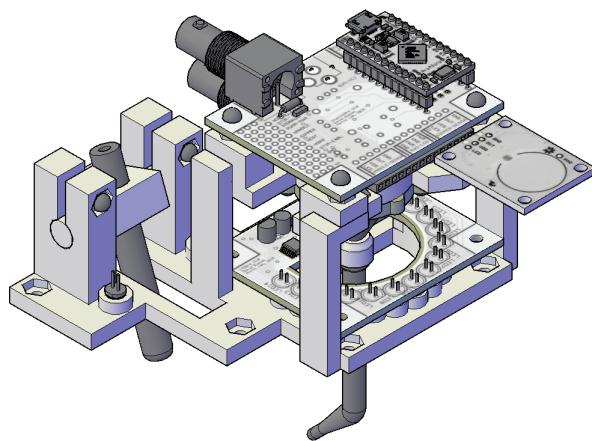
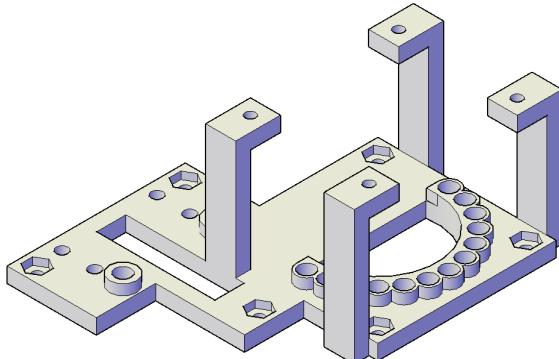


Instruction Manual for ACRoBaT device

designed by David Bjanes

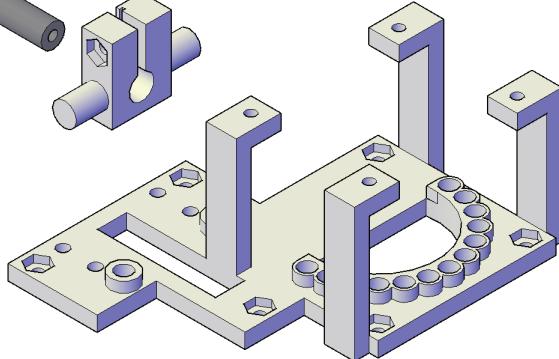
dbjanes@uw.edu
copyright 2017





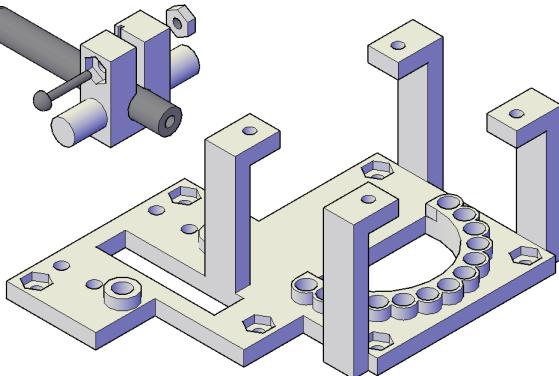
Step 1

Begin with the ACRoBaT Base Plate. This assembly can be completed either with the left or right setup, if your study relies on handedness. All 3D printed parts can be uploaded to shapeways.com and ordered through their website.



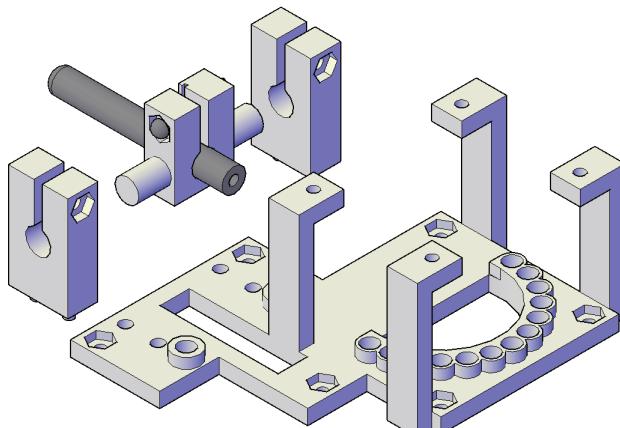
Step 2

Insert the sipper tube into the center piece of the sipper tube mounting bracket. If a lick sensor is desired, a bare 22-gauge wire can be inserted into the channel inside the bracket. This wire will be pressed against the metal tube and then soldered at later step on the PCB.



