1” modified spacers that have a side ground down to the top holes. The header that was soldered in Step 11 is next to the top left hole.

Step – 13

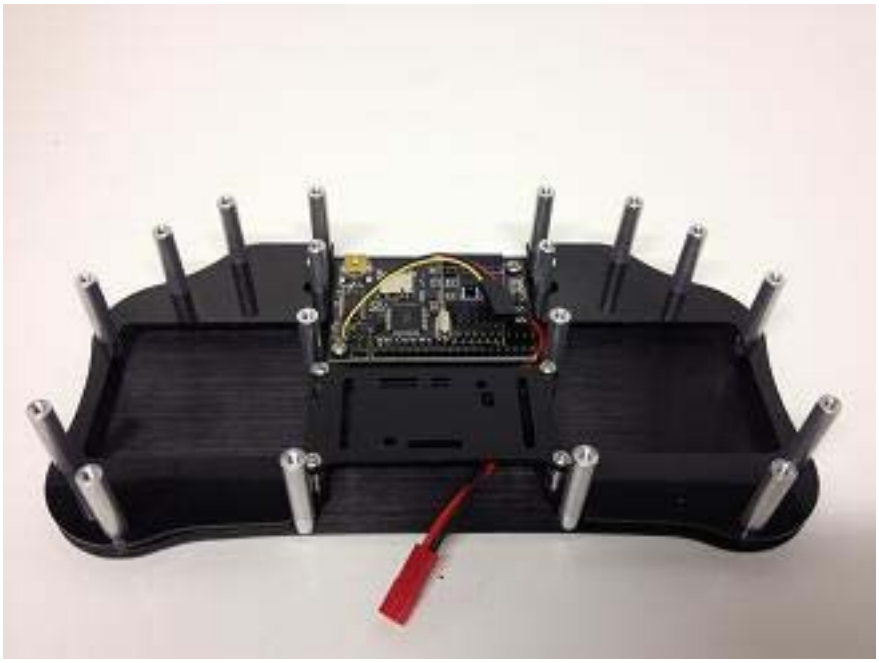


Attach the LCD using 4 X 1/4” screws. Do not tighten all the way.

Step – 14

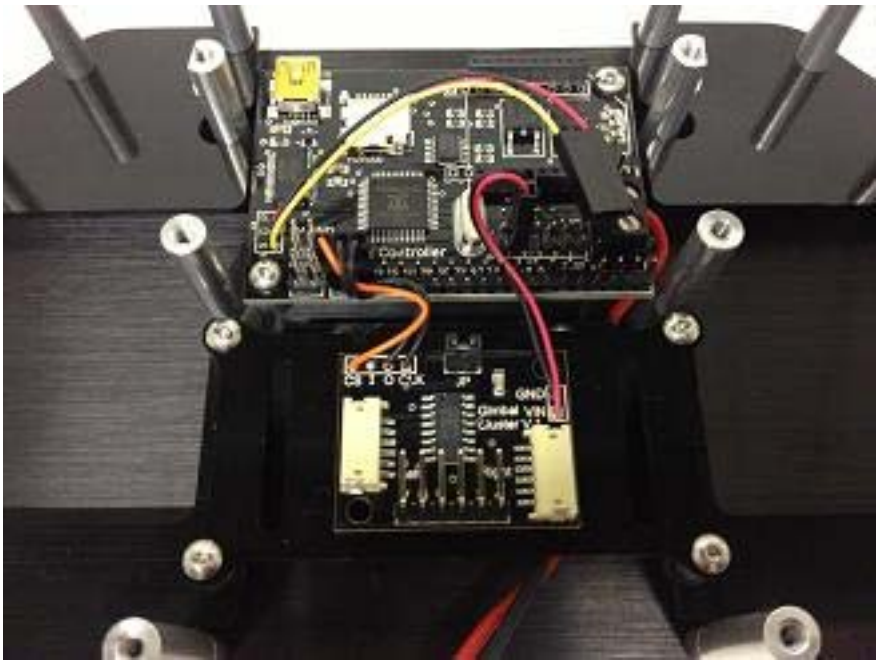
Test fit the top case using 4 X 1/4" screws. With the case in place the screws from Step – 13 can be loosened and the LCD can be centered at this time. Each LCD is a little different, center as best as possible. Then tighten the screws on the bottom case.

Step – 15



Remove the Top Case and Remove the LCD.

Step – 16



Attach the Gimbal Board to the Top Battery Plate. A small 1/2” x 1/2” piece of double sided tape is enough to keep the board in place. Plug in the header with orange going to P1. Plug in the power header into the 3.3V headers as pictured above.

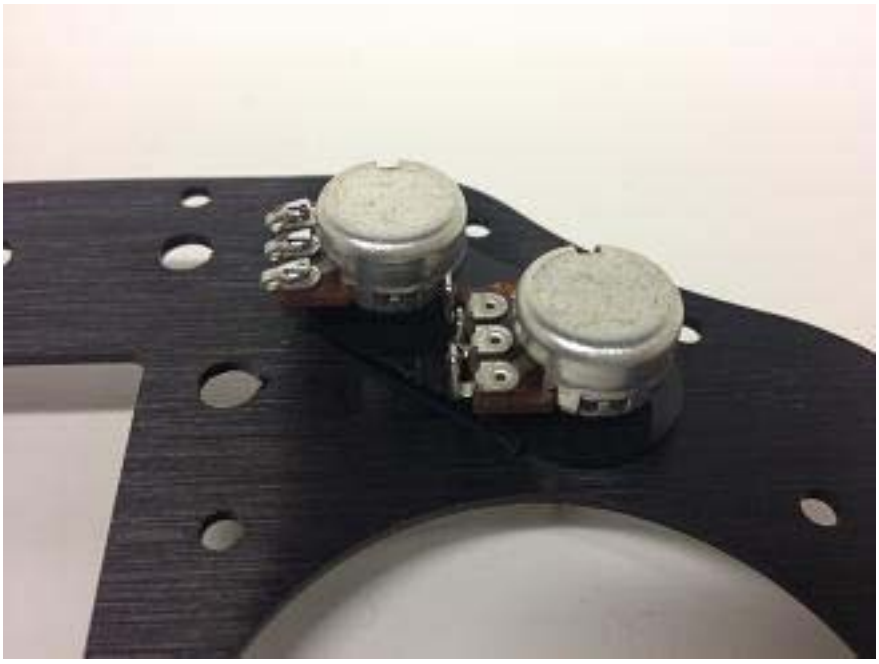
Step - 17

Remove the nut and washer then trim the stop/nub of the potentiometer.

Step - 18

Attach the potentiometers and washers to the case. Aligning them as pictured above.

