BUILD GUIDE

3D printed Collective

DIY Beyond 3D

Thank you for buying the files and support me for creating new controllers. I hope you have fun building this Collective and enjoy playing games with it.

If you wish to support me even more, please visit my Patreon page
www.patreon.com/3dbusdriver

and don't forget to share
https://www.myminifactory.com/users/DIY%20Beyond%203D

and
https://www.facebook.com/DIY-Beyond-3D-100597248769032/

IMPORTANT !!!

Please note that the links for non-printed parts are just for the reference of dimensions and specs. If you can buy parts cheaper elsewhere, by all means do. Especially check your local stores.

Also, you can always use Arduino Micro or Arduino Leonardo clones, if the board in the link is not for you.

I. NON-PRINTED PARTS (BOM list)

1. Board
http://www.leobodnar.com/shop/index.php?main_page=product_info&cPath=94&products_id=204

2. Cables

a) dupont
https://www.amazon.co.uk/Multicolored-Dupont-Female-Breadboard-Arduino-Multi-coloured/dp/B07SYKPB86/ref=psdc_528567031_t1_B01EV70C78

b) 10 pin (3 pieces)
Reprap 3d printer parts LCD cable FC 10P 10 Pins 2.54mm Pitch 60cm JTAG AVR Download Cable Wire Connector Gray Flat Data Cable|3D Printer Parts & Accessories| - AliExpress

3. Button switches
50pcs tactile push button switch momentary tact & cap assorted kit 12x12x7.3mm key caps Sale - Banggood.com

4. Ball bearings

a) 6806 (4 pieces for dual throttle, 2 pieces for single throttle)
https://www.amazon.de/gp/product/B0834R4ZWC/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1

b) 6000 (2 pieces)
https://www.amazon.de/-/en/Bearing-6000-2RS-rubber-sealed-bearings/dp/B07P7T8PQ3/ref=sr_1_3?dchild=1&keywords=kugellager+6000&qid=1616842066&s=industrial&sr=1-3

5. Mini joystick (1 piece)
https://www.amazon.de/gp/product/B077Z8QN3S/ref=ppx_yo_dt_b_asin_title_o03_s00?ie=UTF8&psc=1

6. Rotary encoder
https://www.amazon.de/gp/product/B07R8JGHB1/ref=ppx_yo_dt_b_asin_image_o02_s00?ie=UTF8&psc=1

7. Toggle switches
https://www.amazon.de/-/en/dp/B07ZYKQ4F5/ref=sr_1_4?dchild=1&keywords=micro+kippschalter&qid=1616842602&sr=8-4

8. Potentiometers (3 pieces for dual throttle, 2 pieces for single throttle variant)
https://si.farnell.com/bourns/91a1a-b28-a15l/potentiometer-linear-10kohm-10/dp/2328038?CMP=i-ddd7-00001003

II. 3D PRINTED PARTS (all PLA, 0.2 layer height, 4 perimeters, 40% infill)

Unpack the **Collective_V1.zip** with your favorite unpacker software. Once unpacked, there will be three folders which contain .STL files for each part you need to print:

1. Base
2. Handle
3. Head

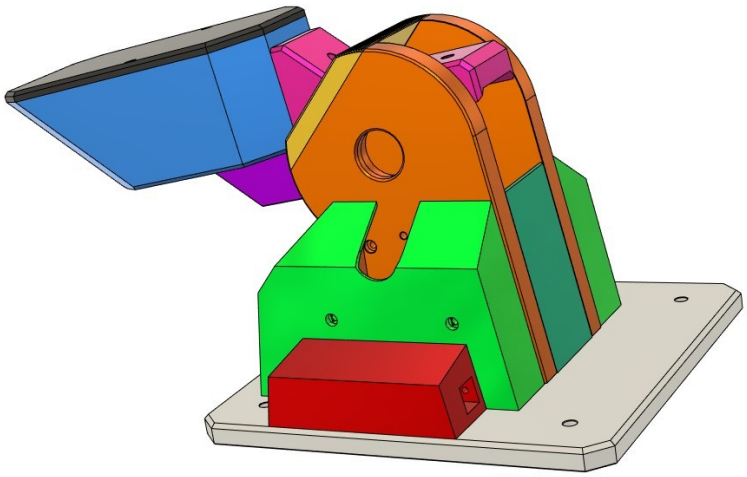
Only a few parts need to be printed twice, you will recognise them while building. Also the file names have a number how many copies to print.
For example: 2x ORANGE... , 3x RED...

For the purpose of this build, all .STL files are color coded so you can easily recognize them from the images. Of course you can print them in any color you want ;)

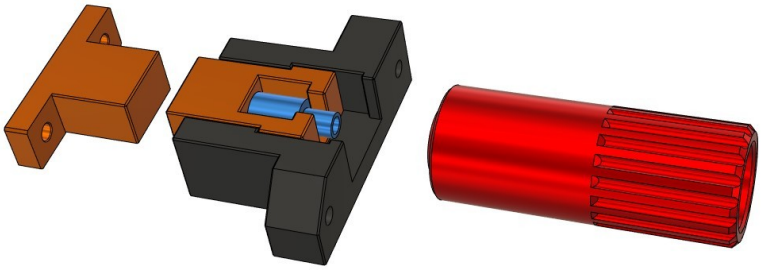
III: NAMES OF PARTS AND IDENTIFYING THEM

1. BASE

BLACK WEIGHT BOX COVER
BLUE WEIGHT BOX
GREEN COVER LEFT
GREEN COVER RIGHT
ORANGE MAIN LEFT
ORANGE MAIN RIGHT
PINK TOP COVER
PURPLE WEIGHT BOX COVER BOTTOM
TURQUOISE MAIN FRONT
WHITE BASE
YELLOW MAIN TOP

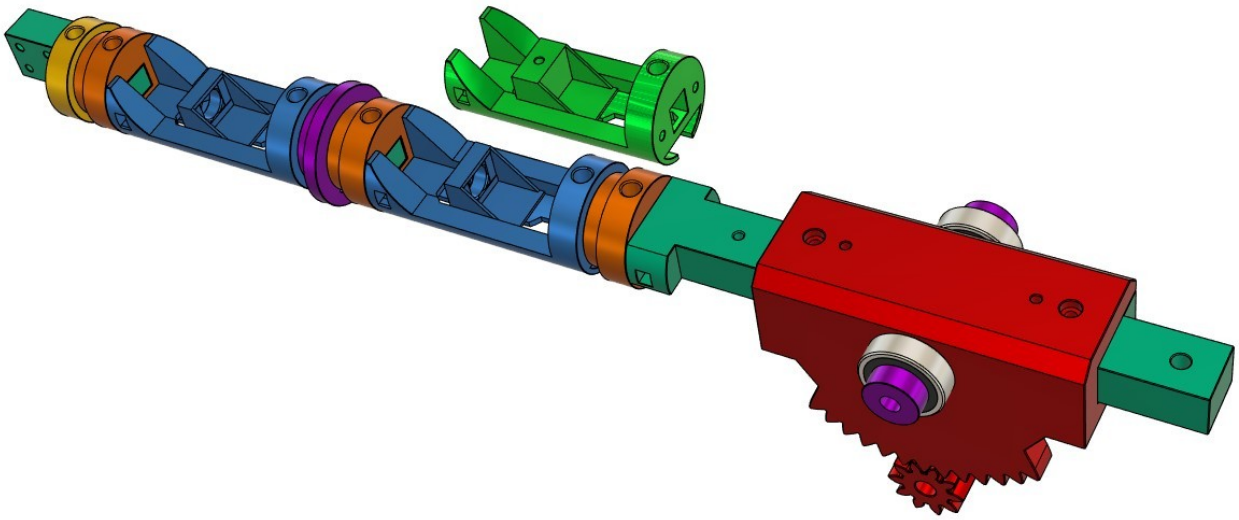


BLACK CLUTCH SLIDE
ORANGE CLUTCH LEFT
ORANGE CLUTCH RIGHT
RED CLUTCH KNOB
BLUE CLUTCH PISTON

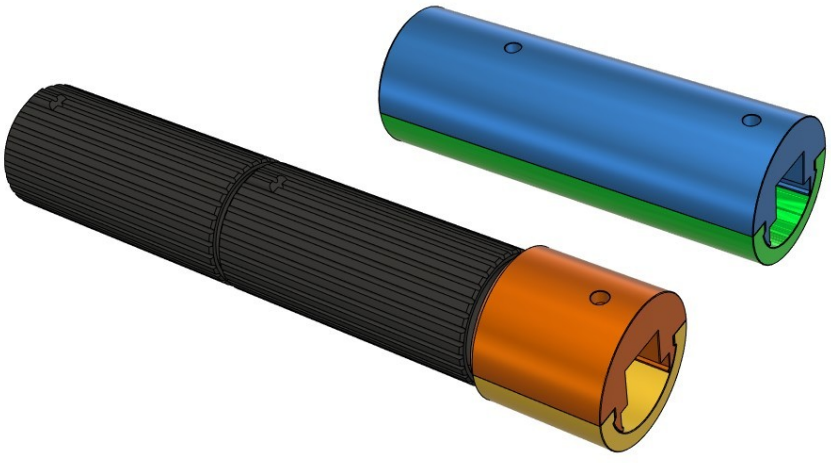


2. HANDLE

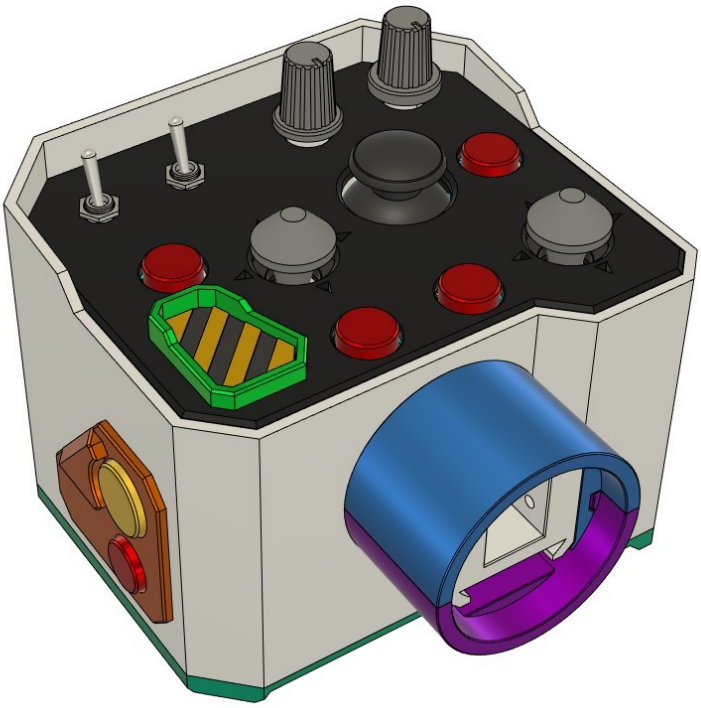
2x BLUE POT MOUNT (1x for single throttle)
2x PURPLE SPACER
3x ORANGE 6806 MOUNT
GREEN NON-POT MOUNT (none for dual throttle)
PURPLE 6806 MOUNT
RED GEAR BIG
RED GEAR SMALL
TURQUOISE HANDLE BACK
TURQUOISE HANDLE FRONT
TURQUOISE HANDLE MIDDLE
YELLOW SPACER