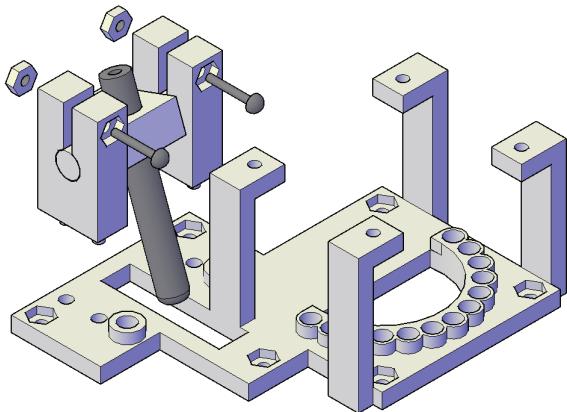
Step 3

Tighten the sipper tube (and wire), with a 4-40 nut and bolt.



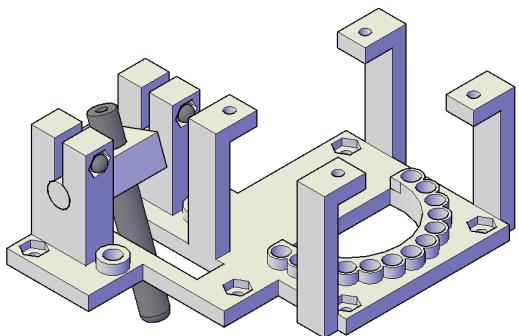
Step 4

Slide the middle bracket on to the ends of the sipper tube bracket.



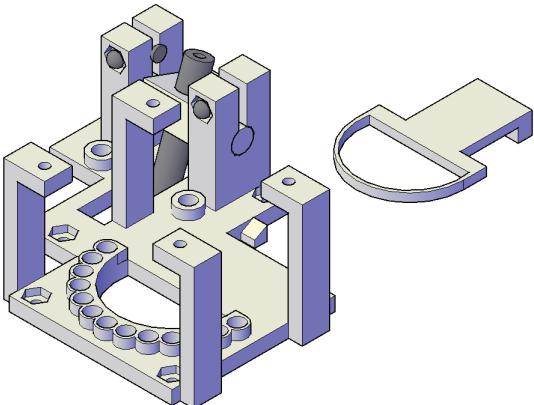
Step 5

Tighten with bolts.



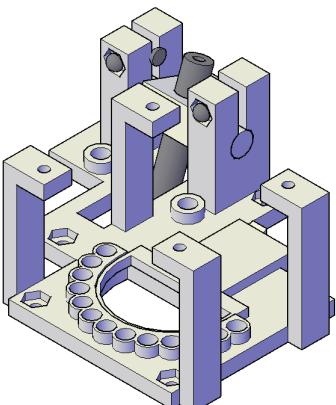
Step 6

Using epoxy, glue the brackets to the base plate.



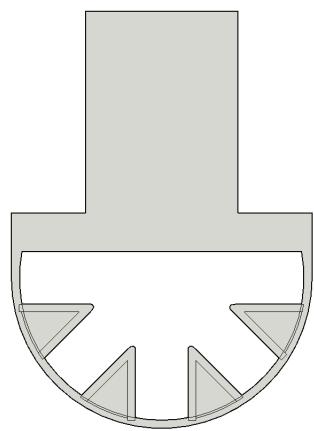
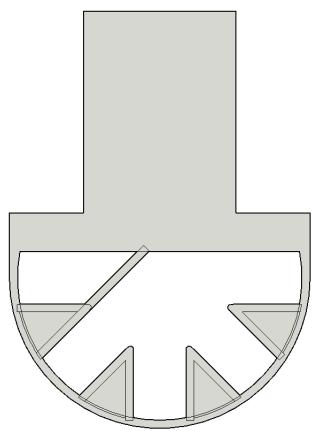
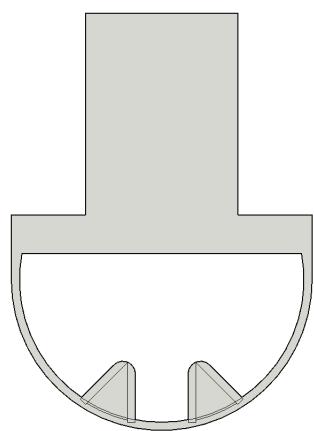
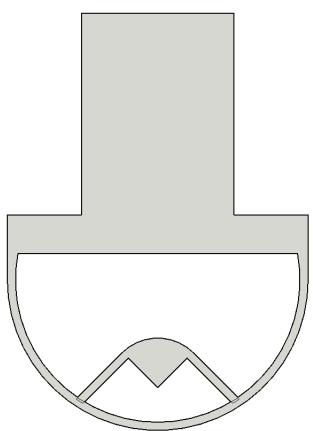
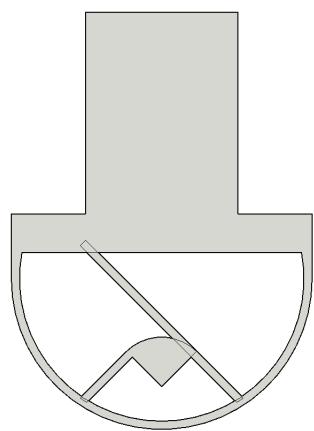
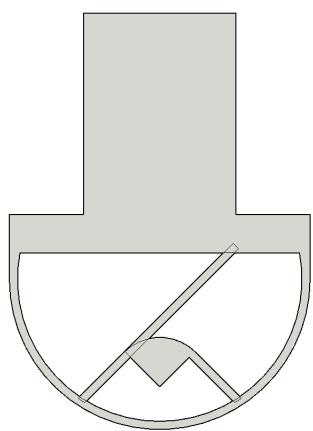
Step 7