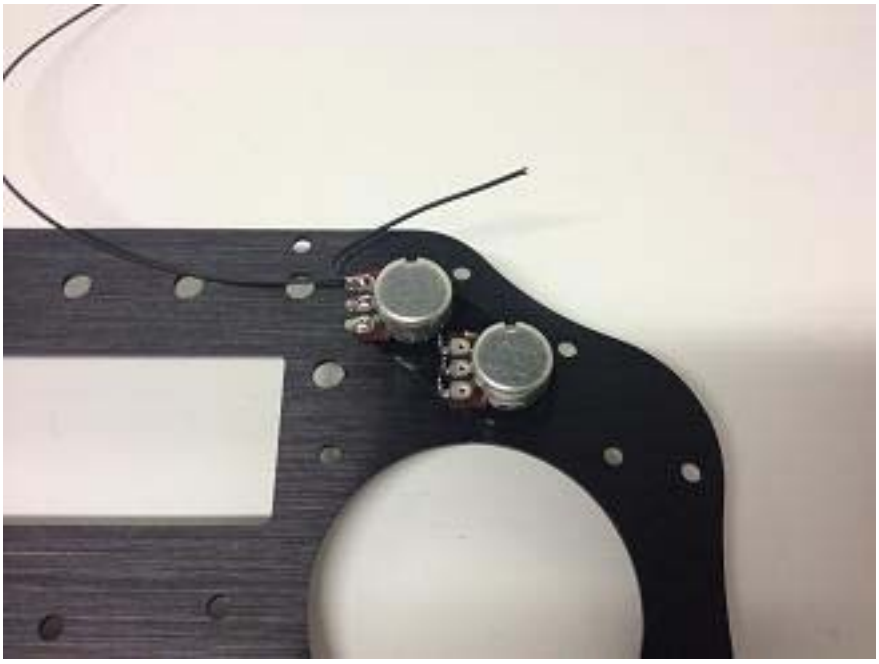
Step - 19

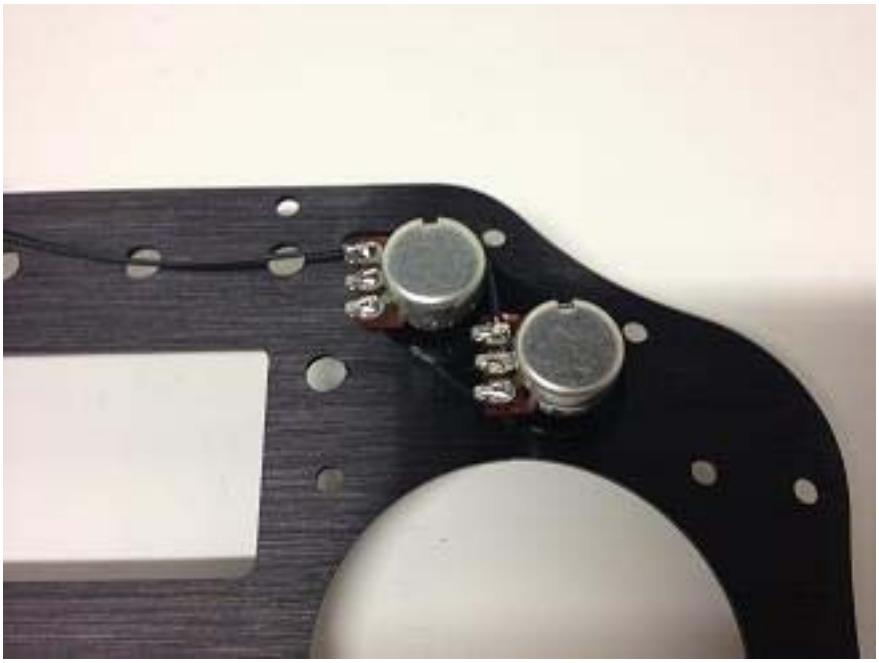


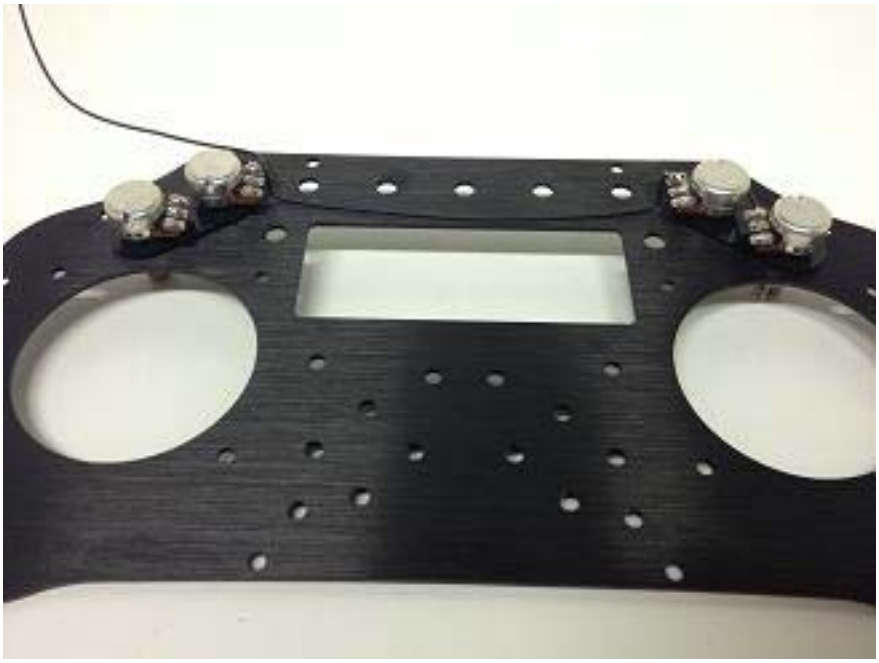
Pre-tin all three legs of all 4 potentiometers. Then bend them back.

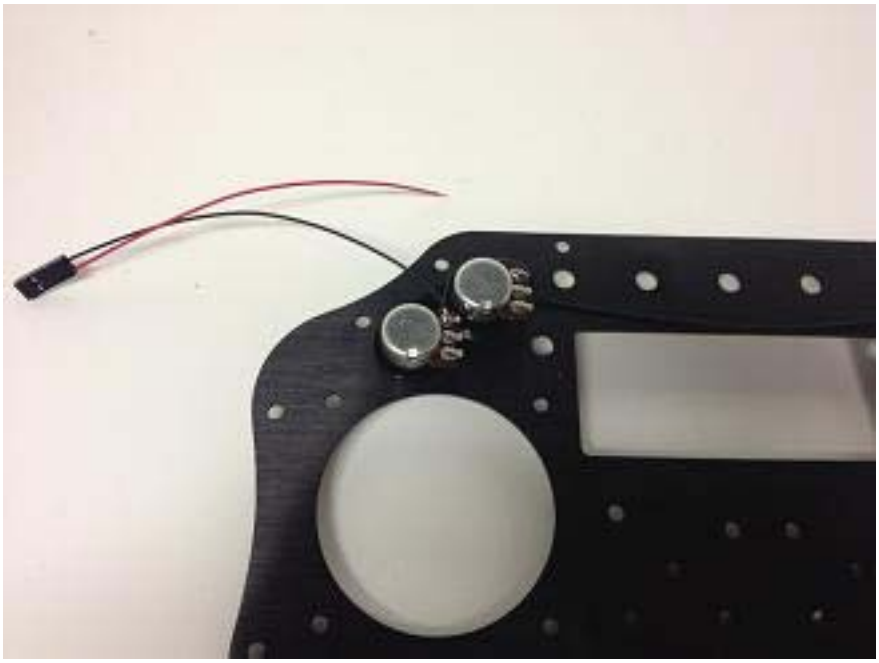
Step – 20

Use the loose red and black wire to solder the potentiometers together.
Using the black loose wire follow and complete these steps.