BLACK TWIST (1x or 2x)
BLUE COVER TOP (S)
GREEN COVER BOTTOM (S)
ORANGE COVER TOP (D)
YELLOW COVER BOTTOM (D)



3. HEAD

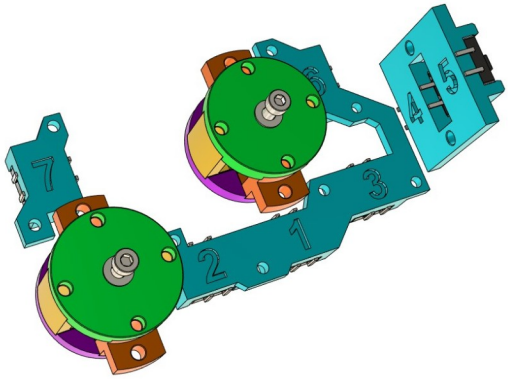


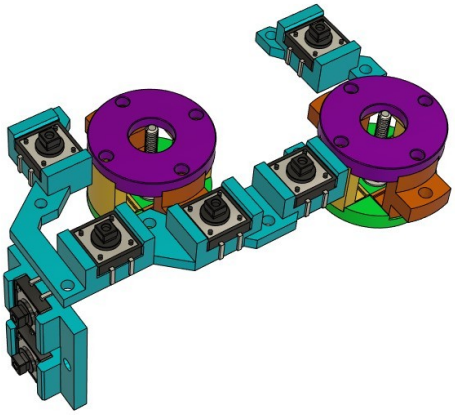
BLACK COVER TOP
BLUE HANDLE COVER TOP
GREEN DECOR
ORANGE DECOR
PURPLE HANDLE COVER BOTTOM
TURQUOISE COVER BOTTOM
WHITE MAIN

a) buttons

5X RED BUTTON
BLACK-YELLOW BUTTON
GREY ROTARY KNOB
YELLOW BUTTON

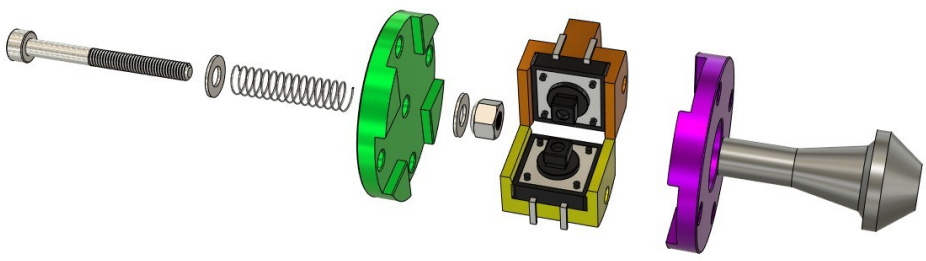
TURQUOISE SWITCH MOUNT 1-2-3-6
TURQUOISE SWITCH MOUNT 4-5
TURQUOISE SWITCH MOUNT 7





b) HAT switch (2x for two of them)

2x ORANGE SIDE
2x YELLOW SIDE
GREEN BACK
GREY HAT STICK
PURPLE FRONT

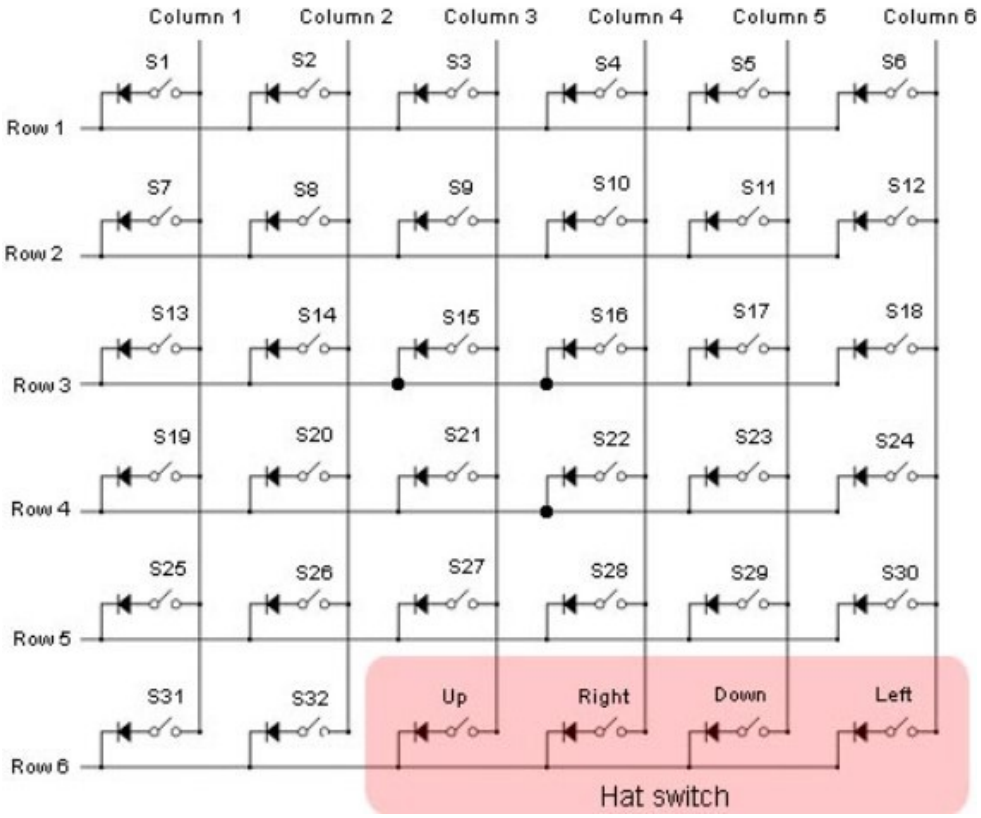


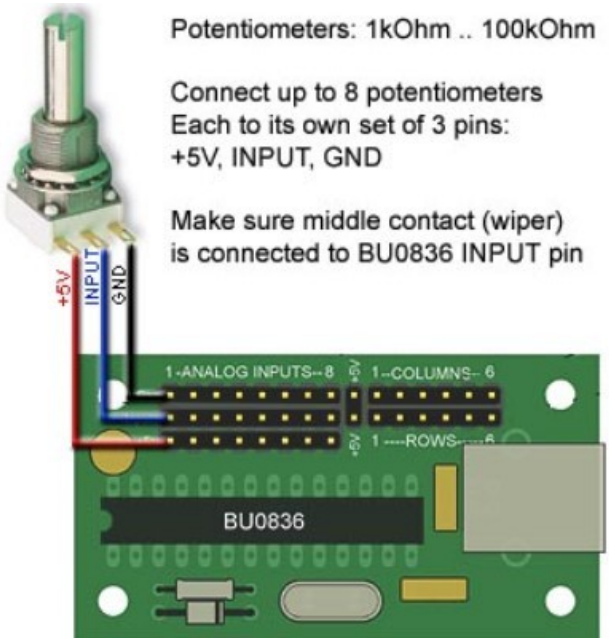
IV. ASSEMBLING

1. WIRING

Note: This wiring is for Leo Bodnars BU0836A josytick board.
Also this matrix wiring works on Arduino, just change the pin numbers to ones available.

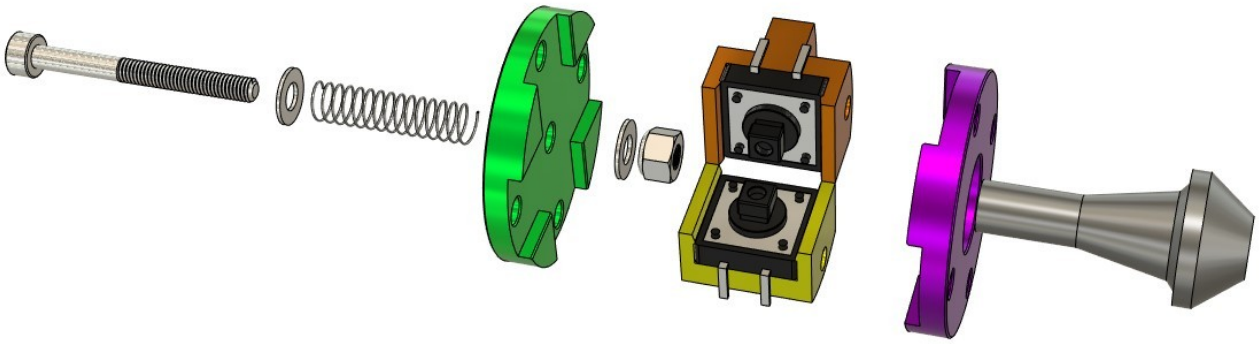
Before you solder switches and wires, try the wiring if it shows the correct input in the Windows USB controller. For the wiring diagram see the picture below or visit Leo Bodnars site in the link above for the board.



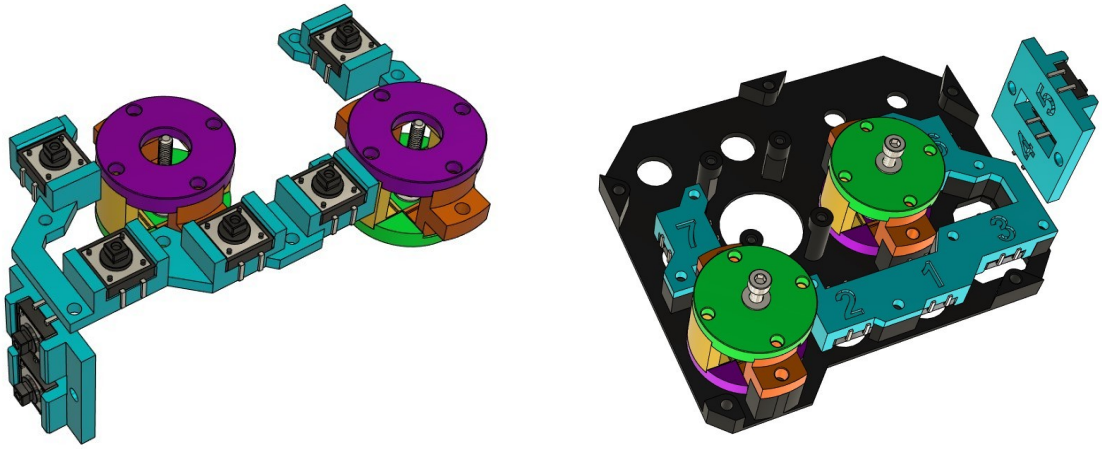


2. PUTTING IT TOGETHER

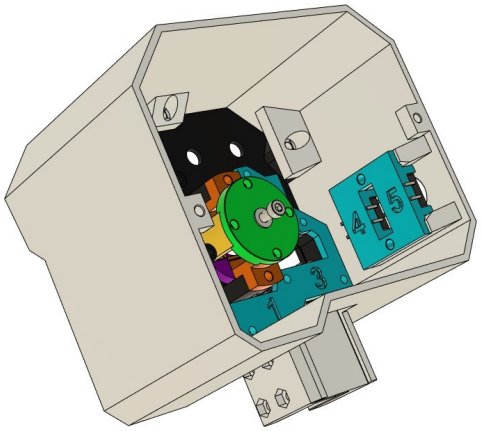
Let's assemble the two 4-way HAT switches first. (only one will be recognized as HAT)
1. Put the 4 switches in all 4 printed parts (YELLOW and ORANGE)
2. Grab M3x 25mm and first put on an M3 washer then **spring from a ball pen**
3. Now add another M3 washer and the GREEN BACK part
4. Add another washer and screw an M3 lock nut reversed, nylon lock first
5. Use 8 M3x10mm or M3x8mm screws to fix the 4 switches
6. Now mount the PURPLE FRONT part and use 4 M3x10mm
7. The GREY HAT STICK will be screwed on M3x25mm when the whole HEAD is finished.