Slide a target slot into position. This can later be swapped for an empty slots (shown in the diagram) or 2/3/4/5 target slots (next page)

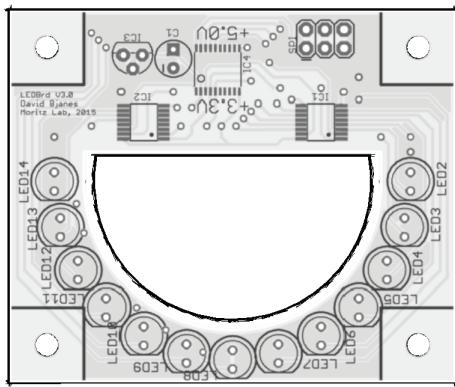


Step 8

Lock by sliding into place. To remove, pull up on the top.

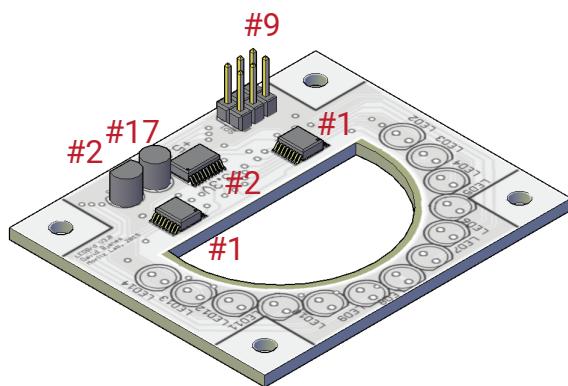


Target slots



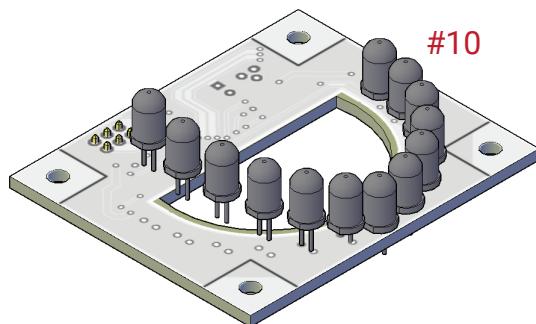
Step 9a

The Led Board. The brd and schematic file can be found in the download folder. We used OSH Park to order our boards.



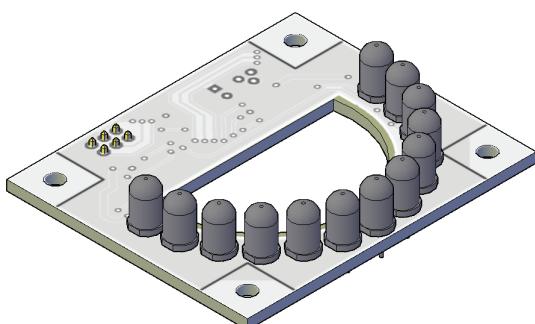
Step 9b

Solder 2 MAX6966 (Digikey Item #1), a TXB0108PWR (Digikey Item #2), a capacitor (Sparkfun Item #17), a 3.3V regulator (Adafruit #2), and 2x3 male header pins (Sparkfun #9).