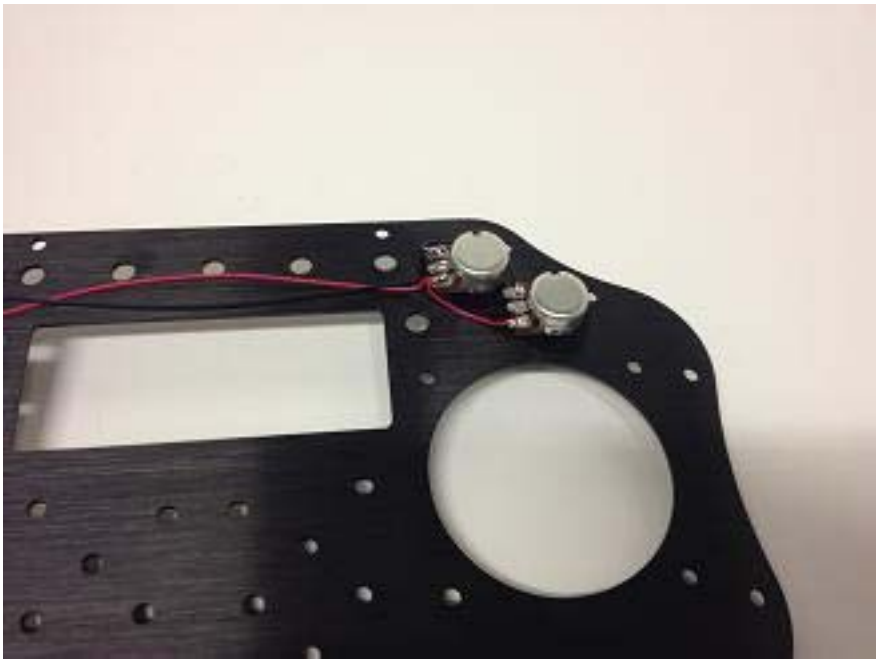


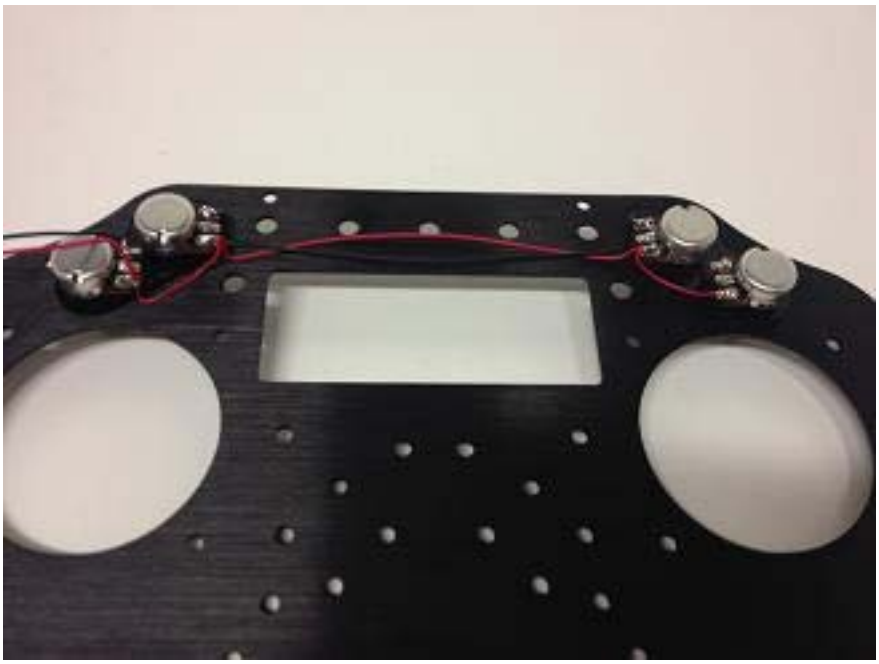


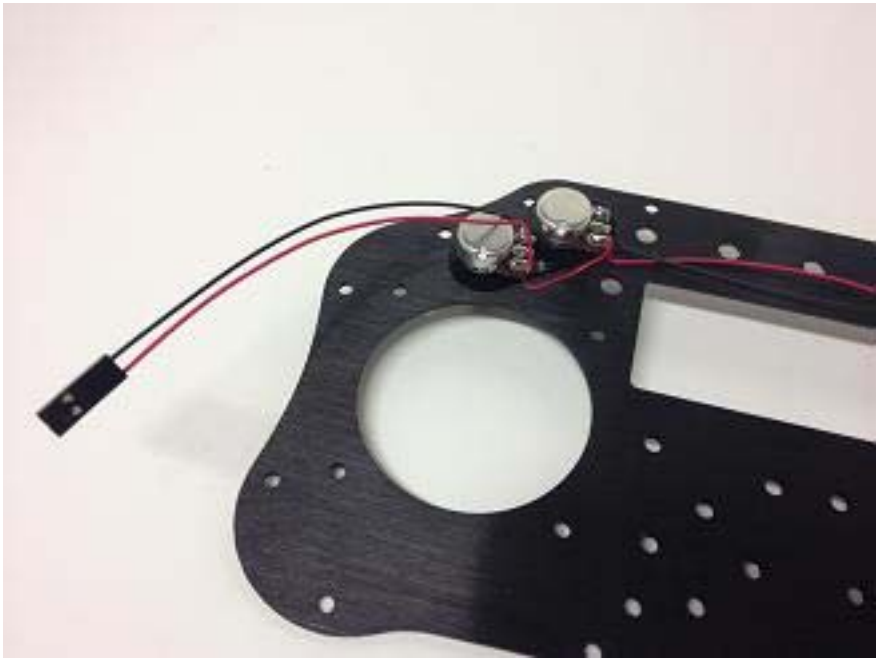


Use the red and black cable with a connector end to complete the portion of the black side potentiometer soldering.

Now repeat the same process for the red wire.



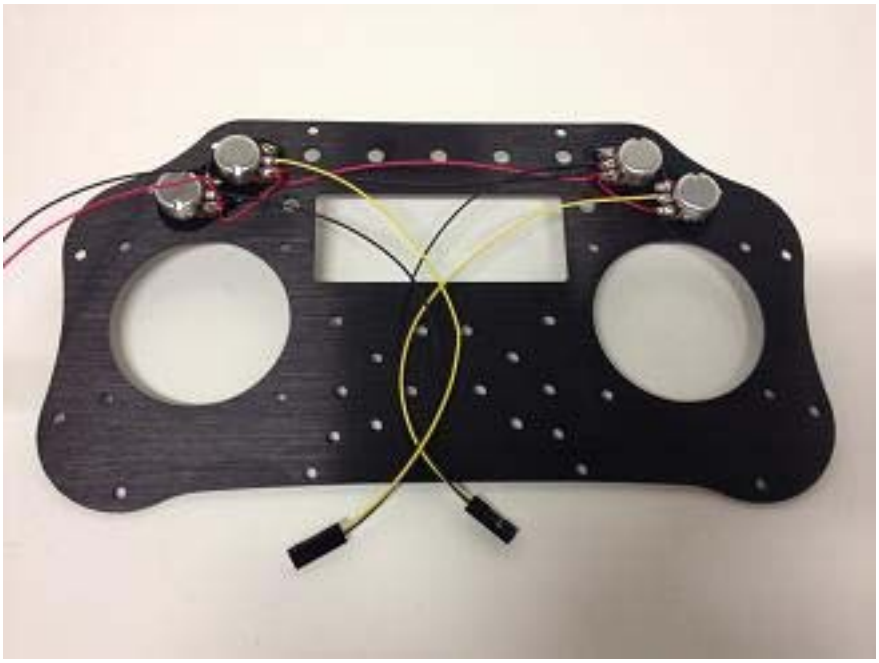


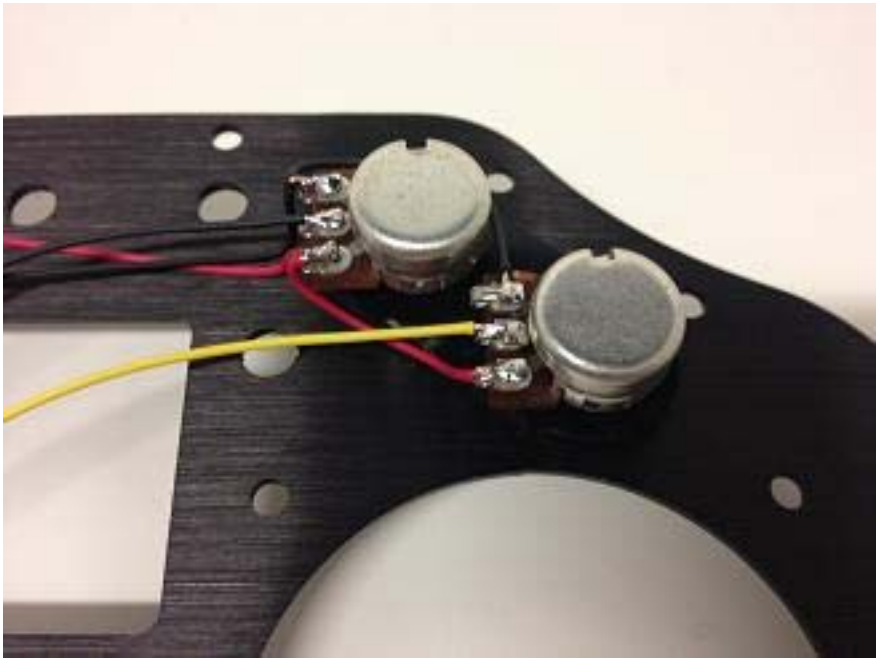


Finish off with the red side of the connector cable.