8. Put the 5 switches into the TURQUOISE SWITCH MOUNT 1-2-3-6, wire them and screw them on BLACK COVER TOP, and 2 previously assembled HATs

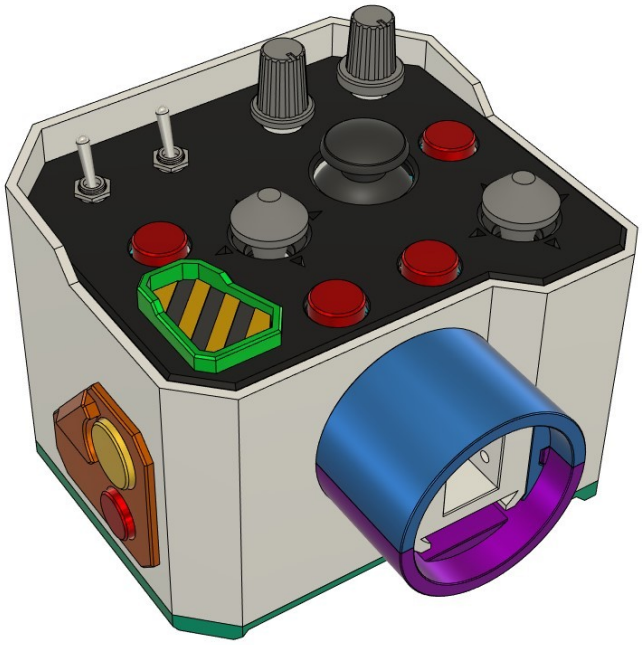


9. Put the 2 switches into the TURQUOISE SWITCH MOUNT 4-5, wire them and screw them on WHITE MAIN



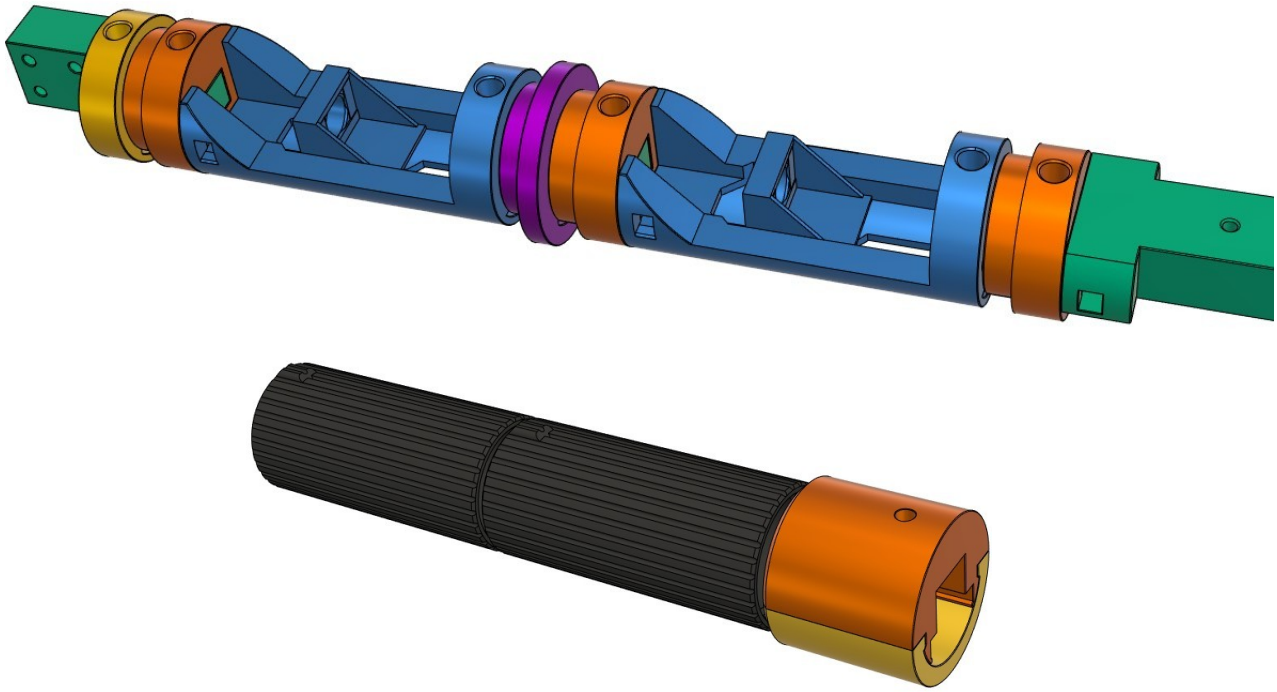
10. Put on all buttons, switches, rotary knobs, HAT sticks.
    Glue the ORANGE and GREEN DECOR

Note: Don't mount BLUE HANDLE COVER TOP , PURPLE HANDLE COVER BOTTOM and the TURQUOISE COVER BOTTOM yet. Mount them on when the whole Collective is finished.



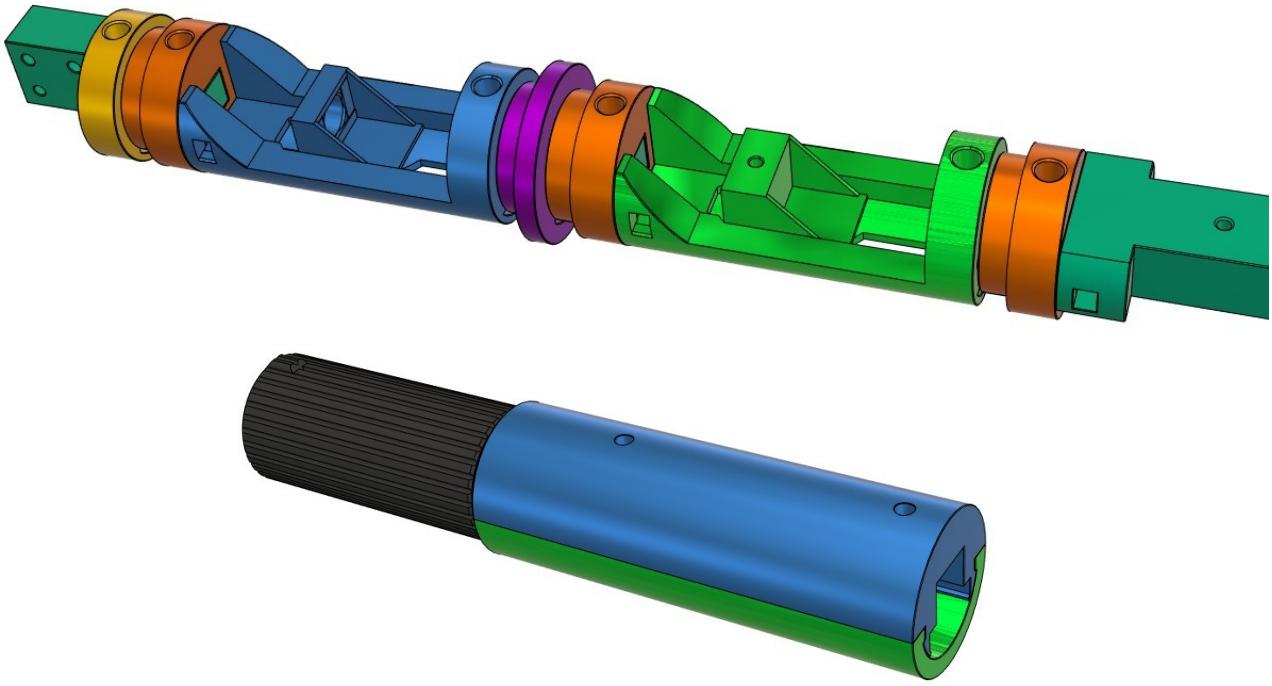
11. Next assemble the Handle and see the video assembly guide for this part
https://youtu.be/WGeATy-sr70

a) dual twist variant



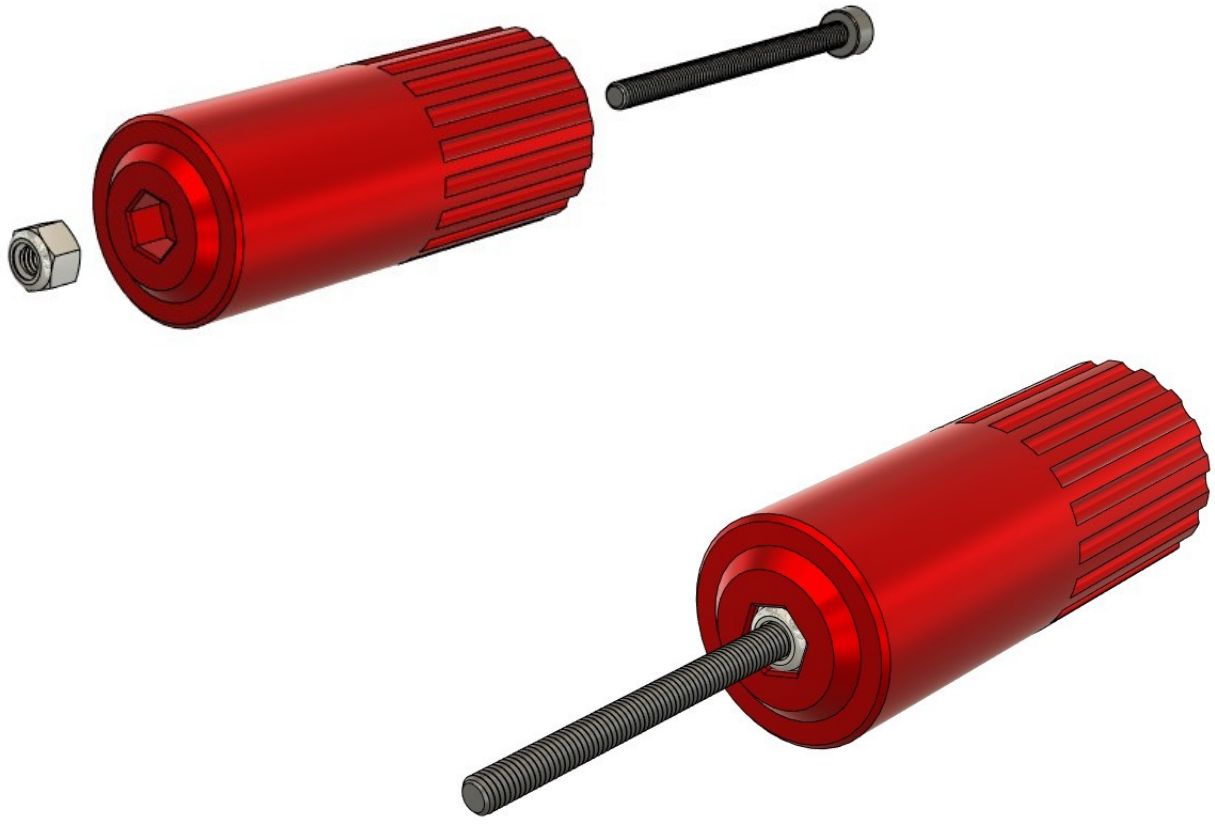
Note: The ORANGE and the YELLOW covers will be put on at the and of the whole assembly.

