

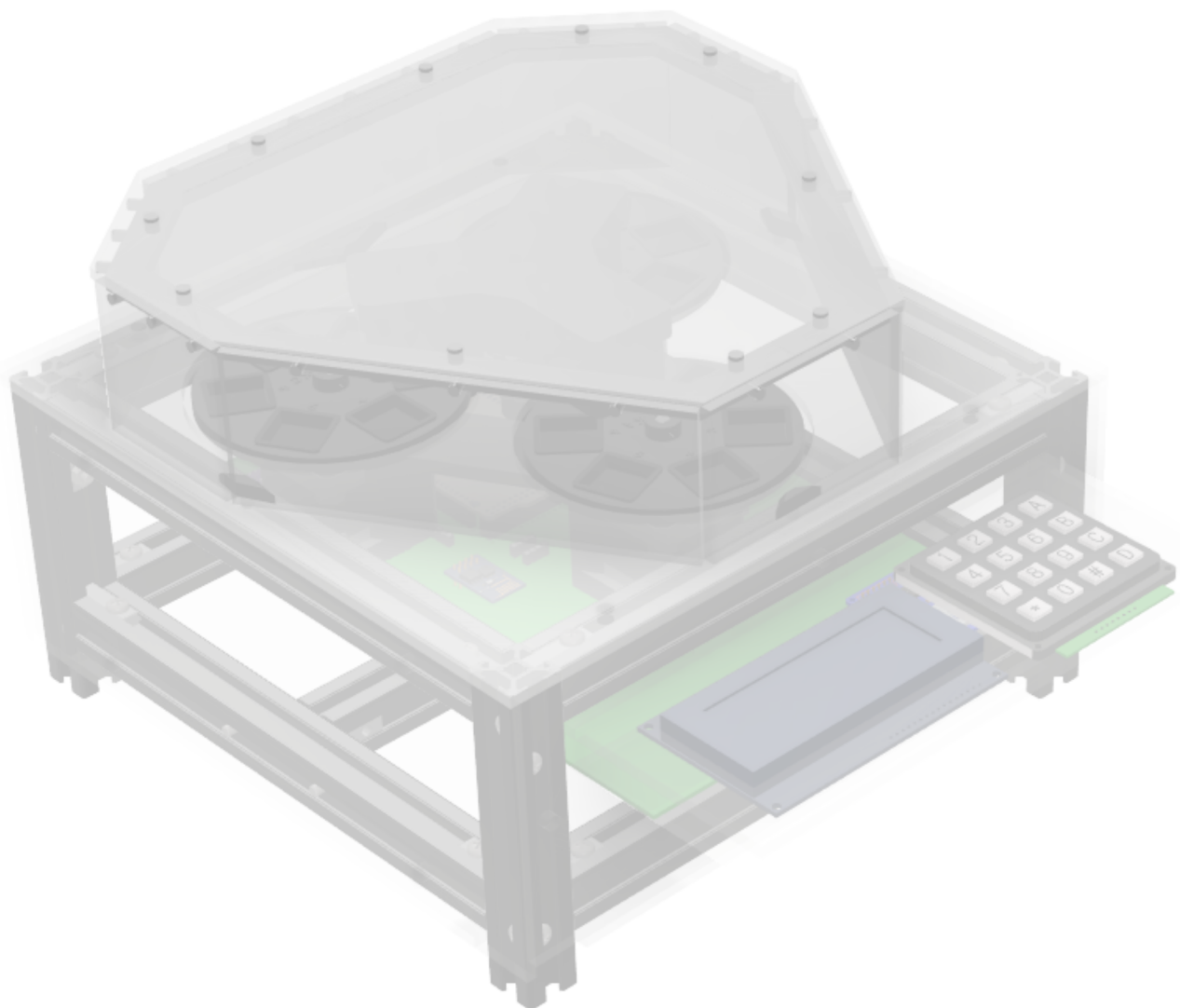


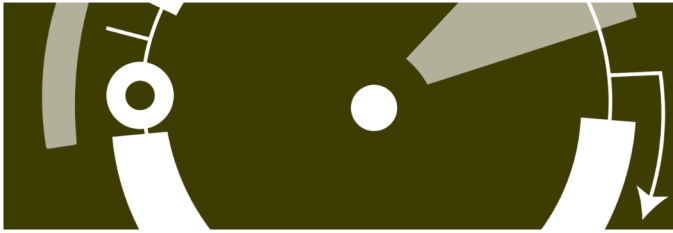
Manufacturing and assembly manual

arsenic detector in contaminated drinking water
AR-10232021

 Equipo de iGEM Bolivia 2021







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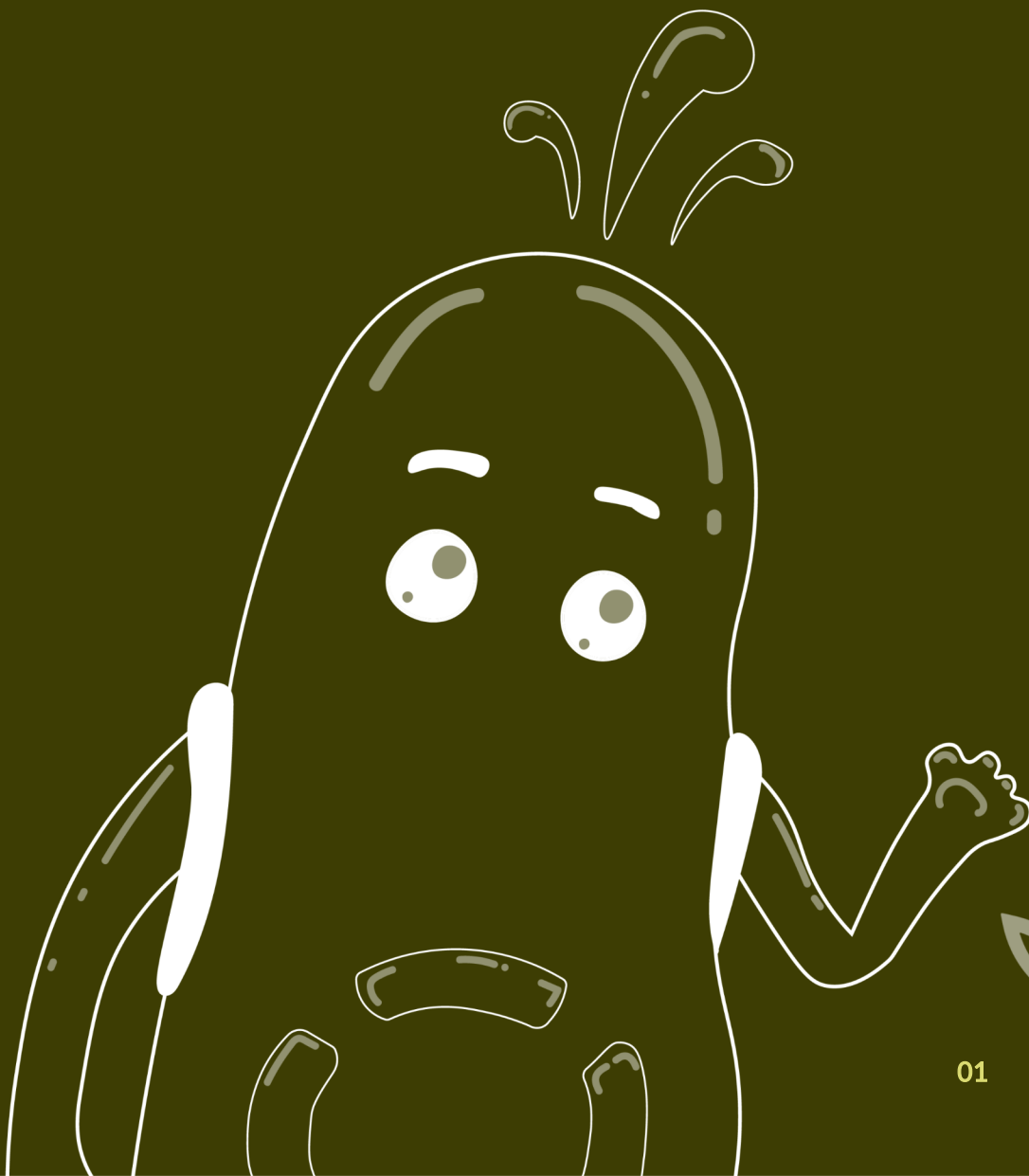