Step – 21

Solder both yellow and black header cables as shown.

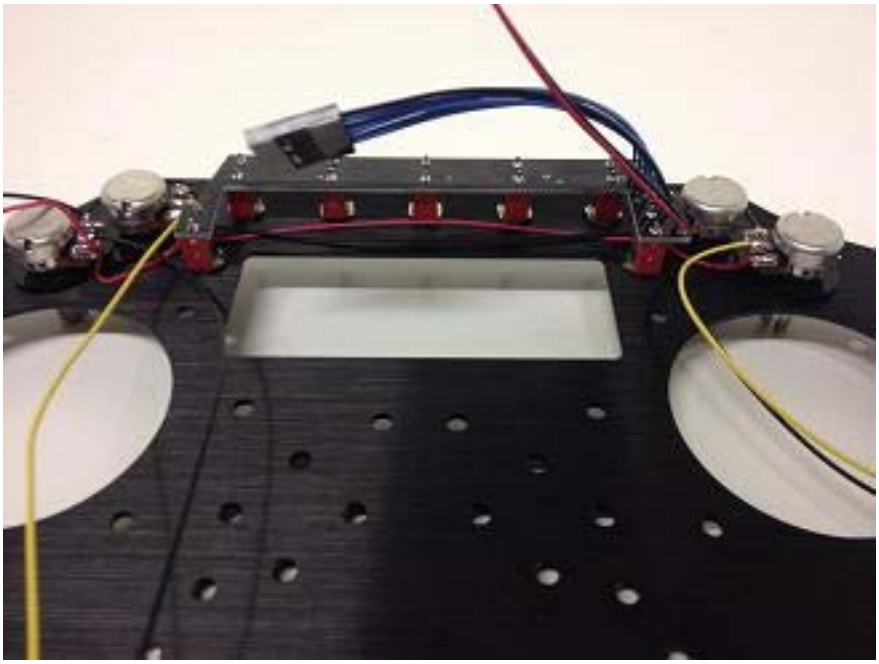




Step – 22

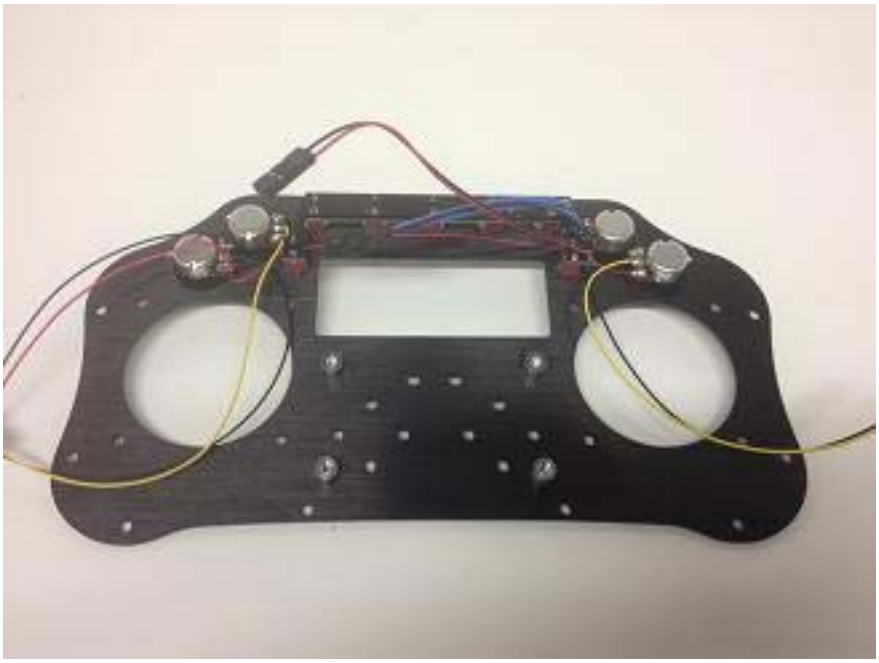
Each toggle switch on the toggle switch board has 2 nuts and 1 washer. Remove 1 nut and washer from each. Make sure that the switches are all flipped the same way, install the toggle switch board. Make sure all existing wiring is placed correctly by looking at the picture below.

Then place the washer and nut back on each switch and tighten till snug.



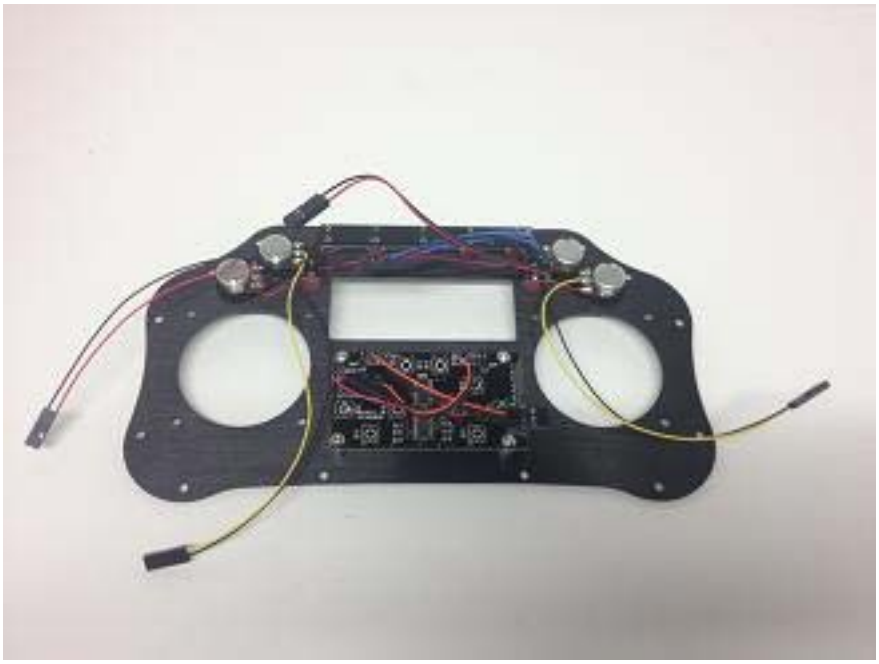
Step – 23

Attach 4 X 1/4” spacers and 4 X 3/16” screws to the Top Case.



Step – 24

Attach the push button board using 4 X 3/16” and 4 X black nylon washers.