b) single twist variant

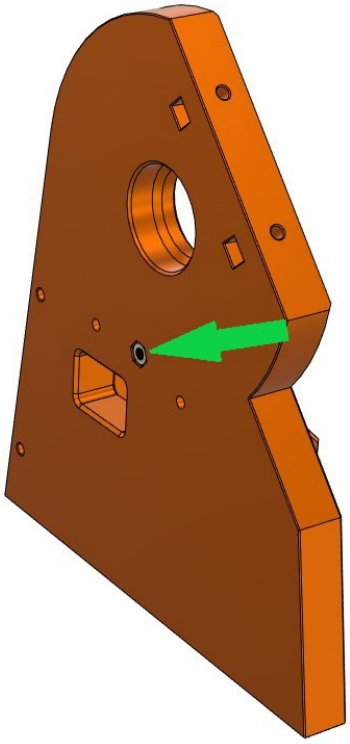


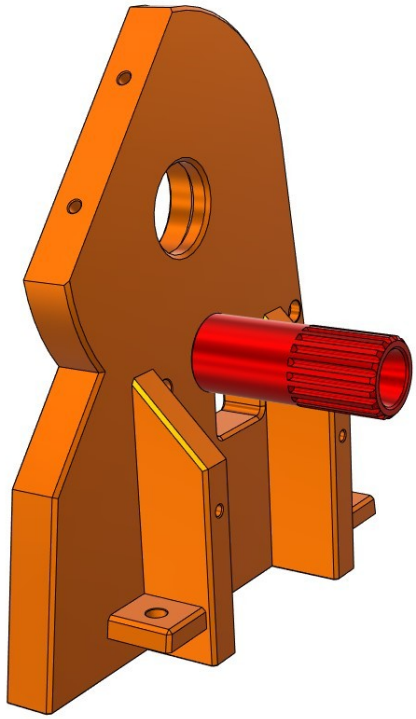
Note: The BLUE and the GREEN covers will be put on at the and of the whole assembly.

12. Assemble the RED CLUTCH KNOB and use M3 lock nut and M3x40mm screw

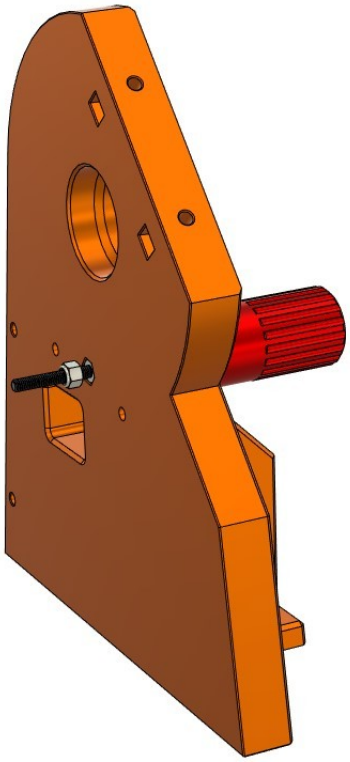


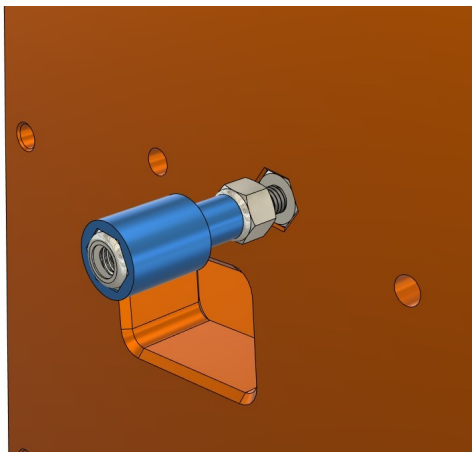
13. Put in the M3 lock nut in the ORANGE MAIN RIGHT where shown in left picture
14. Screw in the assembled RED RED CLUTCH KNOB as shown in the right picture



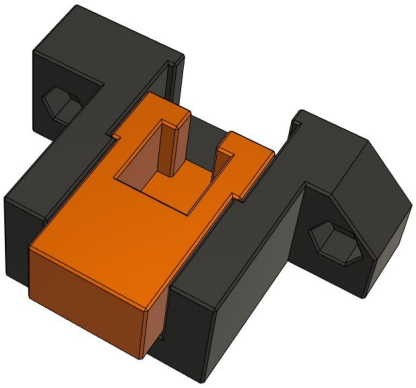


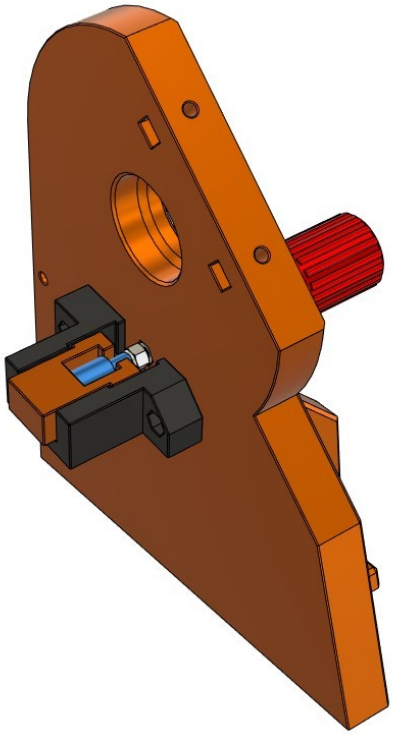
15. Screw on another M3 lock nut, then BLUE CLUTCH PISTON and another M3 lock nut



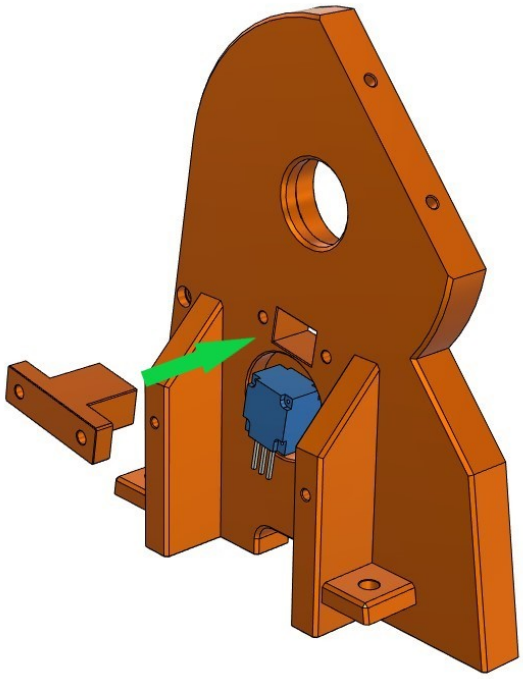


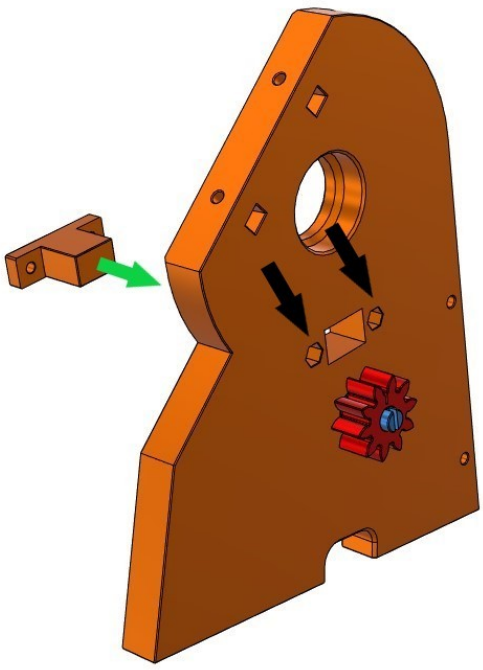
16. Next insert 2x M3 lock nuts in designated holes in BLACK CLUTCH SLIDE
17. And insert ORANGE CLUTCH RIGHT in the SLIDE
18. Now put it on from below as shown in the right picture and use 2x M3x20mm screws



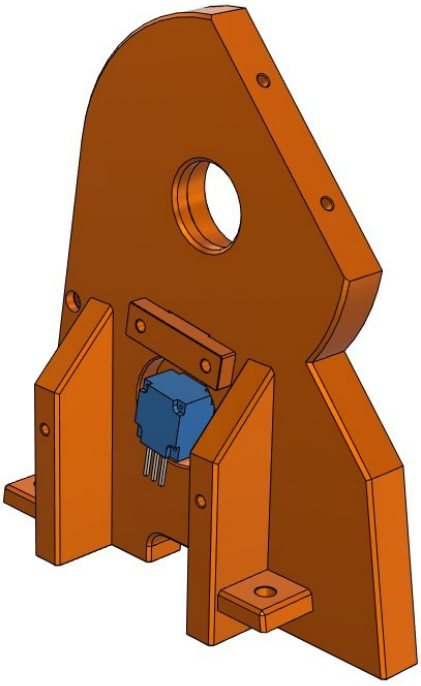


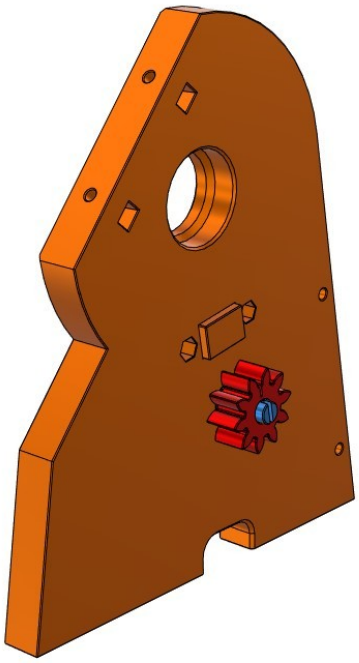
19. Mount the potentiometer, left picture
20. Insert 2 M3 lock nuts and RED GEAR SMALL as shown in the right picture