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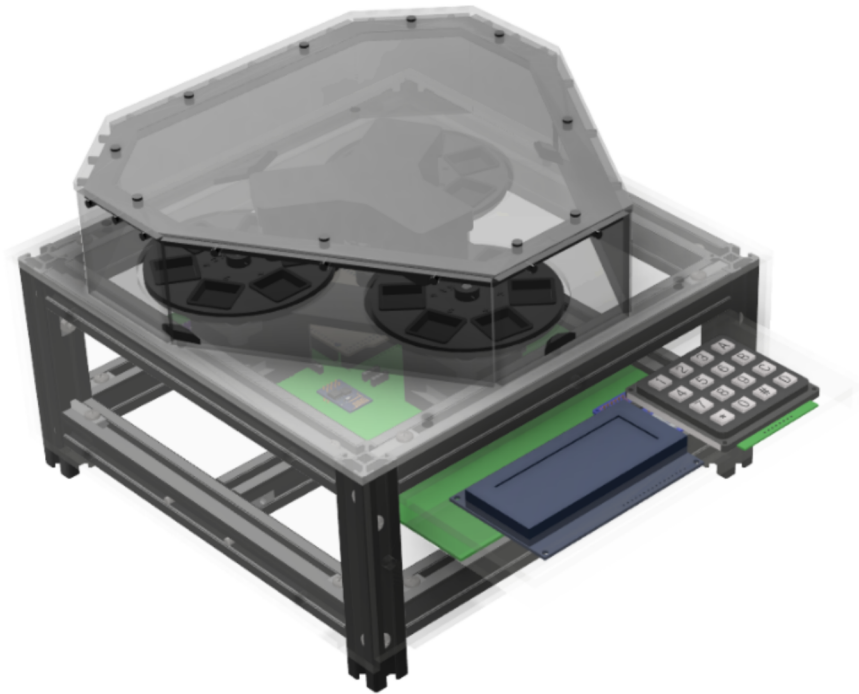
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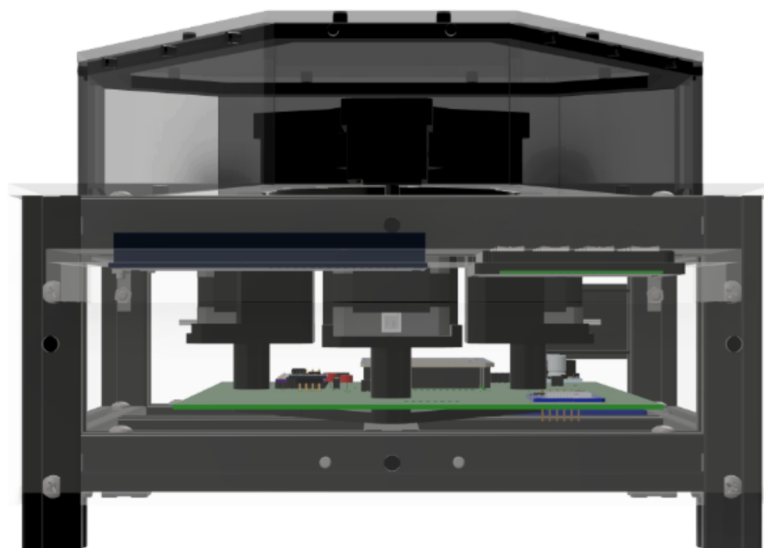
iGEM Bolivia device

 Equipo de iGEM Bolivia 2021



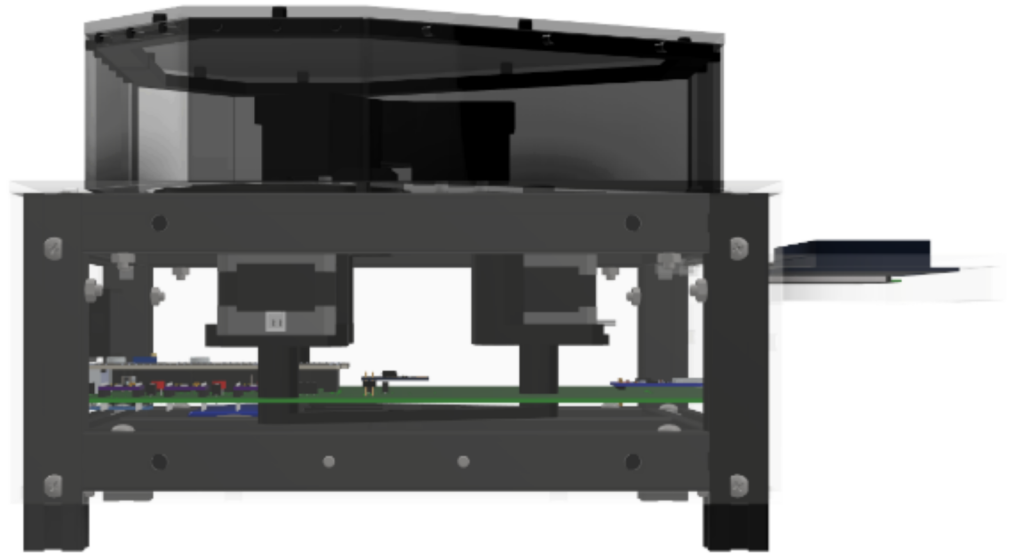
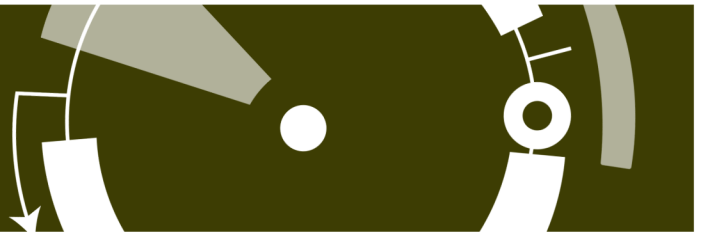