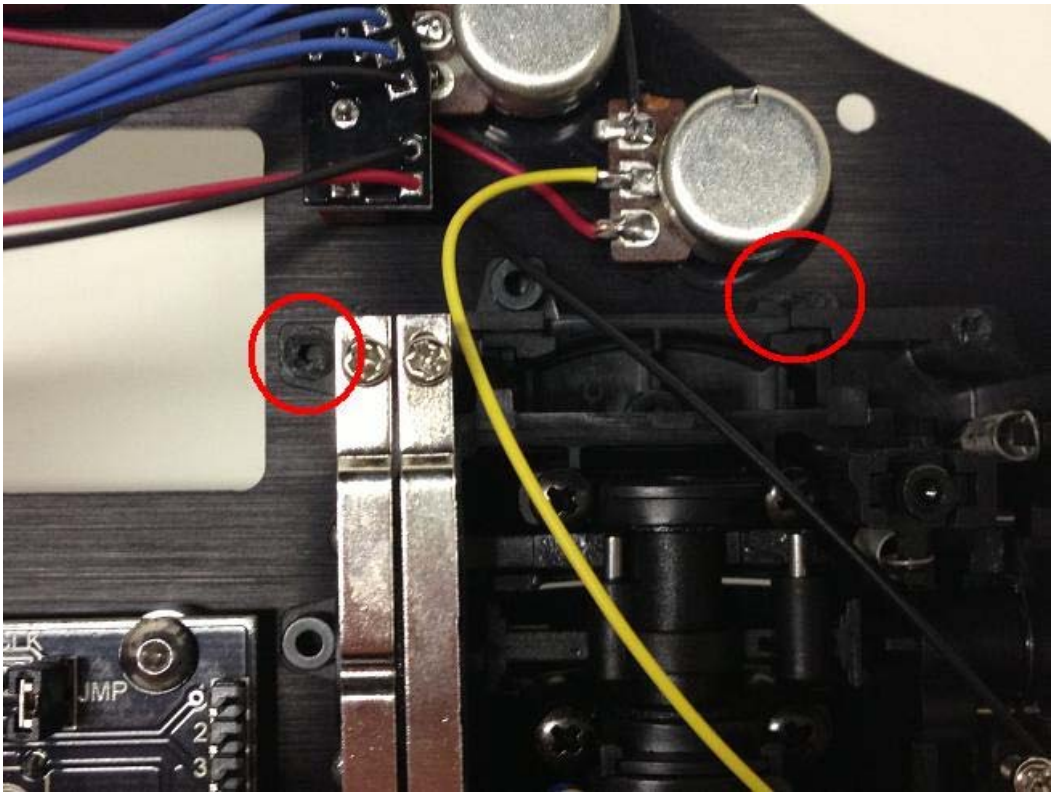
Step – 25

Installing the RC gimbals.

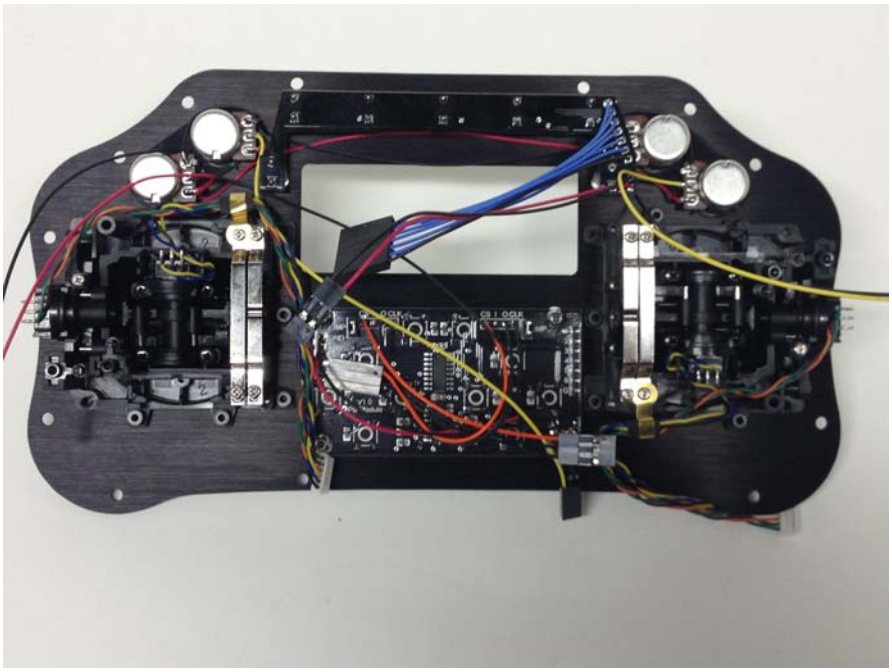
Before the gimbals are attached. Some minor modifications need to be made. In the picture below the red circles show to points that need to be trimmed in order for the gimbal to fit flush against the case and allow clearance for the LCD.

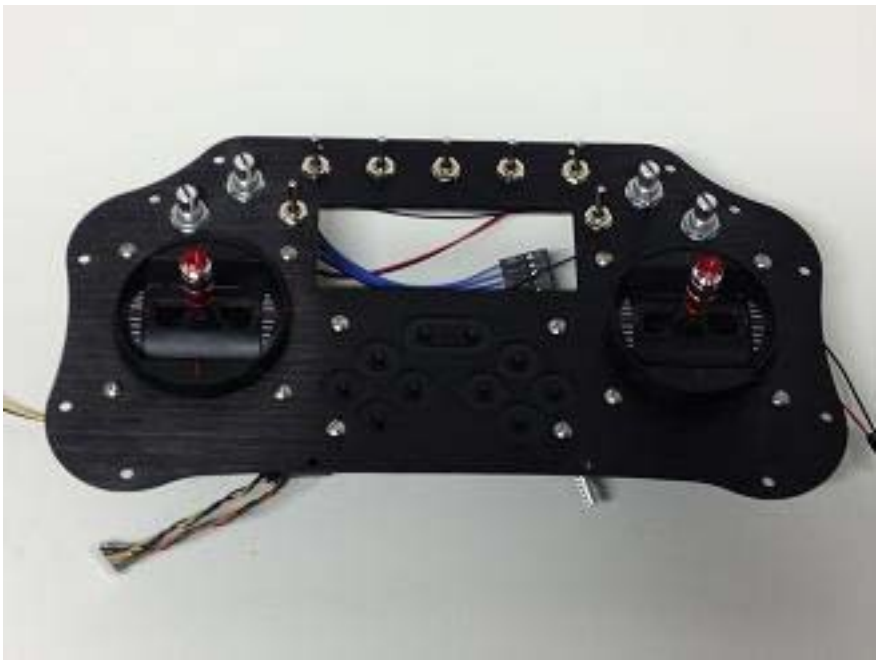
The left circle shows the round portion of the tab trimmed away. The right circle shows the tab is clipped for clearance from the potentiometer. It's easier to trim the round tube portion off first then the tab second.

*****Caution when trimming these parts. Wear eye protection. They tend to shoot in any direction when clipped.*****



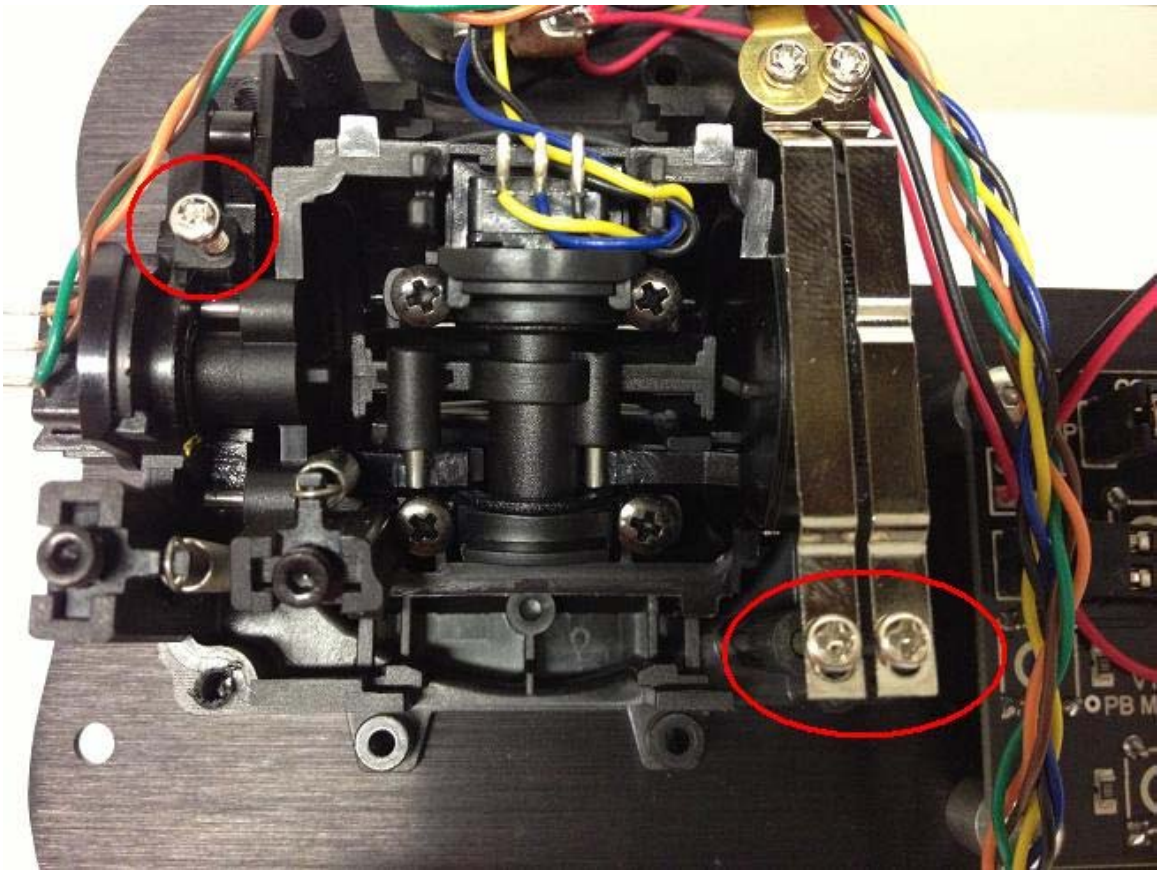
With the gimbals installed as pictured below. Attach with 8 X 1/4” screws. The gimbals have been pre-tapped. ****DO NOT USE THREAD LOCKAS IT TENDS TO WEAKEN PLASTIC OVER TIME.**** Tighten to a snug fit.