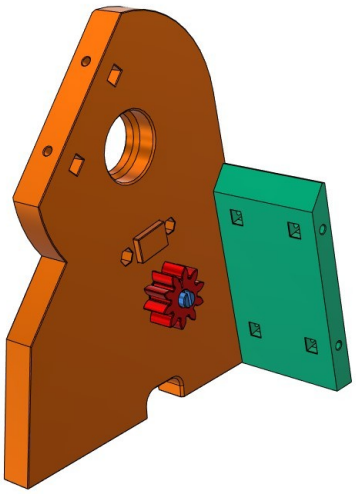


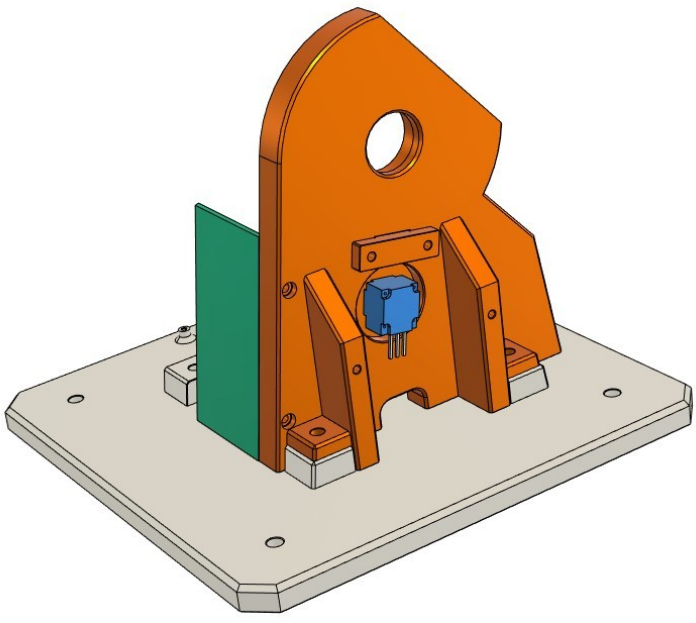
21. Insert ORANGE CLUTCH LEFT in use 2 M3x18mm screws



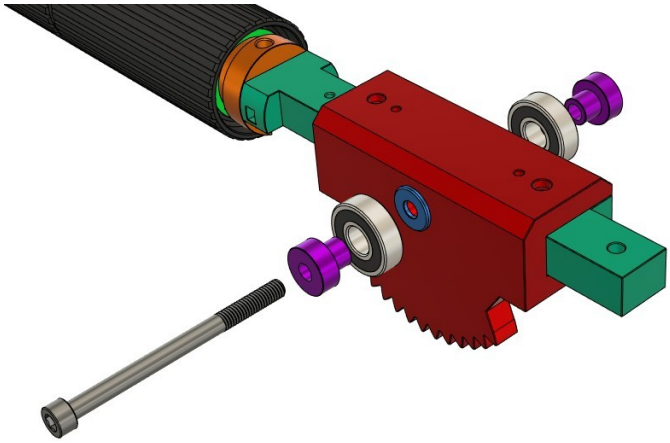


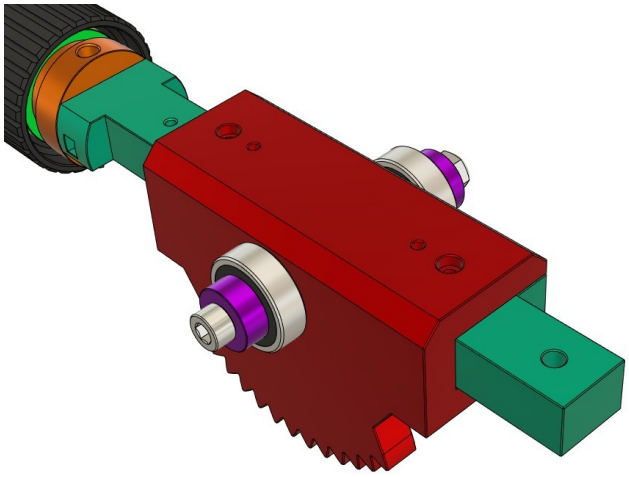
22. Insert 4 M3 lock nuts in TURQUOISE MAIN FRONT and use M3x25mm to secure it on ORANGE MAIN LEFT (left picture)
23. Insert 4 M5 lock nuts from below WHITE BASE
24. Use 2x M5x25 screws to secure ORANGE MAIN LEFT on WHITE BASE (right picture)

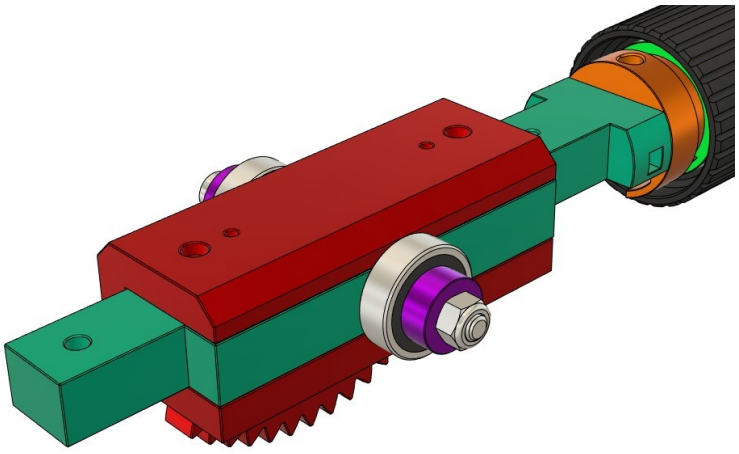




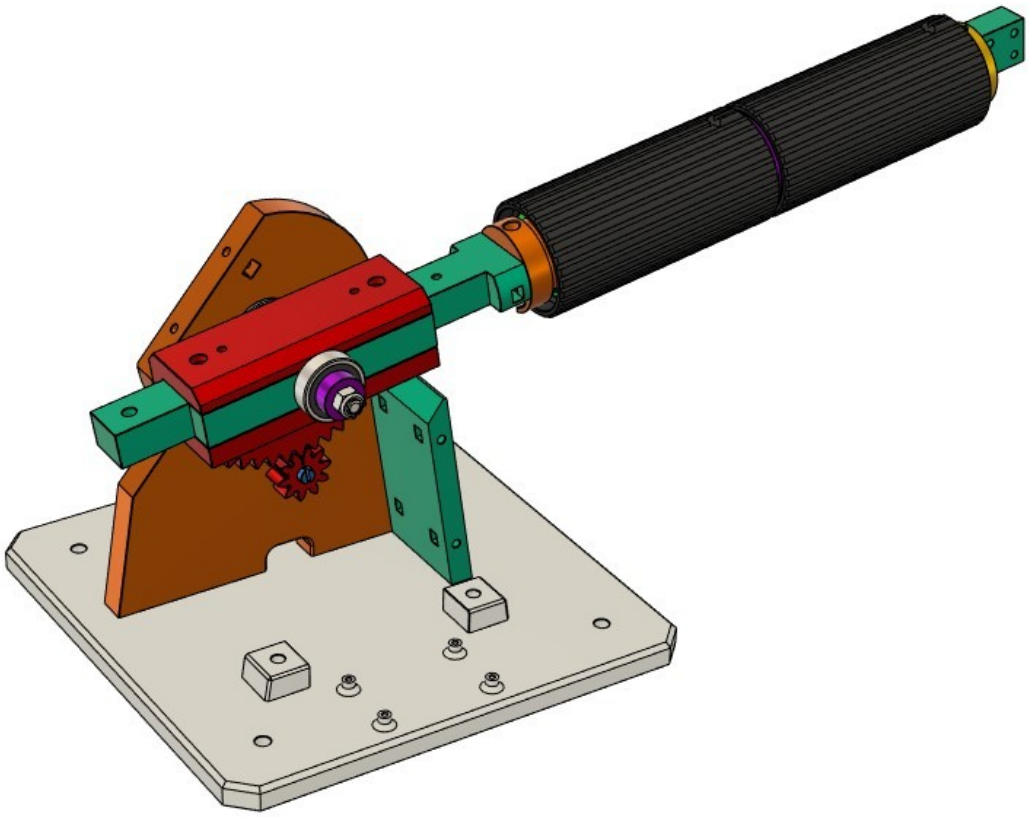
25. Mount the RED GEAR BIG on the TURQUOISE HANDLE BACK and use 2x M3x30mm screws and 2x M3 lock nuts from below
26. Assemble M6x80mm with 2x PURPLE SPACER, BLUE SPACER and 2x 6000 ball bearings
27. Put the M6 lock nut and tighten everything



