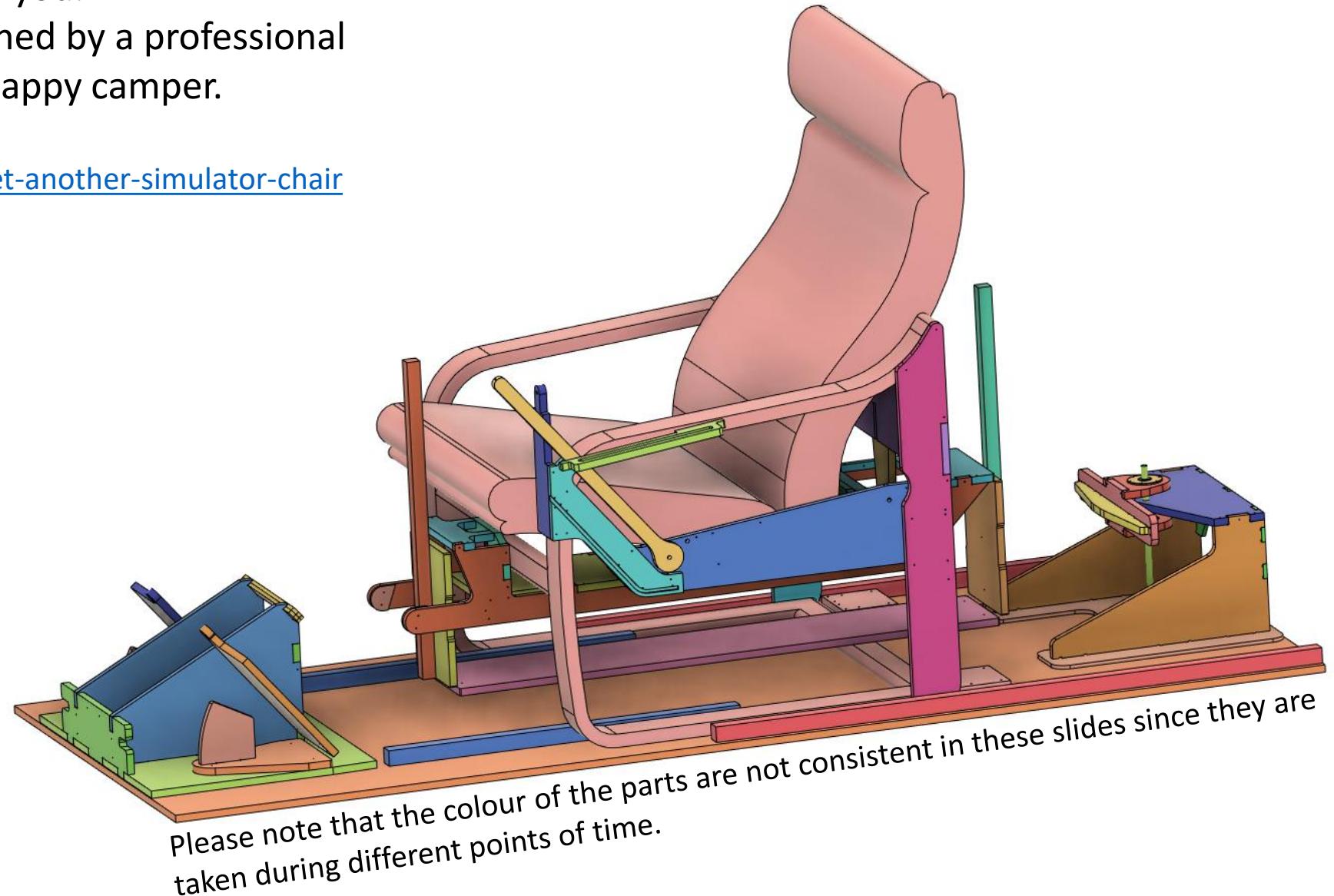


This document is intended to inspire how to assemble the Yet-another-simulator-chair. If you do it in any other manner, way or method it is not wrong. As long as it works for you.

Do note that this is not designed by a professional designer, it is designed by a happy camper.

<https://github.com/speedbird620/Yet-another-simulator-chair>



Please note that the colour of the parts are not consistent in these slides since they are taken during different points of time.

# Warnings



Pre-drill  
the hole!

Pre-drilling a hole is because the material may crack when a screw is applied.



Not too  
long!

Use of a too long screw may penetrate the plywood and poke hole in either floor, humans or animals.

These warnings may be applied to more places than indicated in this document.

Usage of your own judgement is mandatory.

# Design and information

This guide has been inspired by the instruction pamphlets from LEGO and IKEA.

However, it's very hard to mimic their instructions. But at least I tried.

Whenever you find an information gap, please let me know: [avionics@skyracer.net](mailto:avionics@skyracer.net)

The pieces are designed with these principles:

- Pieces only fit in one direction
- Or they are unidirectional

Name	Count	Sum = 12
A1	1	
A2	2	
A3	2	
A4	2	
A5	1	
A6	1	
A7	1	
A8	2	

Name	Count	Sum = 15
B1	2	
B2	1	
B3	2	
B4	1	
B5	1	
B6	2	
B7	1	
B8	2	
B9	2	
B10	1	

Name	Count	Sum = 5
C1	2	
C2	2	
C3	1	

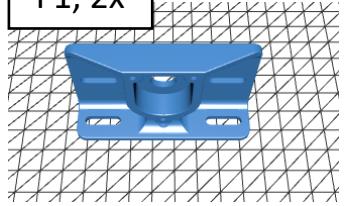
  

Name	Count	
D1	1	
D2	1	
D3	1	
D4	1	
D5	1	

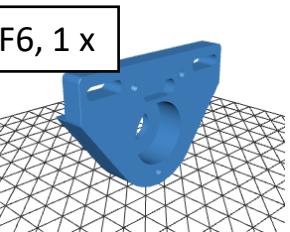
Name	Count	Sum = 15
E1	1	
E2	2	
E3	1	
E4	1	
E5	1	
E6	2	
E7	1	
E8	4	
E9	2	

Redesigned, will be  
3D-printed instead

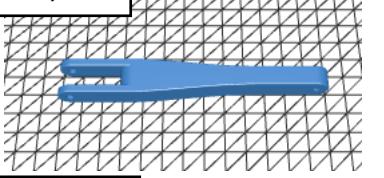
F1, 2x



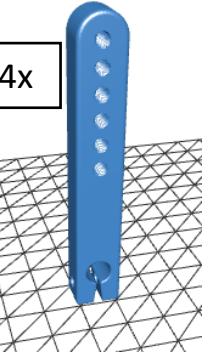
F6, 1 x



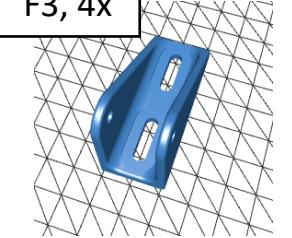
F2, 2x



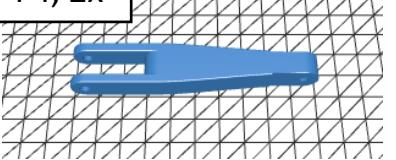
F7, 4x



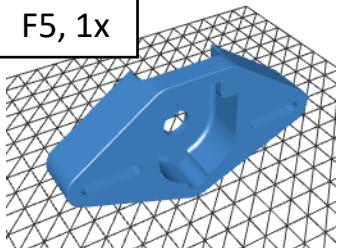
F3, 4x



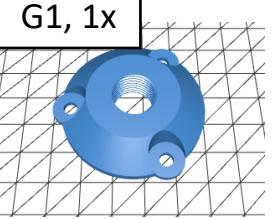
F4, 2x



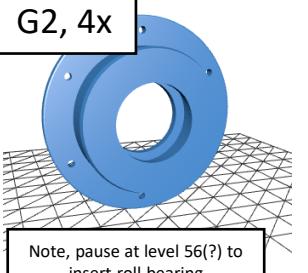
F5, 1x



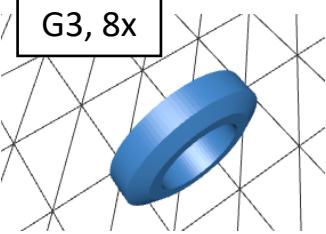
G1, 1x



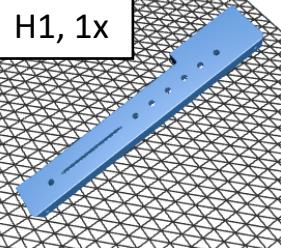
G2, 4x



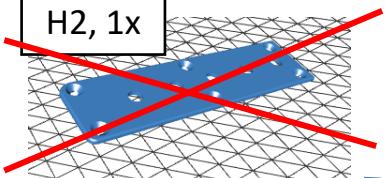
G3, 8x



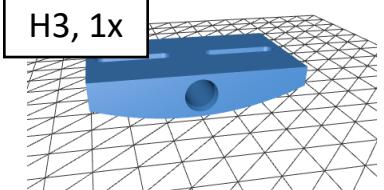
H1, 1x



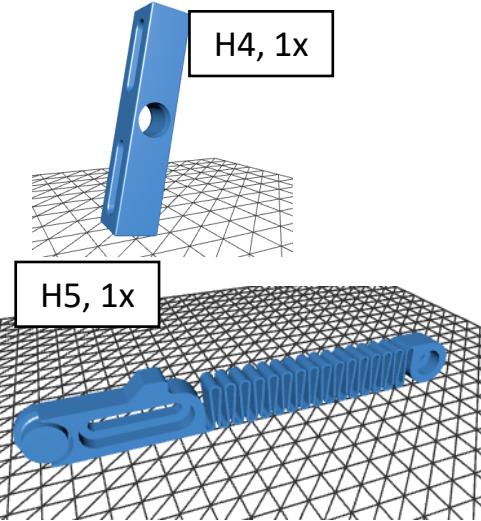
H2, 1x



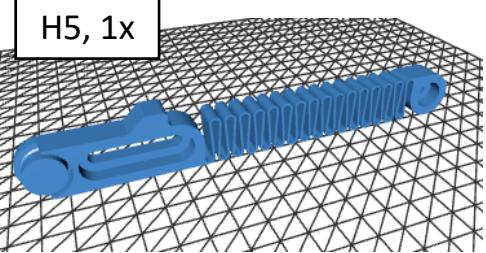
H3, 1x



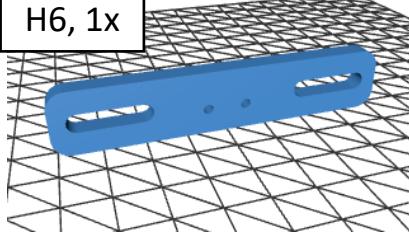
H4, 1x



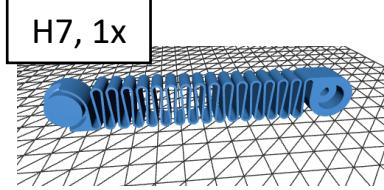
H5, 1x



H6, 1x



H7, 1x



Discontinued: H1, H2 and D4 is combined together into H1

# Step 1, preparations

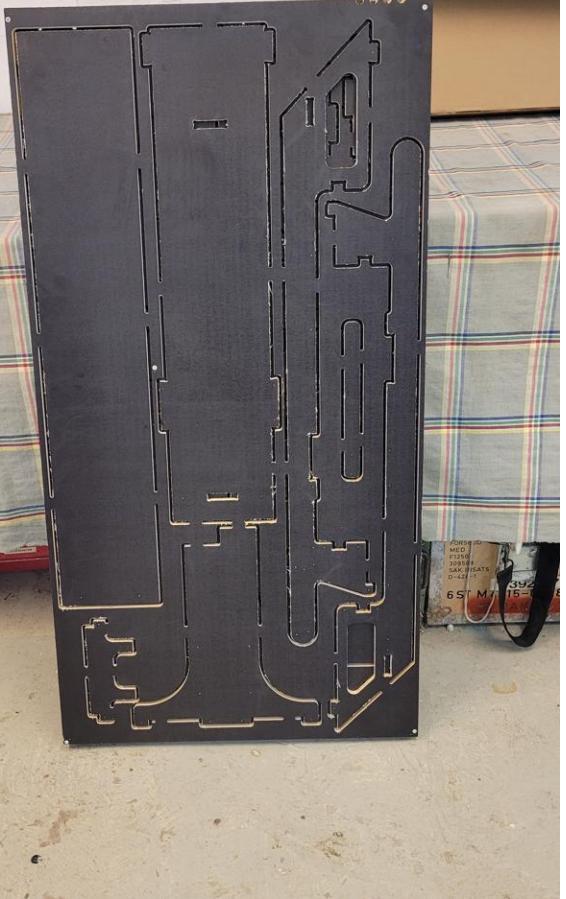
1. Plywood cutouts
  - a) Cut out plywood according to dxf-files on Github, or
  - b) Order a set of plywood cutouts\*
2. 3D-print outs
  - a) Print out the stl-files, or
  - b) Ask a friend to print out the stl-files
3. Get the stuff on the hardware store BOM-list (Bill Of Material)
4. Get the stuff on the electronics BOM-list (Bill Of Material)
5. Order PCB's for Arduino Leonardo\* or get a equivalent adapter board
6. Gather the tools, a few good friends and start the build
7. Afterwards, have a look at the build inspiration PDF Github

\*avionics@skyracer.net

# Tools

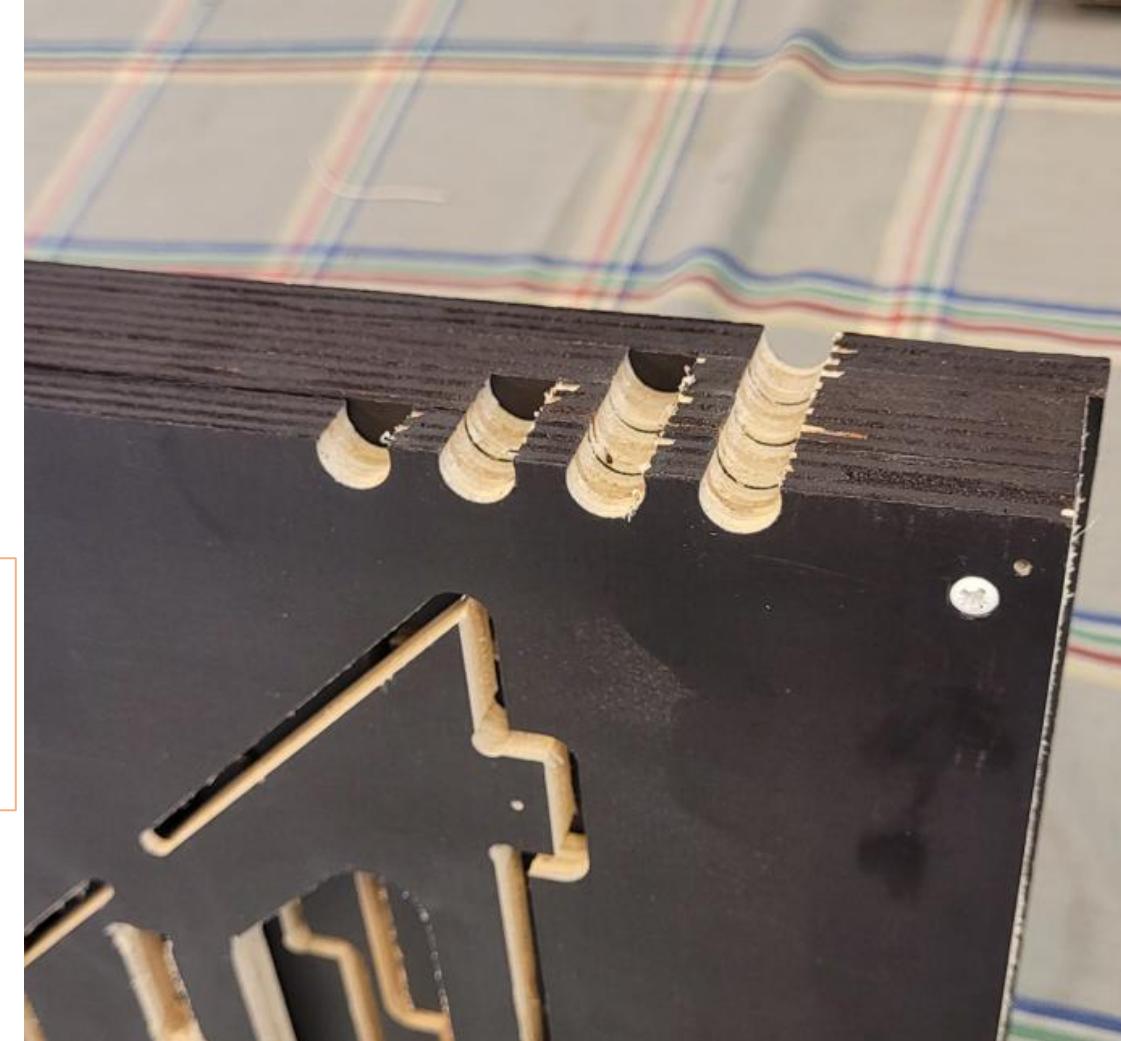
An incomplete list:

- Jigsaw
- Electric drill
- Most kind of manual screw drivers
- Drill bits:
  - T10
  - PZ1, PZ2
  - PH1, PH2
- Ferrule crimp tool
- Wire cutter
- Drills:
  - 2 mm
  - 4 mm
  - 6.5 mm
  - 10 mm
- M4 thread tap
- Wood file
- Ear protection



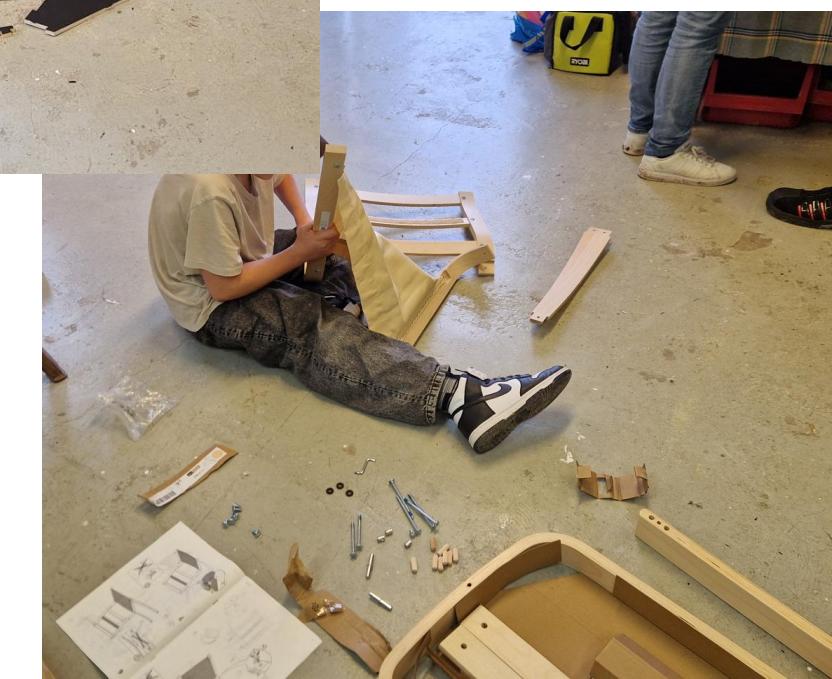
The cutouts consists of  
4 plywood boards  
(1200 x 620 x 12 mm)  
screwed together.

Each plywood board  
has a different number  
of semi circles in order  
to identify the boards.



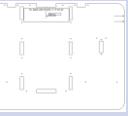


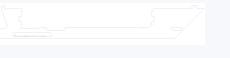
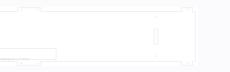
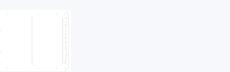
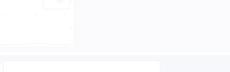
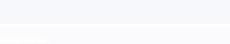
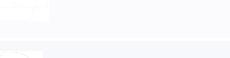
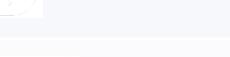
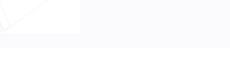
5 screws from each side. 10 in total placed in the corners and in the middle.



# Step 2, front pedals

...

