CyberBrick Animatronic Eyes Assembly Instructions

Part 3 - Mouth

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Welcome to part 3 of the Animatronic Eyes build; adding the Mouth section.

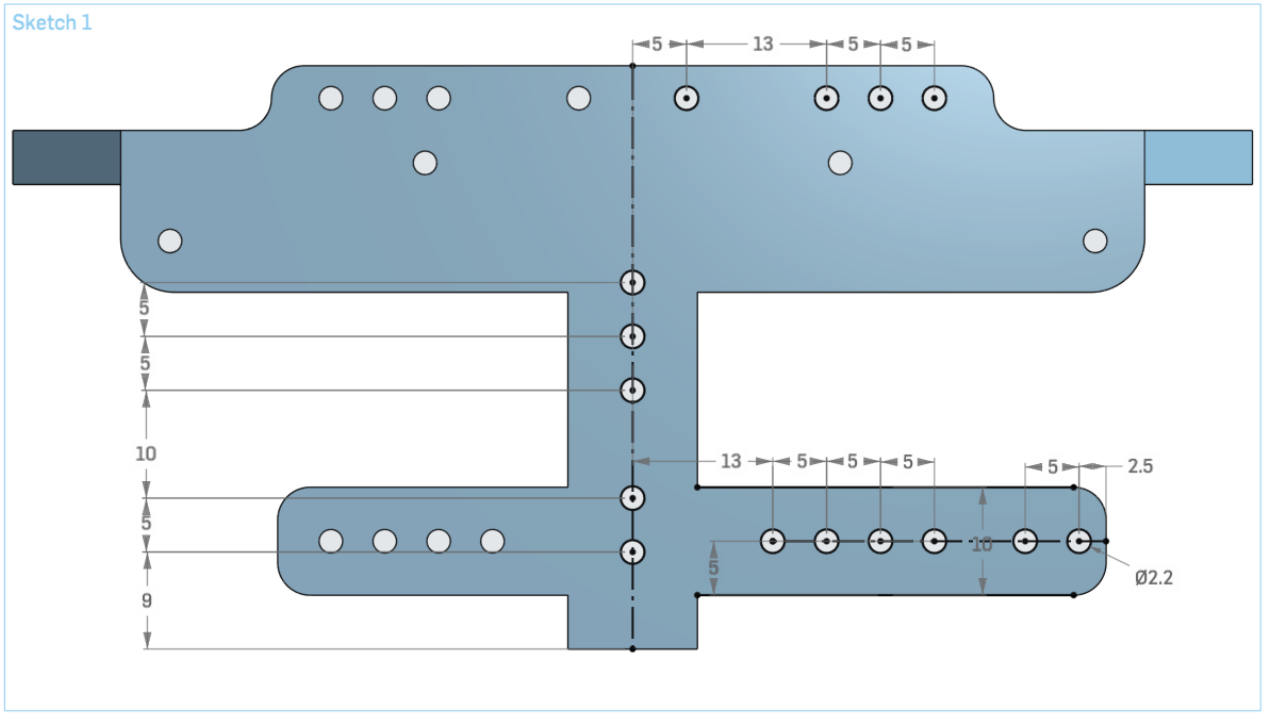
Of note –

- Part 1 can be found here: https://makerworld.com/en/models/1718839-cyberbrick-eyes-animatronic-mechanism#profileId-1824340
- Part 2 can be found here: https://makerworld.com/en/models/1766064-animatronic-eyes-pan-and-tilt#profileId-1879516
- I have used all the same components as parts 1&2, with the following changes:
    - I have designed a new main bracket with the mounting for the mouth and additional holes for future expansion.
    - If you are building the model from the start, then use the new main bracket from the start to save making changes later.
- Make sure the battery for the mechanism is fully charged. The pan and tilt mechanism is moving lots of other parts, and the servos become sluggish when the battery is low.
- This part adds a 3rd servo onto the 2nd receiver board. If not done already, details of adding the 2nd receiver and the required Y power cable are covered in part 2.
- The servo cables were starting to get messy and in danger of becoming trapped in the mechanism. I have used zip ties to shorten the wires, but make sure this is still sufficient length to allow for movement.
- There are 2 versions of the Jaws, with and without teeth. Choose which ever suits best.
- The new main bracket now has extra unused holes, and the dimensions are shown in the diagram below. The intention is for the bracket to be adapted as required for different models.
- These instructions are the same for the jaws with or without teeth.
- I would love feedback and comments; please message me via Makerworld @PurpleShark or at my website, www.purpleshark.uk