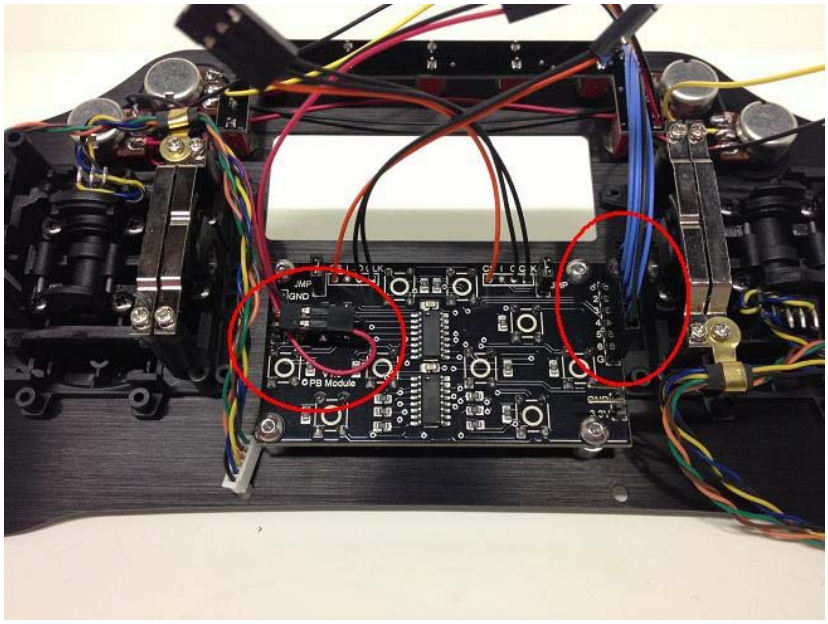
Enabling the throttle feature.

The left screw has to be tightened down to enable the throttle/click feature. Then the two screws on the right are adjusted to user preference. These adjust tension/friction and the amount of clicking that is felt.



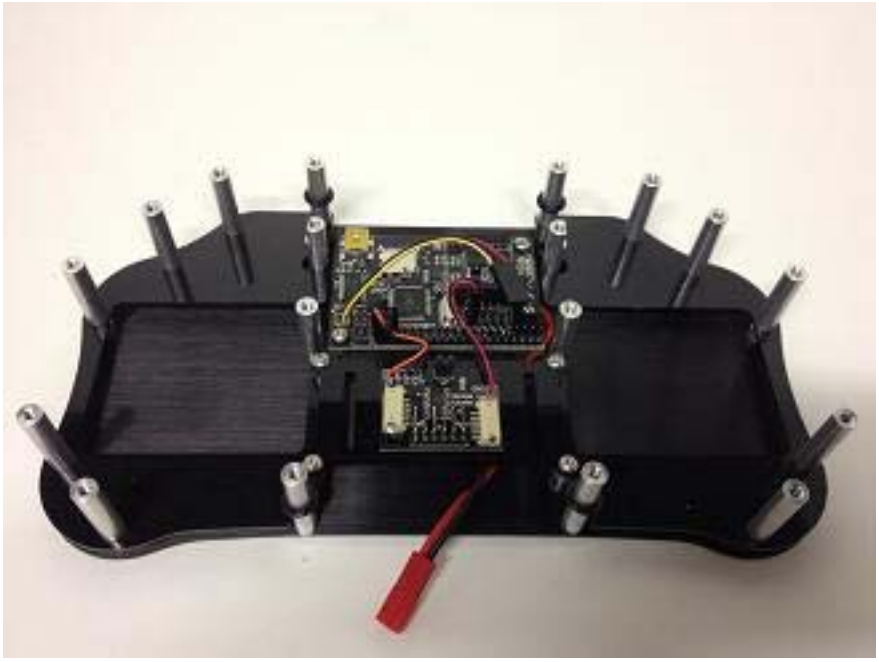
Step -26

Connect the toggle switch header to the pushbutton board. The black wire is connected to pin labeled G.
Connect the black and red potentiometer cable to the pushbutton board. Red goes to 3.3V and black on GND.



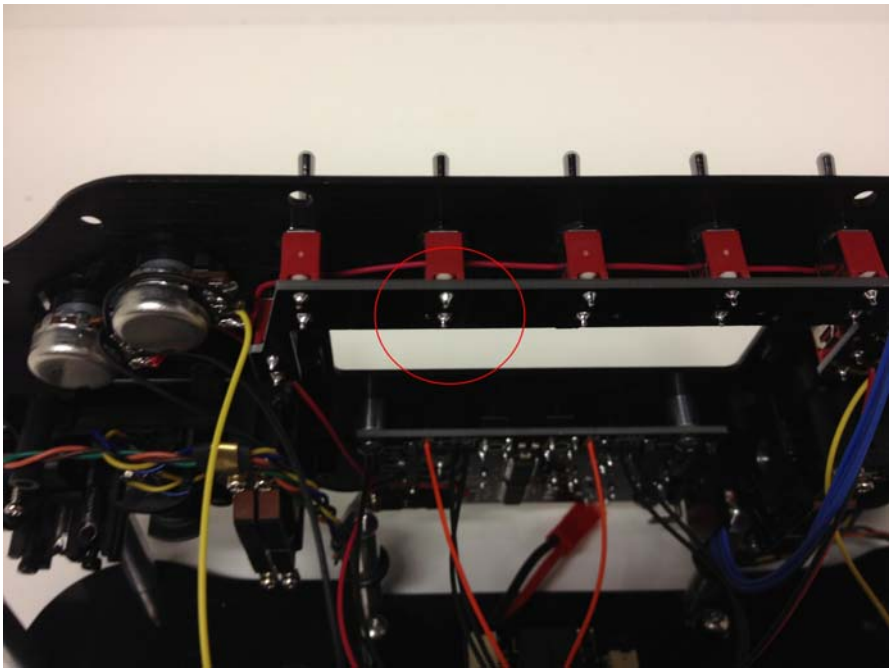
Step – 27

Slide 4 X Black O-Rings on to the spacers as shown below.