Name	Count	Sum = 12
A1	1	
A2	2	
A3	2	
A4	2	
A5	1	
A6	1	
A7	1	
A8	2	

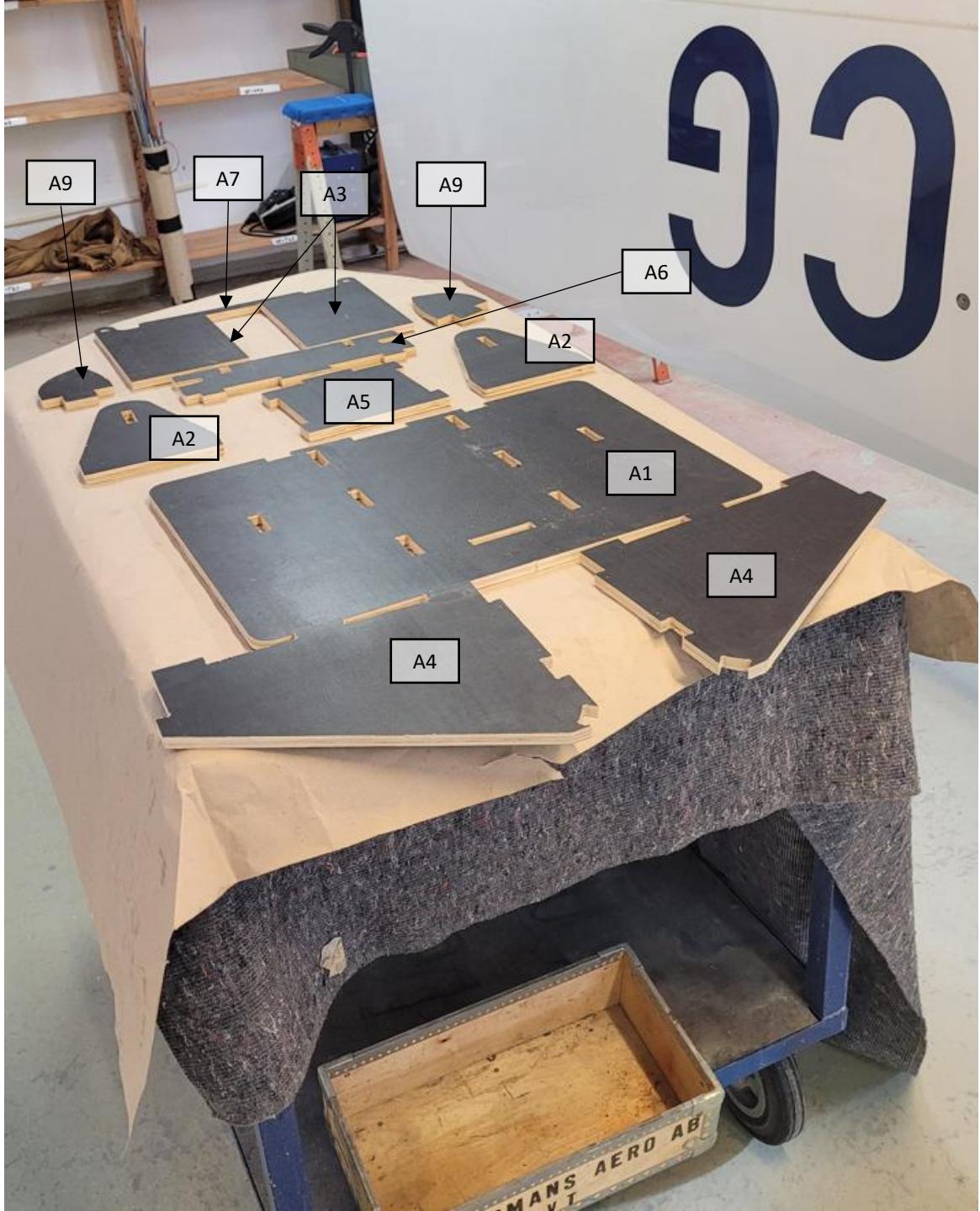
Name	Count	Sum = 15
B1	2	
B2	1	
B3	2	
B4	1	
B5	1	
B6	2	
B7	1	
B8	2	
B9	2	
B10	1	

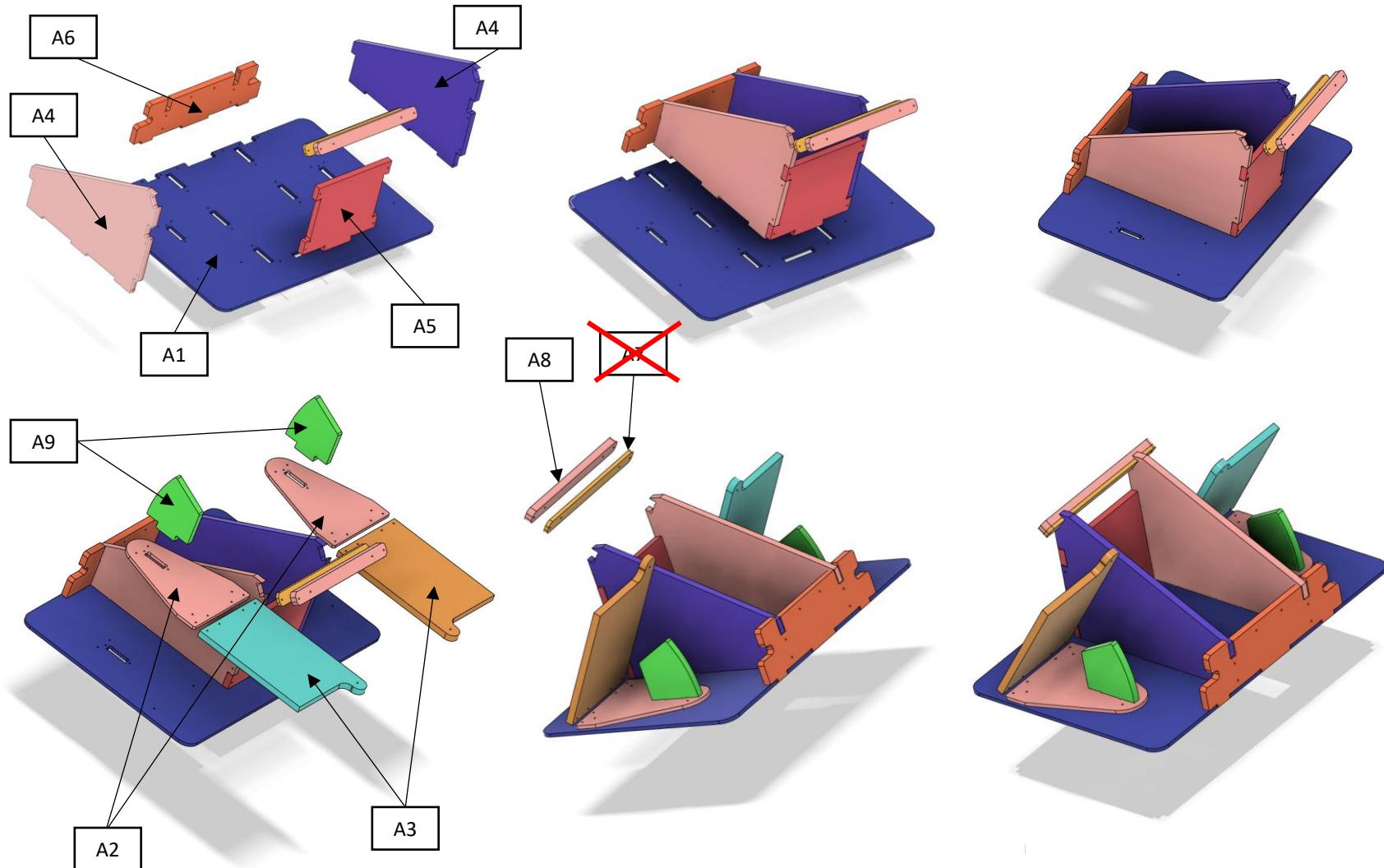
Name	Count	Sum = 5
C1	2	
C2	2	
C3	1	
Name	Count	
D1	1	
D2	1	
D3	1	
D4	1	
D5	1	

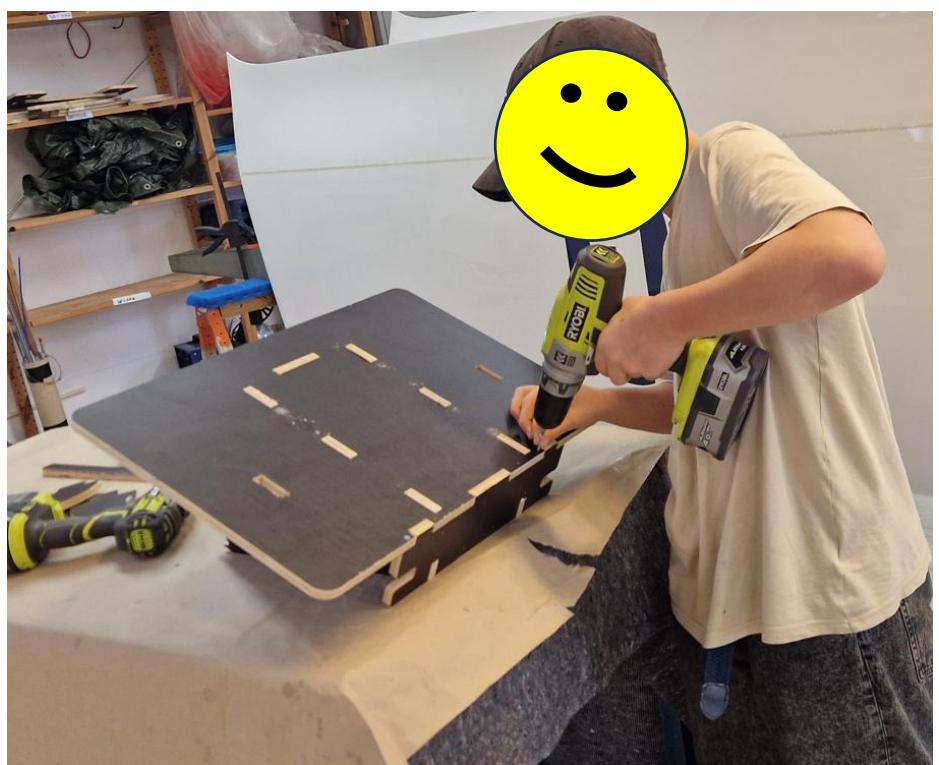
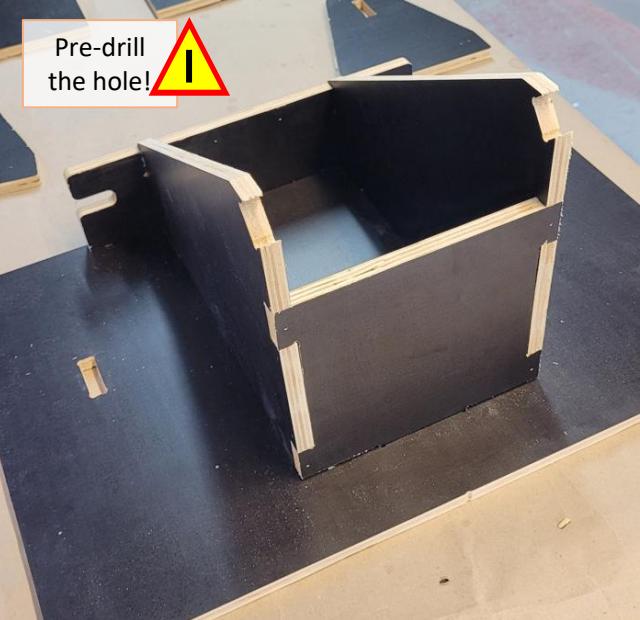
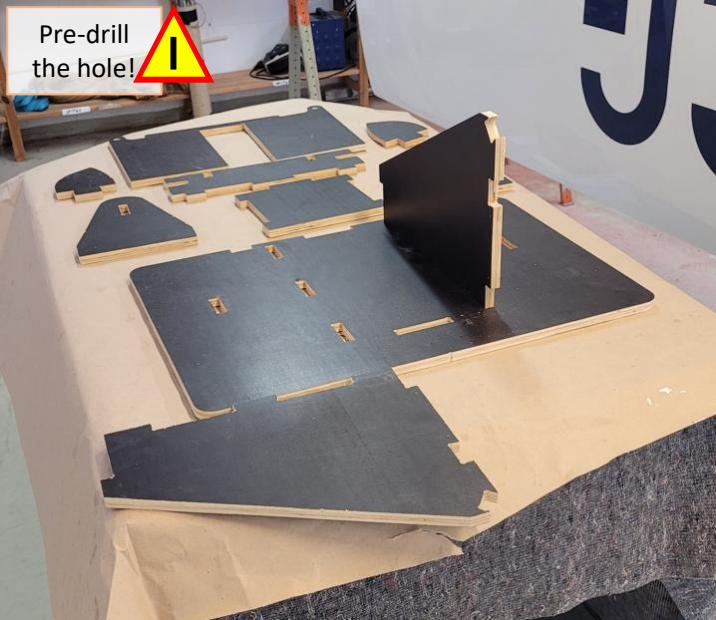
Name	Count	Sum = 15
E1	1	
E2	2	
E3	1	
E4	1	
E5	1	
E6	2	
E7	1	
E8	4	
E9	2	

Redesigned, will be  
3D-printed instead



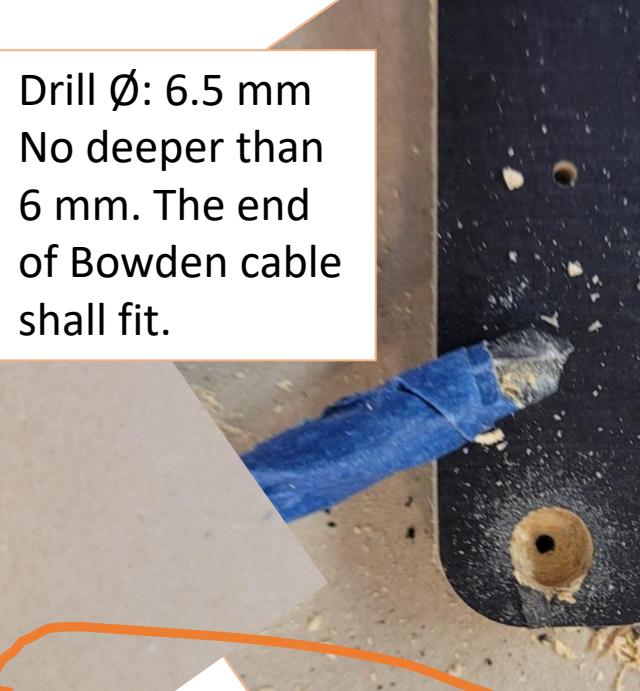




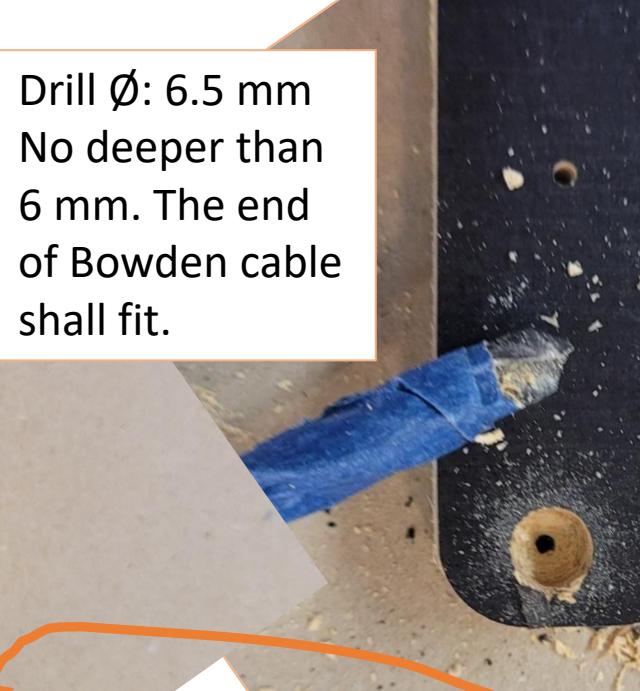




Note: the supplied screws are too long. Use other screws or shorten them by sanding the tip.



Drill Ø: 6.5 mm  
No deeper than 6 mm. The end of Bowden cable shall fit.

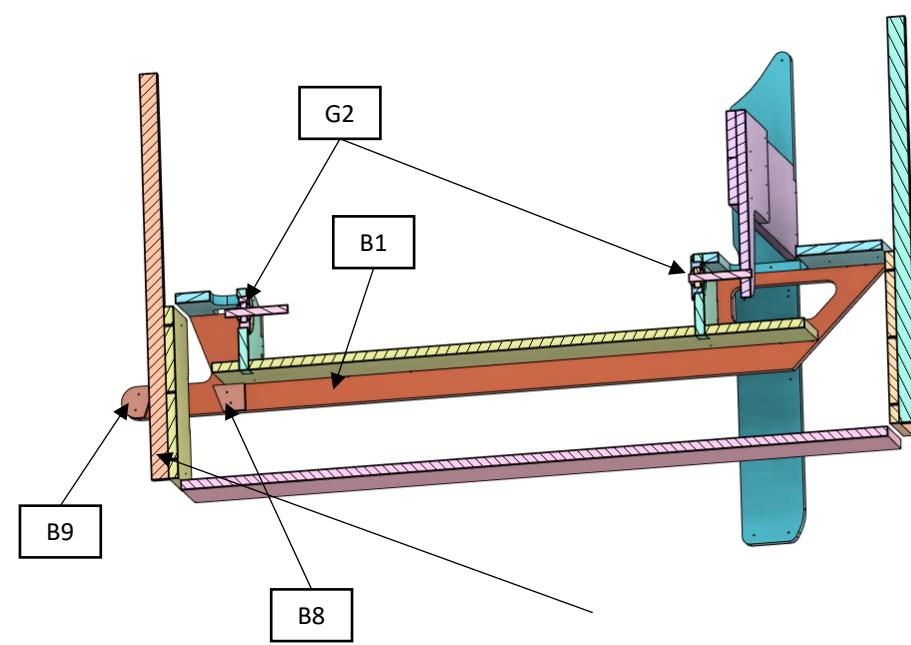
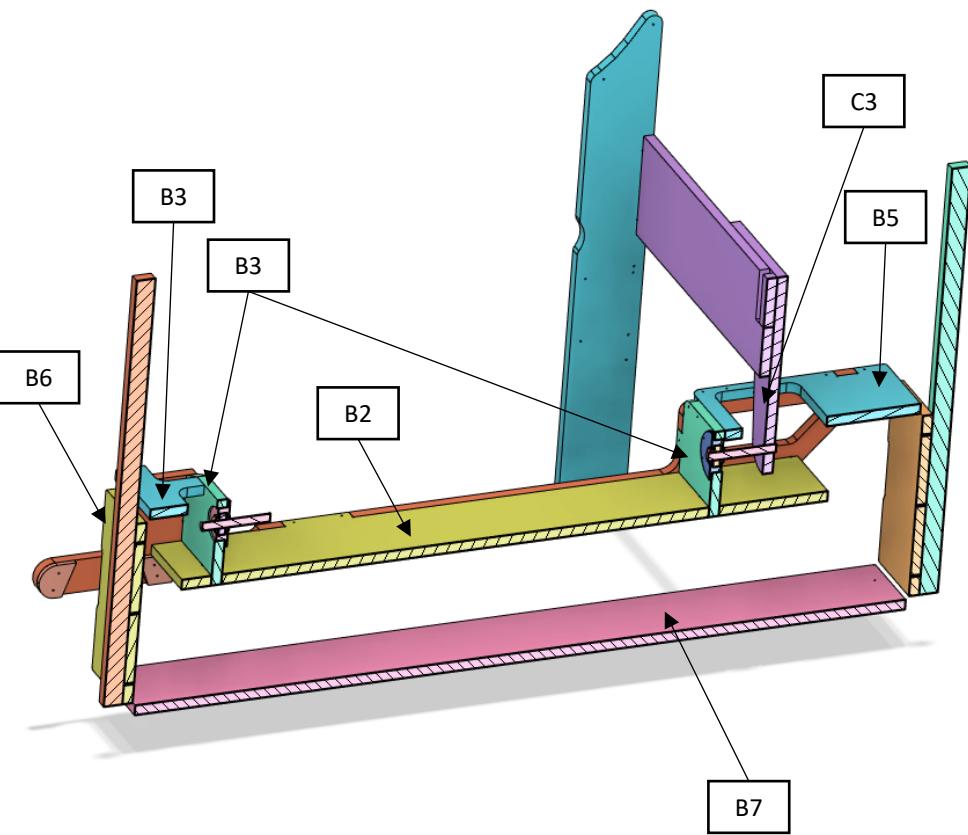
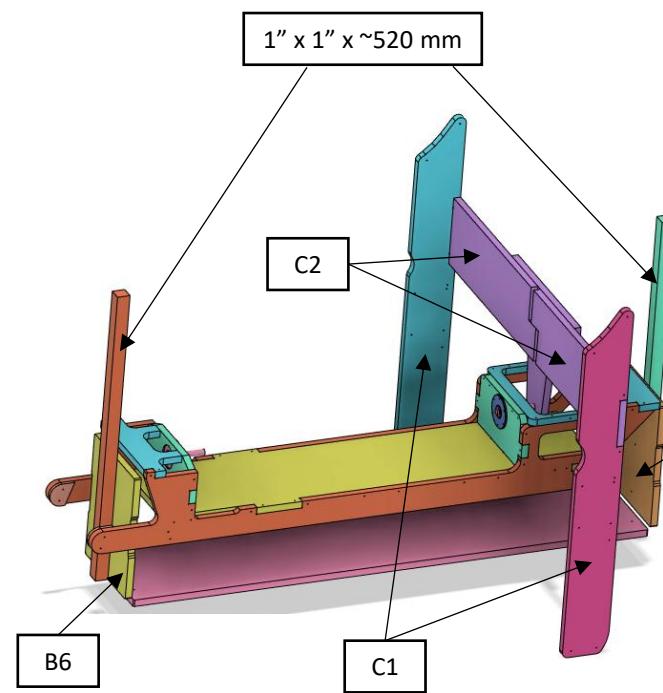
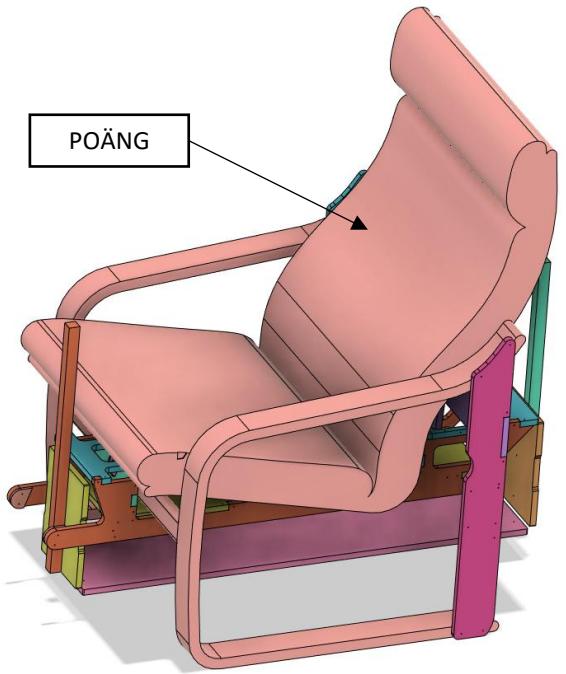


Note: Pedal is flipped the wrong way in the picture ....

Pre-drill the hole!

# Step 3, control assembly

...