1. Required Tools (same as parts 1&2)

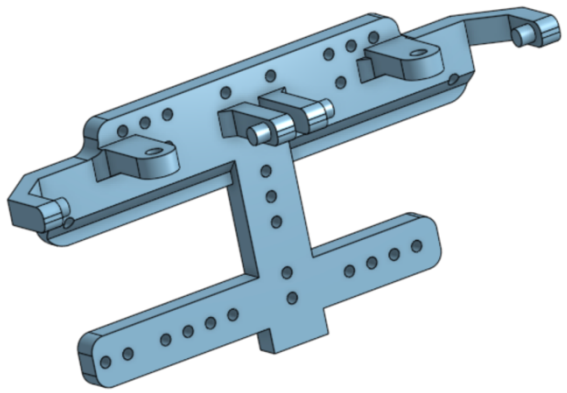
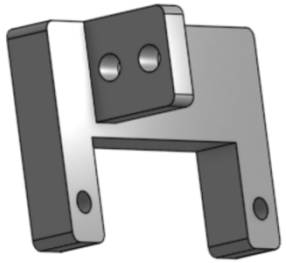
- Allen keys (hex wrenches):
  - 1.5mm
  - 2.0mm
- Spanner
  - 4.0mm
- Small screwdriver to fit the servo horns, Philips 0
- 2mm drill to enlarge the holes in the servo horns
- Tweezers
- De-burring tool or sharp knife

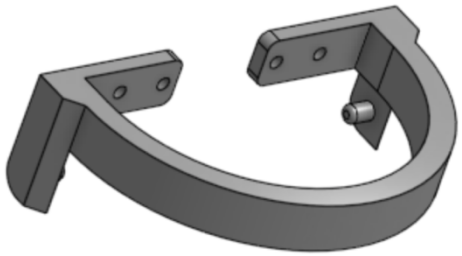
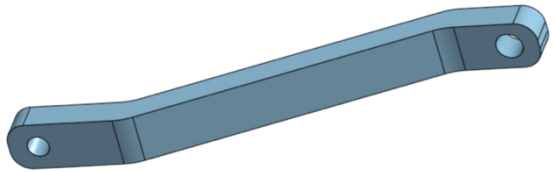
Sketch with dimensions of the main bracket

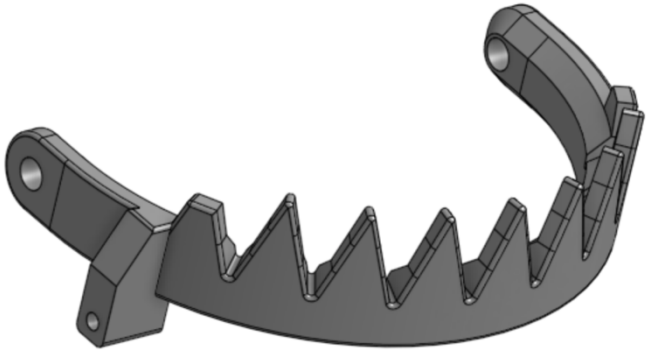
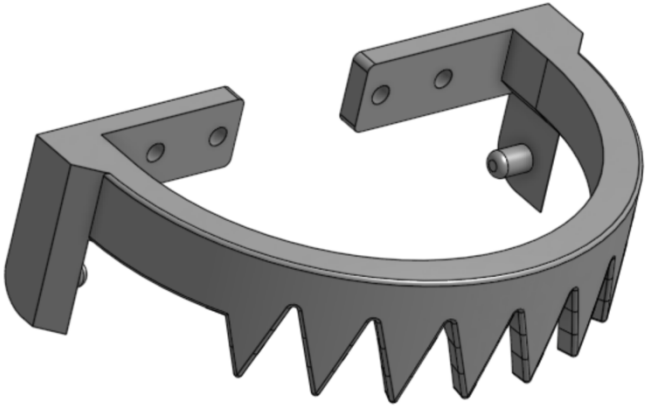


2. Bill Of Materials (additional to those used in part 2)

3D Printed Parts

Qty	Description	STL file name
1	Main Bracket v2 	Main bracket v2.stl
1	Jaws Servo Mount 	Jaws servo mount.stl

Qty	Description	STL file name
1	Bottom Jaw 	Bottom jaw plain.stl
1	Top Jaw 	Top jaw plain.stl
1	Jaws Connector 	Jaws connector bar.stl

Qty	Description	STL file name
1	Bottom Jaw Teeth 	Bottom jaw teeth.stl
1	Top Jaw Teeth 	Top jaw teath.stl

Hardware

I have noted all the parts additionally required for part 3 of the build. You will need to check which parts are needed in addition to those in the beginner kit and/or items already purchased.