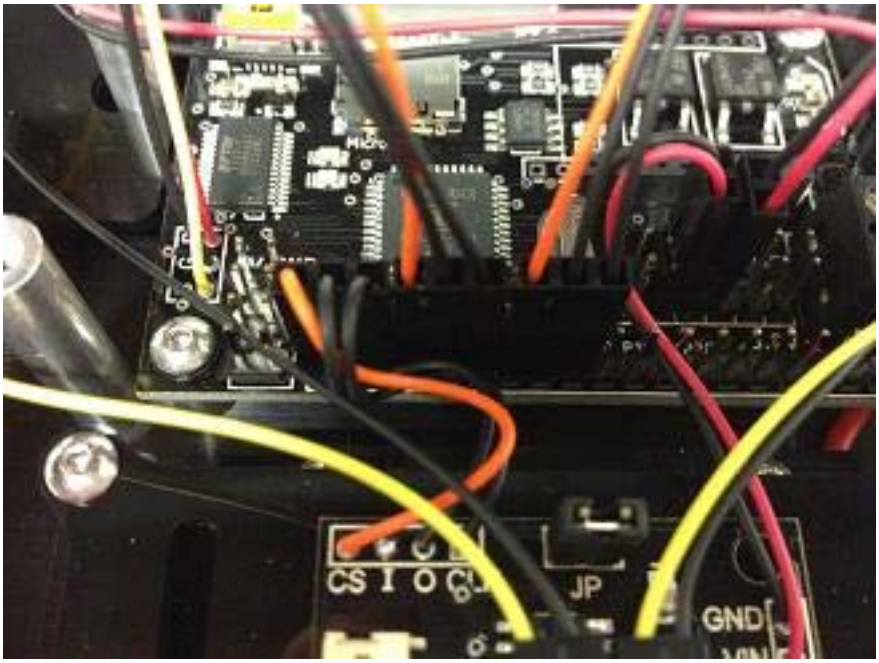


Step – 28

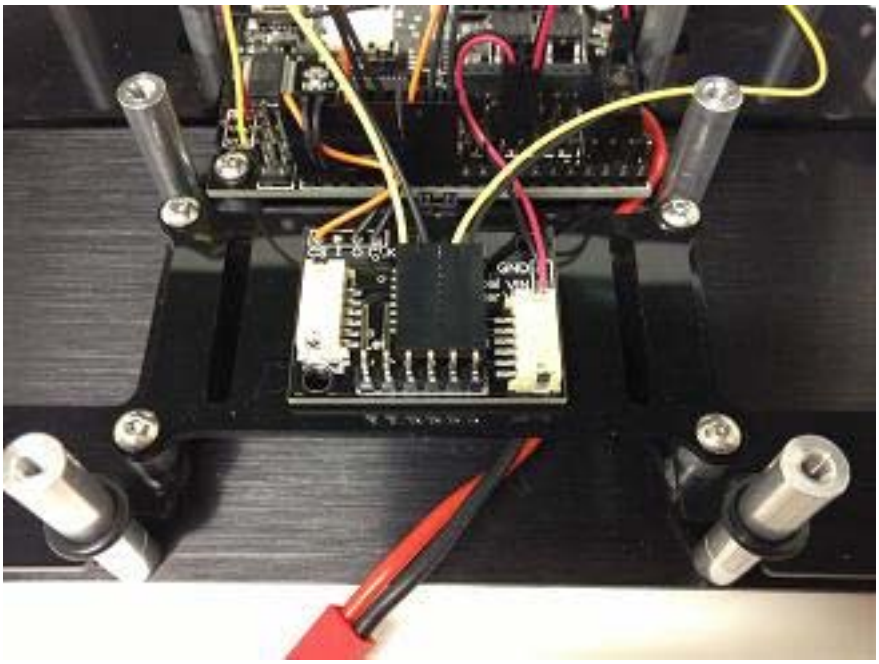
Clipping the leads to switch 5 allows for more room to remove and install an XBee once the controller is completely assembled.



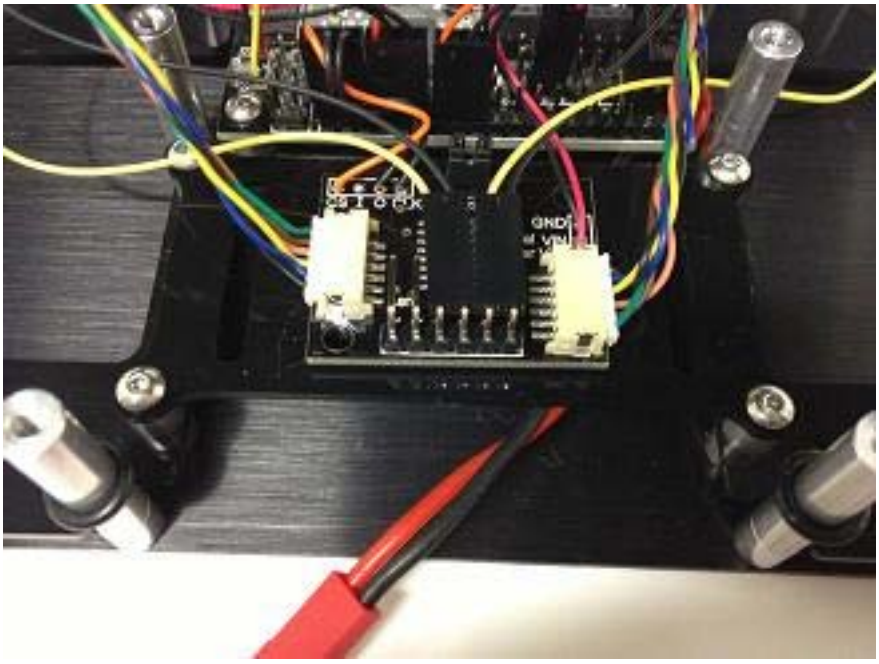
Plug in the data lines from the push button board into the main controller board.
Plug the red and black header from the push button board into the main controller board.



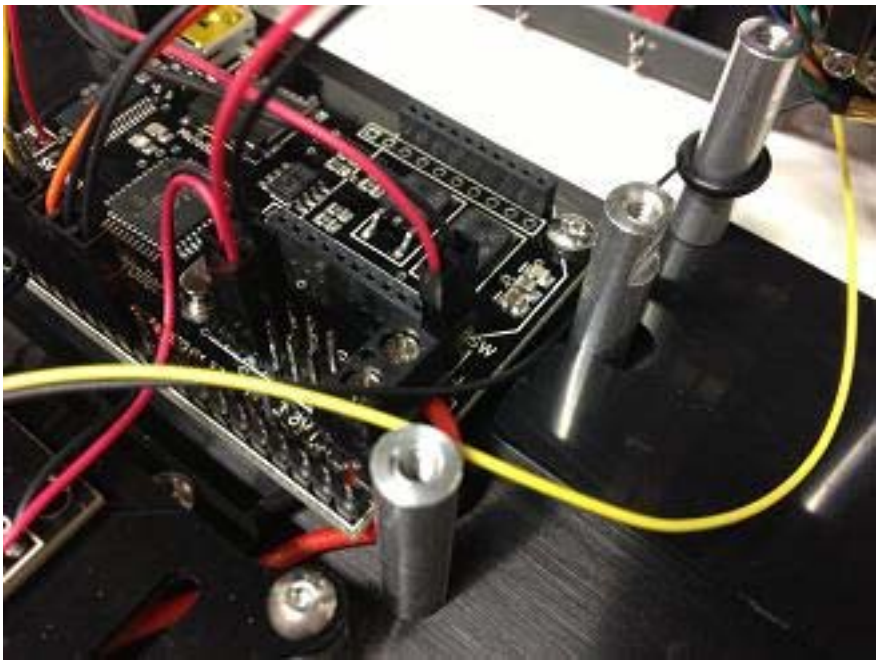
Plug the pot leads into the gimbal controller board. Just as pictured below.