Name	Count	Sum = 12
A1	1	
A2	2	
A3	2	
A4	2	
A5	1	
A6	1	
A7	1	
A8	2	

Name	Count	Sum = 15
B1	2	
B2	1	
B3	2	
B4	1	
B5	1	
B6	2	
B7	1	
B8	2	
B9	2	
B10	1	

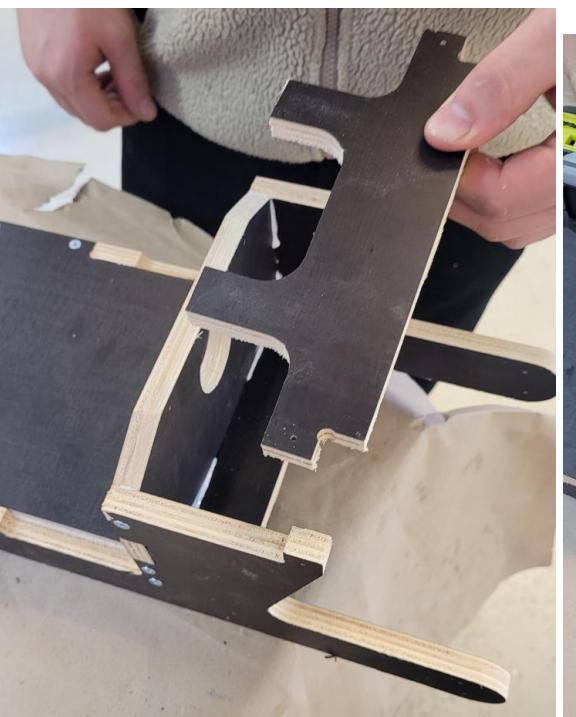
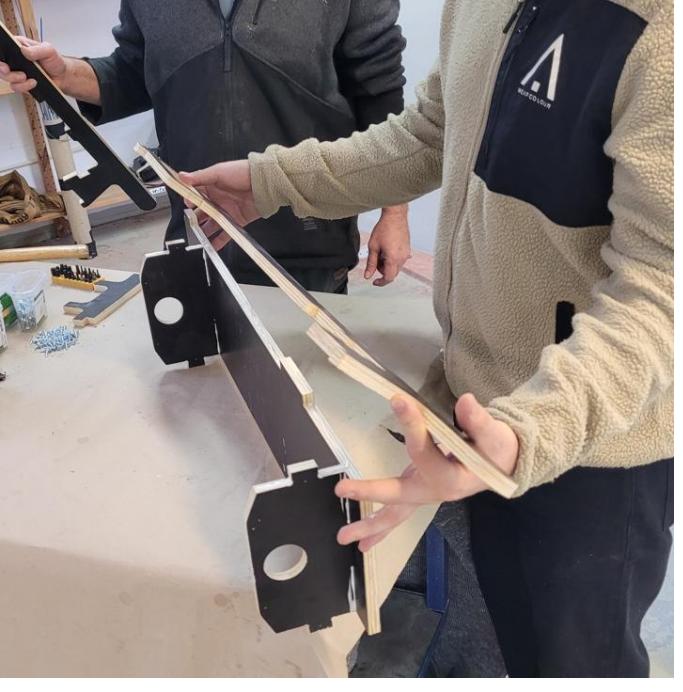
Name	Count	Sum = 5
C1	2	
C2	2	
C3	1	

Name	Count	
D1	1	
D2	1	
D3	1	
D4	1	
D5	1	

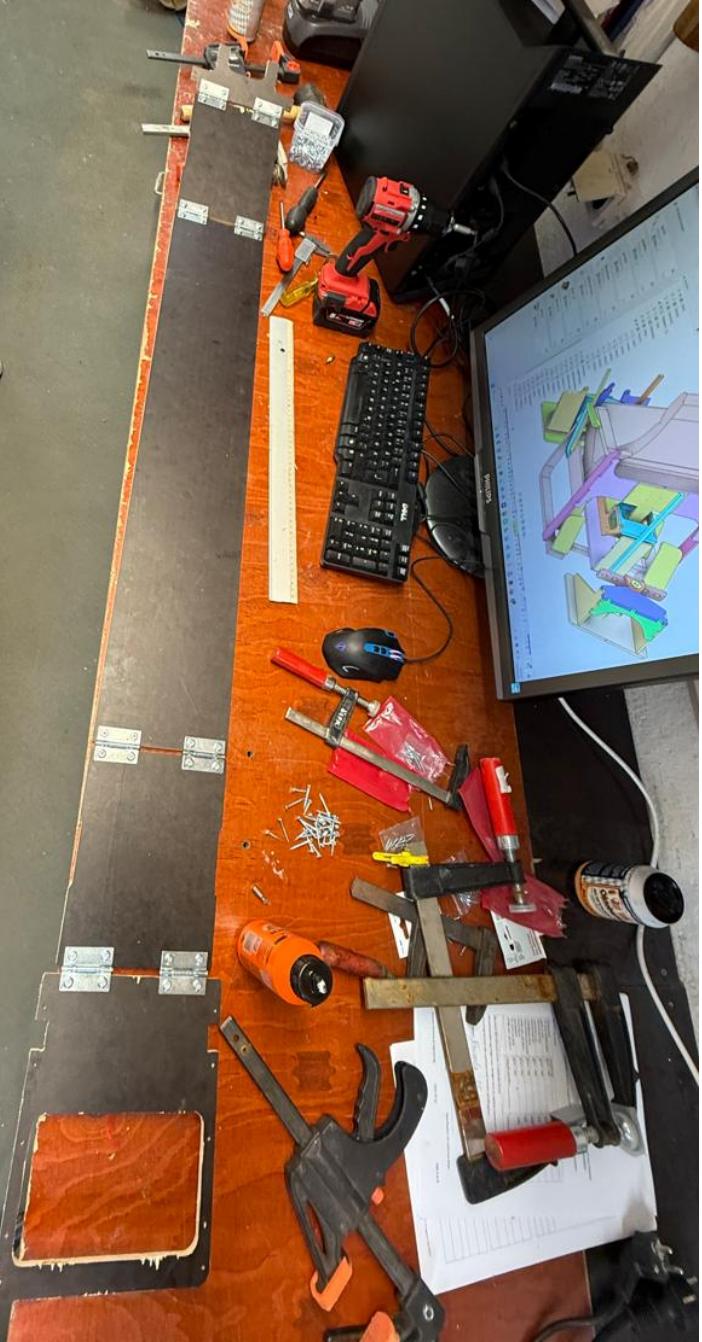
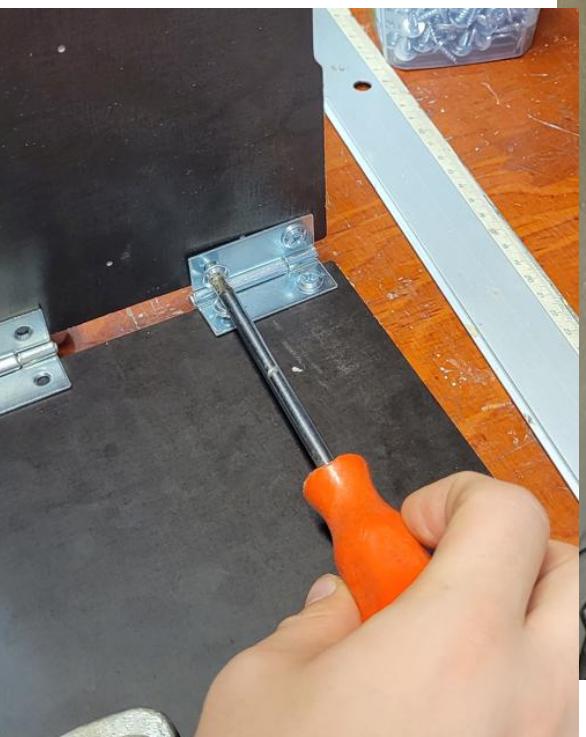
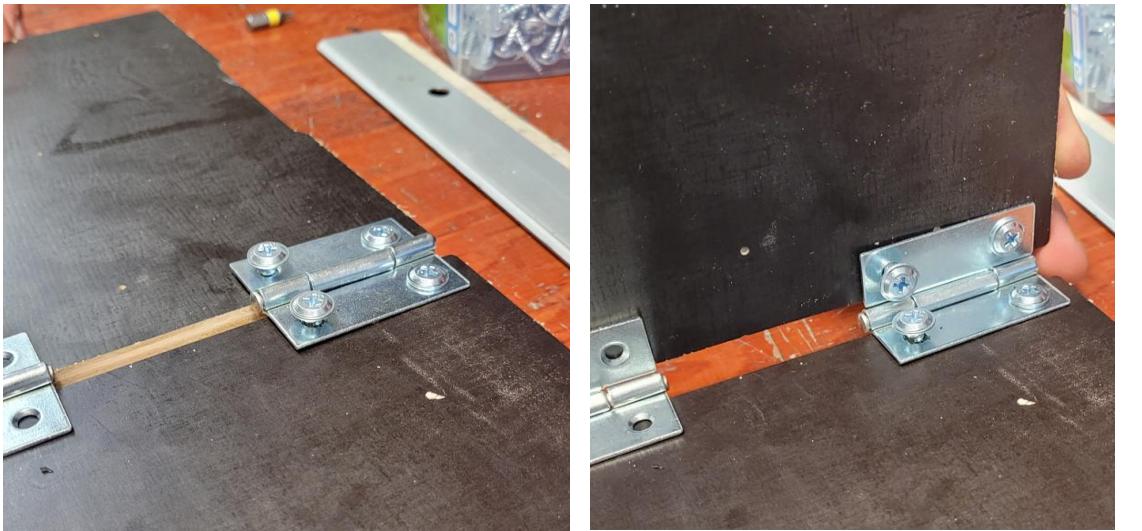
Name	Count	Sum = 15
E1	1	
E2	2	
E3	1	
E4	1	
E5	1	
E6	2	
E7	1	
E8	4	
E9	2	

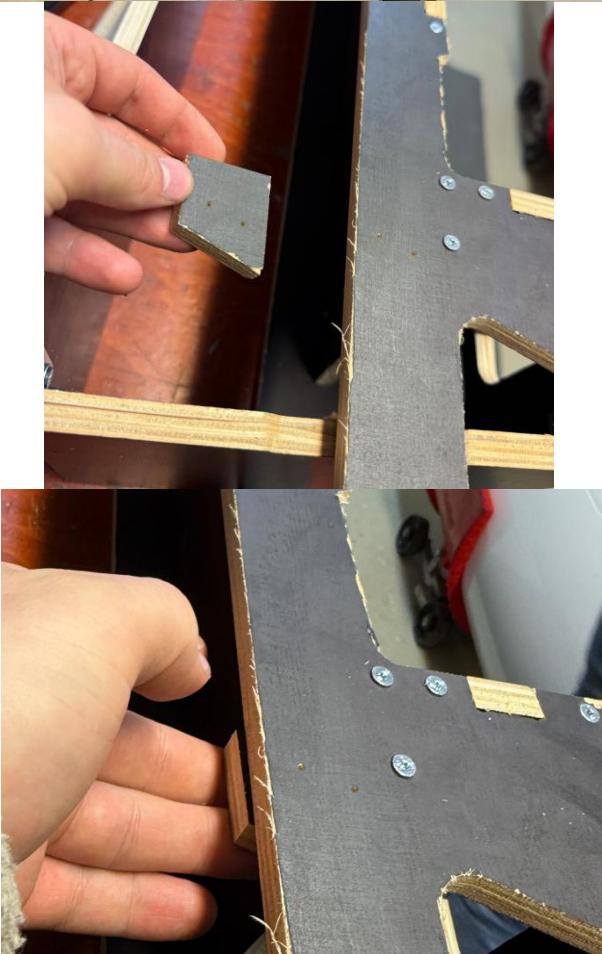
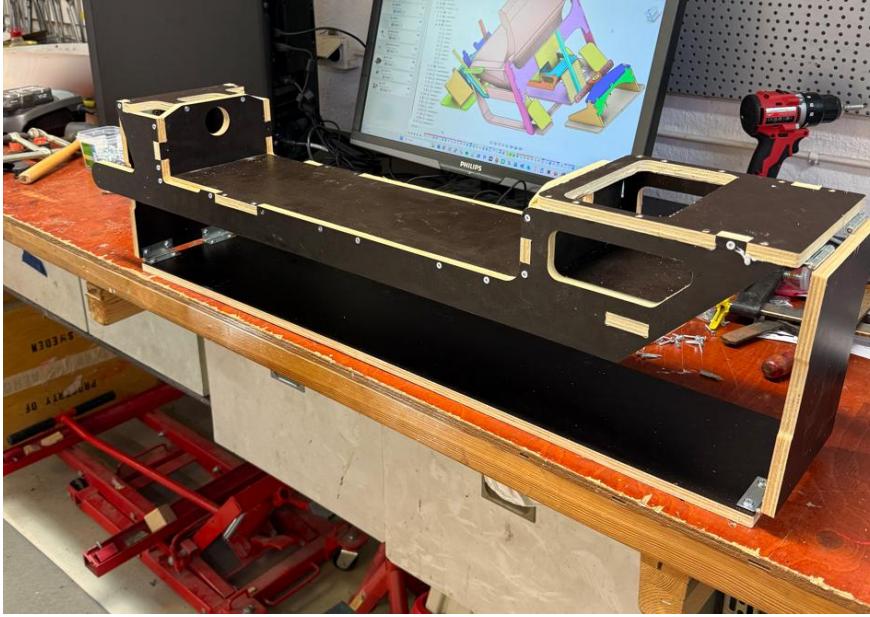
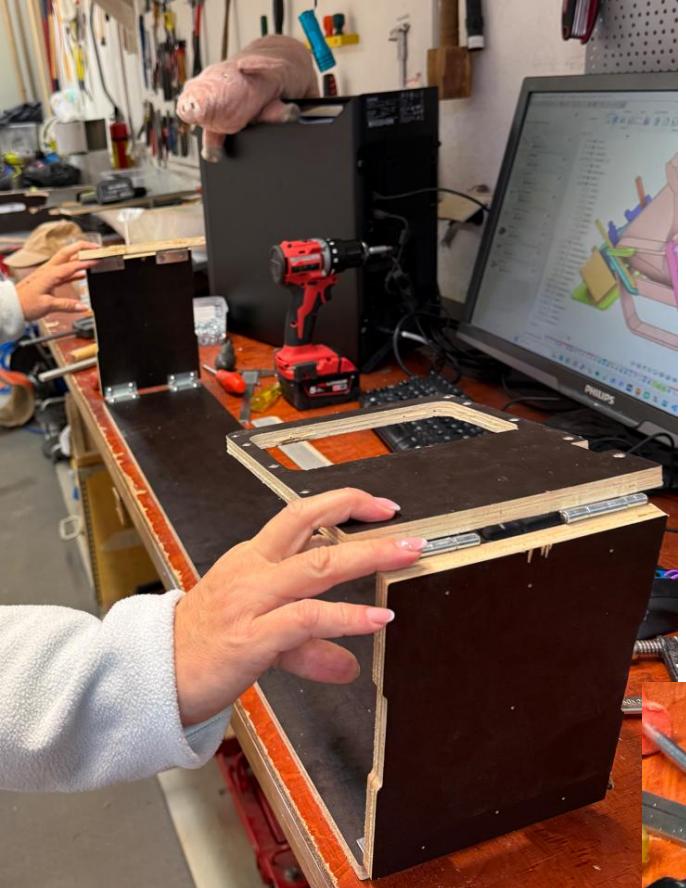
Redesigned, will be  
3D-printed instead





Tighten the screws on the hinges at 90° in order to align the hinges

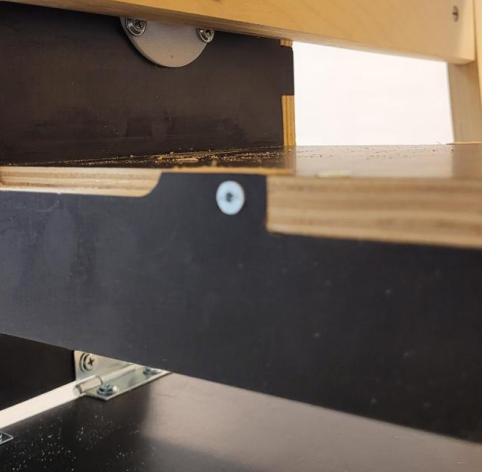
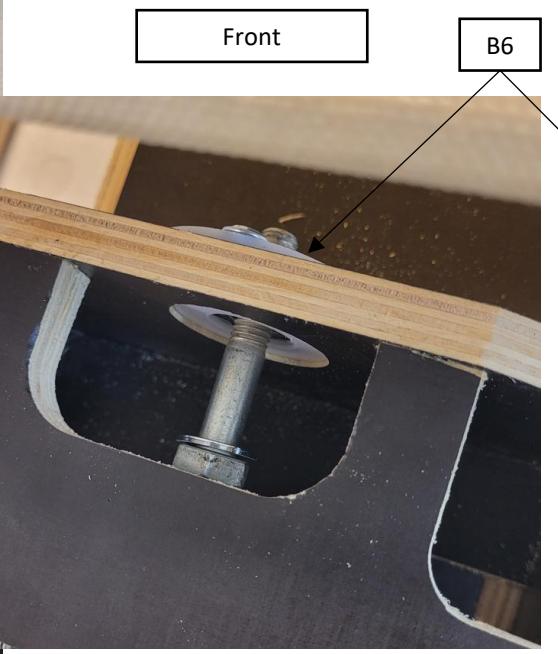
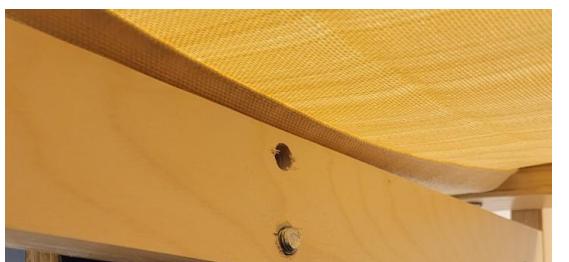
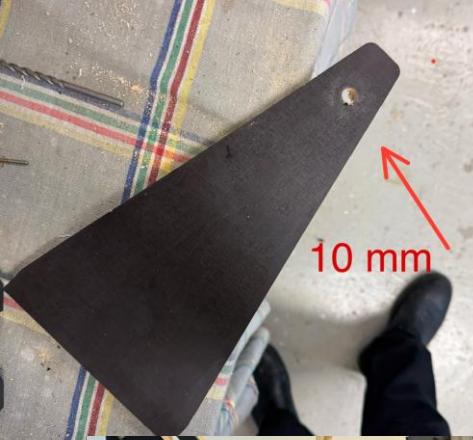


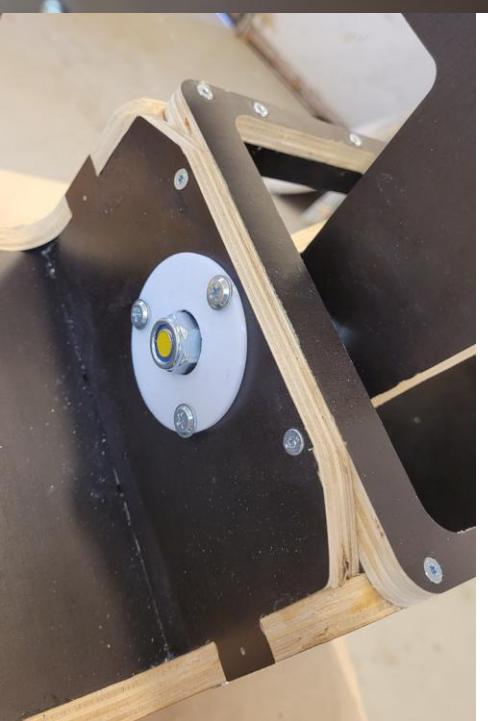
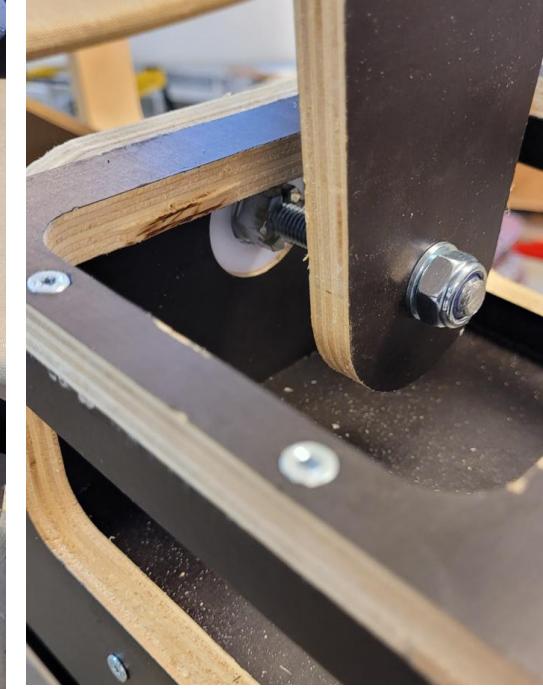
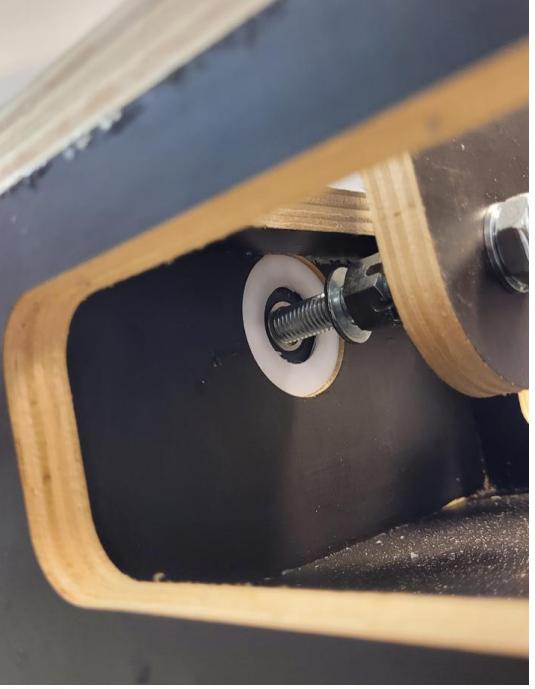
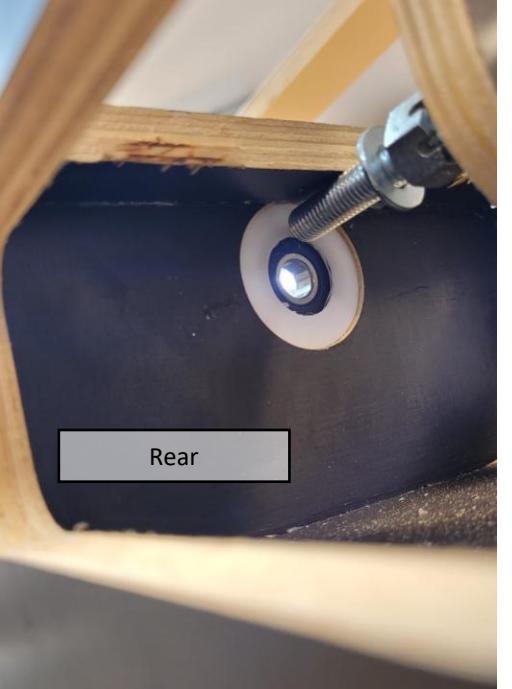




Yes, it looks like it's  
container ship

Oops. We found a design flaw when assembling the prototype. This has been corrected since then.