Qty	Description	Notes
9	M2.5x6 machine screw	
1	Lubricant grease	
1	180° 9g servo motor with clutch protection	https://uk.store.bambulab.com/products/9g-servo-motor-with-clutch-protection?id=505284261155450883
1	M2x12 machine screw	https://uk.store.bambulab.com/products/m2-socket-head-cap-machine-screws-shcs?id=41630170742844
1	M2 nut	https://uk.store.bambulab.com/products/hex-nut?id=41692088860732
1	Small cable tie	

If parts 1&2 has already been built, then these are the same as already used, the only extra part is the additional servo.

3. Assembly details

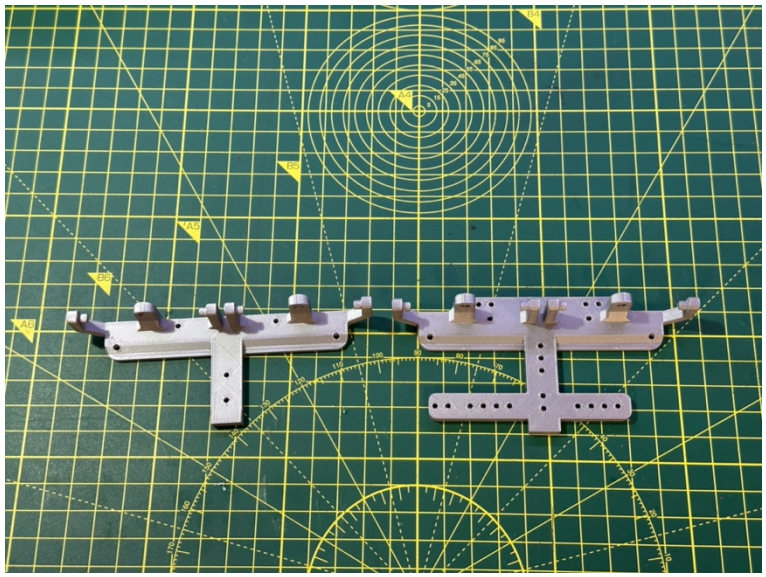
1. Obtain all the CyberBrick parts as listed above & print all the 3D plastic parts. PLA is fine for all items.

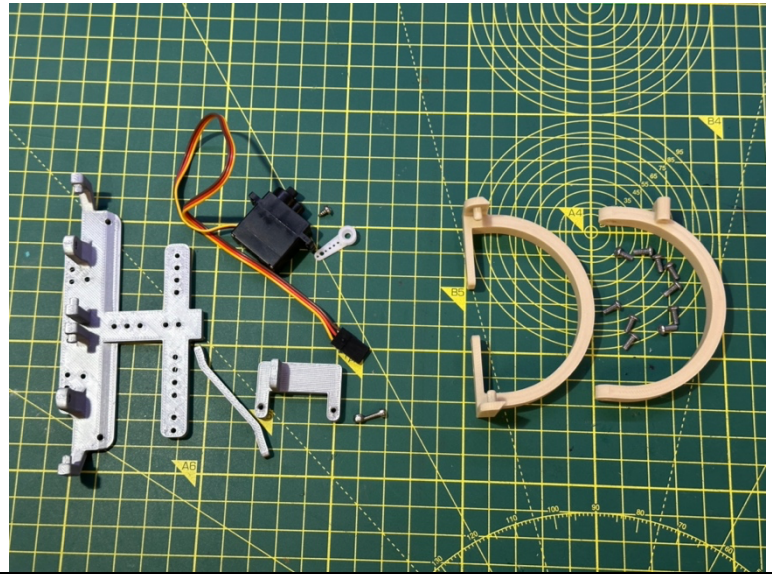
   It is assumed Part 1 & 2 has already been built and is working fine. If you have used the old smaller version of the main bracket, you will need to swap to the new version.

   Use the de-burring tool to remove any excess brim material. Make sure all the parts and holes are smooth.