Orthogonal view

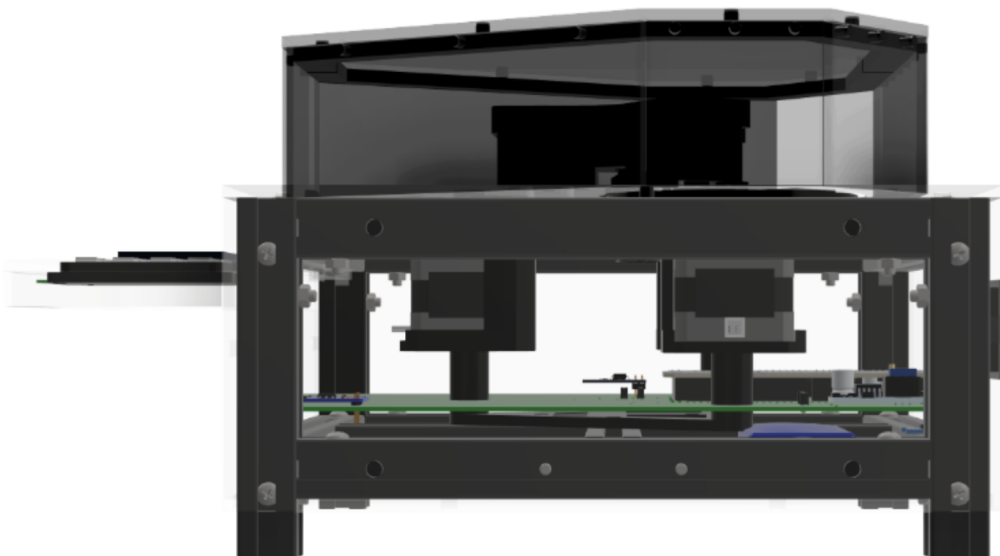


Frontal view

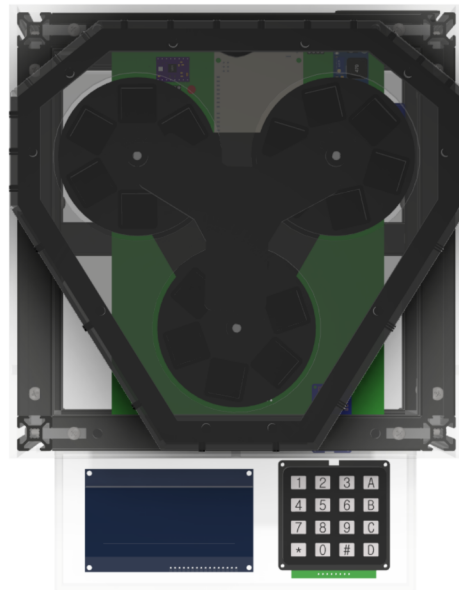
Rendered device



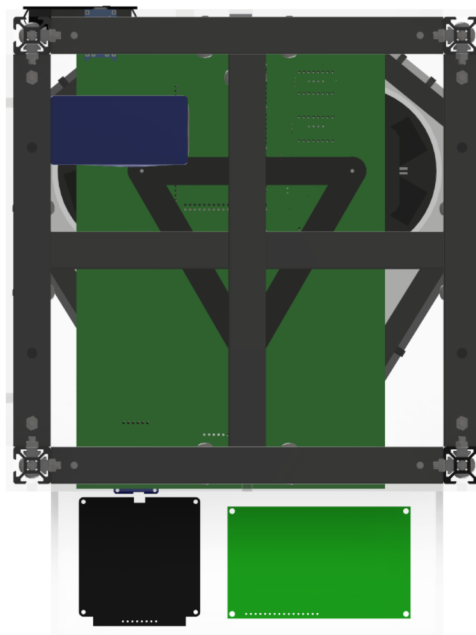
Left side view



Right side view

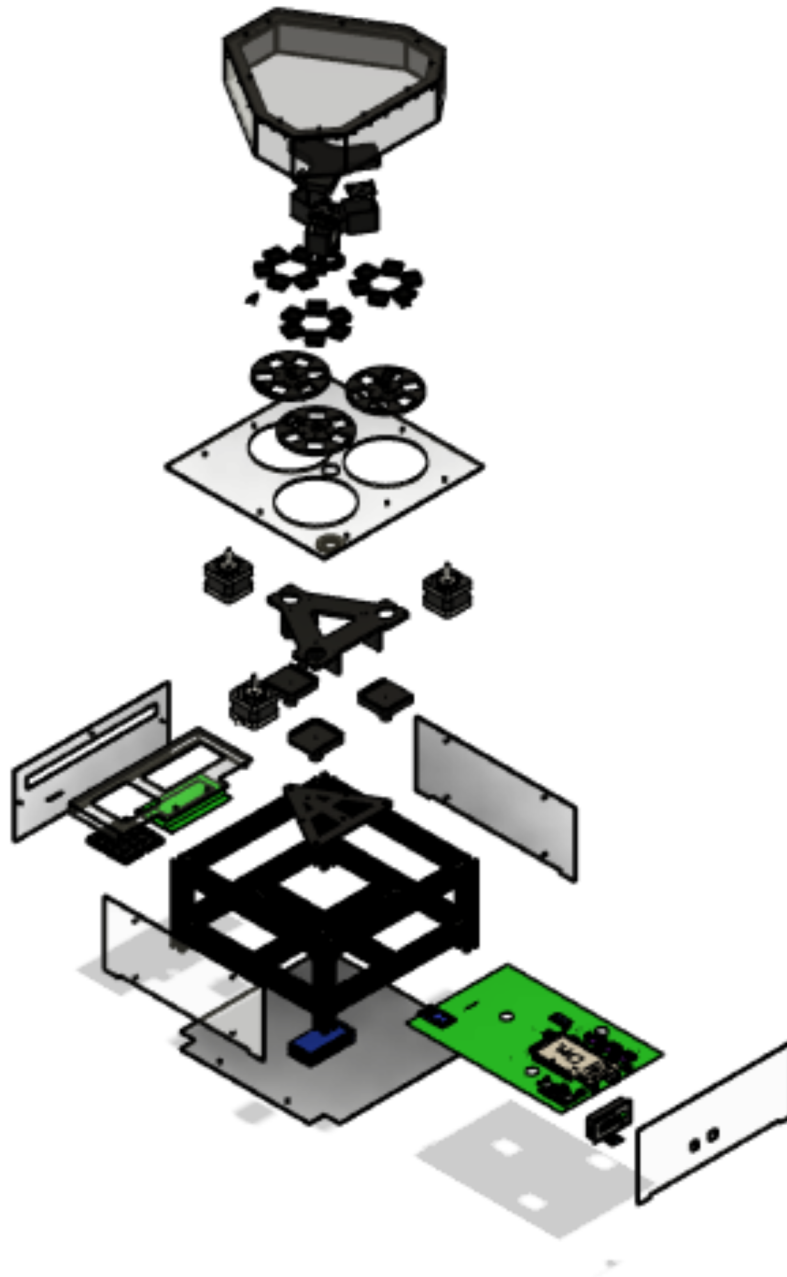


Upper view

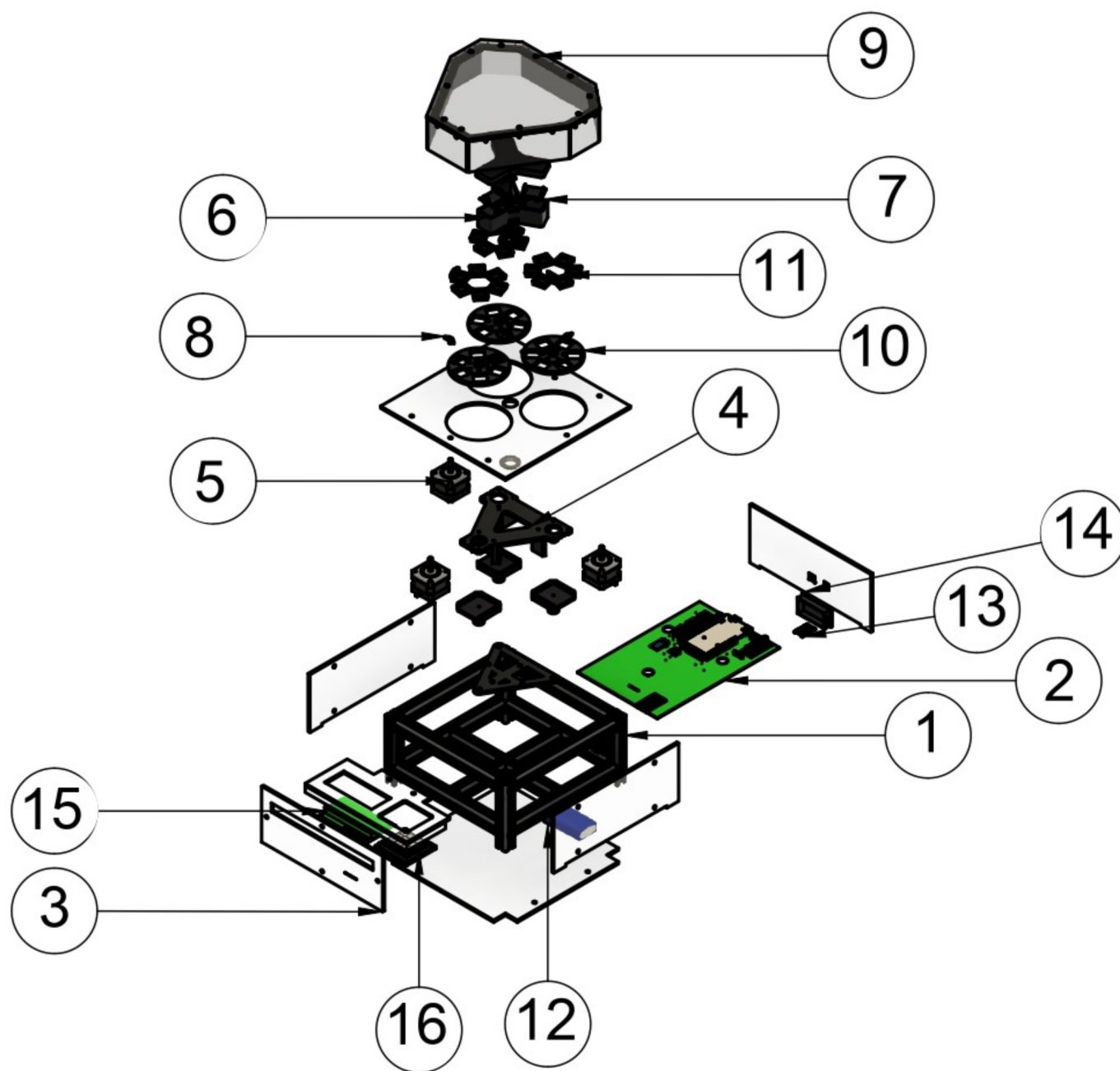


Bottom view

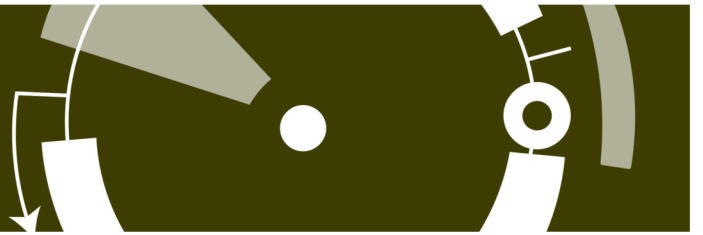