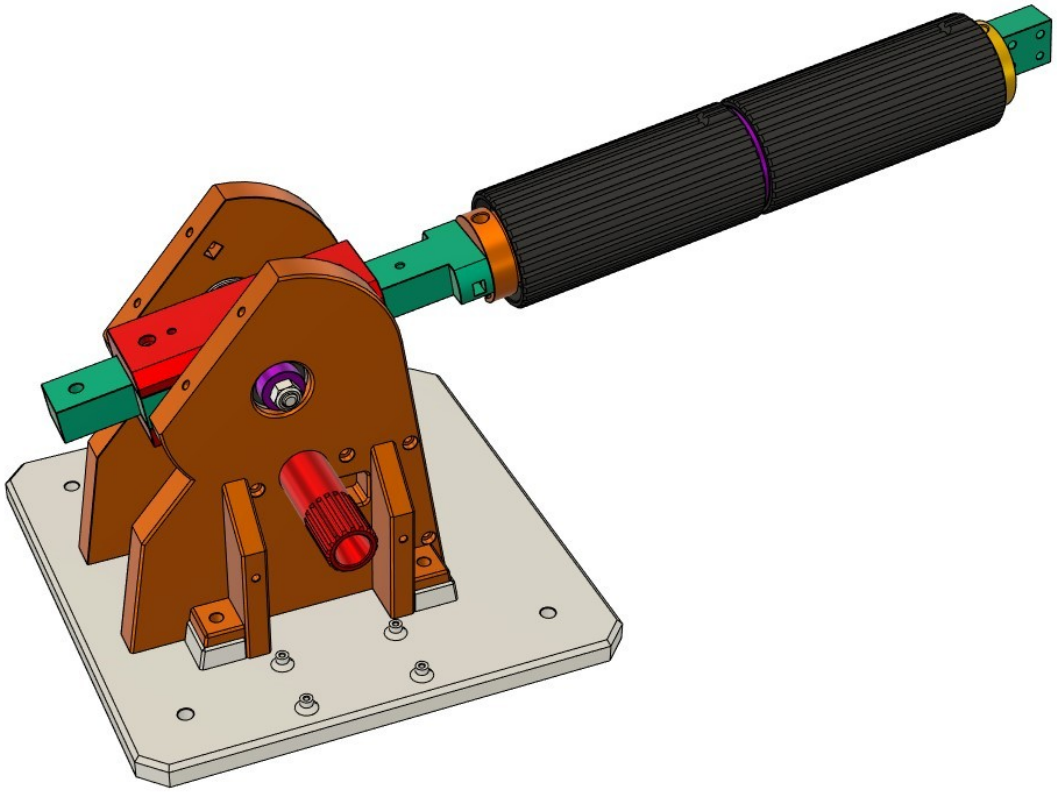




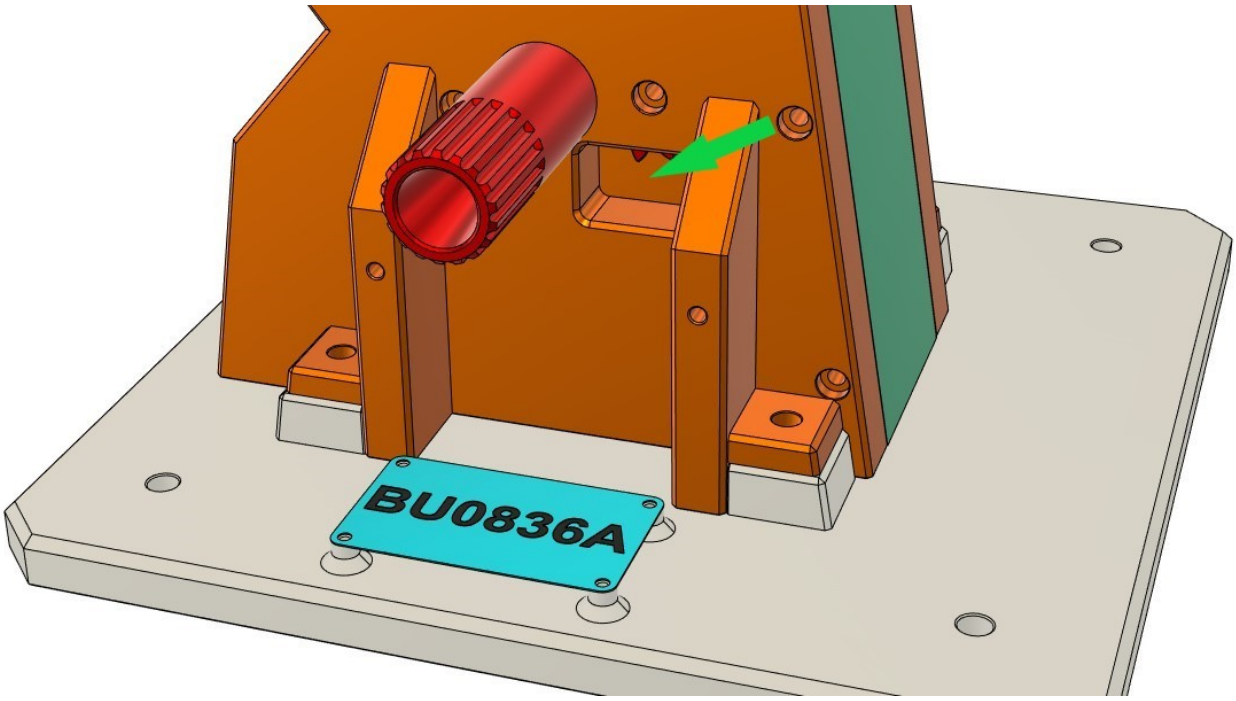
28. Put the handle on previously assembled BASE and the LEFT part



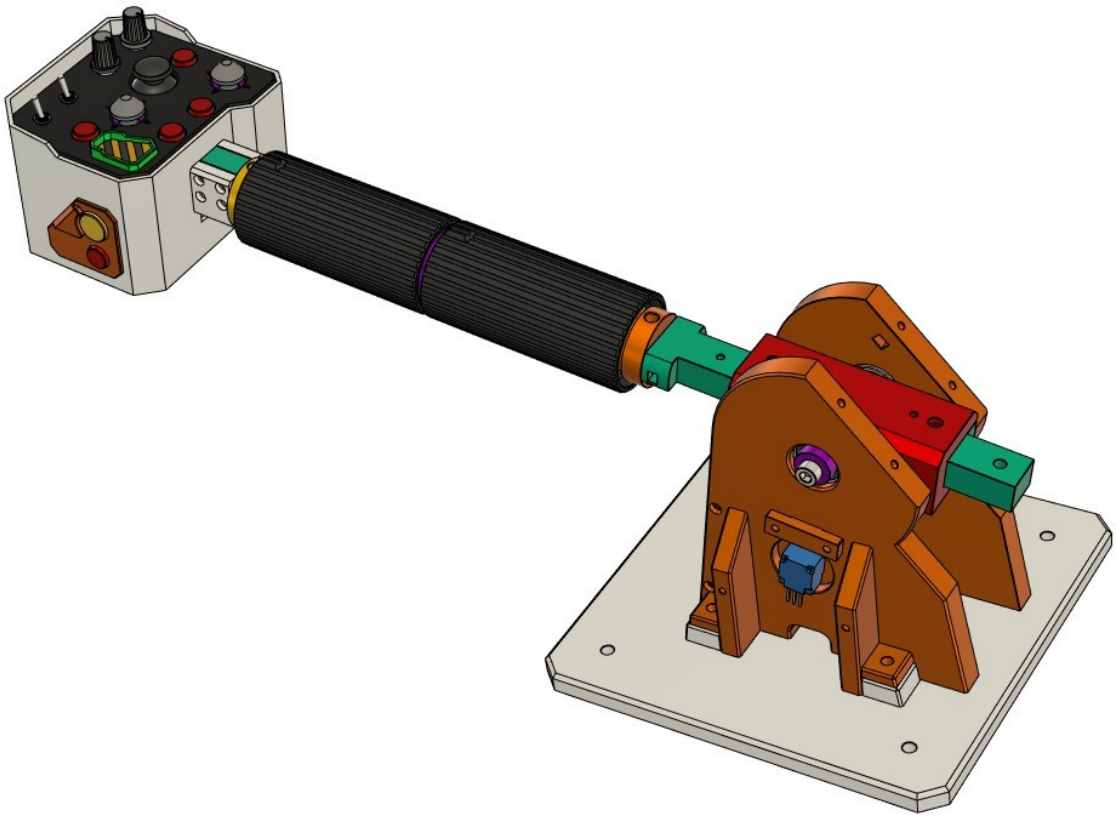
29. Now mount previously assembled RIGHT part and again use 2x M5x25mm screws for the WHITE BASE and 2x M3x25mm for the TURQUOISE MAIN FRONT



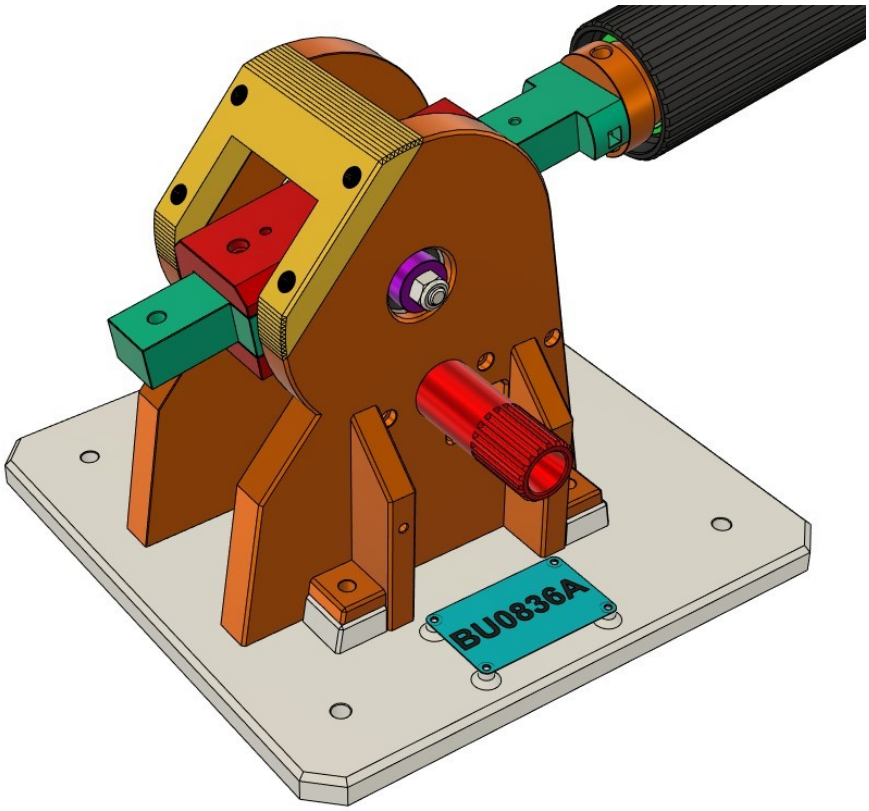
30. Mount the joystick board and manage 2x 10 pin cables and the 3 cables from the left side potentiometer through the hole shown with the green arrow.



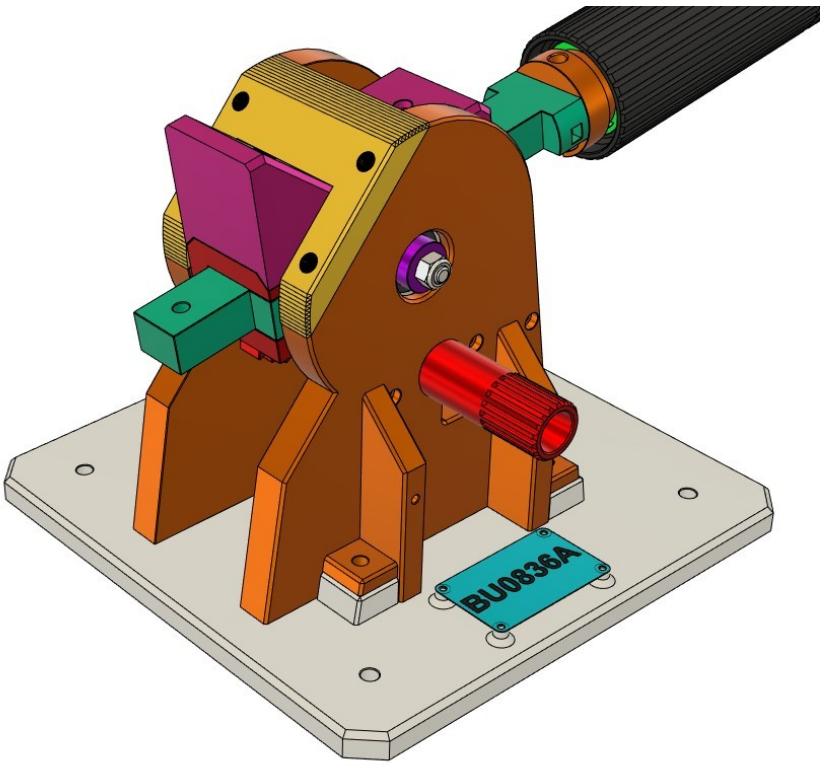
31. Mount the HEAD with 4x M3x25mm screws and 4x M3 lock nuts
32. Connect all wires to 2x 10 pin cables and make notes for each cable