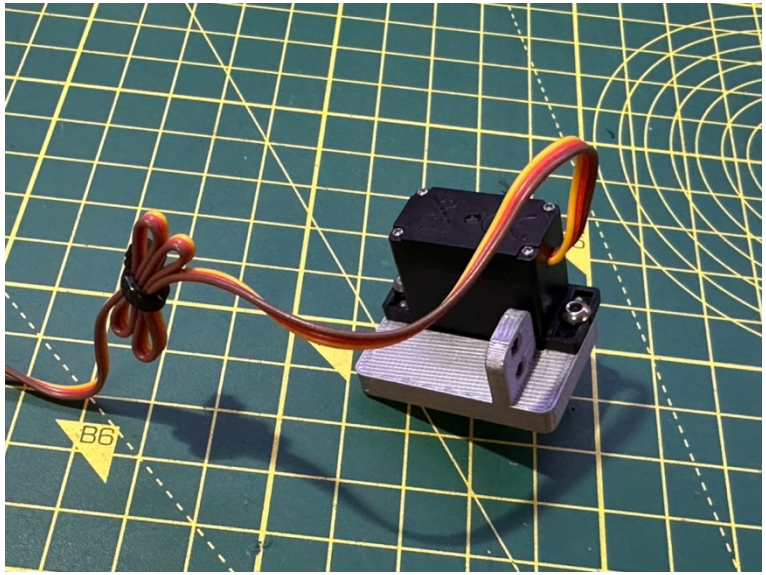
   Charge the rechargeable battery, ready for use later.

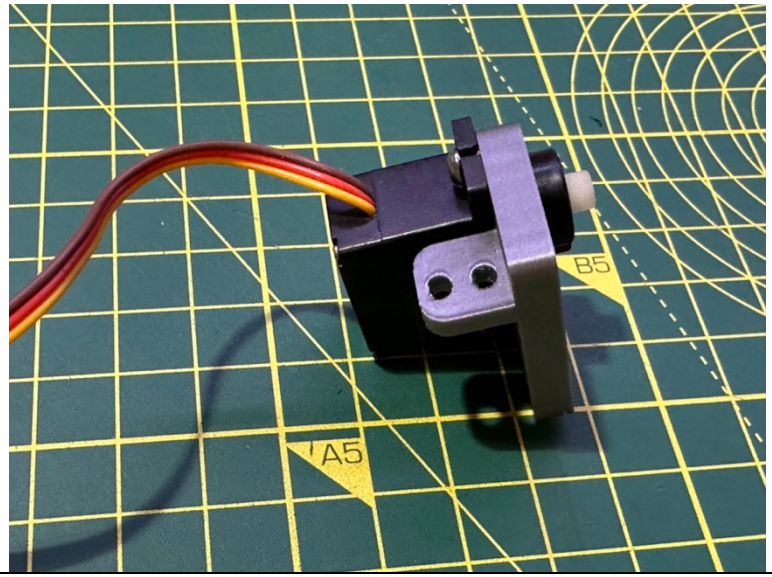
   Note: all screws are the CyberBrick M2.5 unless otherwise stated.

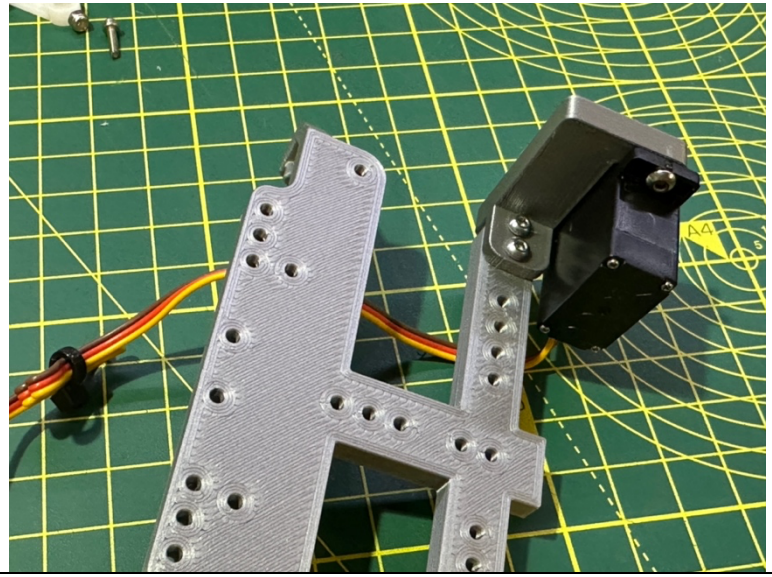
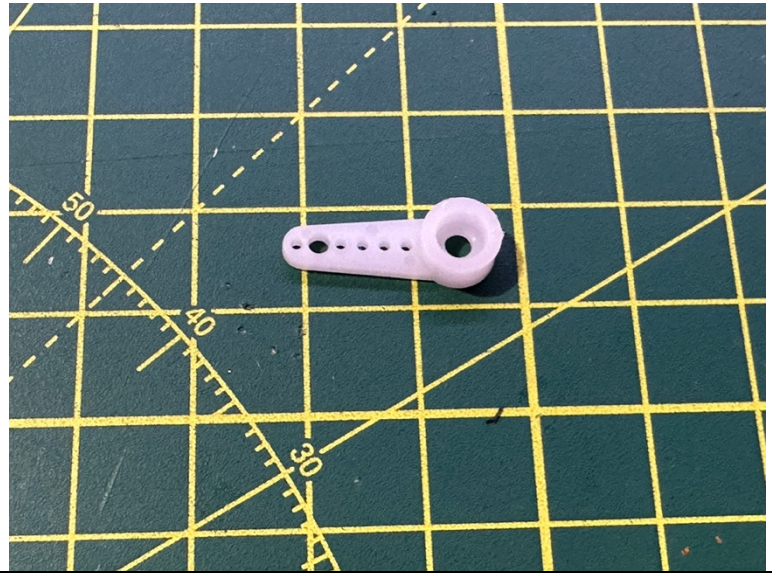