Explode



Parts list



Parts list

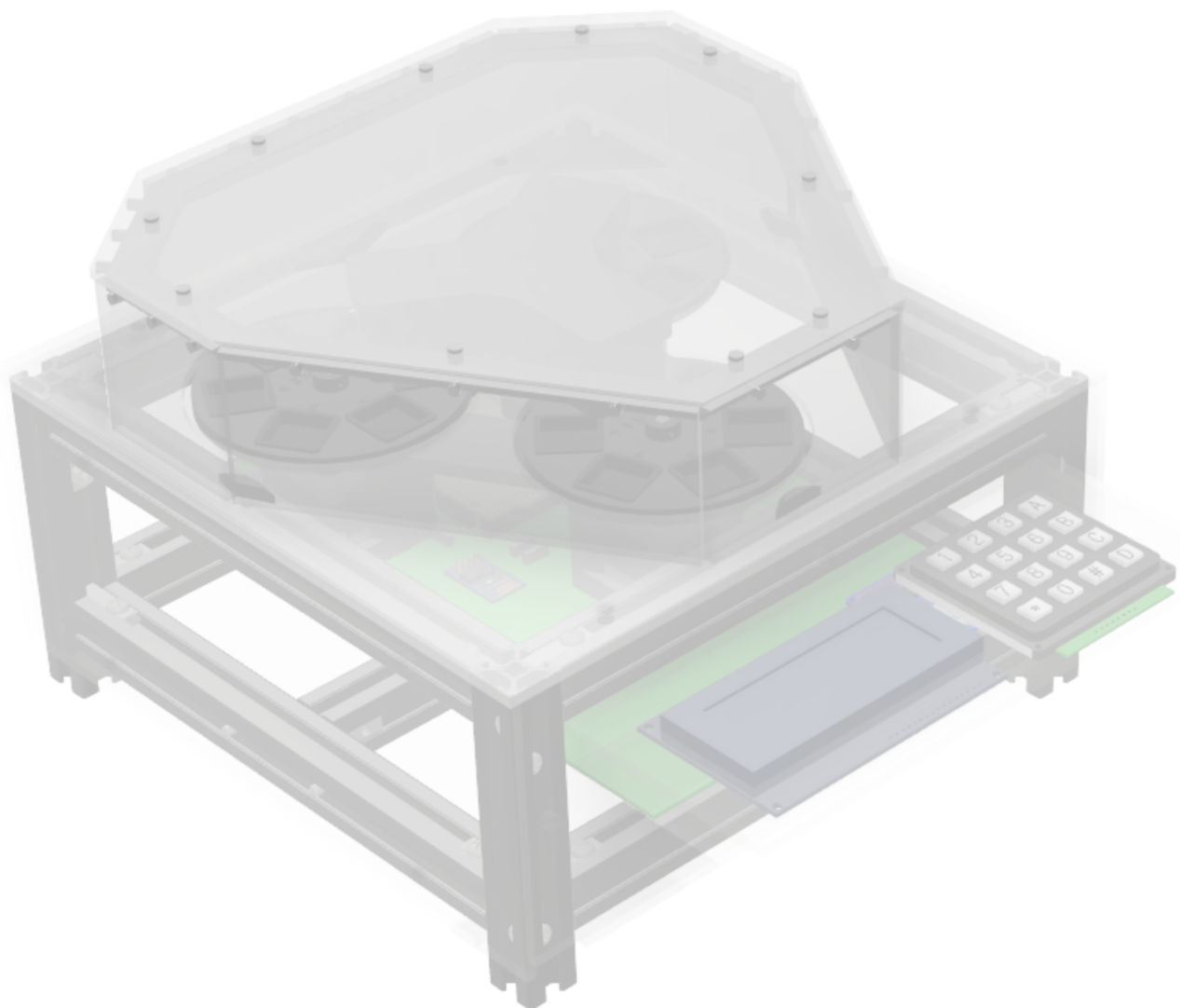


PART LIST		
ITEM	QTY	NAME
1	1	ALUMINIUM CHASSIS
2	1	PCB
3	1	CASE
4	1	ENGINE MOUNTS SET
5	3	NEMA 17
6	1	SENSOR MOUNTS SET
7	3	TCS 230
8	1	LOCK SET
9	1	SHIELD
10	1	DISC KIT
11	18	CONTAINER
12	1	LIPO BATTERY
13	1	LIPO BATTERY CHARGER
14	1	LY6W
15	1	20X4 DISPLAY
16	1	4X4 KEYPAD