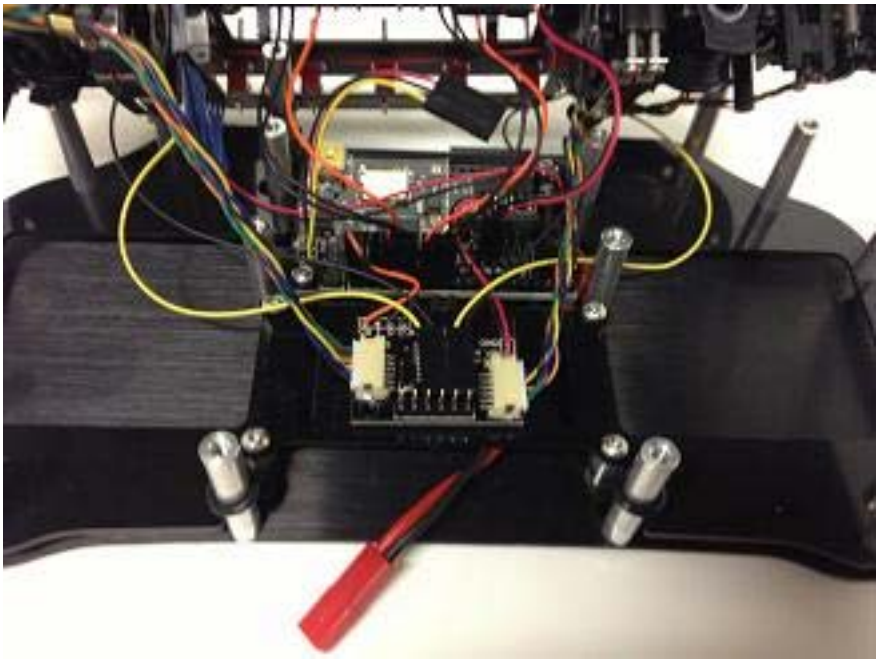
Now plug the joystick gimbals in the gimbal controller board.



Plug the red/black lead from the toggle switch board to the heads labeled SW on the main controller board.

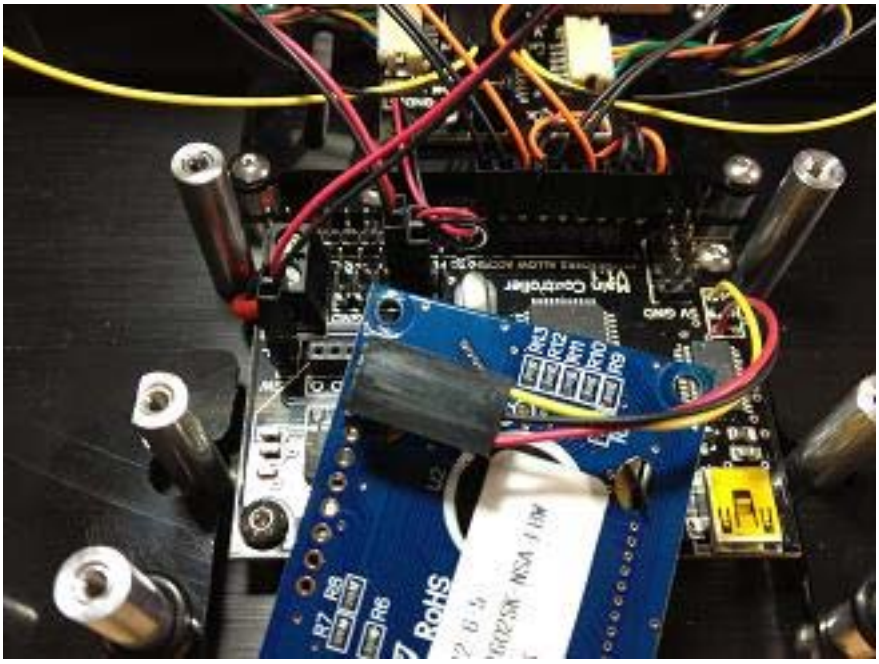


An overview picture of everything plugged in.

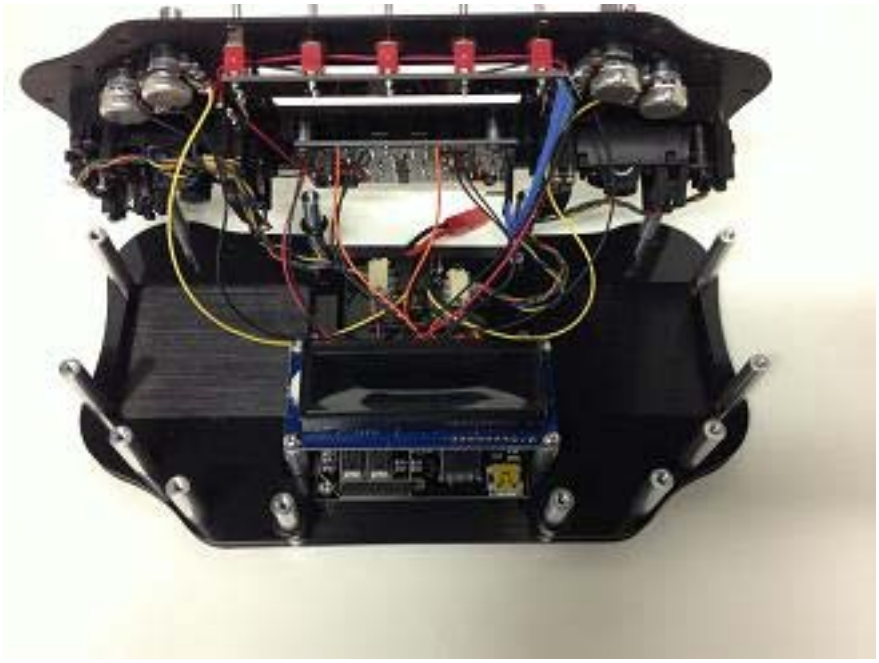


Step – 29

Connect the LCD to the main controller board.



Attach the LCD to the case using 4 X 1/4" screws.



Step – 30

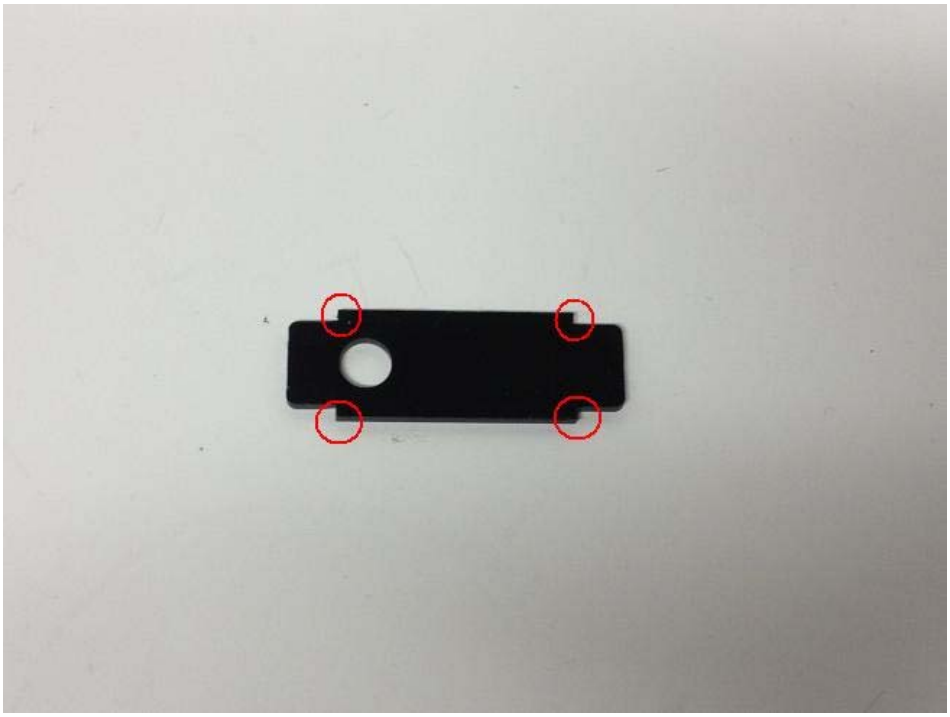
Place the Top Case down on to the spacers. Make sure no wire pinching occurs. Then attach the Top Case with 14 X 1/4” screws.

At this time attach the potentiometer knobs. The potentiometer center is as pictured below.

Step – 31

Attach a front latch plate using 2 X 7/16”spacers, 2 X 1/4" screws, and 2 steel washers.

The piece below needs to be trimmed to fit the front latch plates. The round fillet needs to be made squar.



Complete the assembly by attaching the last front latch plate with 2 X 3/16” screws.

Step – 32

Using 2 X 1/4” spacers, 2 X battery latch plates and 4 X 3/16” screws assemble the battery latch.

Both latches are snapped on to the controller with the o-ring keeping them in place.