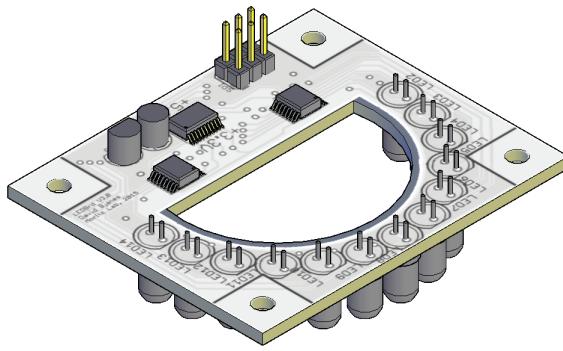
Step 9c

Flip over and solder 13 white LEDs (Sparkfun Item #10).



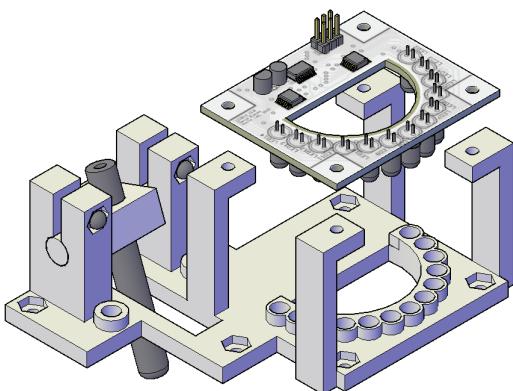
Step 9d

LEDs should be flush with the board to ensure parts assemble correctly.



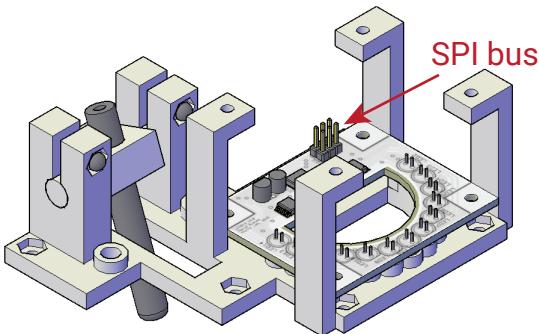
Step 9e

Flip over. Board assembly is complete.



Step 10

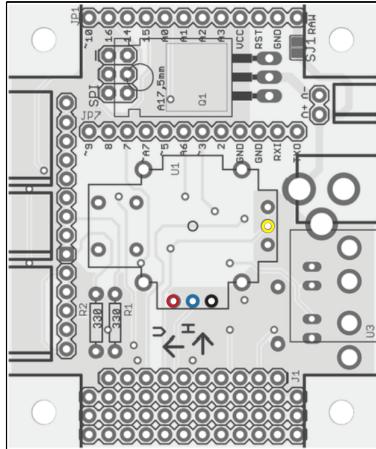
Insert board facedown such that LED fit into each little open ring.



Step 11

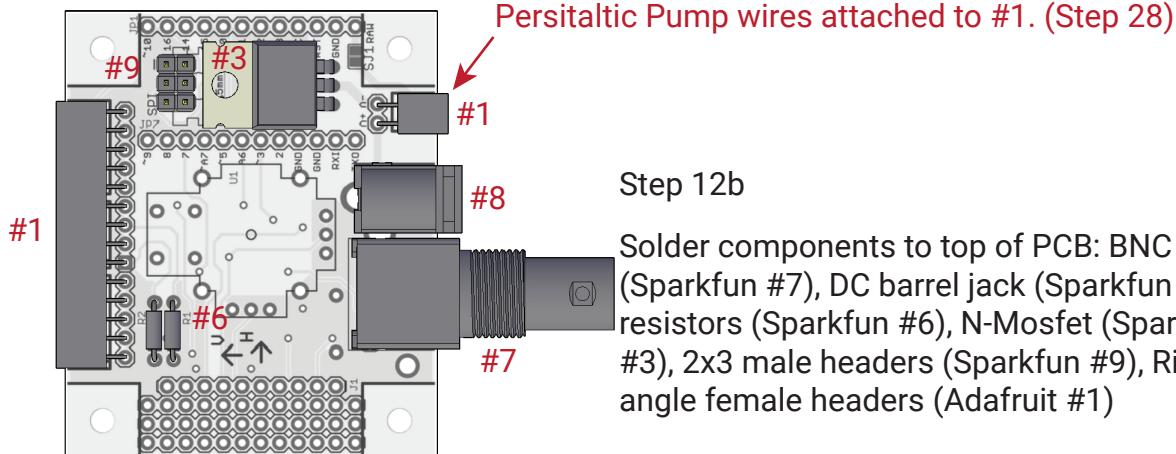
Led Board should be pressed firmly down, such that board mates with the base plate.

SPI bus should be connected to an IDC cable (2x3). This can be built using the ribbon cable (Sparkfun #5) and the crimp connectors (Sparkfun #4). One crimp connector should go on each end. The ribbon cable should be about 8 in long.