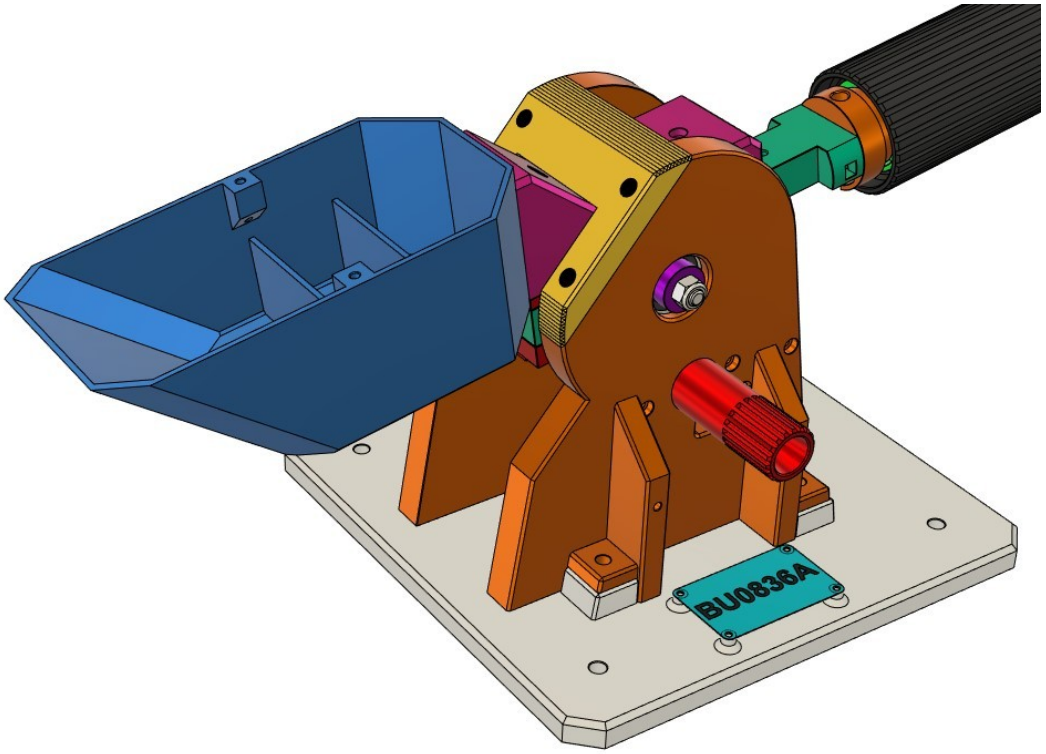
33. Mount the YELLOW MAIN TOP and use 4x M3x20mm screws



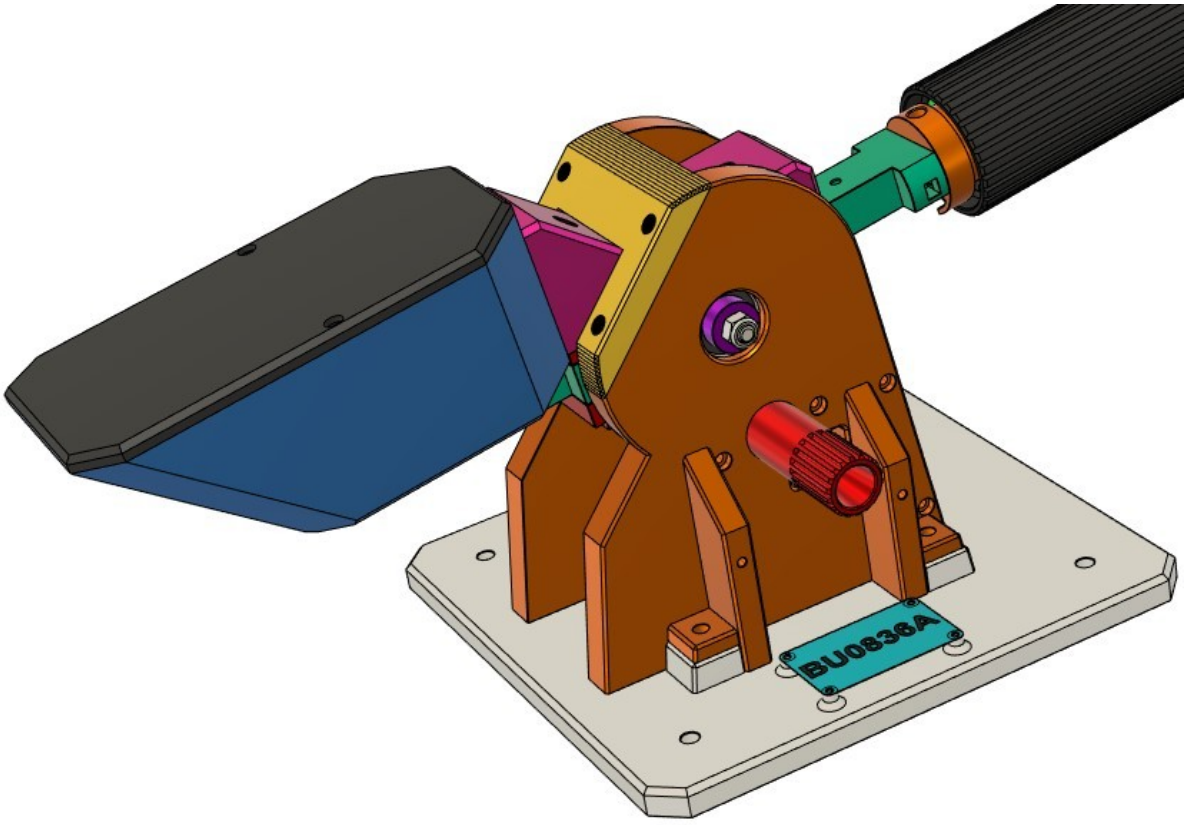
34. Mount the pink PINK TOP COVER from behind and use 2x M3x20mm screws



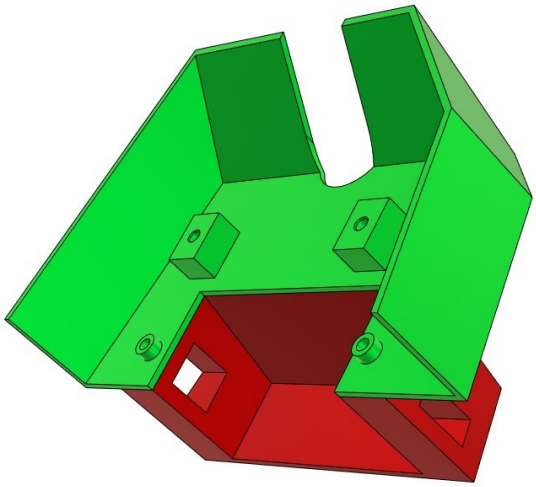
35. Mount the pink BLUE WEIGHT BOX and use M5x20mm screw and M5 Lock nut below
36. Fill the box with something heavy, like nails or nuts or screws.