# Step 4, rear pedals

...

Name	Count	Sum = 12
A1	1	
A2	2	
A3	2	
A4	2	
A5	1	
A6	1	
A7	1	
A8	2	

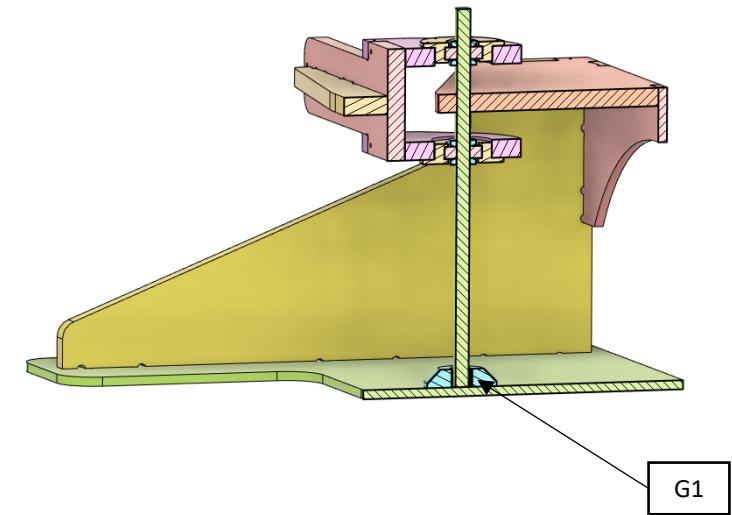
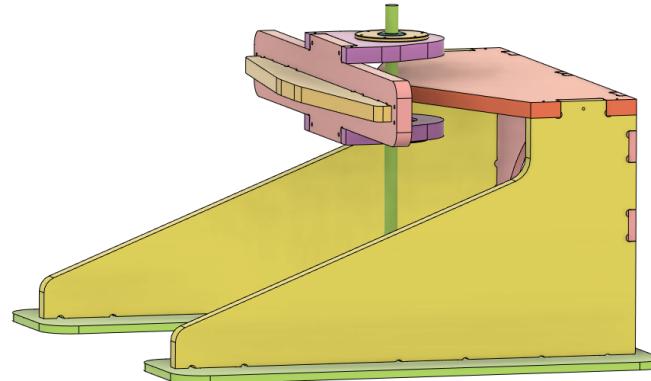
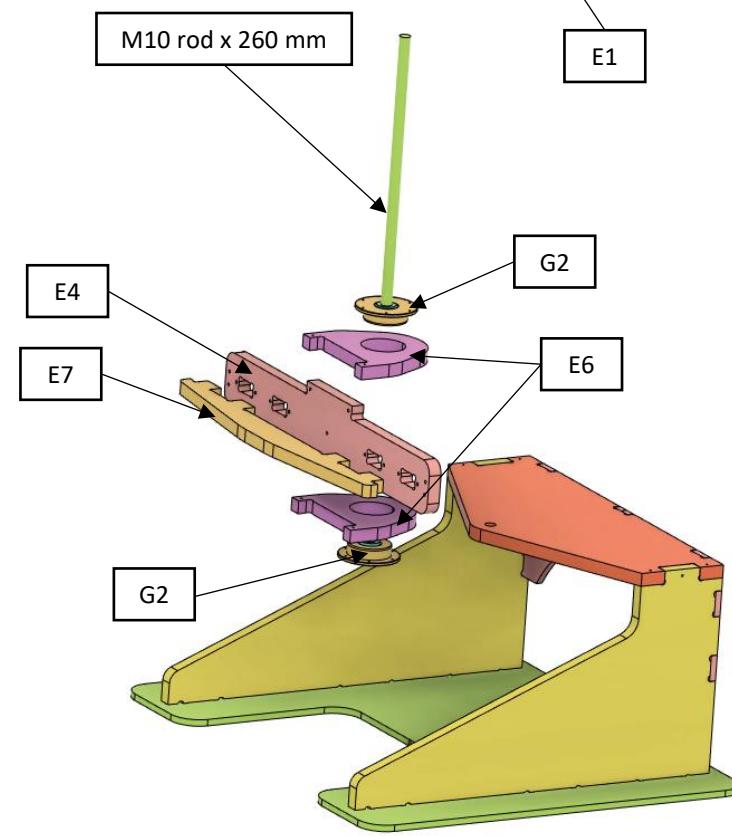
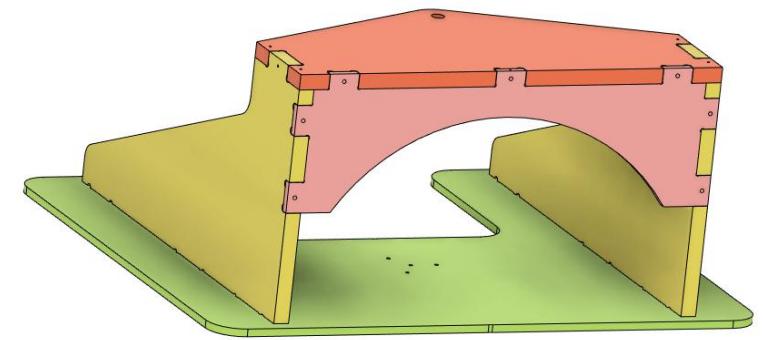
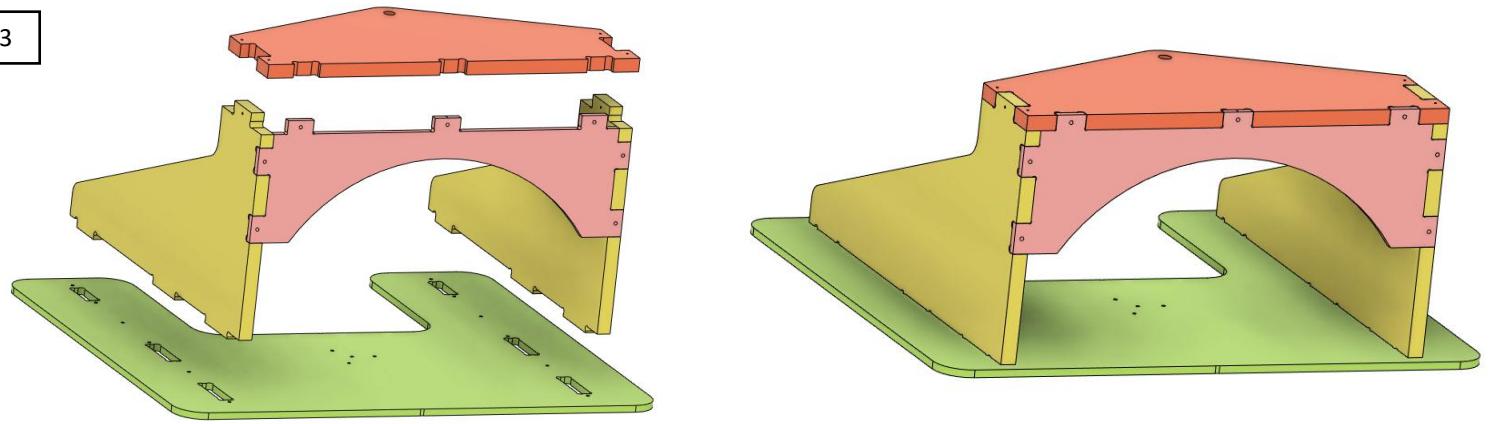
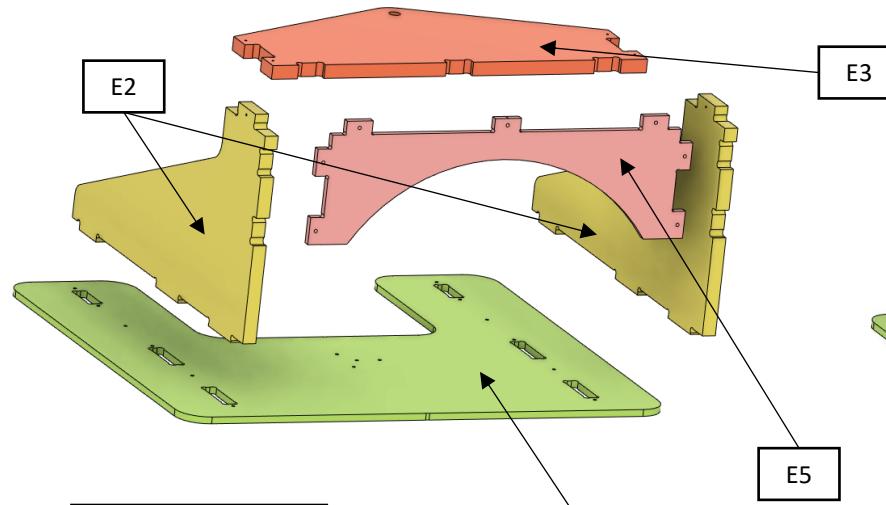
Name	Count	Sum = 15
B1	2	
B2	1	
B3	2	
B4	1	
B5	1	
B6	2	
B7	1	
B8	2	
B9	2	
B10	1	

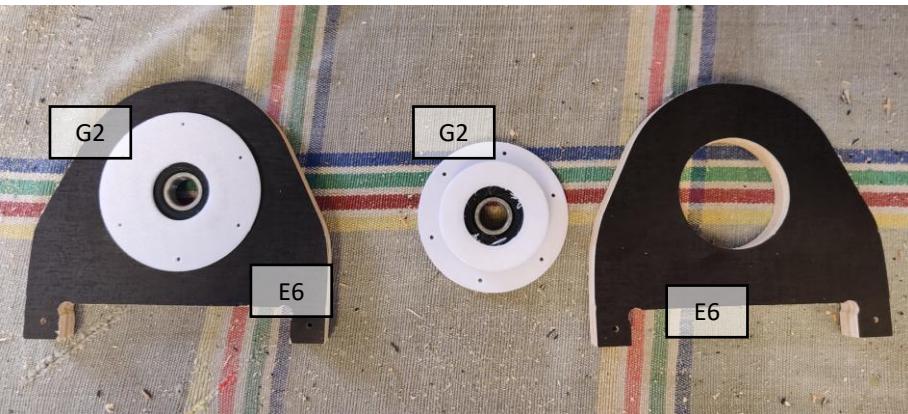
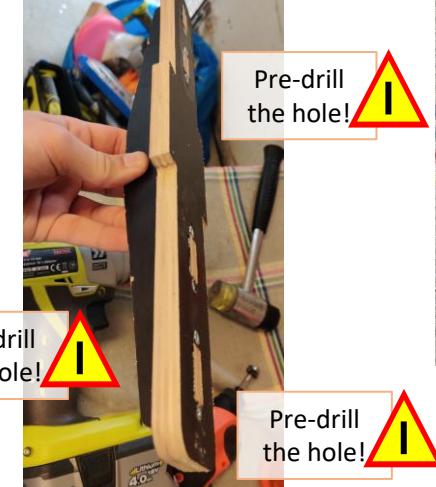
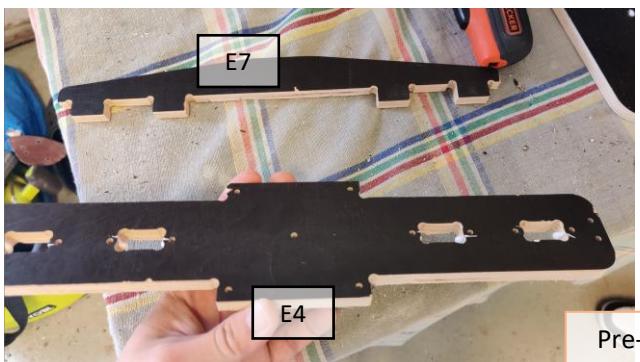
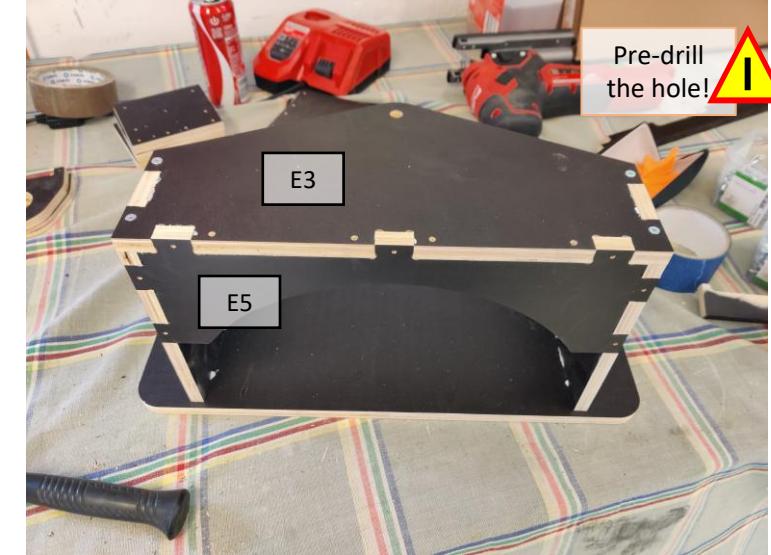
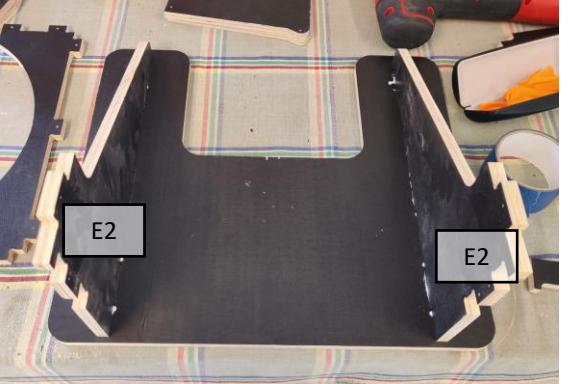
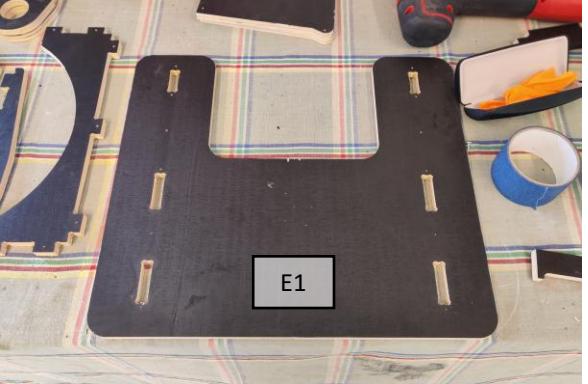
Name	Count	Sum = 5
C1	2	
C2	2	
C3	1	
D1	1	
D2	1	
D3	1	
D4	1	
D5	1	

Name	Count	Sum = 15
E1	1	
E2	2	
E3	1	
E4	1	
E5	1	
E6	2	
E7	1	
E8	4	
E9	2	

Redesigned, will be  
3D-printed instead

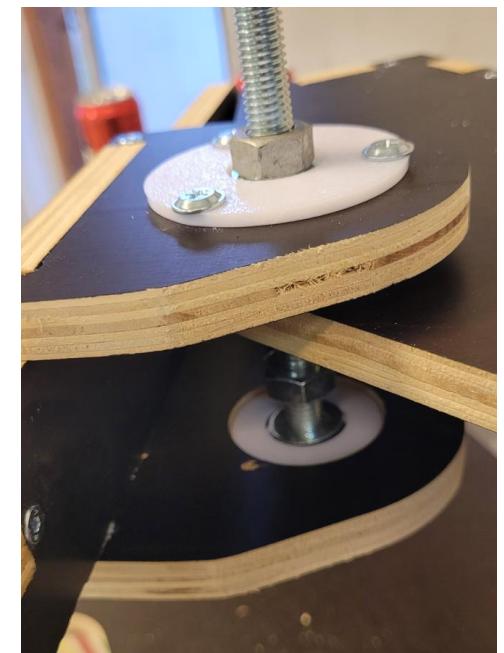
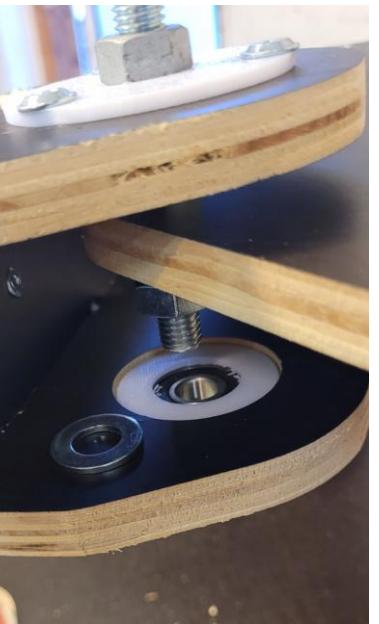
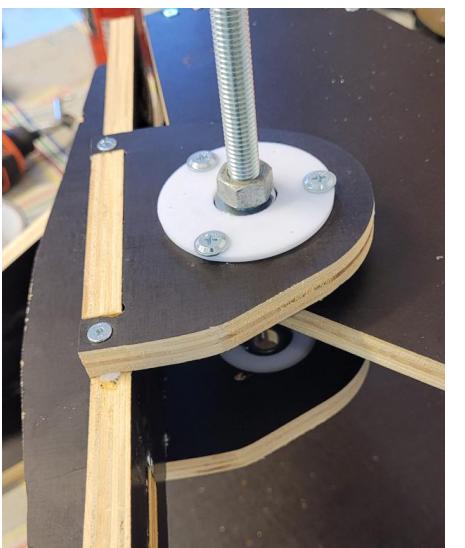
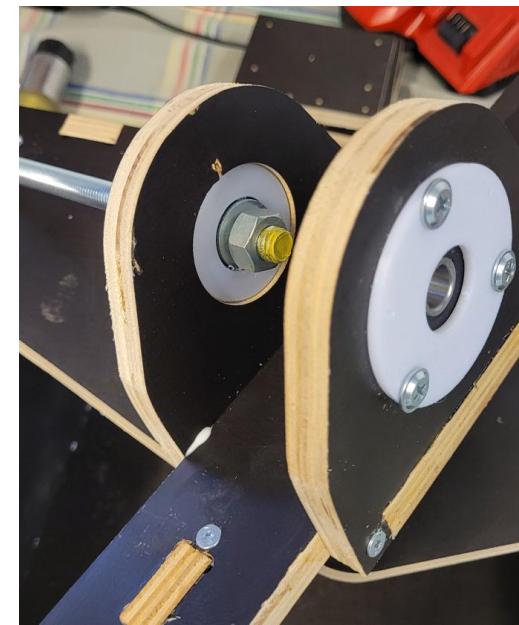
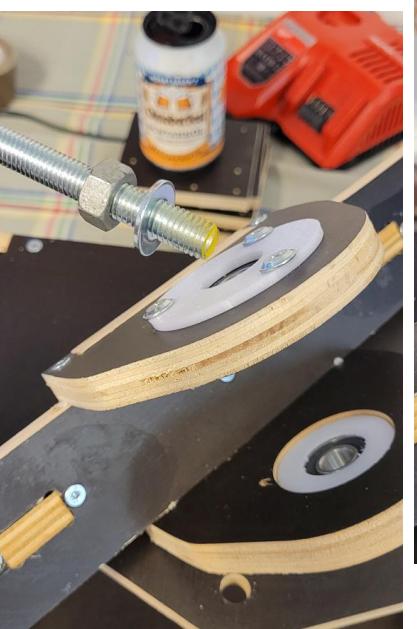


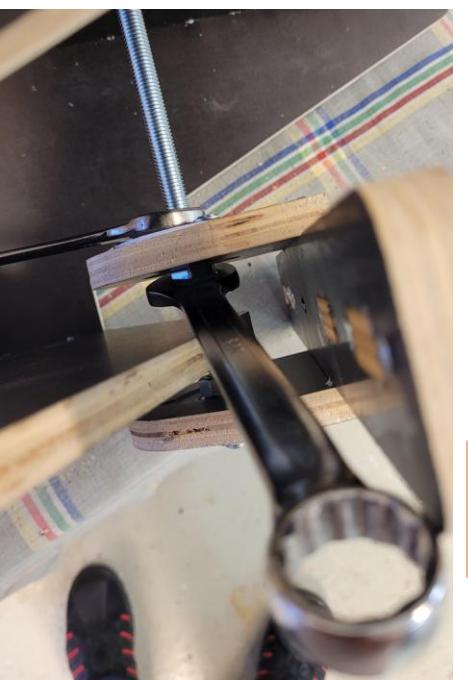
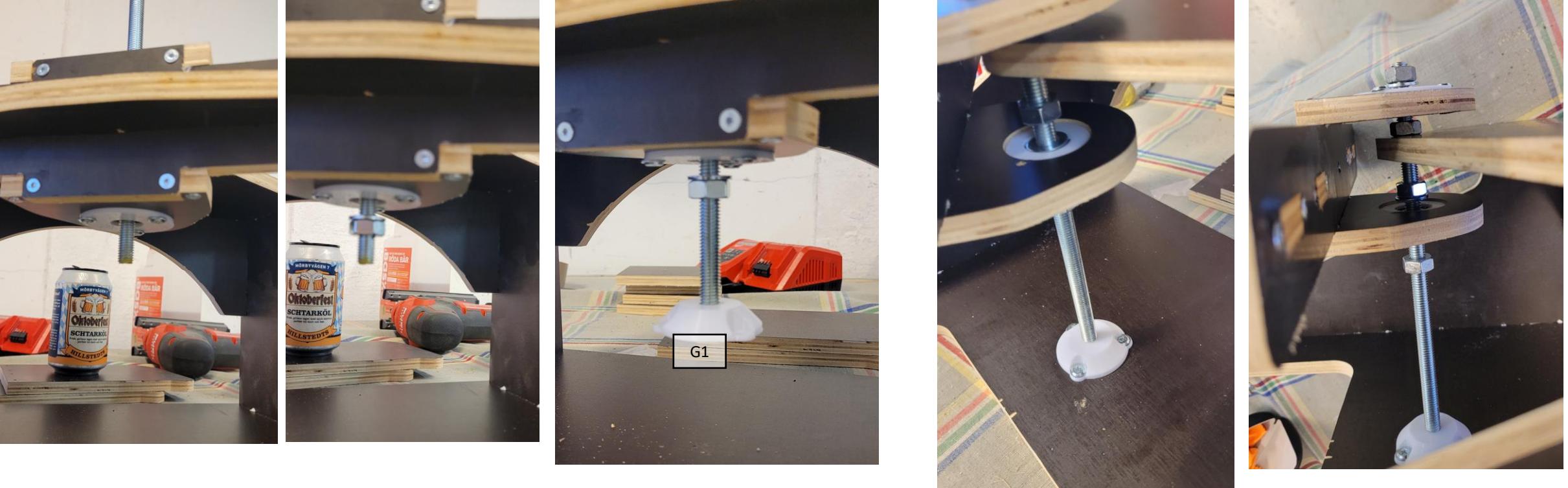




Make sure the screws  
of G2 in on outside ...