2. Collect all the required parts. Select either jaws with or without teeth	

3. Fix the servo onto the holder.

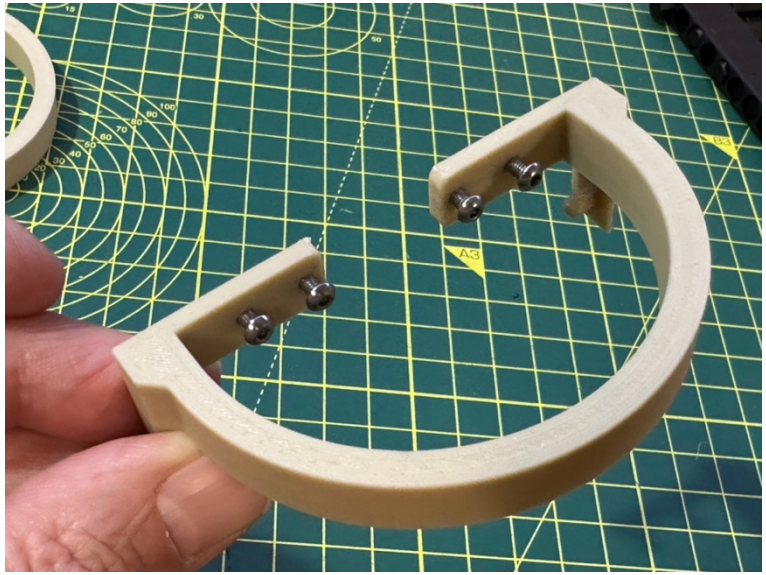


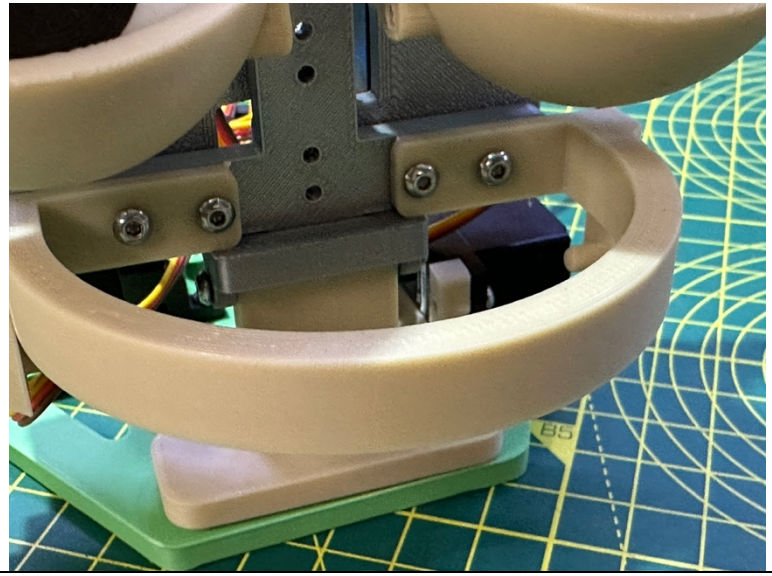


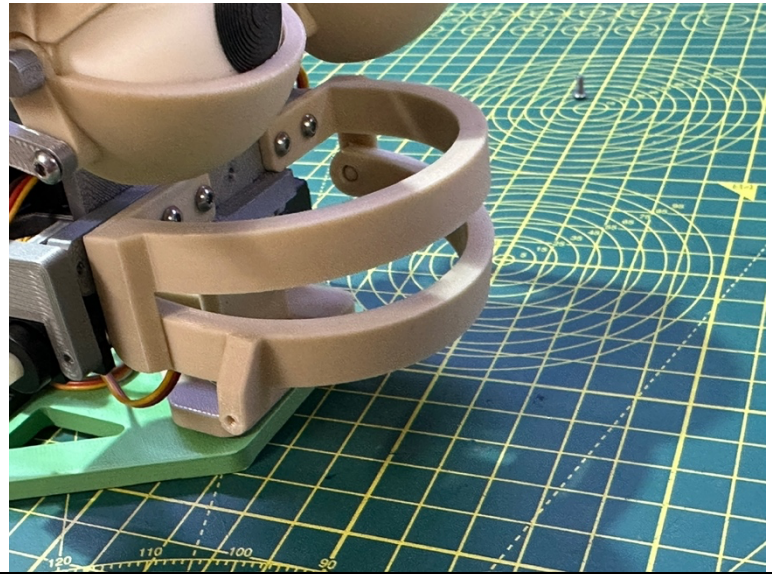
4. Fix the servo and holder onto the main bracket It is shown here without the eye mech in place. If the eye mech has already been assembled, then the servo can still be fitted into place using a long Allen Key. The eye mech and pan and tilt mech should now be built as per parts 1 & 2 if not already done.	
5. A 2mm hole will need to be drilled into the servo horn at the second position.	

6. The top jaw can then be fixed using 4 screws. These are a little fiddly and easier with a ball ended Allen Key.

   It is best to pre-start the 4 screws.