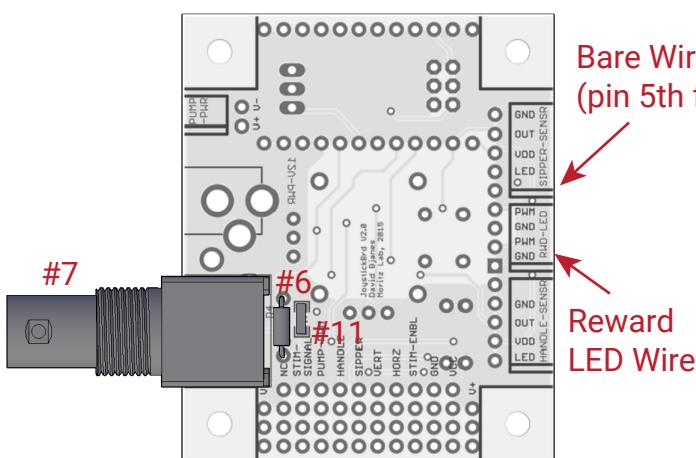
Step 12a

Order main board. We used OSH Park. Red, yellow, blue, and black circles on the board indicate solder locations for the wires in Step 17.



Step 12b

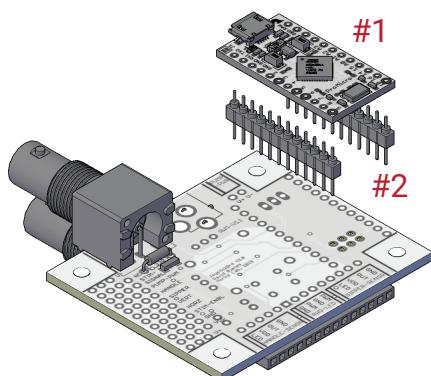
Solder components to top of PCB: BNC (Sparkfun #7), DC barrel jack (Sparkfun #8), resistors (Sparkfun #6), N-Mosfet (Sparkfun #3), 2x3 male headers (Sparkfun #9), Right angle female headers (Adafruit #1)



Step 12c

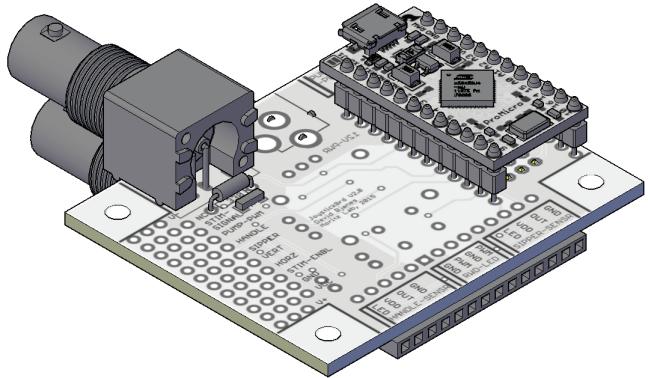
Flip over and solder components to top of PCB: BNC (Sparkfun #7), resistors (Sparkfun #6), SMD led (Sparkfun #11).

Marked are places for Reward LED to be connected (Step 21) and capacitive sensor (Step 2 & 22).



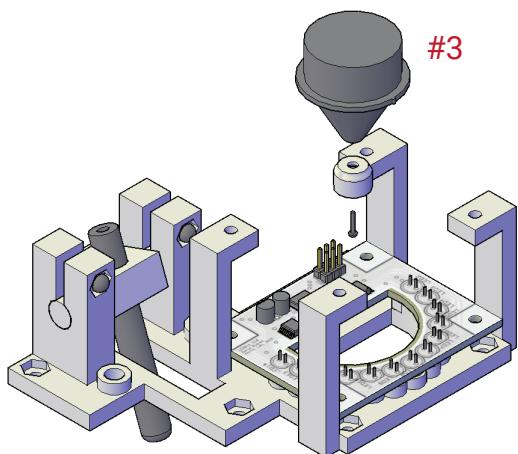
Step 12d

Flip over and solder headers (Sparkfun #2) to the Arduino Pro-Micro (Sparkfun #1)