Measure proper length of M10 rod

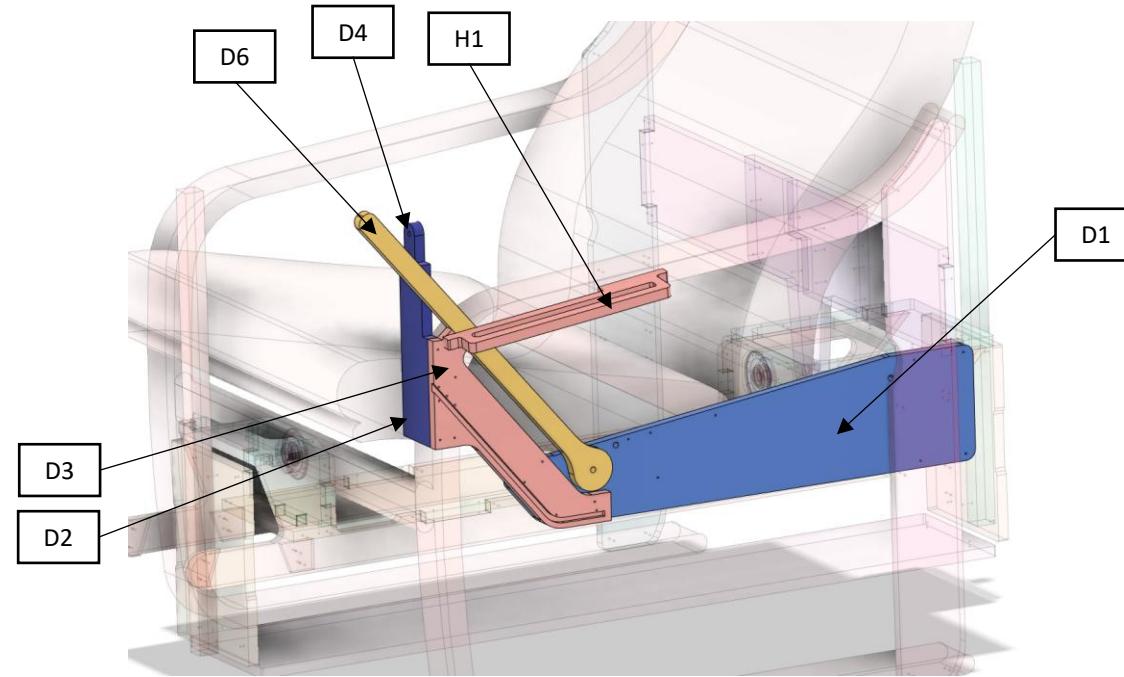




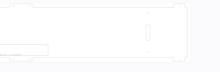
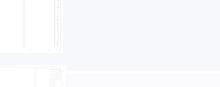
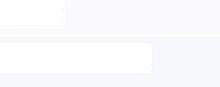
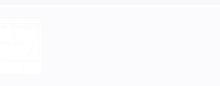
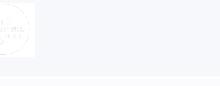
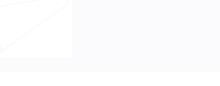
Tighten all  
4 nuts.

# Step 5, chair and side

...



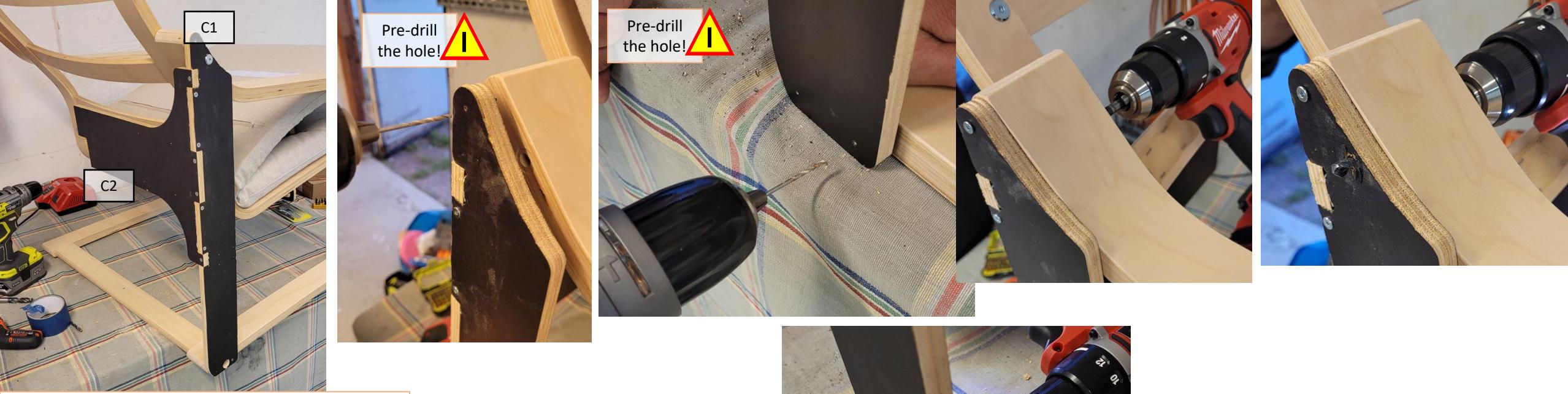
Name	Count	Sum = 12
A1	1	
A2	2	
A3	2	
A4	2	
A5	1	
A6	1	
A7	1	
A8	2	

Name	Count	Sum = 15
B1	2	
B2	1	
B3	2	
B4	1	
B5	1	
B6	2	
B7	1	
B8	2	
B9	2	
B10	1	

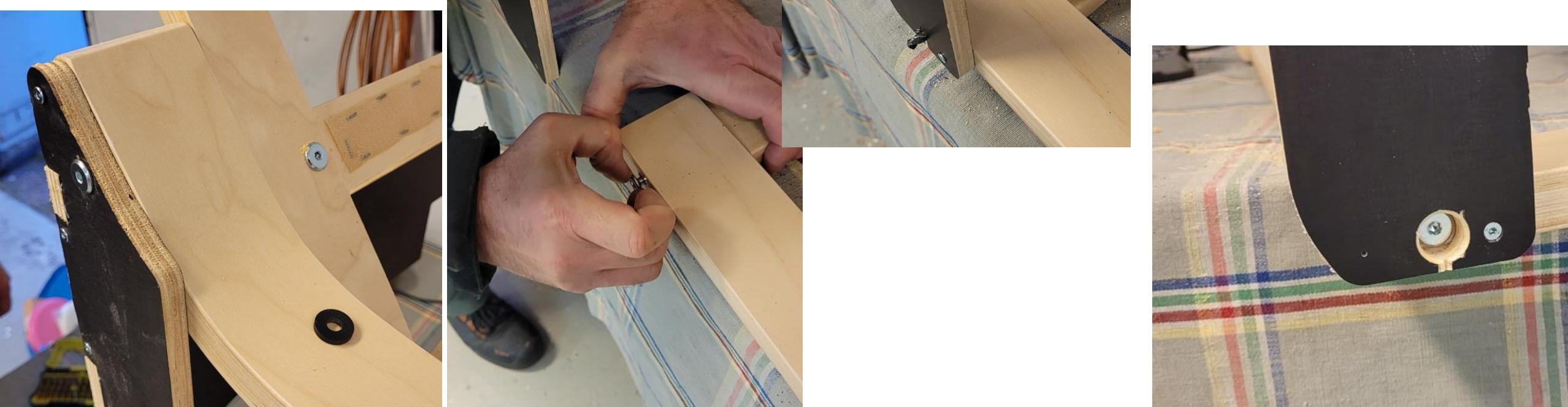
Name	Count	Sum = 5
C1	2	
C2	2	
C3	1	
Name	Count	
D1	1	
D2	1	
D3	1	
D4	1	
D5	1	

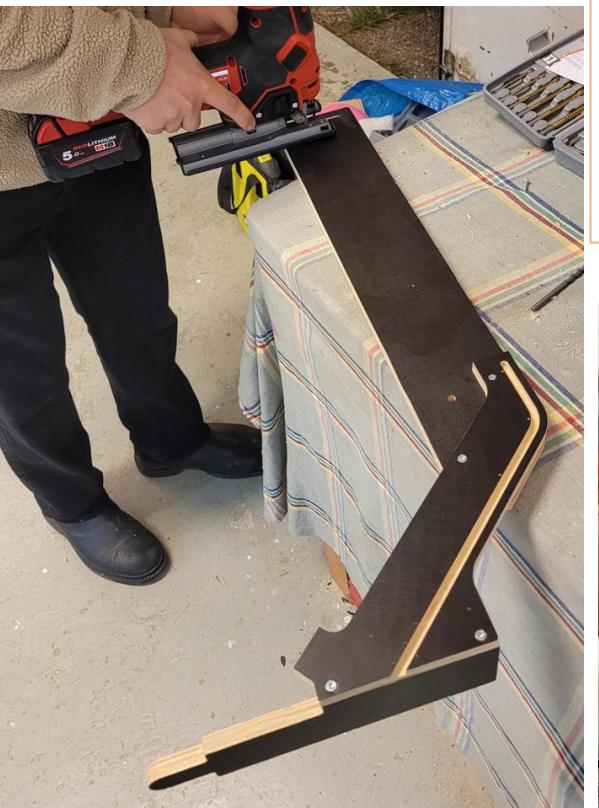
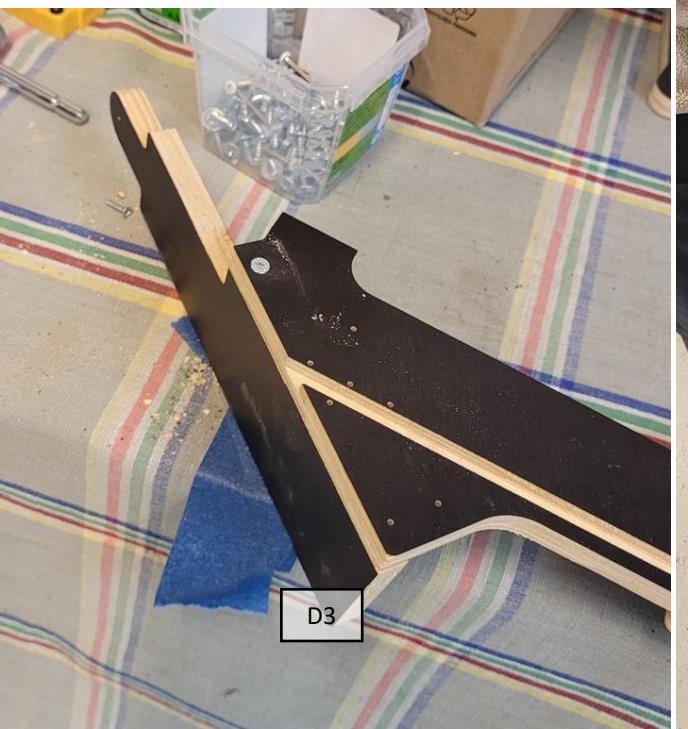
Name	Count	Sum = 15
E1	1	
E2	2	
E3	1	
E4	1	
E5	1	
E6	2	
E7	1	
E8	4	
E9	2	

Redesigned, will be  
3D-printed instead

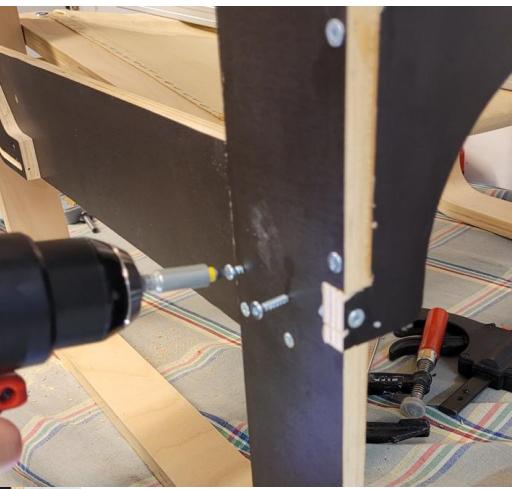


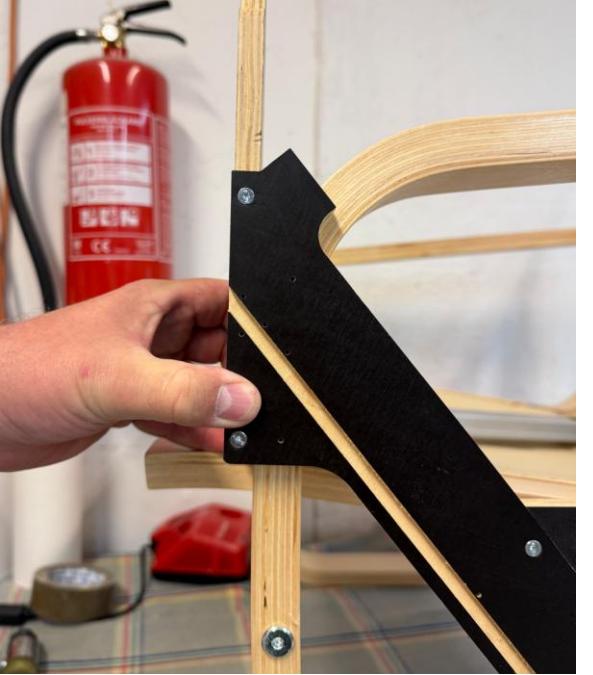
We forgot to take pictures, but  
assemble C1 and C2, both sides.



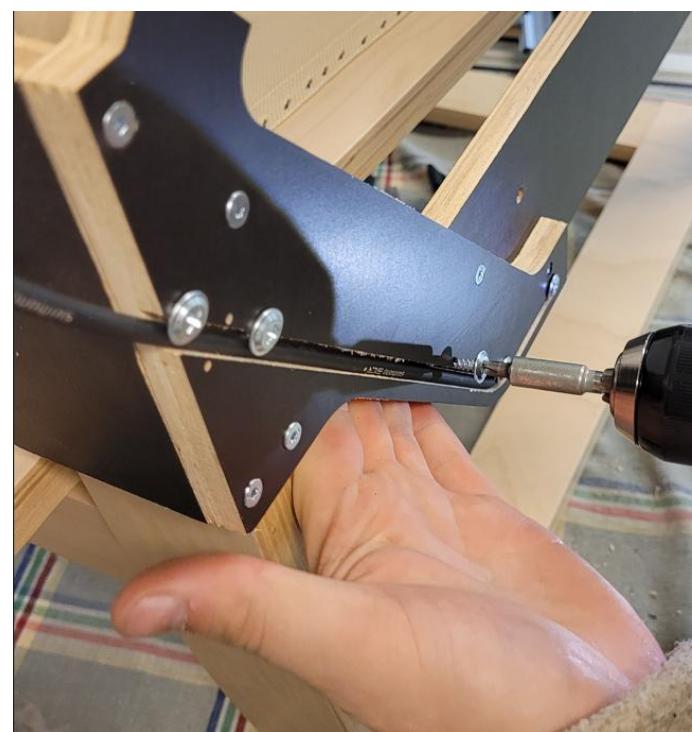
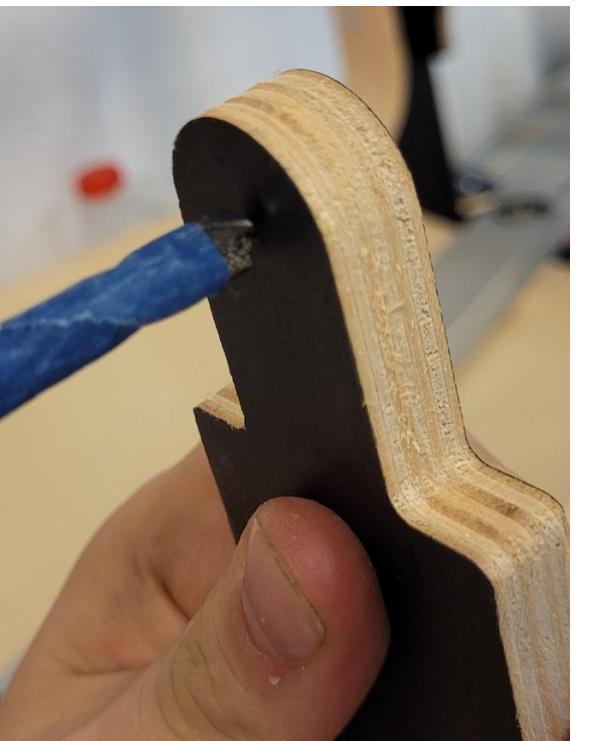


D2 may be a bit  
too long. Adjust  
at your own  
discretion



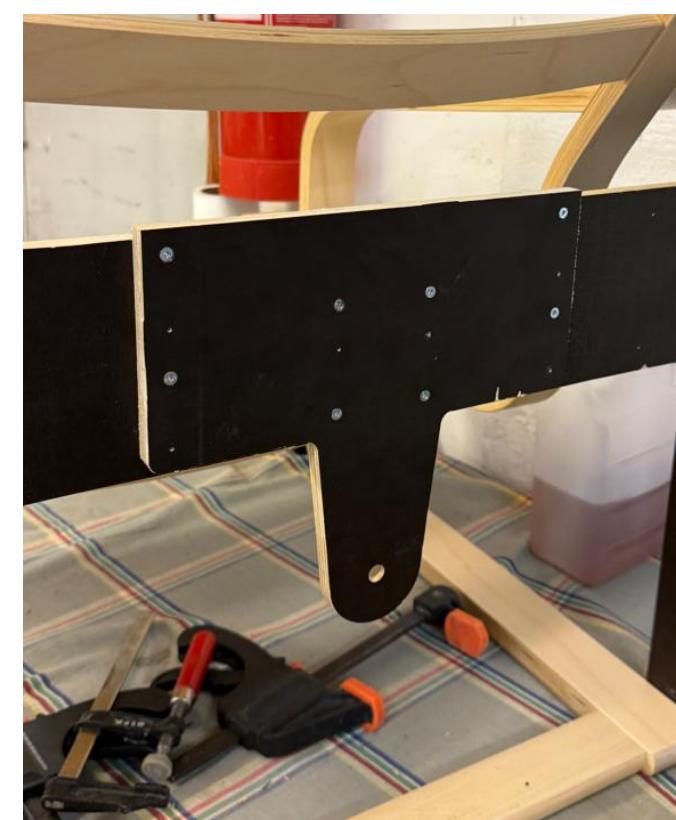
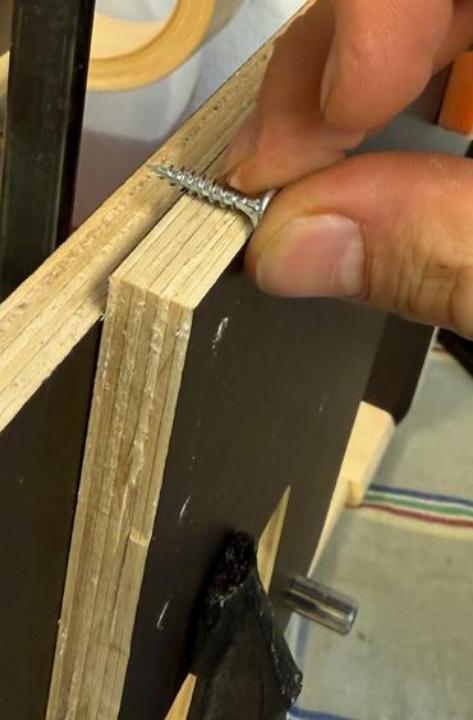


Drill Ø: 6.5 mm  
No deeper than  
6 mm. The end  
of Bowden cable  
shall fit.