Software used

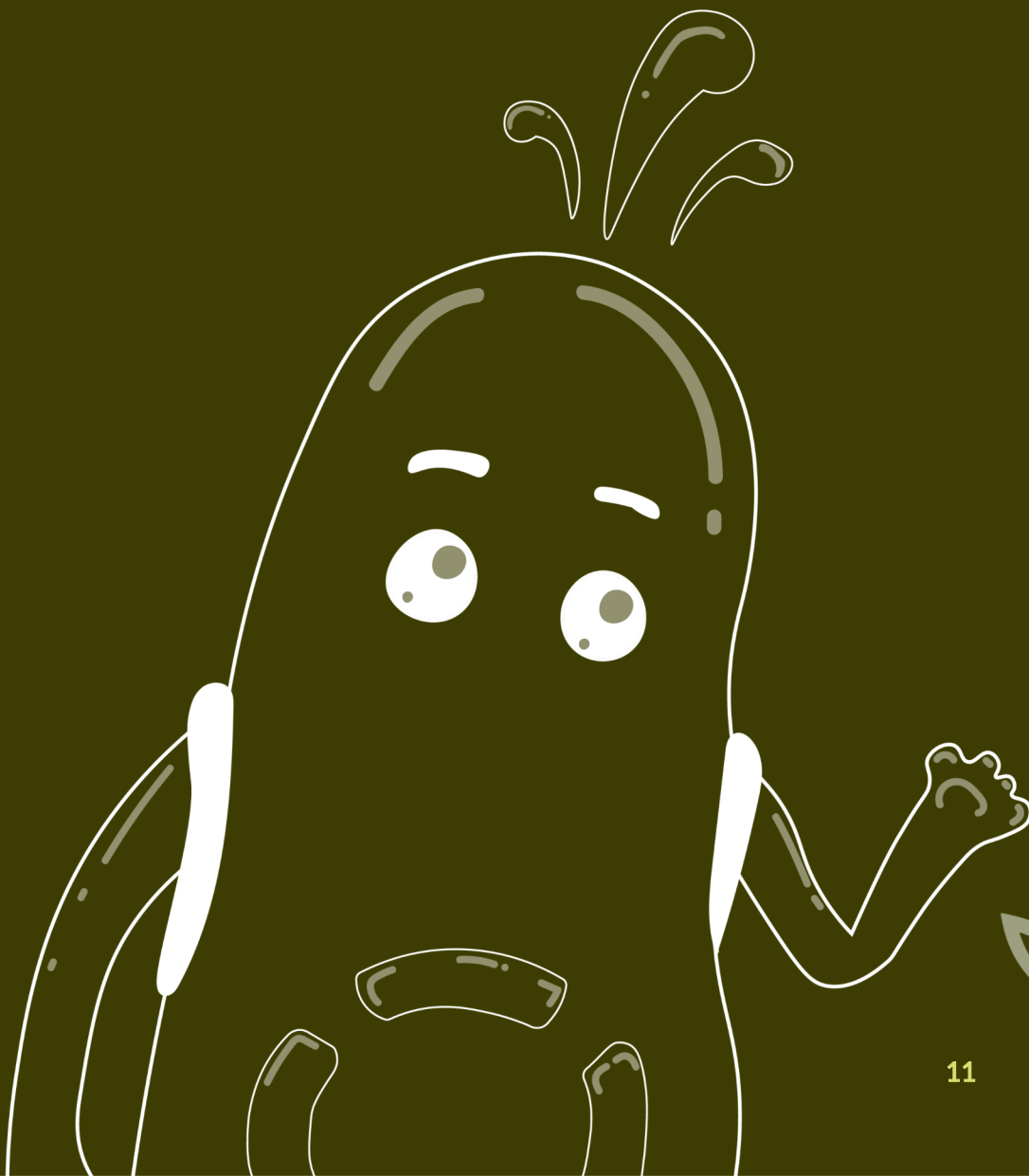
The device design was carried out in combination of the following so:

- Autodesk inventor professional 2021
- Autodesk fusion 360



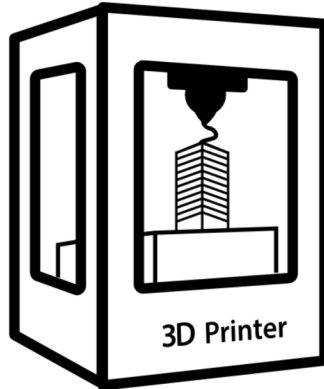
Device fabrication and assembly

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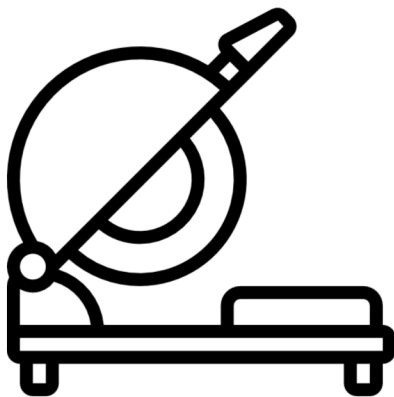