7. The bottom jaw is just clipped into place. A small amount of the grease can be applied.	
8. Fix the jaw connector bar to the bottom jaw through the larger hole and allow to move. Then attach the servo horn using the 2mm screw and nut through the smaller hole. A small amount of the grease can be applied.	

9. Download and install the new version of the CyberBrick configuration (see details below).

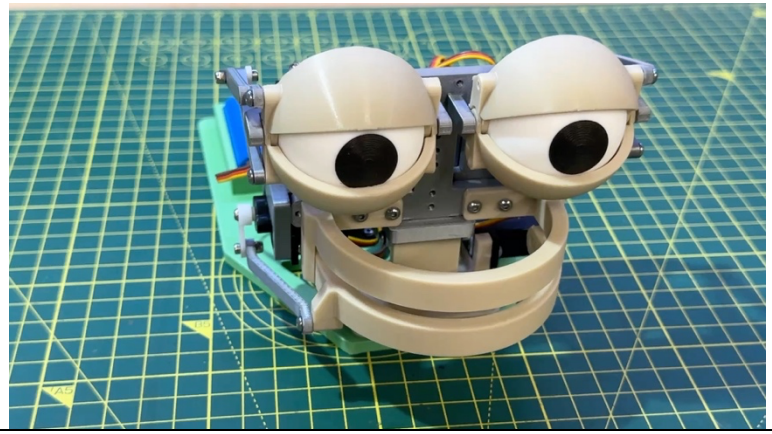
   Connect the new servo into the 3rd position on the second receiver as shown on the CyberBrick config. Press then release the left shoulder button a few times to allow the servo to find its mouth closed position.

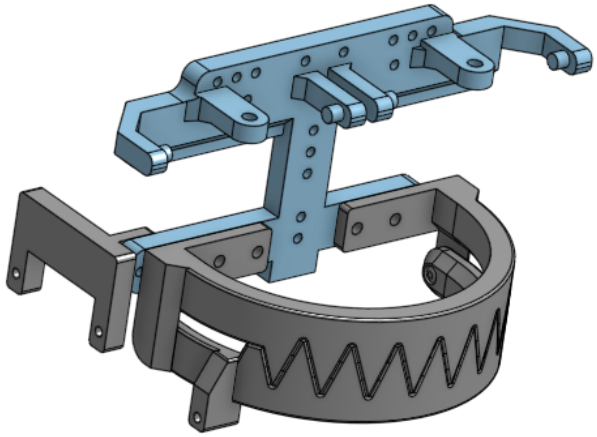
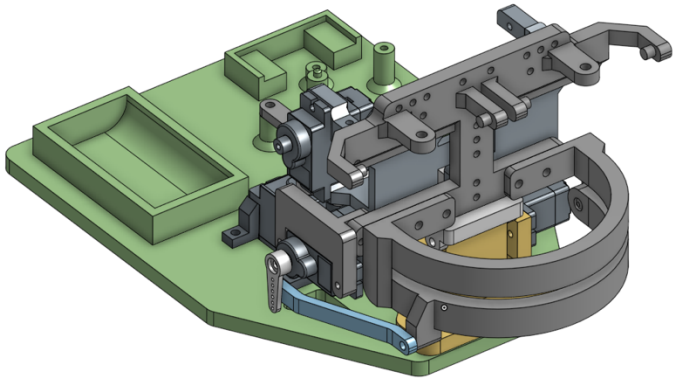
   The loosely place the servo horn onto the servo. When the button is pressed the mouth should open & close when released.