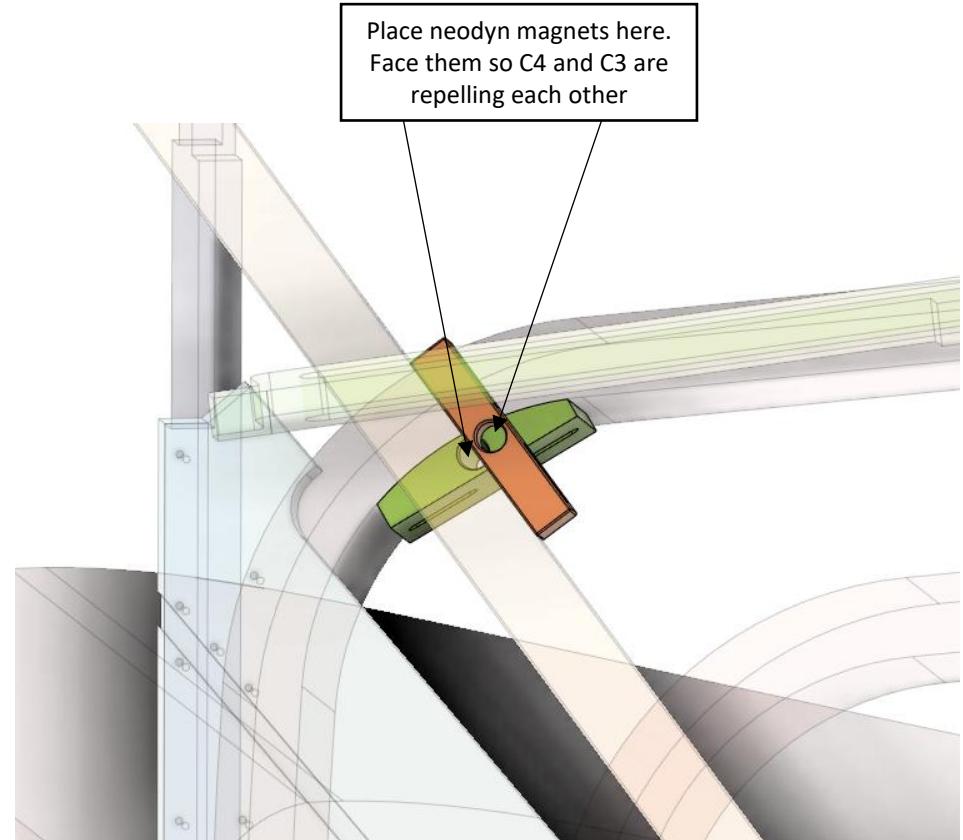
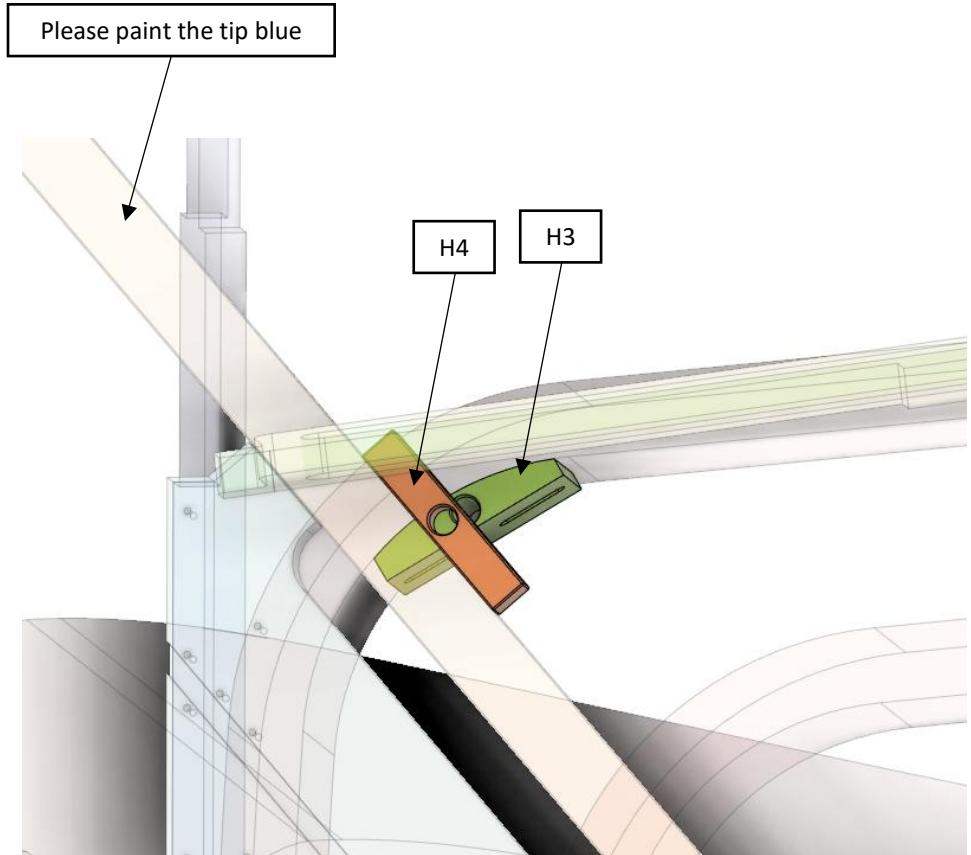
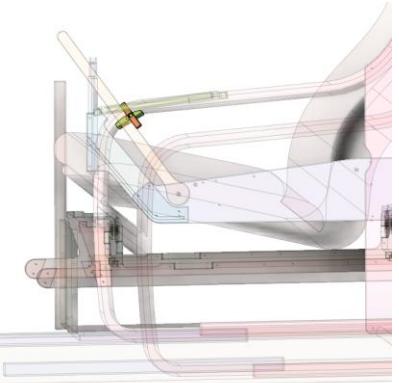




Find the center.

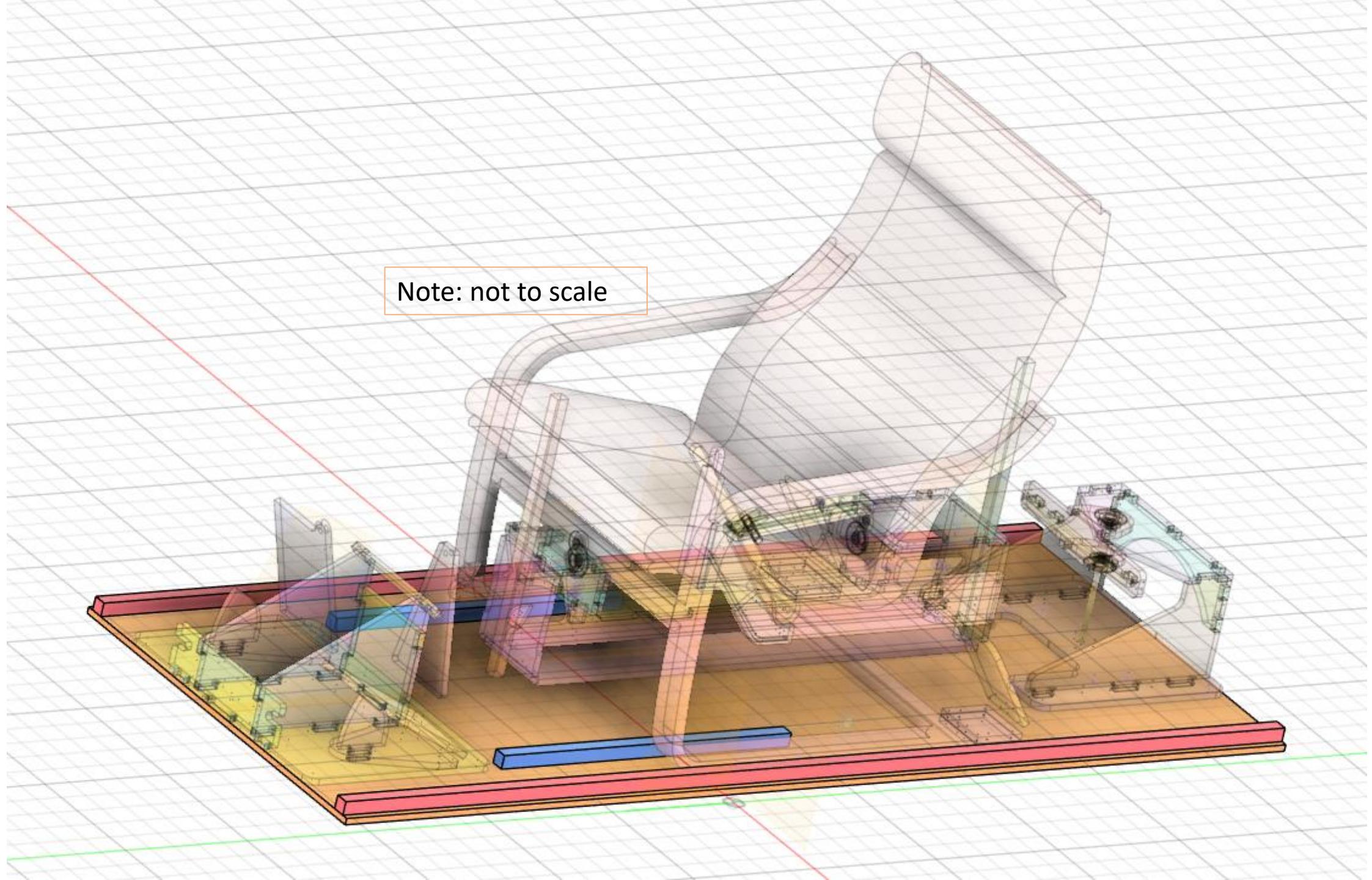


# This is to simulate the air brake leaver lock.



# Step 6, base plate

...



Name	Count	Sum = 12
A1	1	
A2	2	
A3	2	
A4	2	
A5	1	
A6	1	
A7	1	
A8	2	

Name	Count	Sum = 15
B1	2	
B2	1	
B3	2	
B4	1	
B5	1	
B6	2	
B7	1	
B8	2	
B9	2	
B10	1	

Name	Count	Sum = 5
C1	2	
C2	2	
C3	1	
D1	1	
D2	1	
D3	1	
D4	1	
D5	1	

Name	Count	Sum = 15
E1	1	
E2	2	
E3	1	
E4	1	
E5	1	
E6	2	
E7	1	
E8	4	
E9	2	

Redesigned, will be  
3D-printed instead

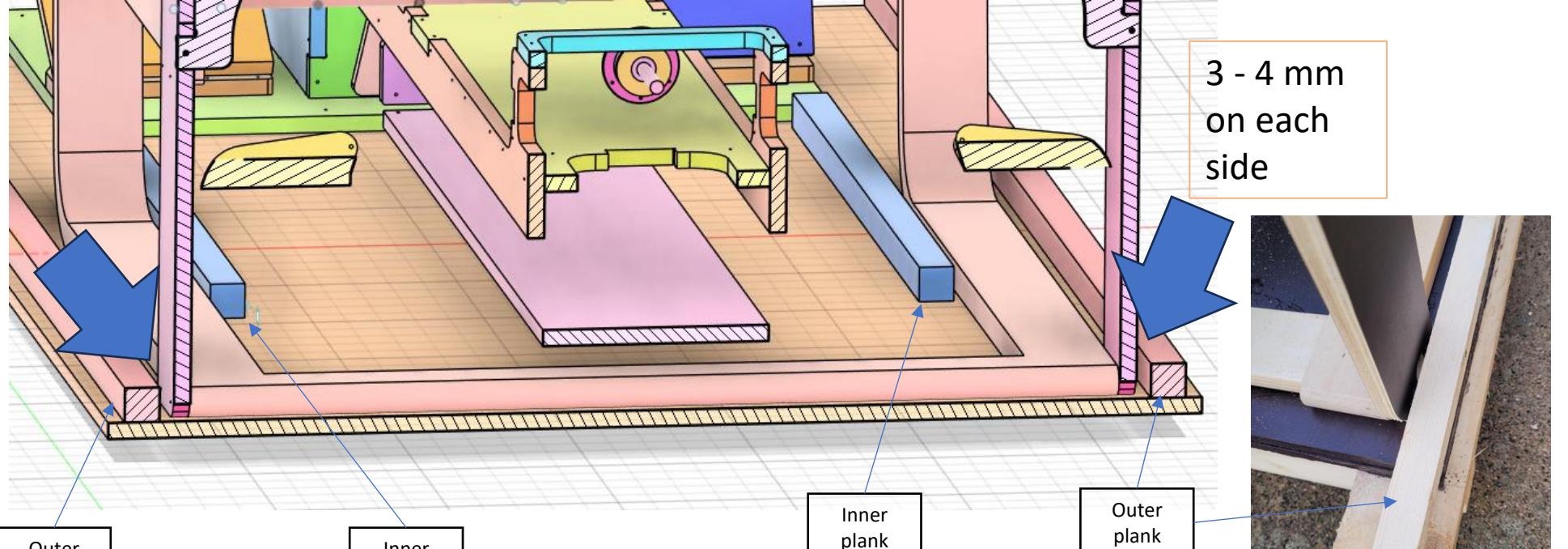


Mount front pedals to the front aligned in the centre.



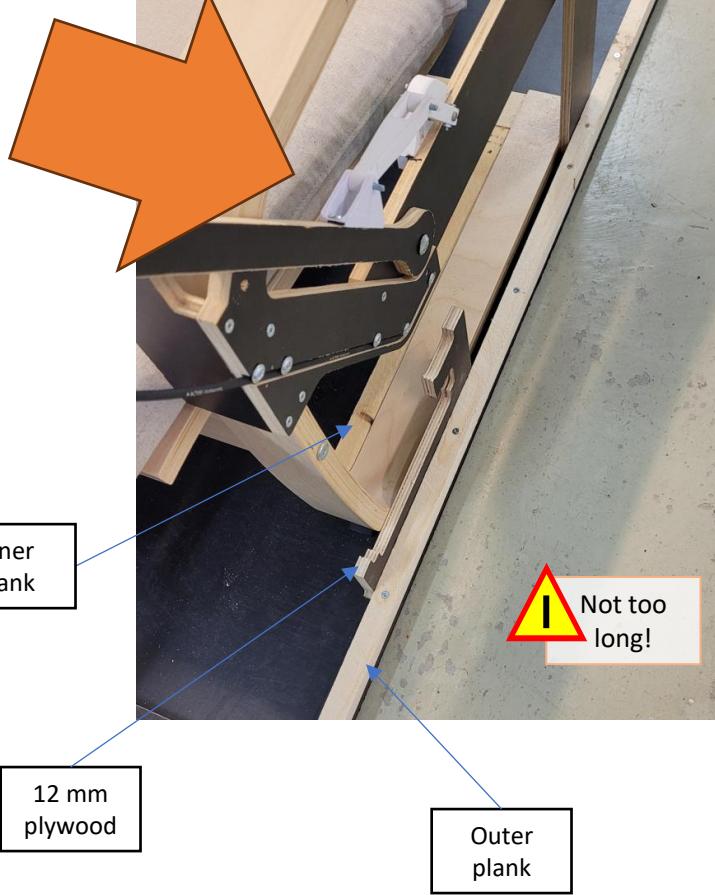
Since the base plate shall be on the floor, make sure the screws are in adequate length. If they are too long they will damage the floor.







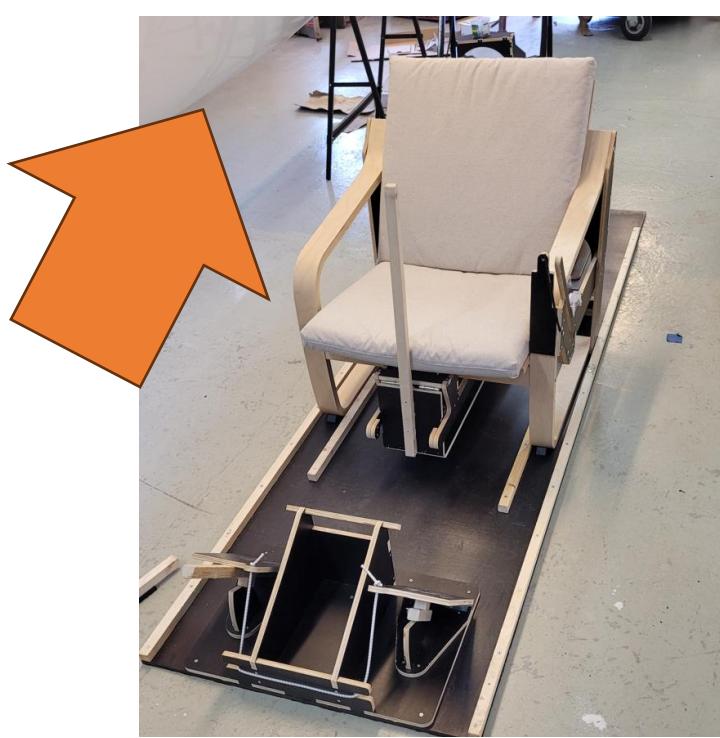
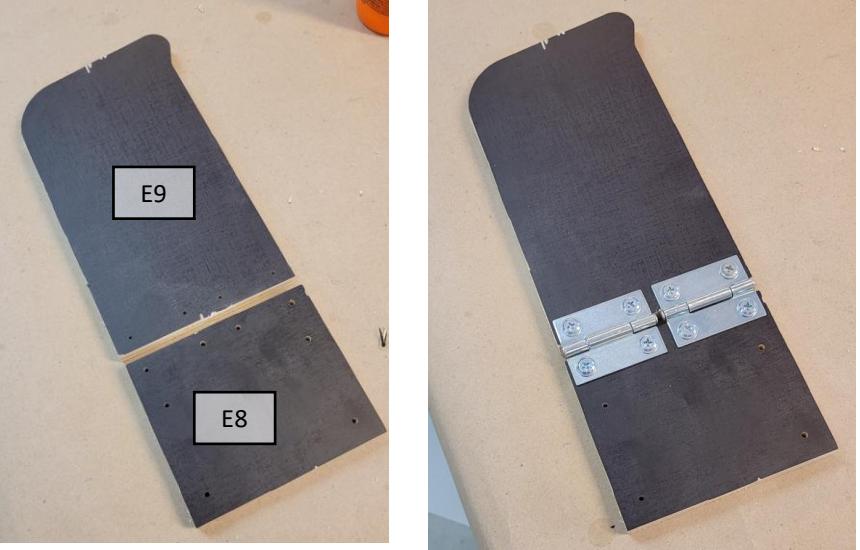
1. Mount outer planks.
2. Push chair to front to simulate a short pilot.



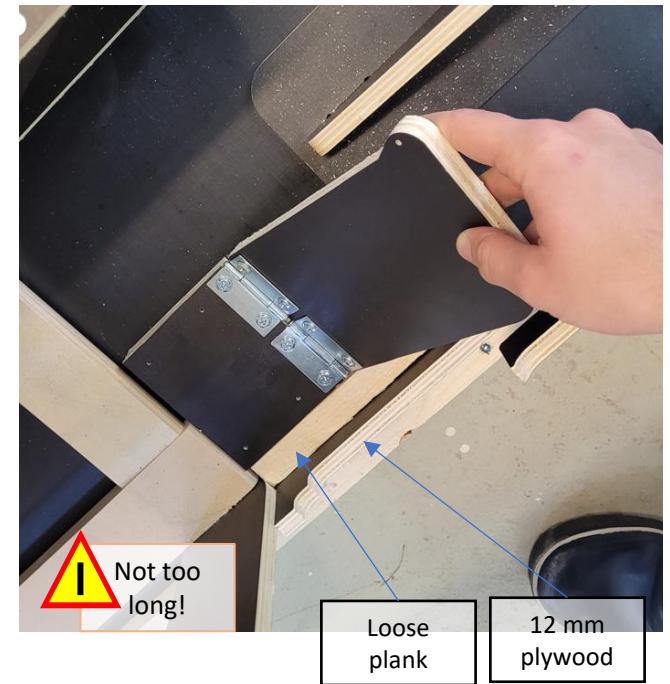
3. Place a 12 mm piece of plywood between chair and outer plank.
4. Push the chair firmly against outer plank.
5. Screw down inner plank to base plate.



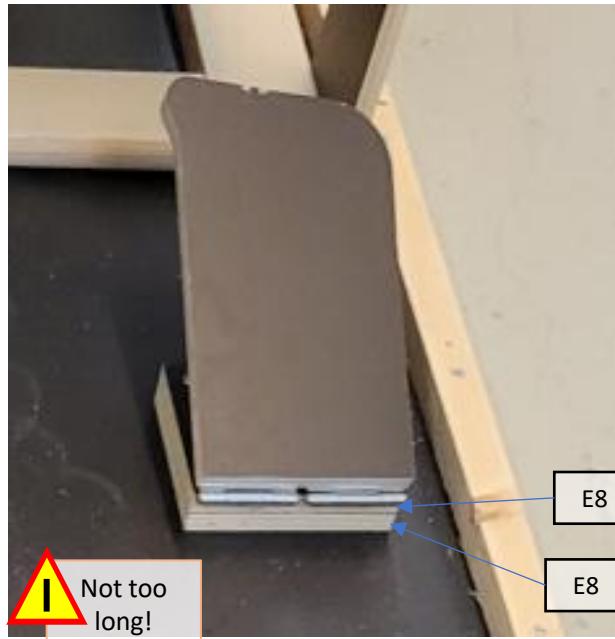
- To the same thin at the other side:
6. Place a 12 mm piece of plywood between chair and outer plank.
  7. Push the chair firmly against outer plank.
  8. Screw down inner plank to base plate.