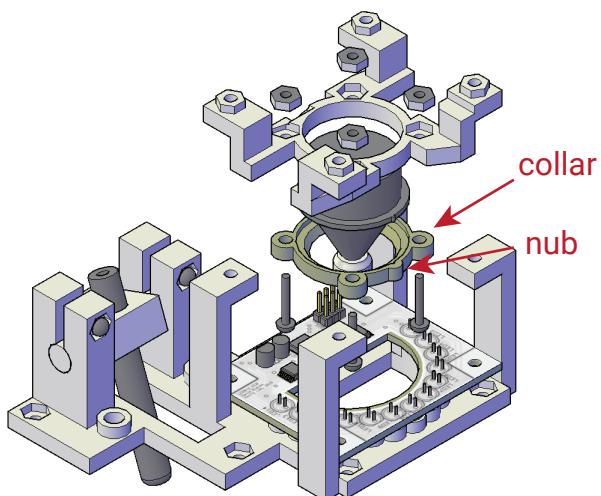
Step 12e

Solder headers to the main board



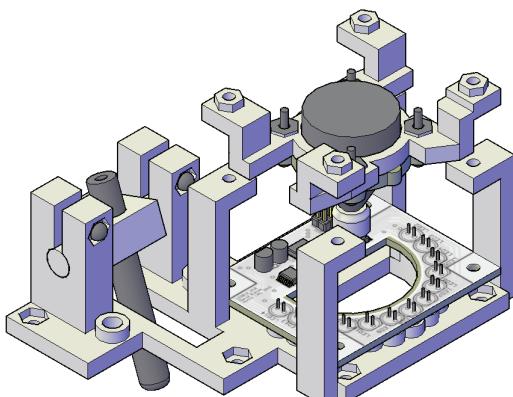
Step 13

Remove all attachments from the joystick (Digikey #3), and screw the 3D printed part, "Joystick - Socket" into the shaft of the joystick.



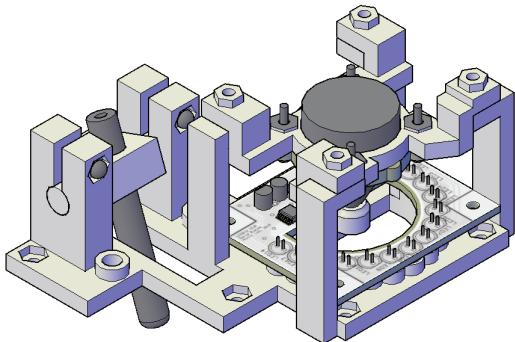
Step 14

Assemble bracket for the joystick. Ensure collar for the joystick has the nub pointed downwards.



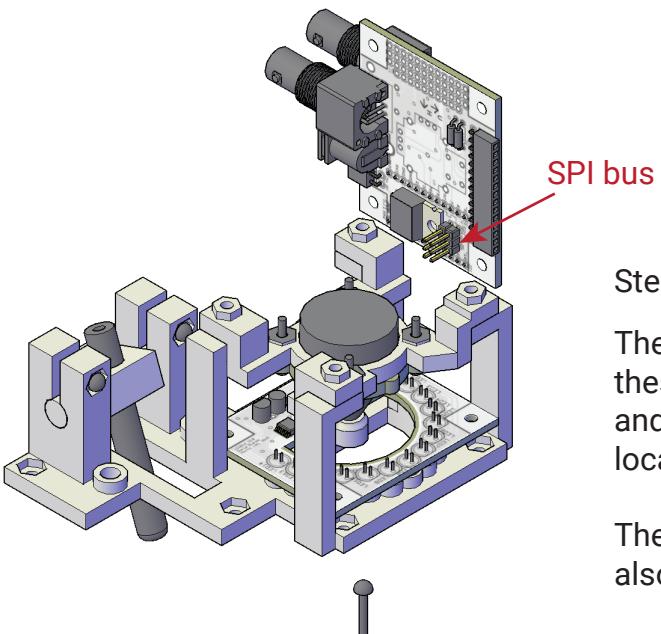
Step 15

4-40 nuts and bolts tighten to attached joystick to bracket.



Step 16

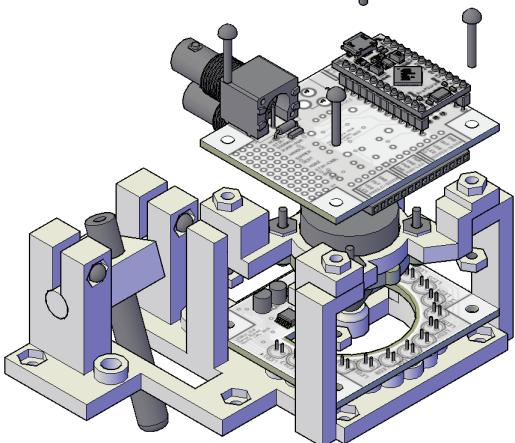
Lower bracket into place.