   When happy the servo horn is in the correct position, then fix into place with the small screw.

   Pass the servo wires under the cable holder and tidy the wires using a zip tie.

   Build Finished! ☺



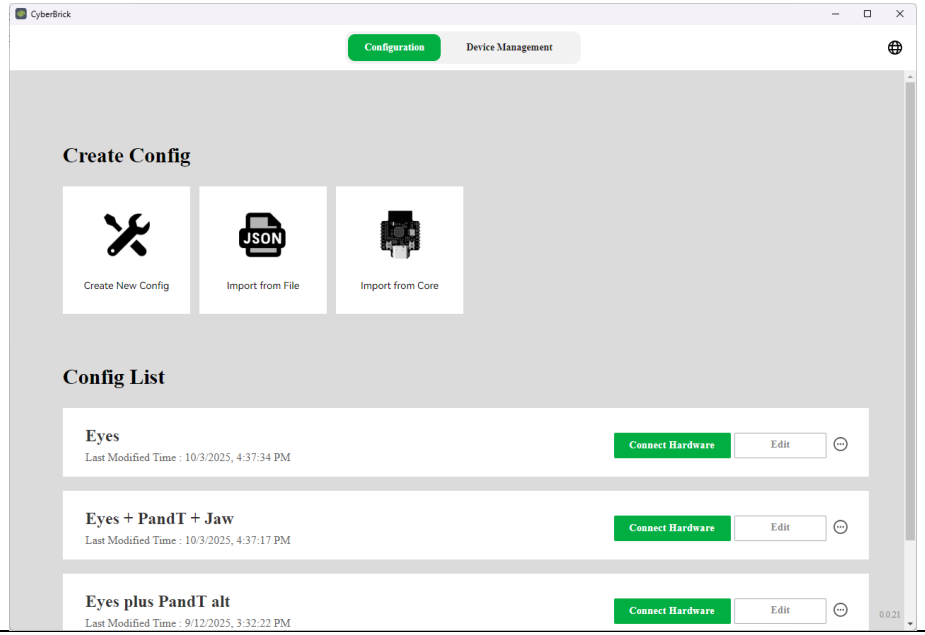
General assembly drawings to help with where bits go.	 

4. CyberBrick software setup

1. I'm (still) very new to CyberBricks, but these are notes from the part 3 setup. The rest is pretty much the same as parts 1&2, with just the addition of the servo for the jaws.

   Import the `Eyes+PandT+Jaw.json` config file. This also contains the part 1 eyes and part 2 Pan & Tilt config and can be used for either project.

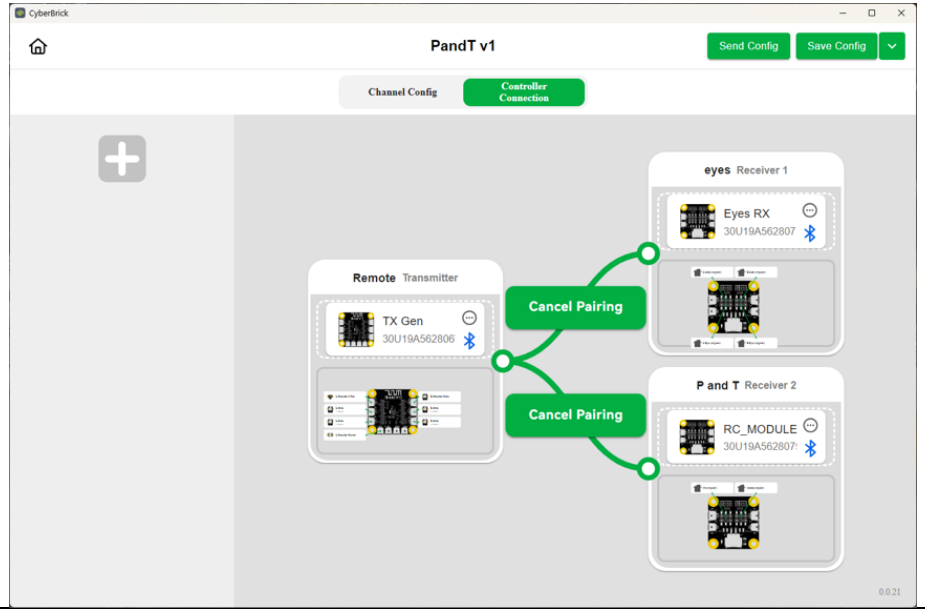
   Select the Connect Hardware button.