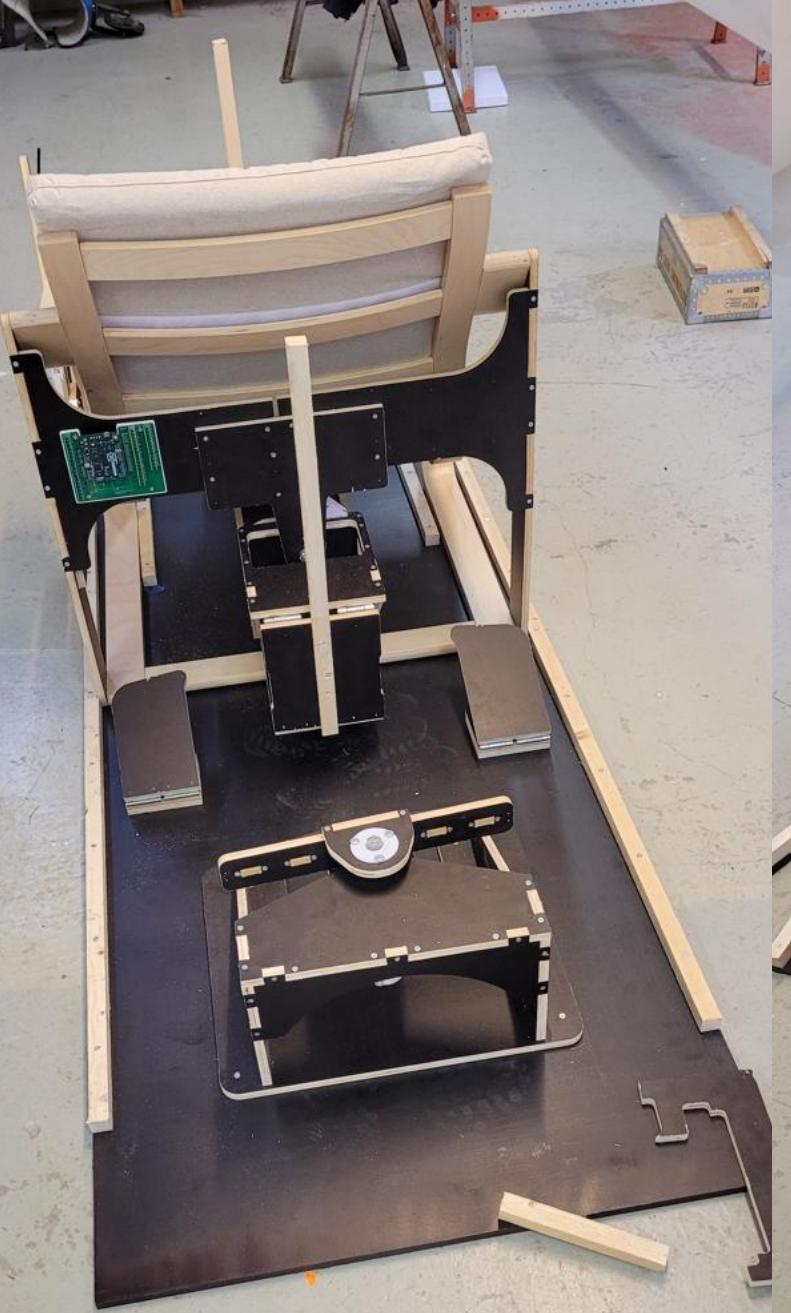
Push chair to back  
so a very long  
basket player pilot  
sits comfortably.



Place E8 approx. 37  
mm from outer plank.  
( $37\text{ mm} = 12\text{ mm}$   
plywood and a  
leftover piece of  
outer/inner plank)

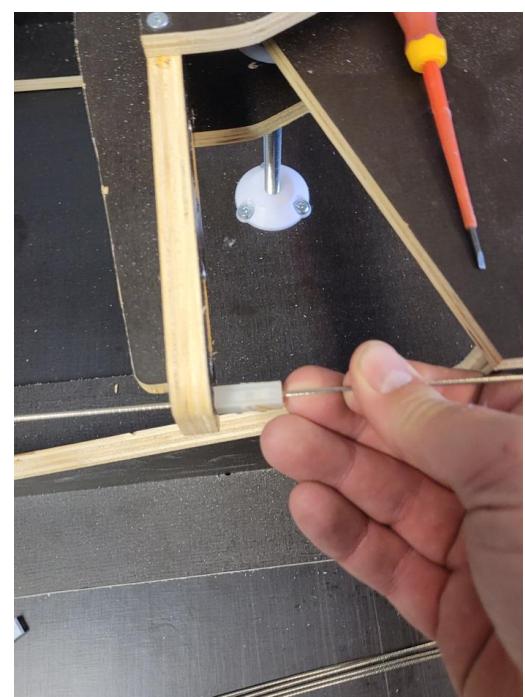
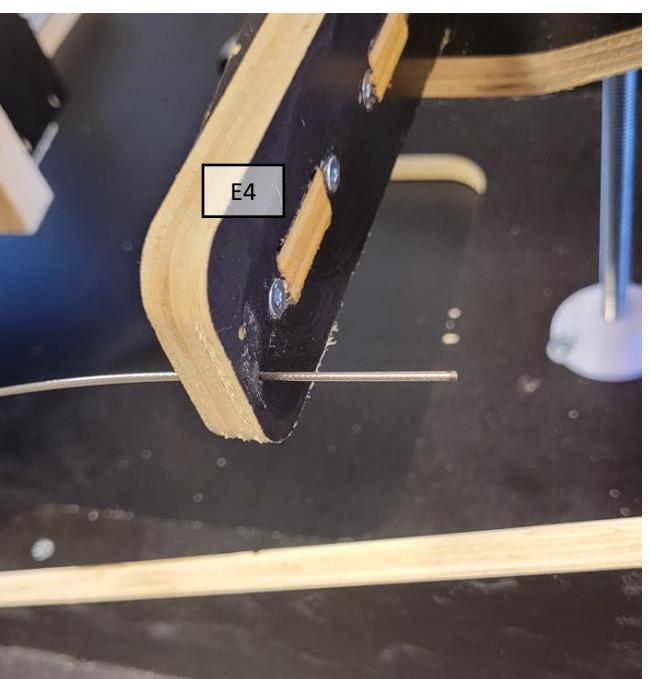
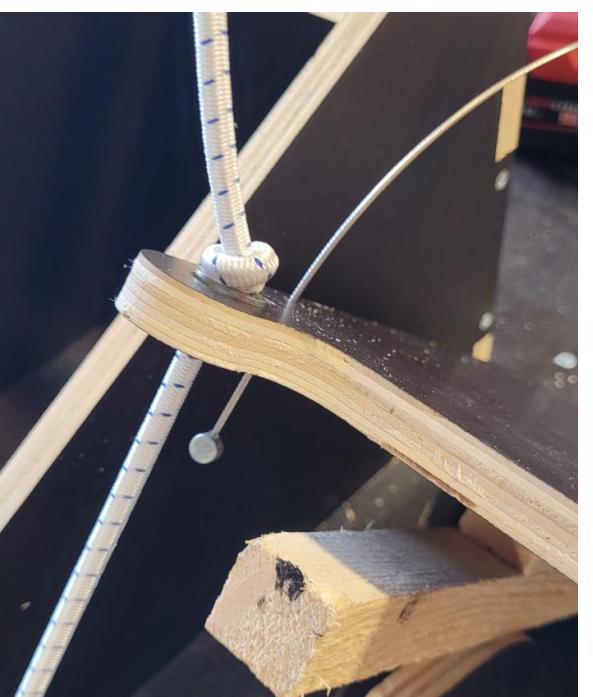
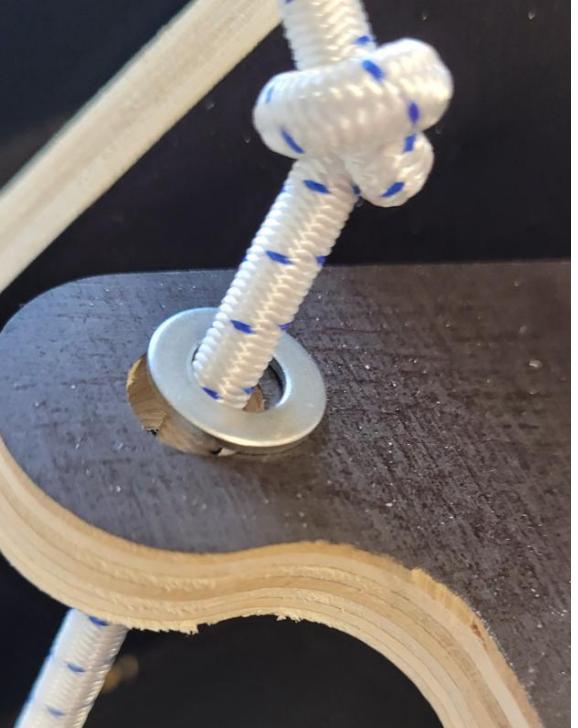


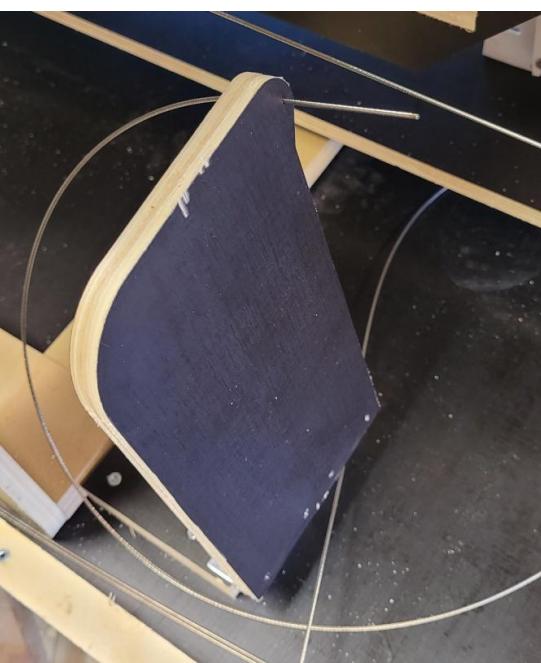
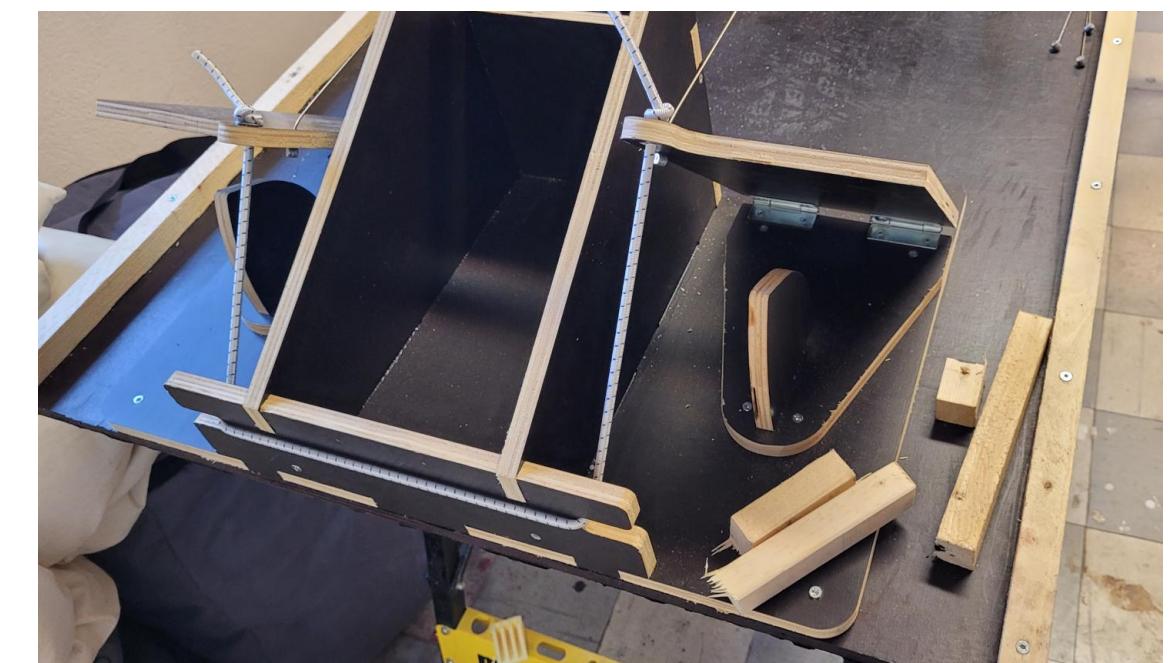
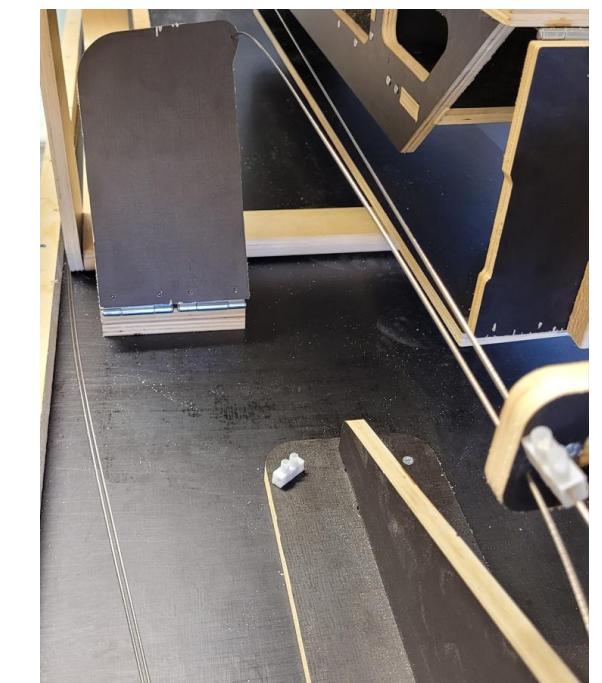
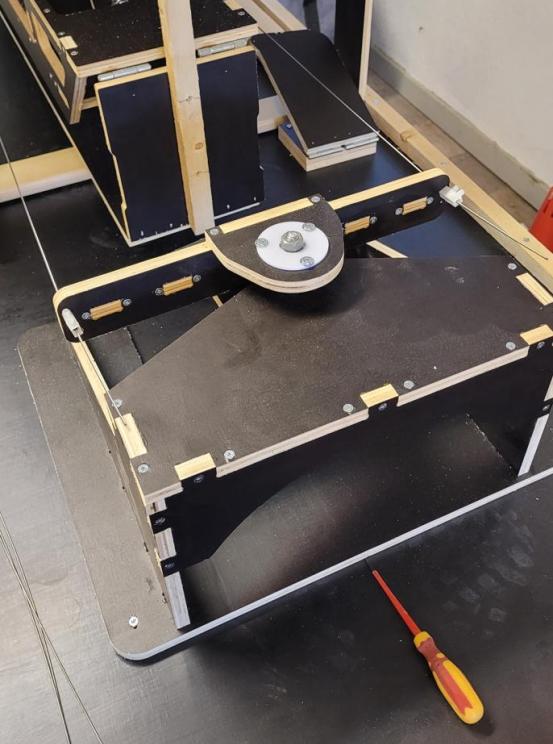
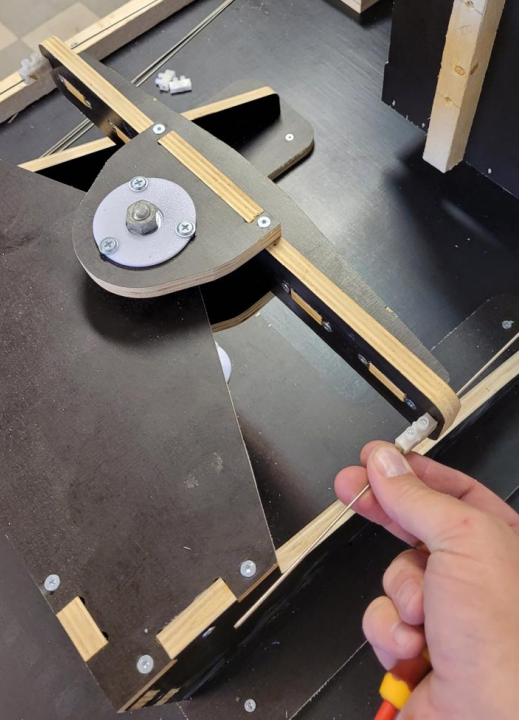
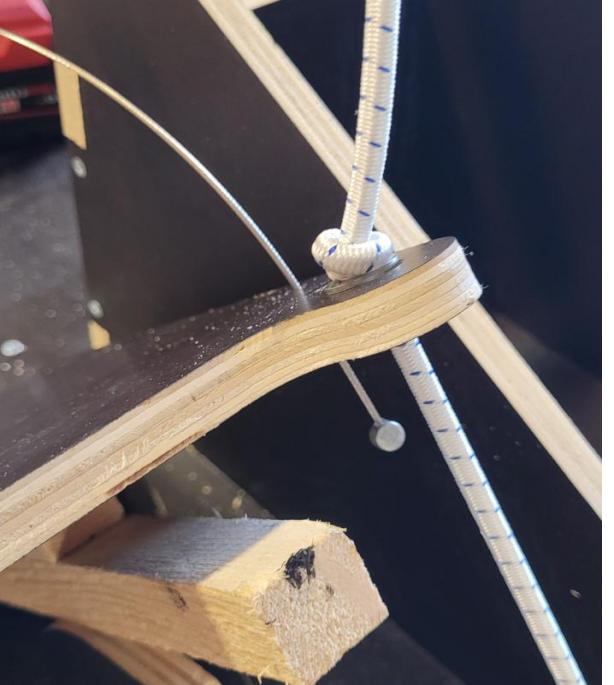
Note: 2 x E8 on top  
of each other!

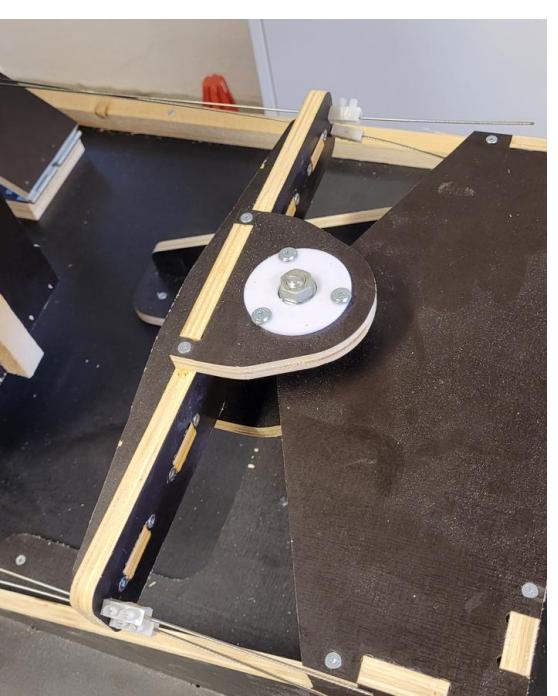
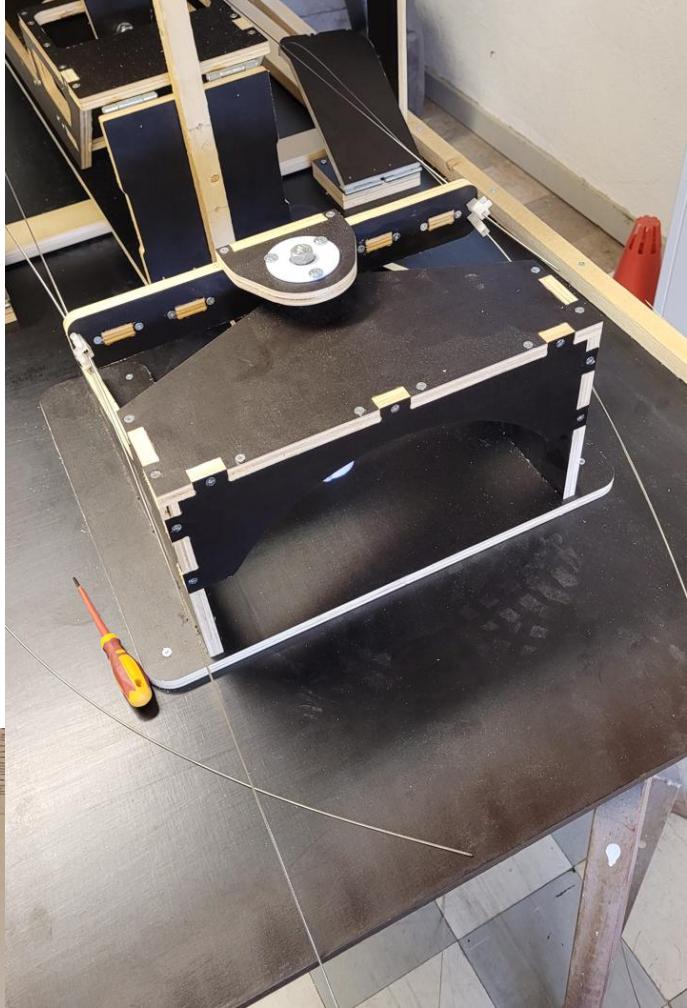
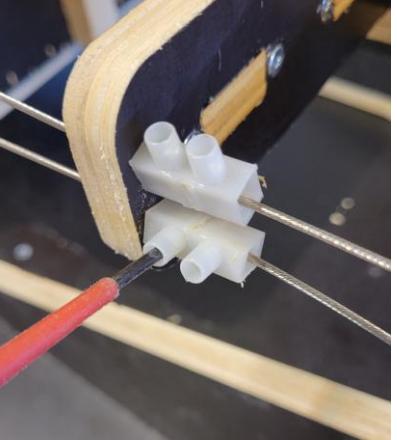
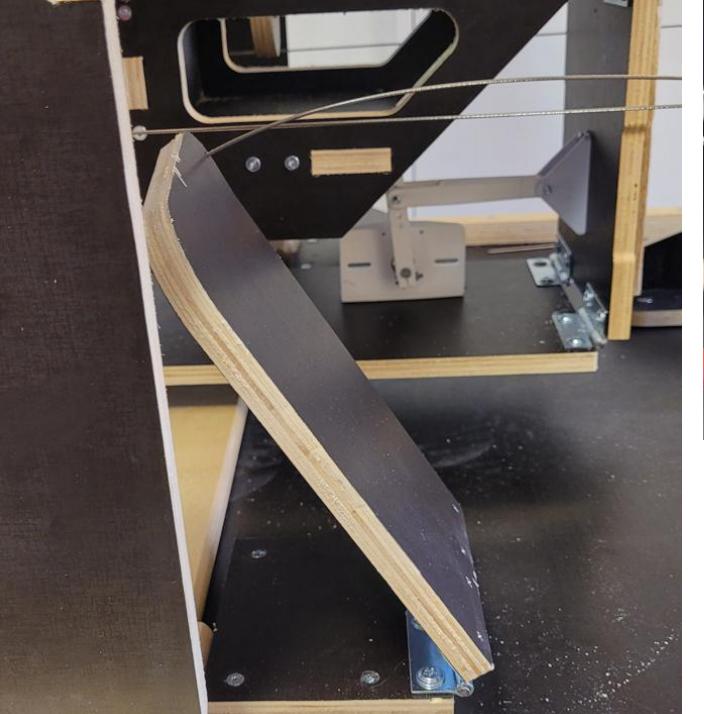
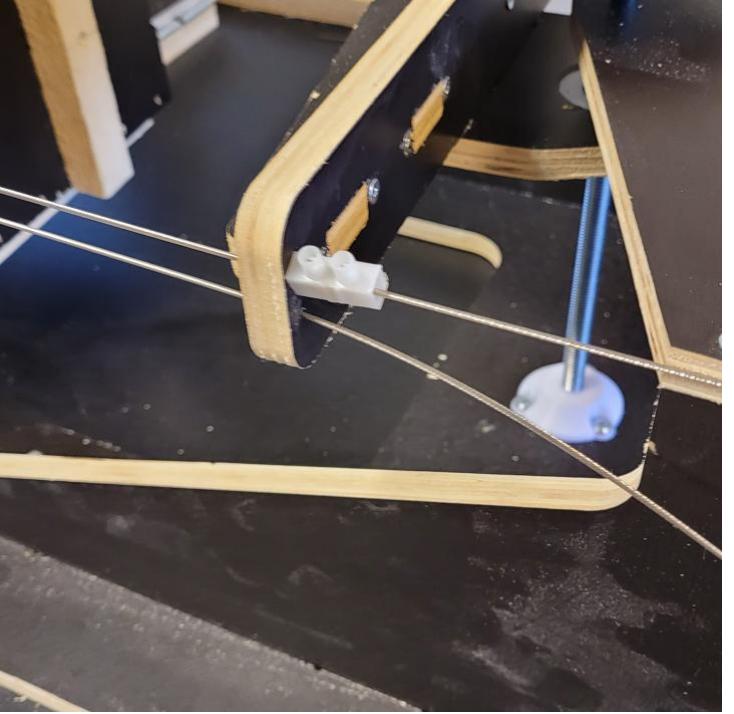


# Step 7, wires and rubber bands

...