Step 17

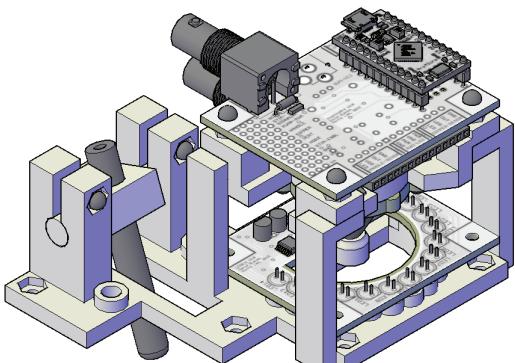
There are four wires coming from the joystick, these should be soldered into the main board, and the wires trimmed. See Step 12a for location of each wire.

The other end of the SPI bus cable should also be plugged into the header.



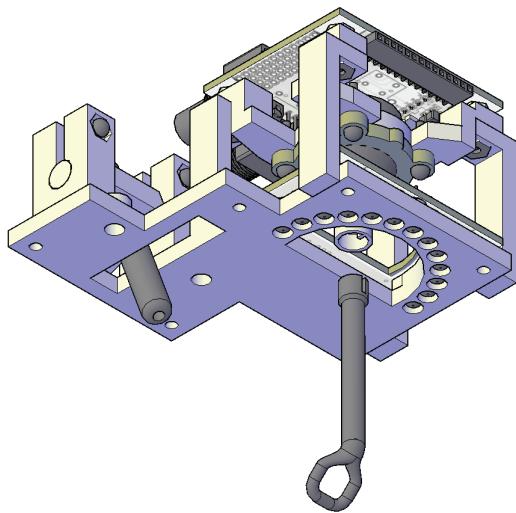
Step 18

4-40 nuts and bolts tighten to attach main board to the base plate.



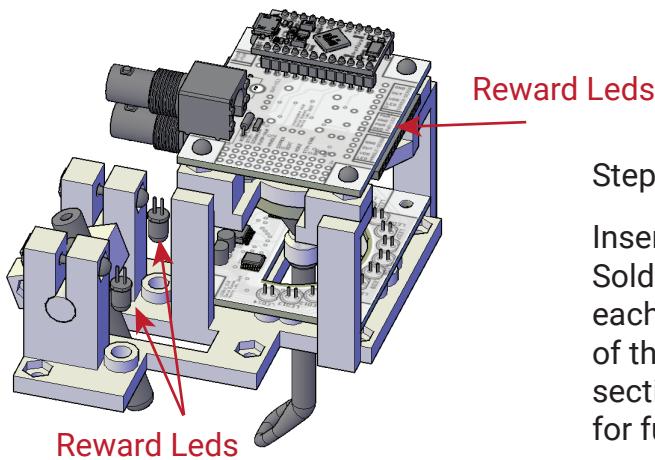
Step 19

Main hardware is secure.



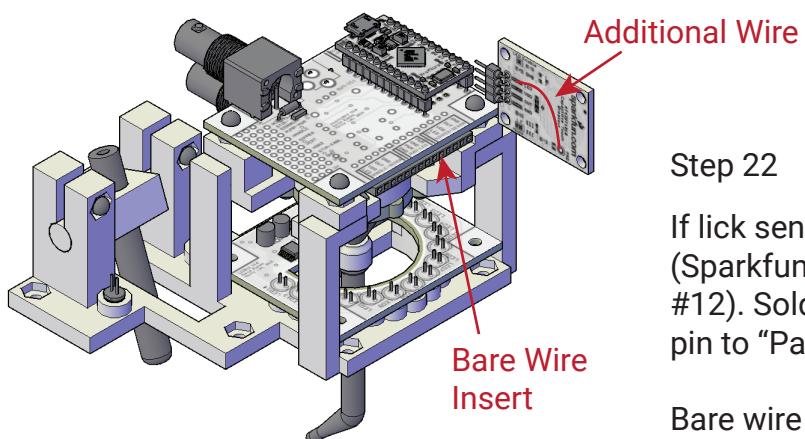
Step 20

Flip assembly over, and insert handle. Socket may have rotated, so simply loosen screw, orient socket, tighten screw and reinsert handle.