2. Power on and connect the modules as required (both receivers can work independently if required).

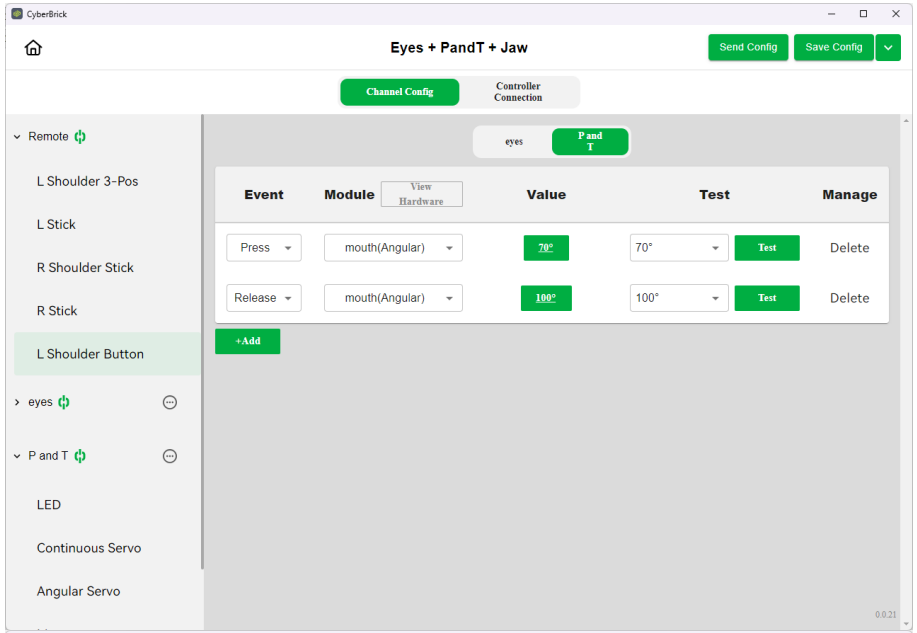
   Drag from the left side each of the modules as shown.

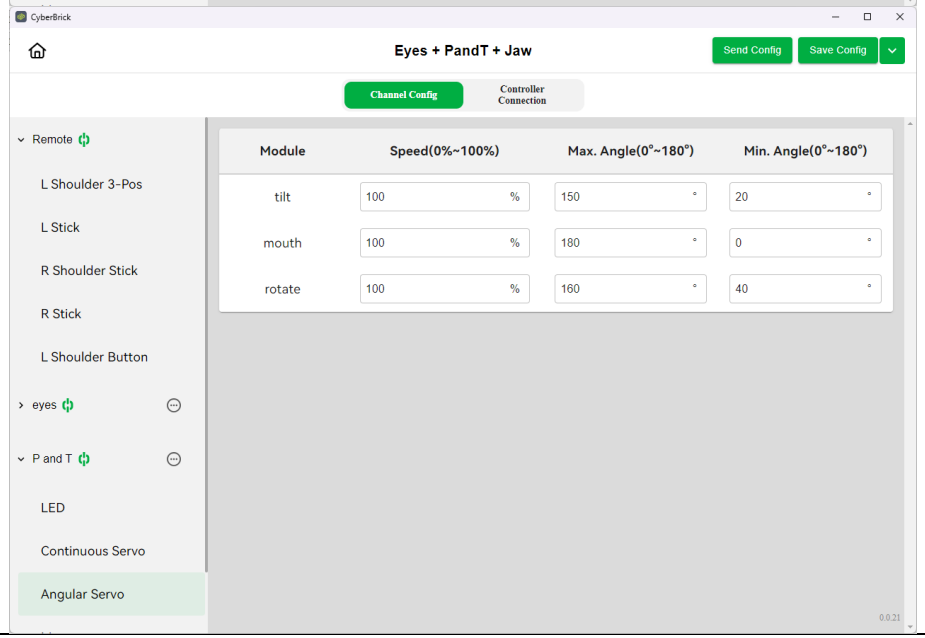
   Then pair the devices.



3. The left shoulder button is set to move the mouth as shown. To open the mouth more or less then adjust these settings

   The mouth servo settings are left at default.





4. Ther mouth servo is connected to the third position of the second receiver.