iGEM
BOLIVIA

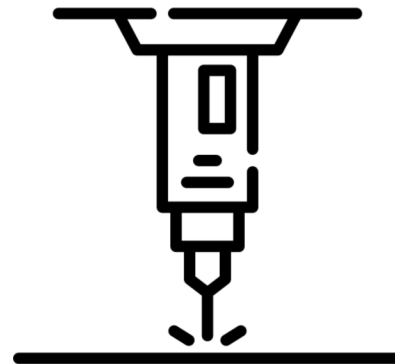
Fabrication: Equipment and tools needed



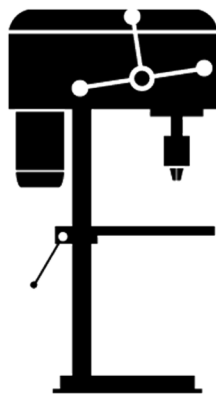
3D printer



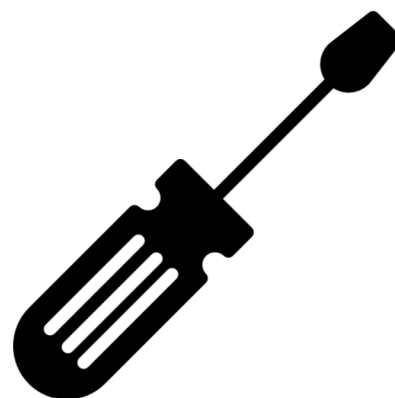
Mitter saw



CNC Laser

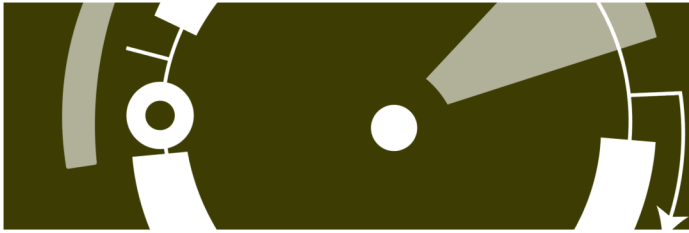


Drill press



Screwdriver

Icons from freepik.com



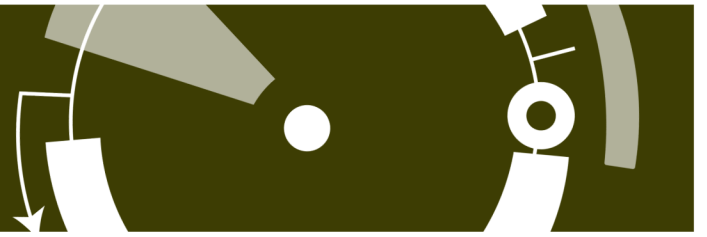
Fabrication: Recommendations

Recommendations

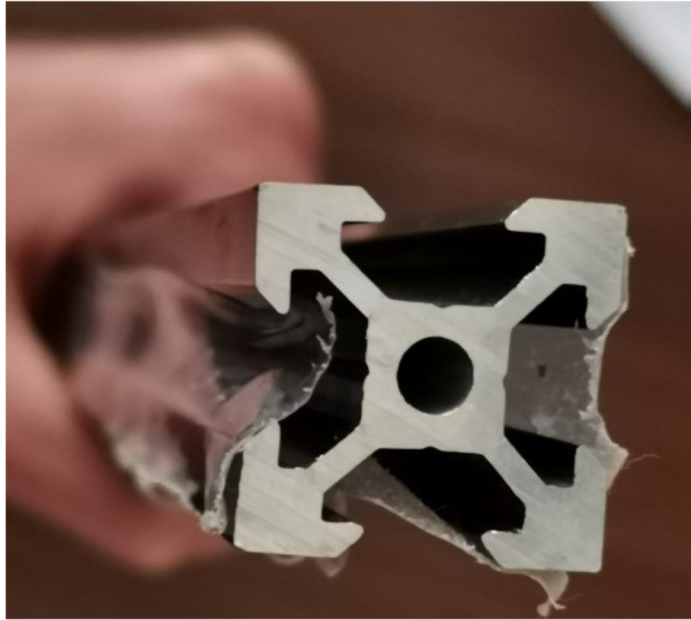
For the manufacture of the elements, it is recommended

- Calibrate the machine tools.
- Order and cleaning.
- Consider and mitigate the risks involving the use of each machine tool.
- Use EPP (Personal protective equipment).

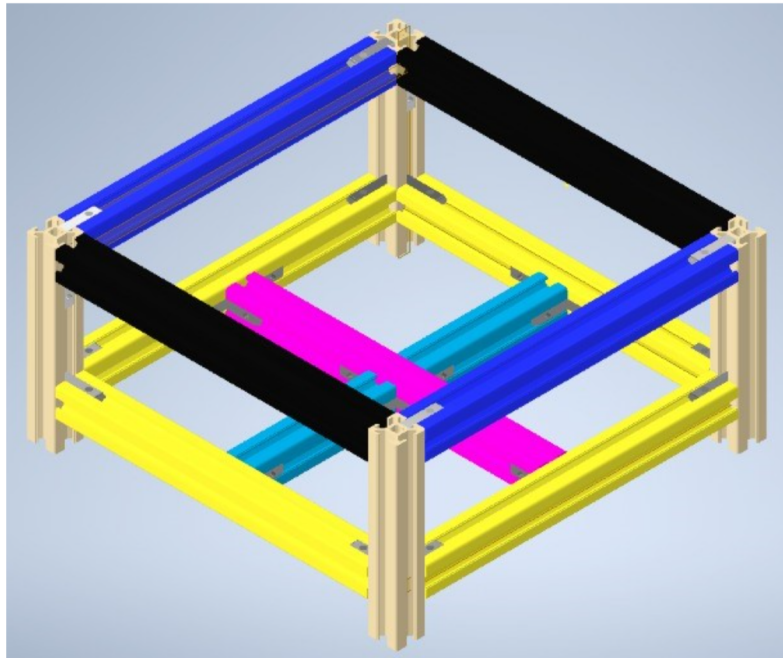
Fabrication: Cutting and drilling



The aluminum chassis is made of 20 x 20 mm structural aluminum profiles



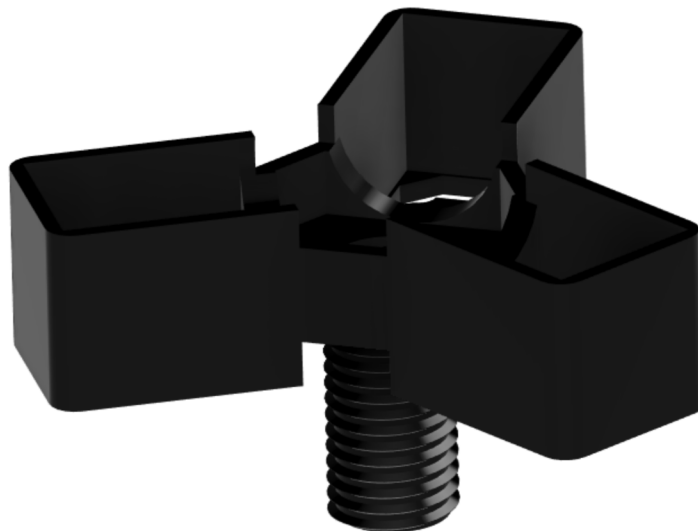
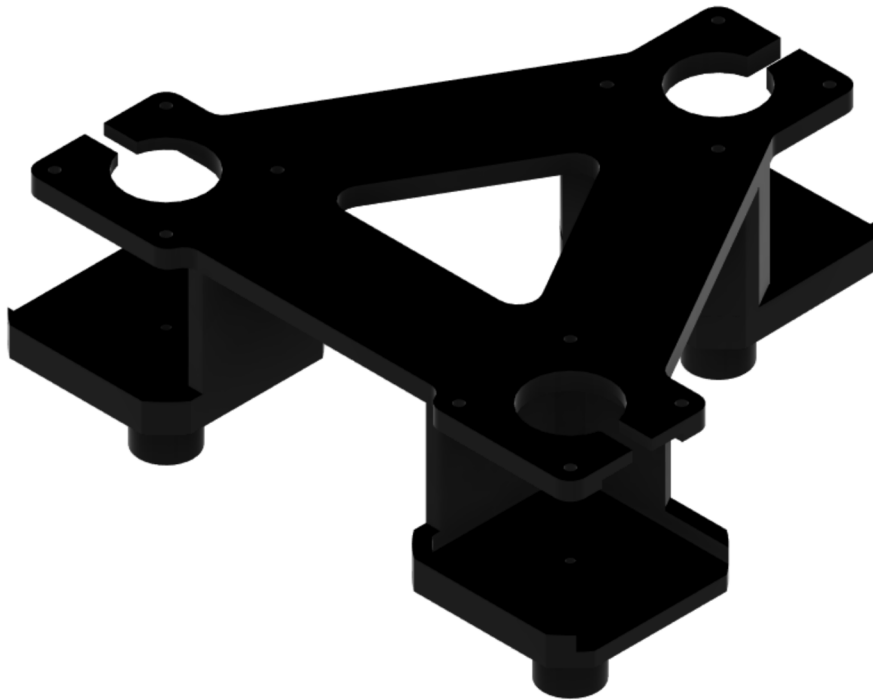
For the assembly of the chassis, 15 pieces are required, approximately a total of 2620 mm, estimating losses



The plans with the lengths and drilling centers are shown in the appendix.

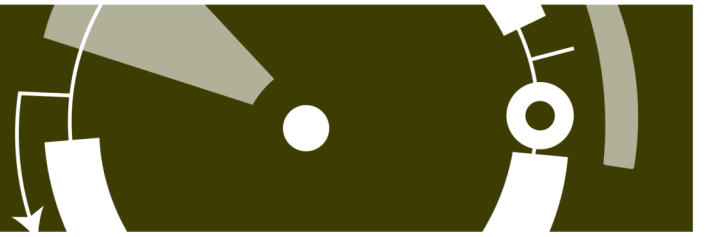
Fabrication: 3D printing

About 30 pieces are 3d printed



The stl files can be found in the appendix.