Step 21

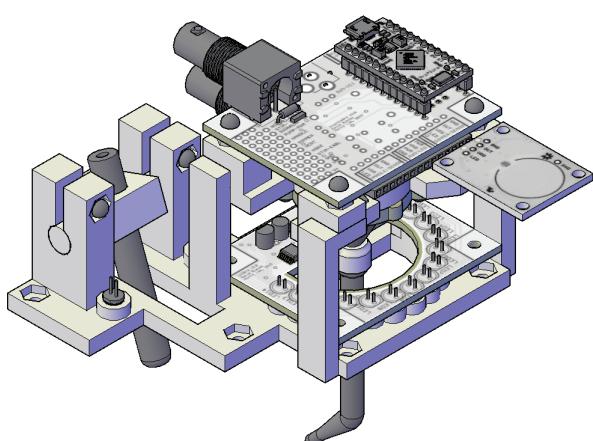
Insert Reward Leds (Sparkfun #10) into slots. Solder a red and black wire (respectively) to each lead of each led and plug the other end of the wire into PWR and GND in the middle section of the female headers. See Step 12c for further detail.



Step 22

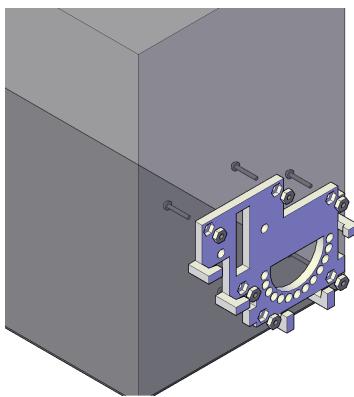
If lick sensor is desired, attach male headers (Sparkfun #13) to sparkfun board (Sparkfun #12). Solder additional wire from LED header pin to "Pad".

Bare wire which was inserted around sipper tube, in Step 2, can be inserted into back of main board, beside capacitive sensor board. See Step 12c for greater detail.



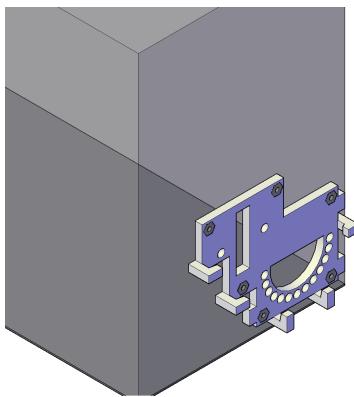
Step 23

Flip over and insert capacitive sensor board.



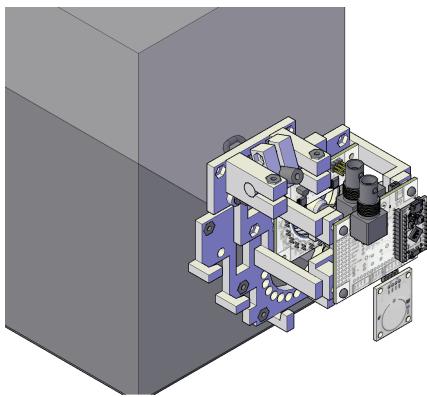
Step 24

Assemble acrylic area approximately 12in long, 6 wide, and 12in tall. Drill holes and cutouts for mounting Arena Mounting Plate.



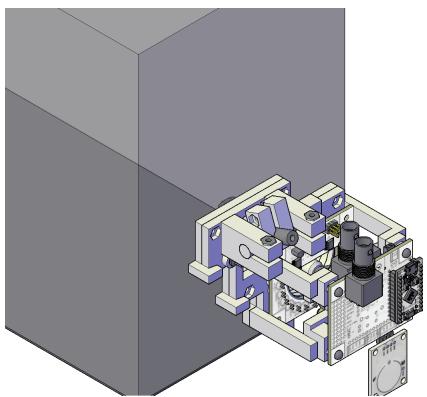
Step 25

Tighten.



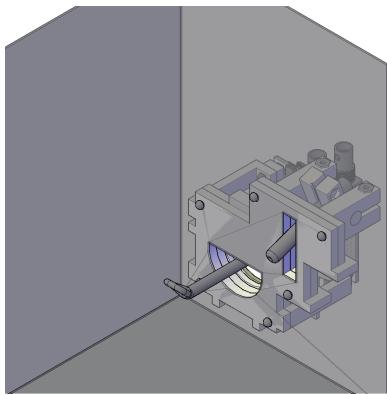
Step 26

Slide assembled device onto the mounting plate, this will easily secure your device to the arena, but allow easy removal if necessary.



Step 27

Slide down to attach.



Step 28

Assembly is complete. Pump (Adafruit #3) can be attached to the 3D printed part "Mounting Bracket - Peristaltic Pump and Juice" wherever desired on arena.

Micro-USB cable should be attached to the Arduino Pro-Micro, and the 12V power supply attached to the DC Barrel Jack.

The Pump's wires should be attached to the female headers (See Step 12b for detail) and device is fully complete.