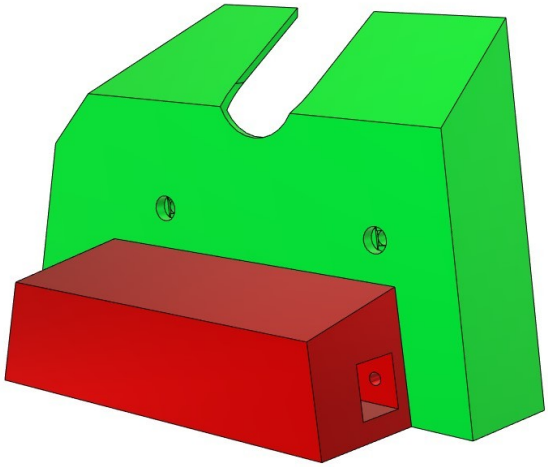


37. Close the box with the BLACK WEIGHT BOX COVER and use 2x M3x10mm screws

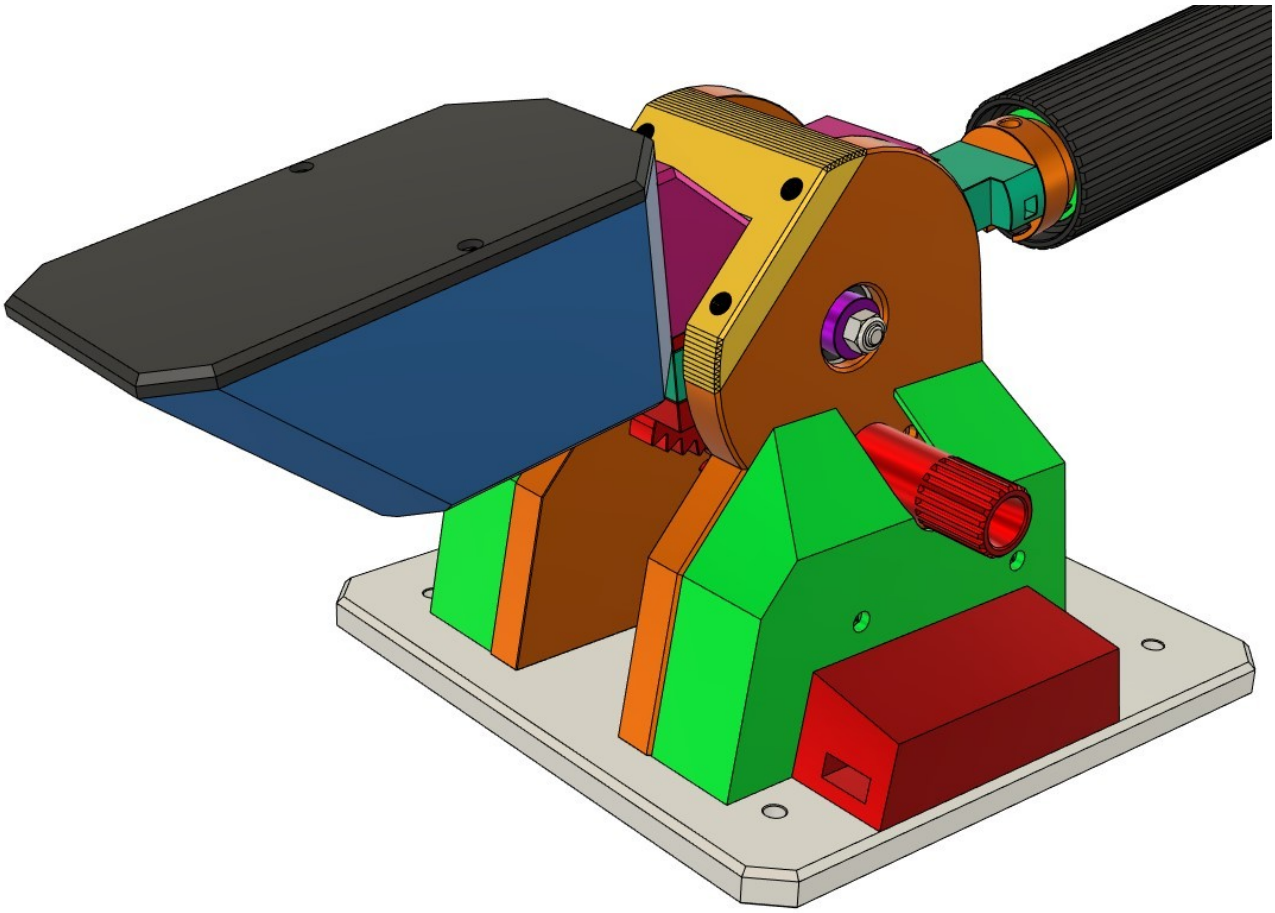


38. Mount the RED COVER on the GREEN COVER RIGHT with 2x M3x8mm screws



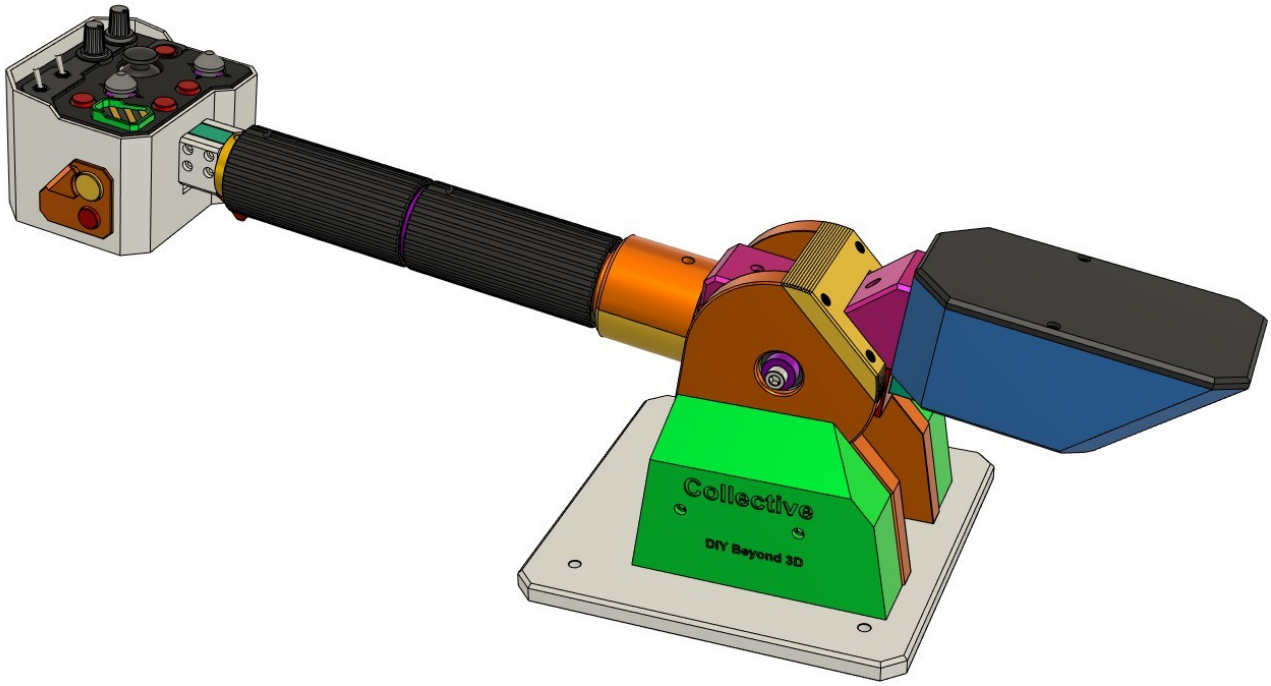


39. and mount both on the base, also the GREEN LEFT COVER with 4x M3x10mm screws



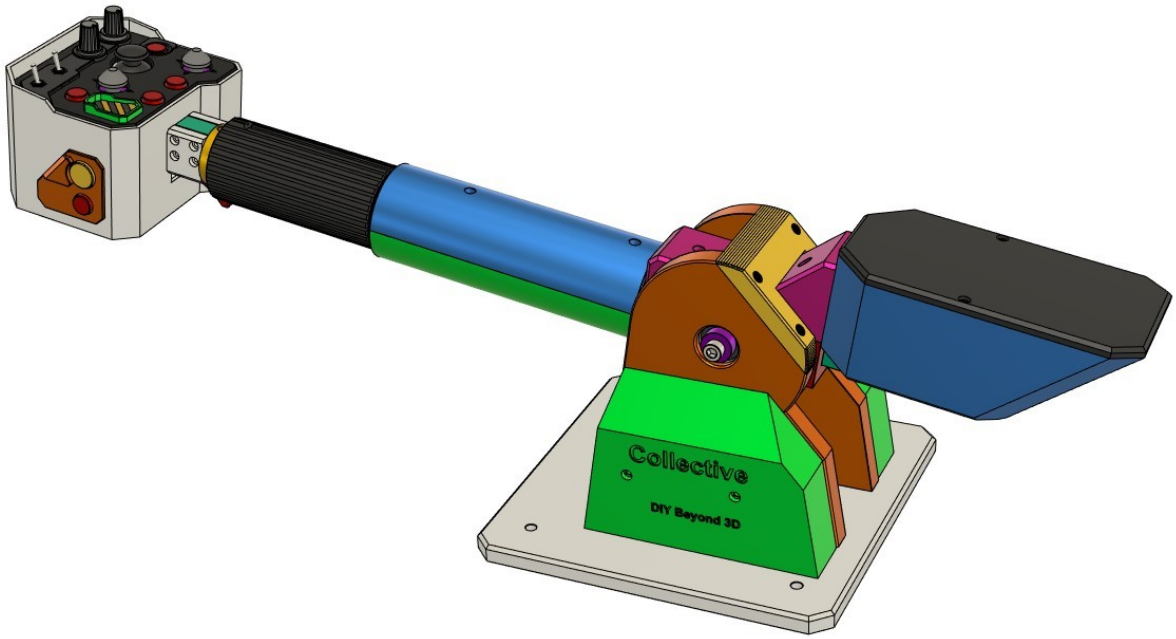
For dual throttles variant

40. Put on the ORANGE COVER TOP (D) and use M3x20mm to secure it
41. Snap fit the YELLOW COVER BOTTOM (D) on the ORANGE COVER TOP (D)

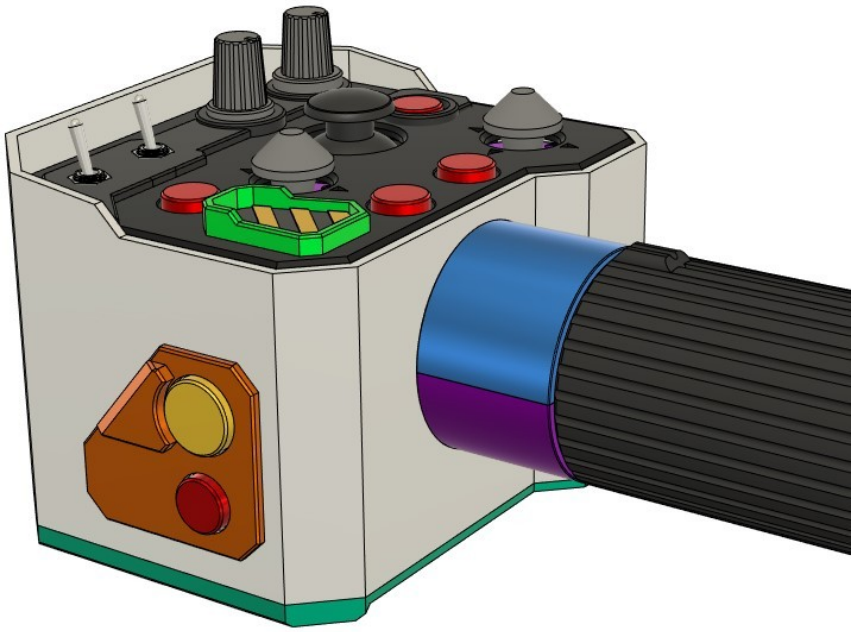
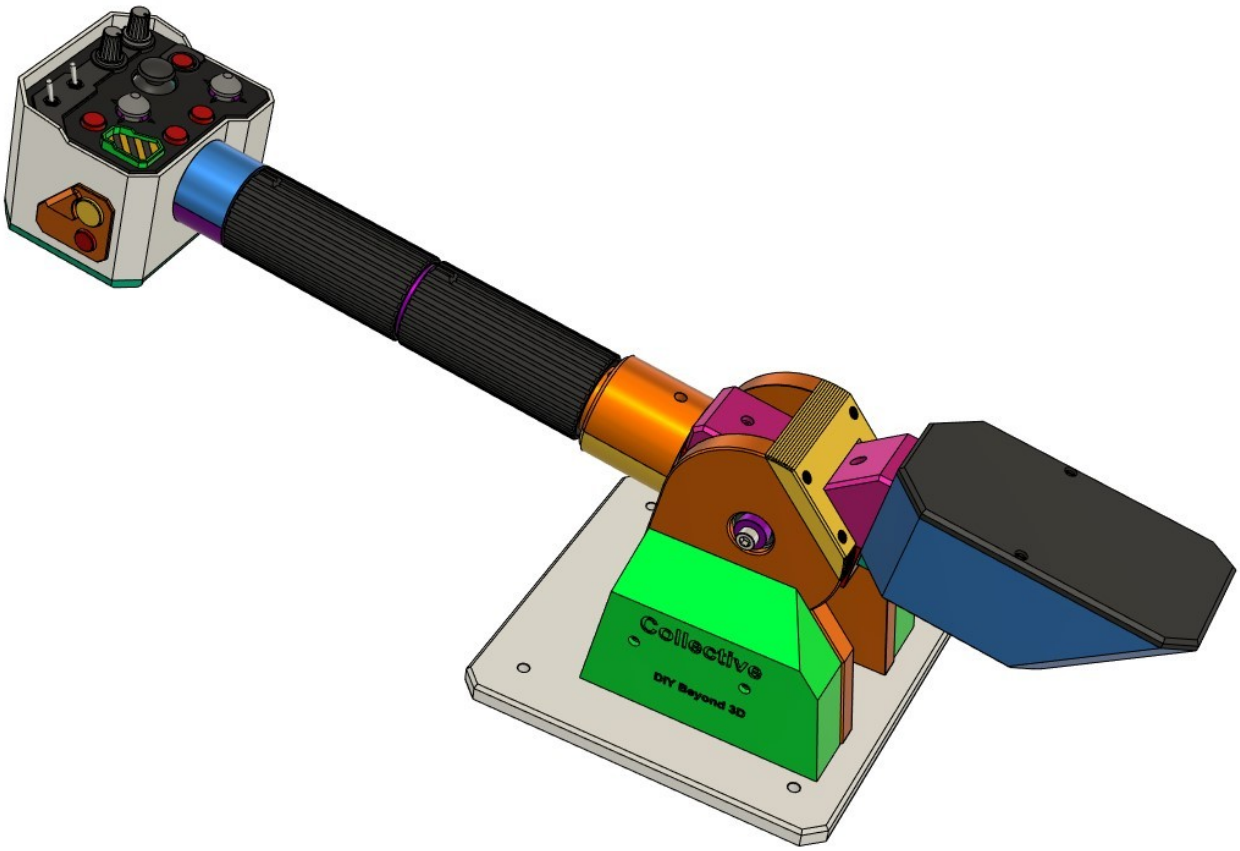


For single throttle variant

42. Put on the BLUE COVER TOP (S) and use 2x M3x20mm to secure it
43. Snap fit the GREEN COVER BOTTOM (S) on the BLUE COVER TOP (S)



44. Snap fit BLUE HANDLE COVER TOP first, then snap fit PURPLE HANDLE COVER BOTTOM
45. Mount the TURQUOISE COVER BOTTOM and use 2x M3x10mm screws



CONGRATULATIONS !!!