Fabrication: CNC Cutting



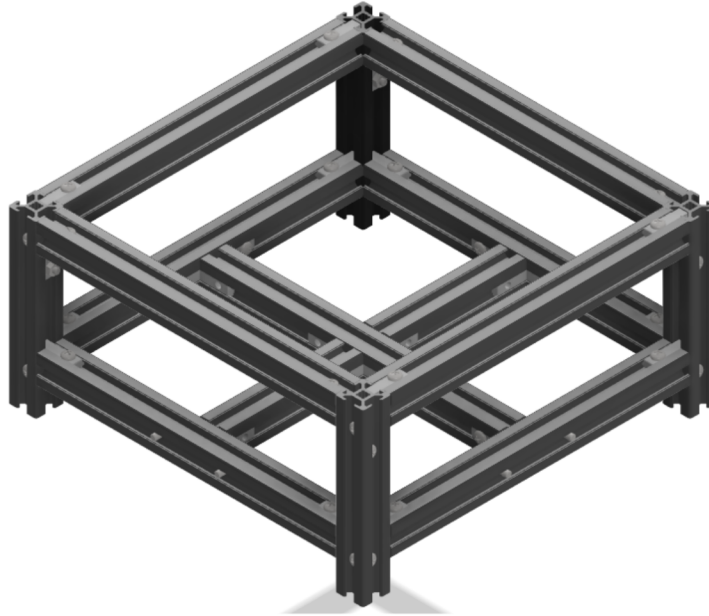
The components of the case and the shield are made of 4mm thick acrylic produced by this method.



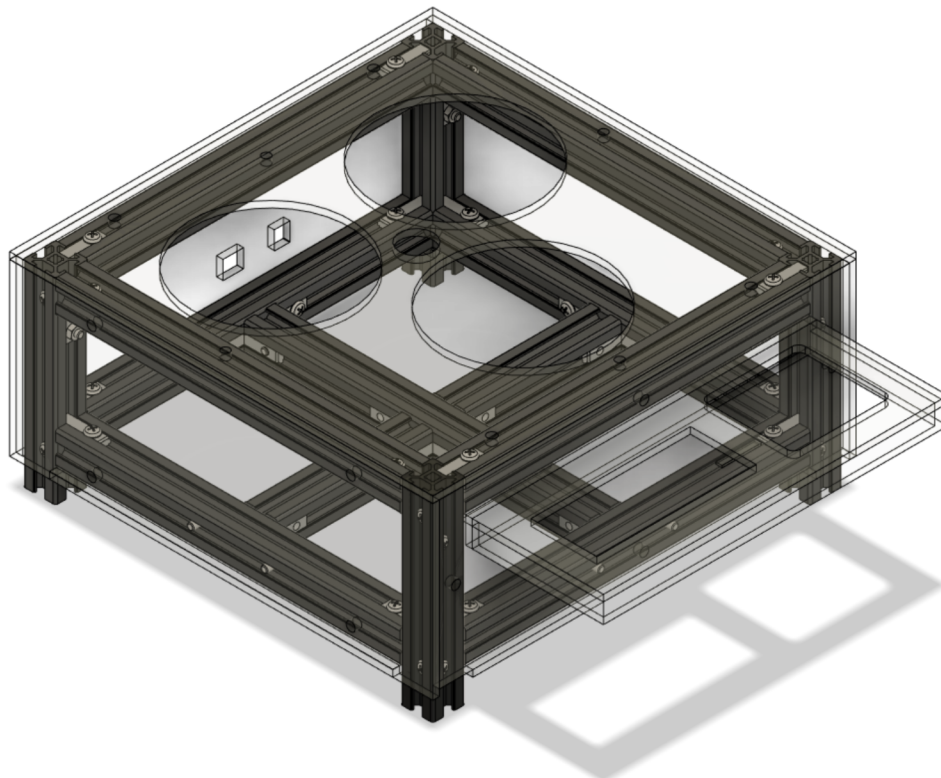
The dxf files needed for the cutting of the case components are in the appendix

Device assembly

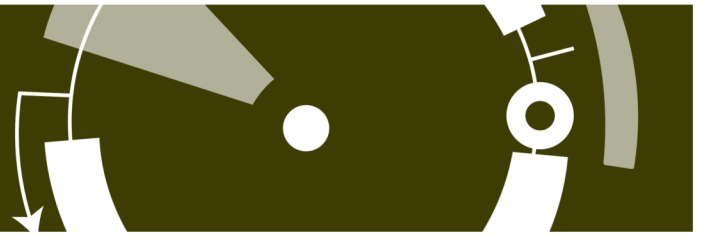
The aluminum structure is jointed by slotted brackets, screws and nuts.



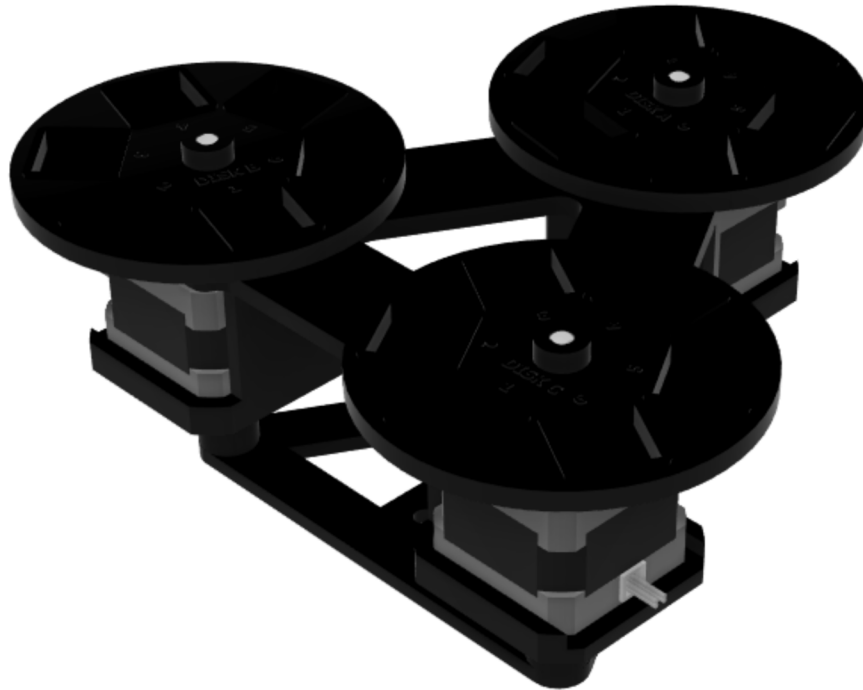
The case is fixed to the structure by hammer head screws