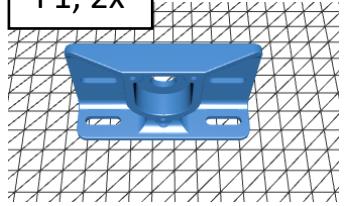




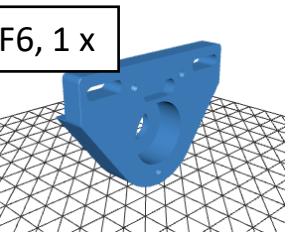
# Step 7, the electronics stuff

...

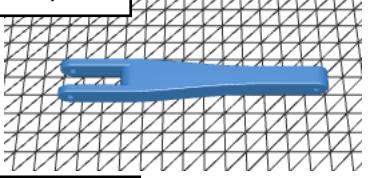
F1, 2x



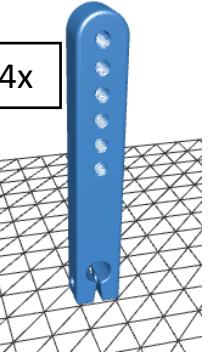
F6, 1 x



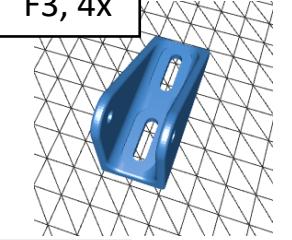
F2, 2x



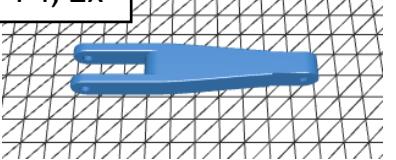
F7, 4x



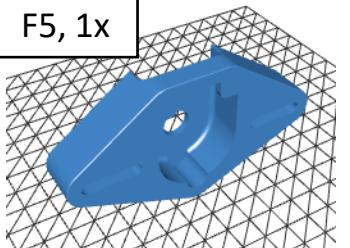
F3, 4x



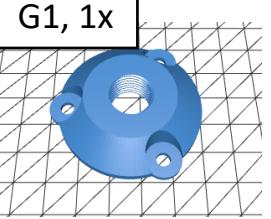
F4, 2x



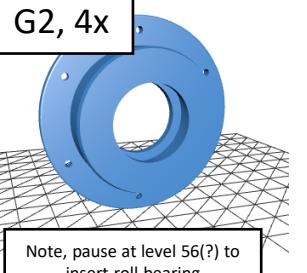
F5, 1x



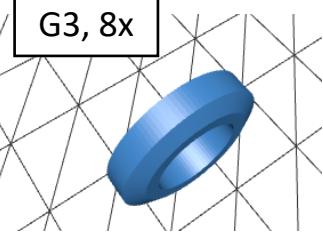
G1, 1x



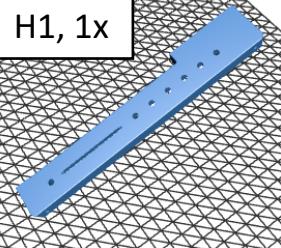
G2, 4x



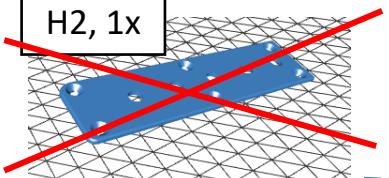
G3, 8x



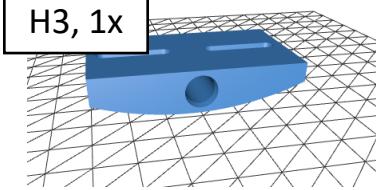
H1, 1x



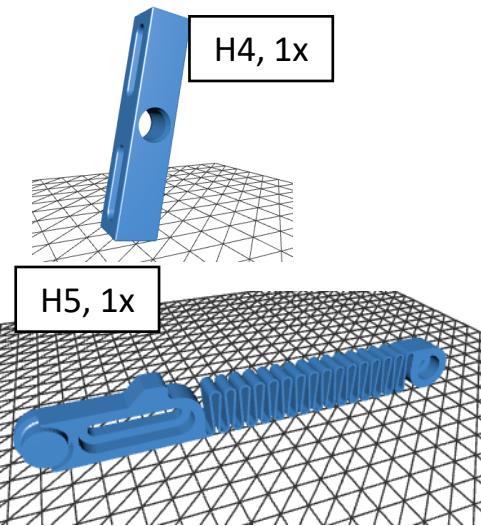
H2, 1x



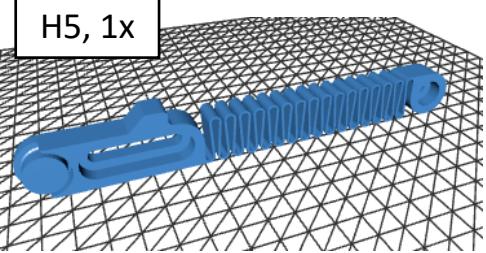
H3, 1x



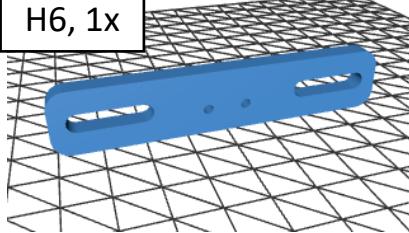
H4, 1x



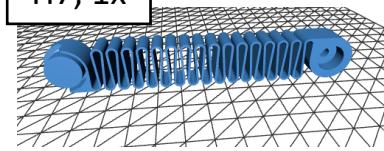
H5, 1x



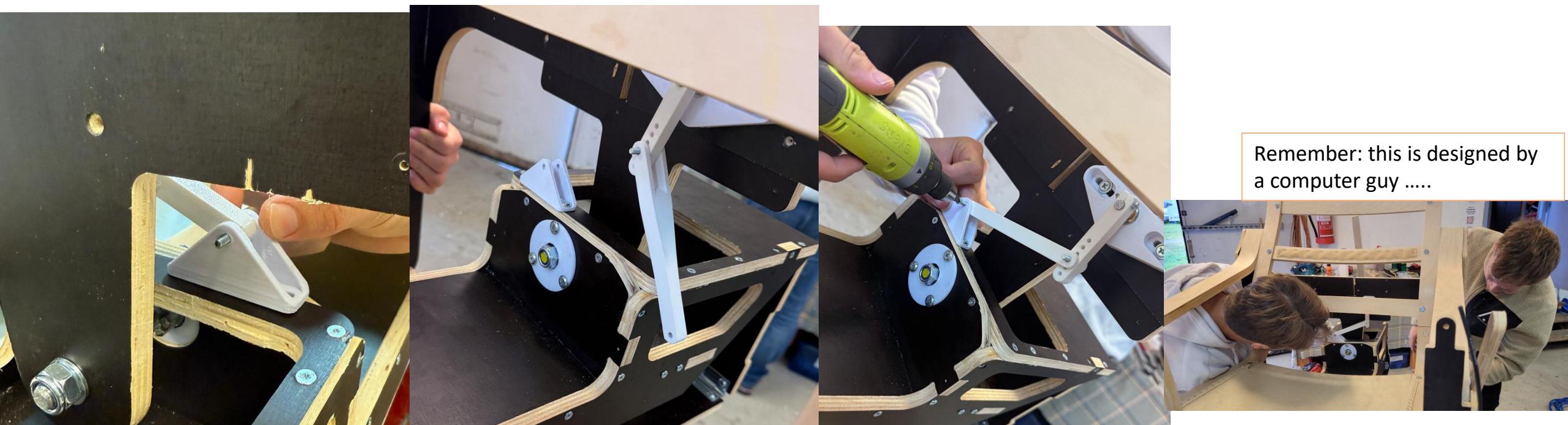
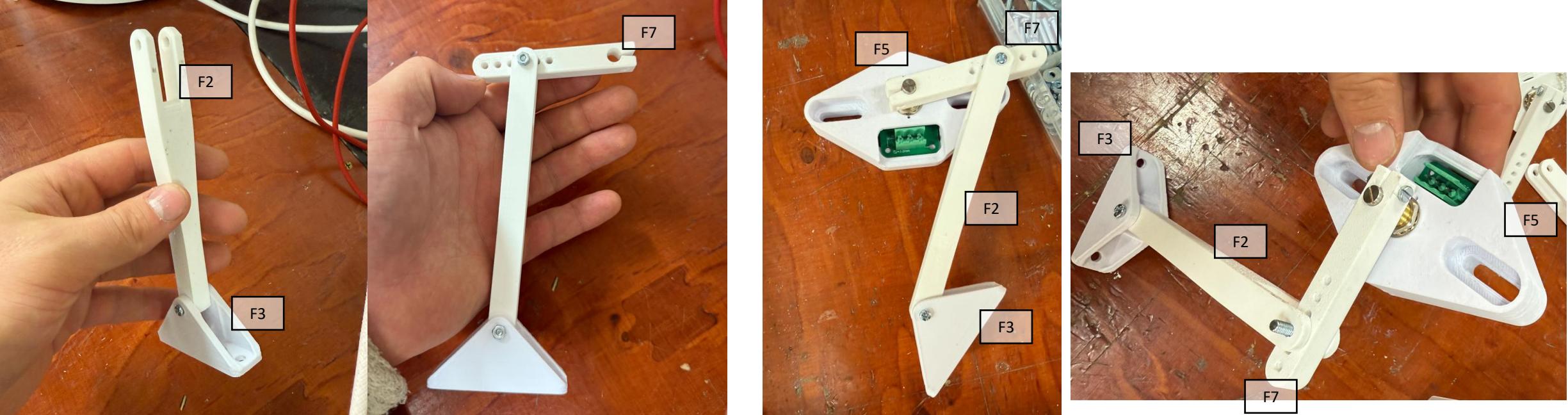
H6, 1x

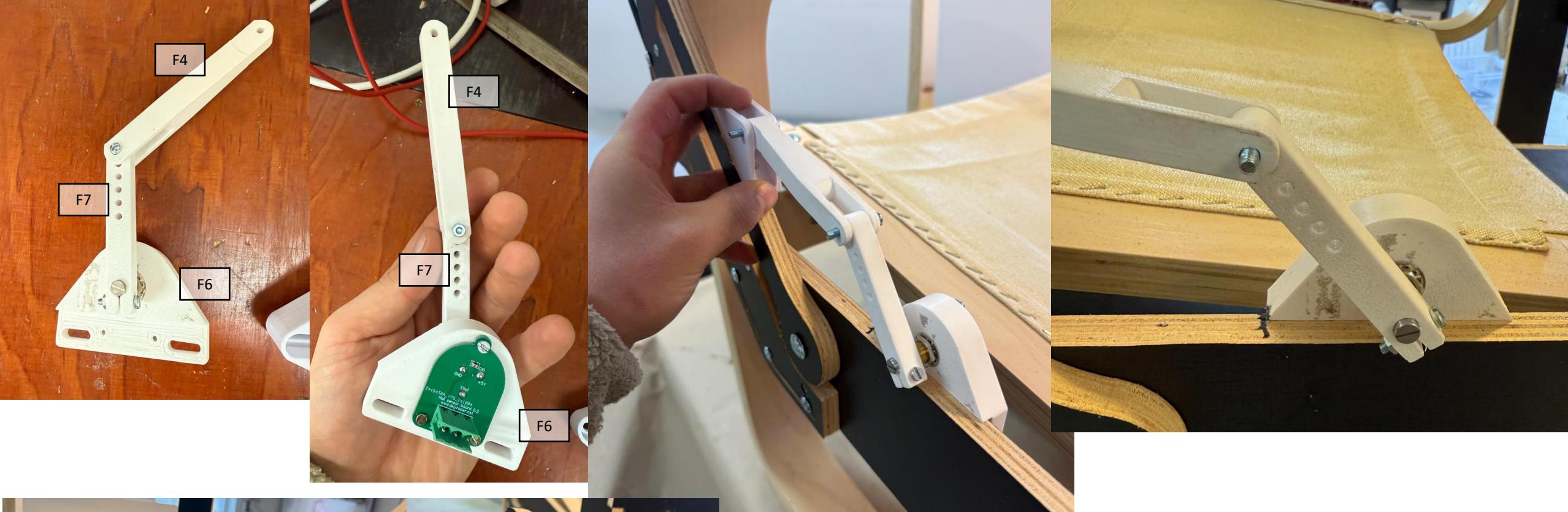


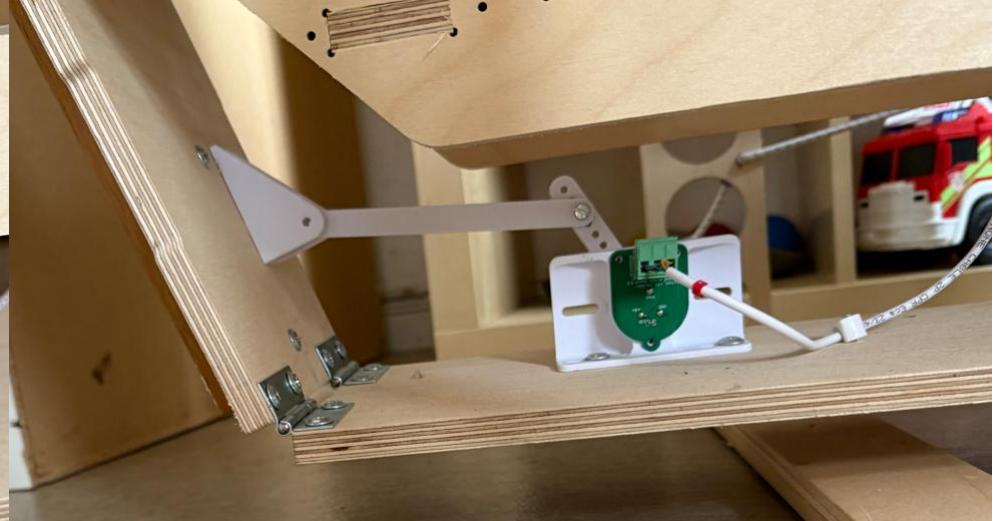
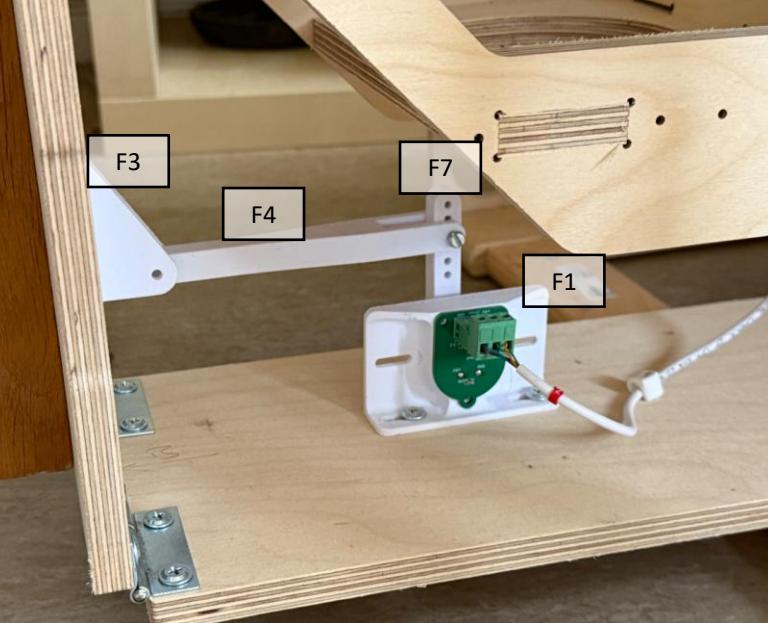
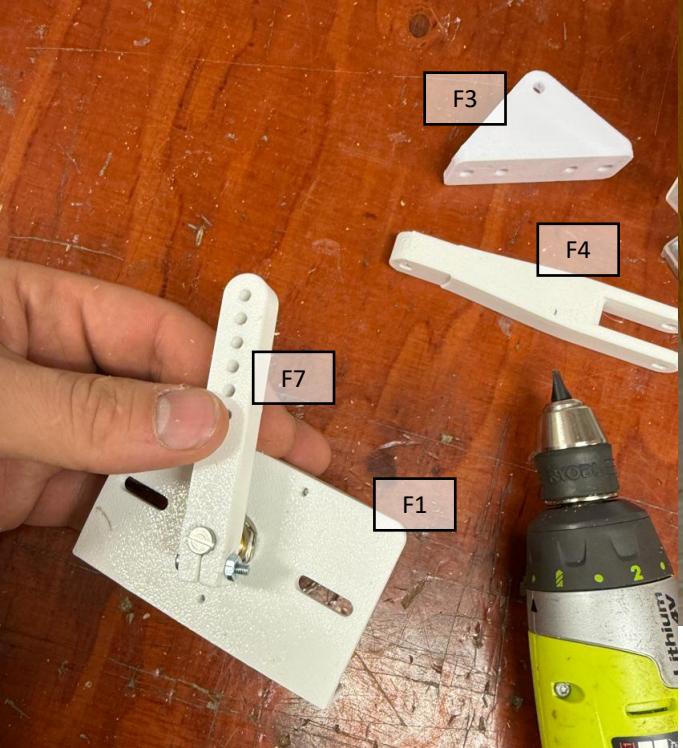
H7, 1x



Discontinued: H1, H2 and D4 is combined together into H1







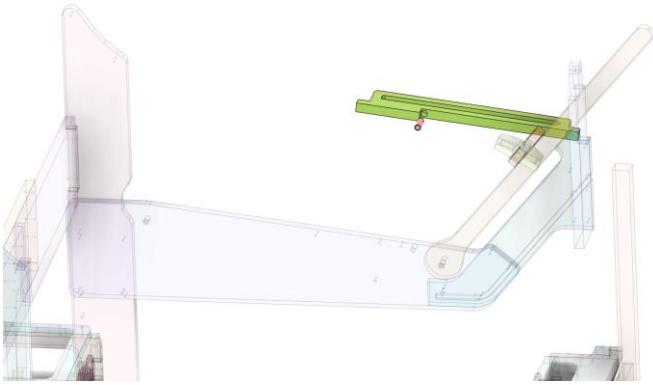
F8



# Calibration

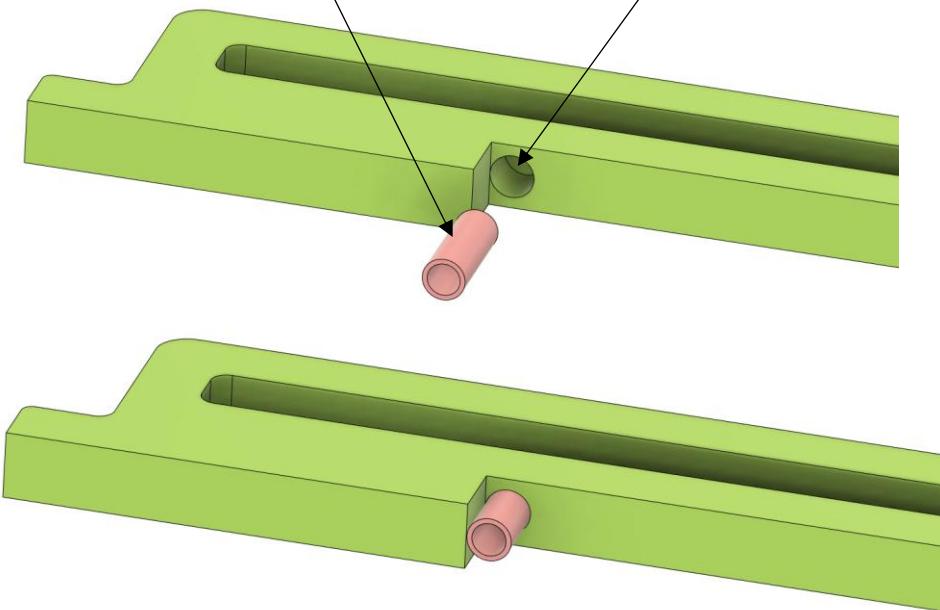
To be continued ...

# Simulating wheel brake



8mm PVC tube

Drill a hole 8mm diameter



When deploying full airbrake, the PVC-tube will be compressed and simulating the wheel brake