Device assembly



The lower support of the engines is fixed to the chassis with hammer head screws



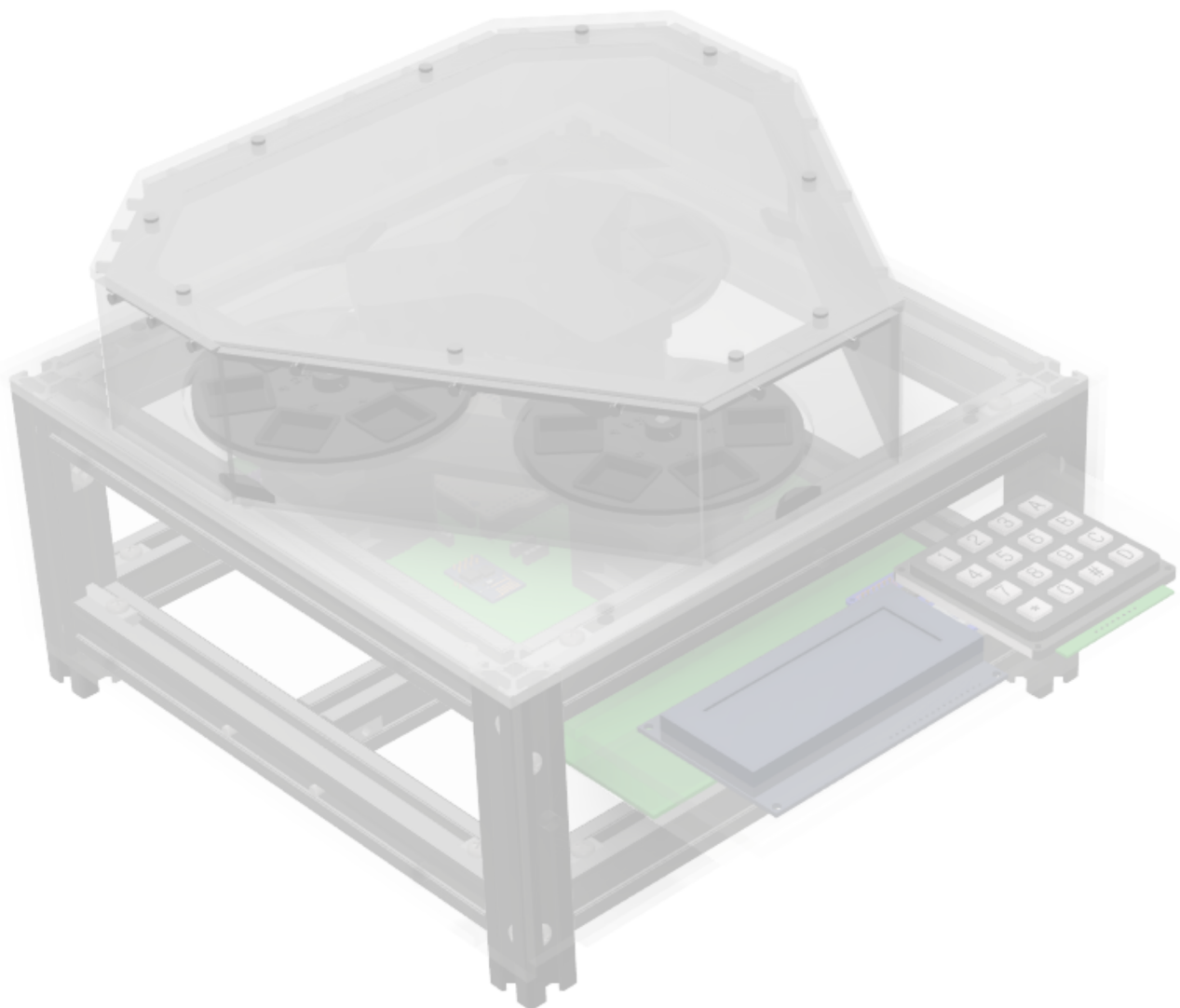
With the containers on the disks, the mobile assembly is finished



Device assembly

The sensor support is assembled with its cover, the sensors and their stabilizers.





Fabrication files

Cutting and Drilling:

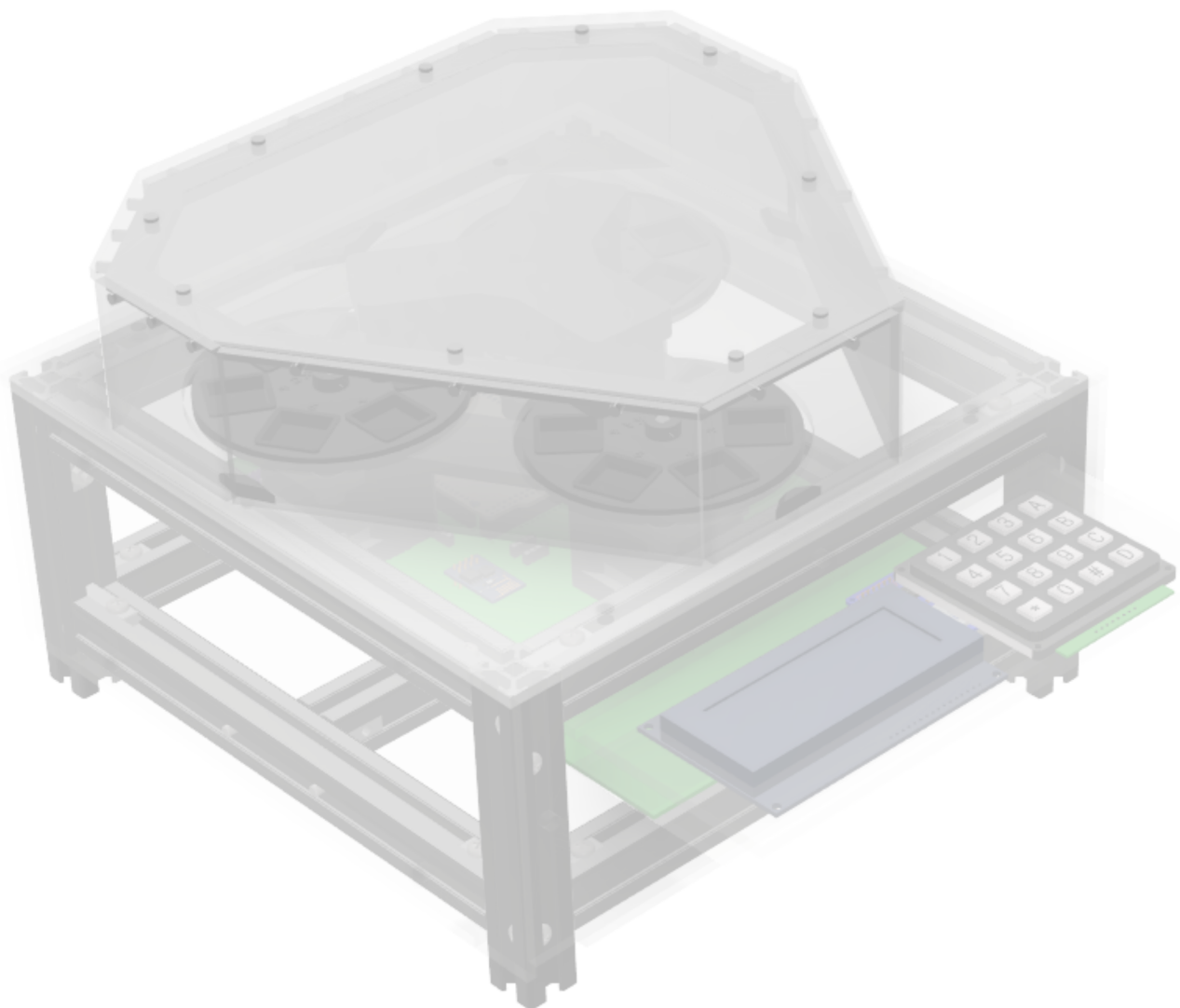
https://drive.google.com/drive/folders/1Z_5o7dOgbtihysnRFnZBACW3VpsYEHE?usp=sharing

3D printing:

<https://drive.google.com/drive/folders/1qIPQz6FLMV9RHtBY3sXtR0nFJ0DEFECY?usp=sharing>

CNC cutting:

<https://drive.google.com/drive/folders/1Y26OzibPsRGg7OyMP7Ra1N60TDyZ9MH8?usp=sharing>



We elaborated a very detailed manual for our device which includes instructions for assembly, correct use, 3D models, exact dimensions for its parts and some downloadable files for 3D printing.

Equipo de iGEM Bolivia 2021

