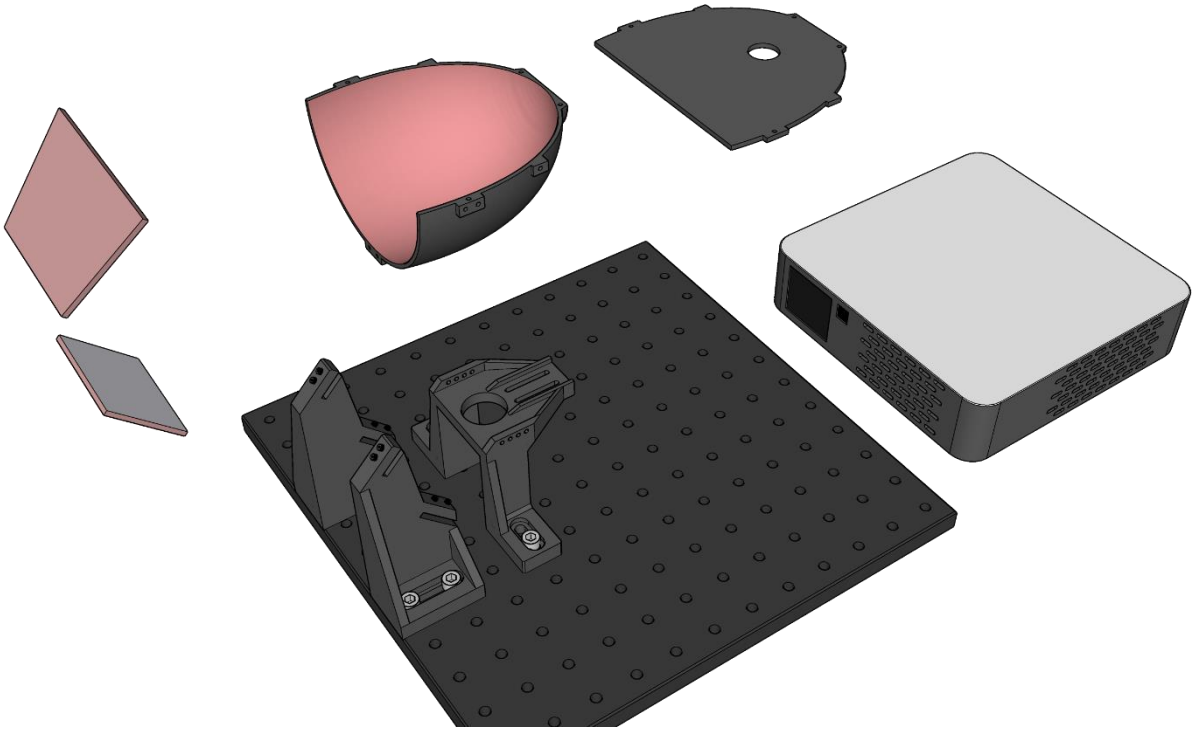
Assemble instruction “Bowl V1.1” via 3d print

Here is an overview of the individual components of the Bowl setup. The setup initially consists of a breadboard, this can either be an optical table or a separately purchased breadboard (Thorlabs / Newport). The grid dimension is 2.5cm. https://www.thorlabs.com/thorproduct.cfm?partnumber=MB2530/M



The design is applicable for both projectors LG PH510PG (used in the paper) and ViewSonic® M2E (120 Hz mentioned in the paper). The lid is optional and largely depends on the setup constraints and fly holder used.

1. 3D printing of the components.

First, the screen should be printed to avoid long production times. Make sure that the geometry can be printed correctly in your 3d printer. It may be necessary to select the best orientation before the printing process in order to avoid poor results. While the other components are being printed, the processing and painting of the surface can be taken care of.

1. Bowl screen
2. Screen holder
3. Left and right mirror holders (careful the design is mirrored not rotated)
4. Screen lid (optional)

2. Preparation and coating of the screen

With resin-based 3d printing, minor post-processing is required. if other 3d printing methods are used, it may initially be necessary to close deep grooves with 2k car body filler. In addition, after each painting or filling step, the drying times specified must be ensured.

2.1 Printing result after resin-based 3d print

2.2 Sanding the surface with wet sanding paper (grain 240 to 800 in several steps)

2.3 Filling the paint filler (1-2 layers)

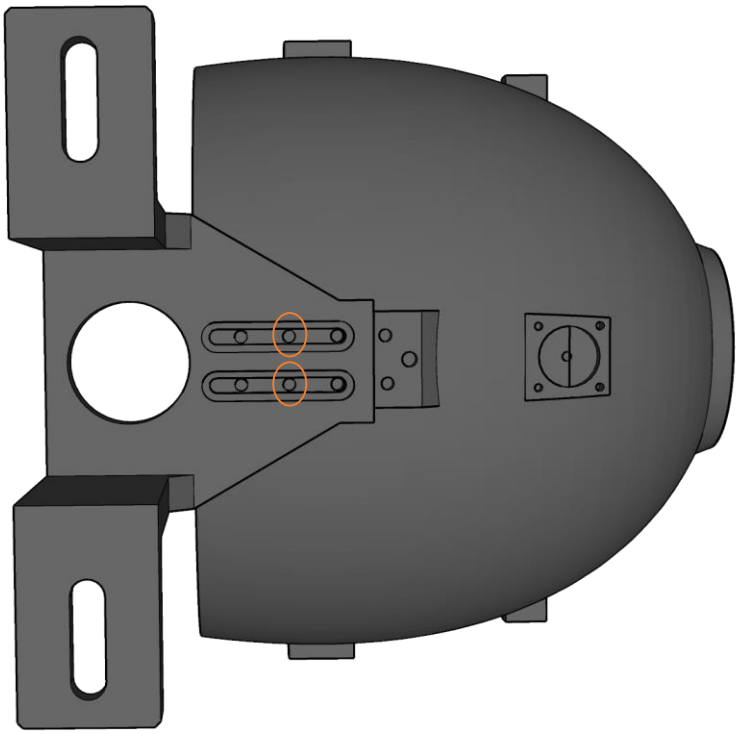
2.4 Sanding with grain 400 to 800

2.5 painting with dupli color white color spray (2 layers)

2.6 finish with marabu matt spray (1 thin layer)

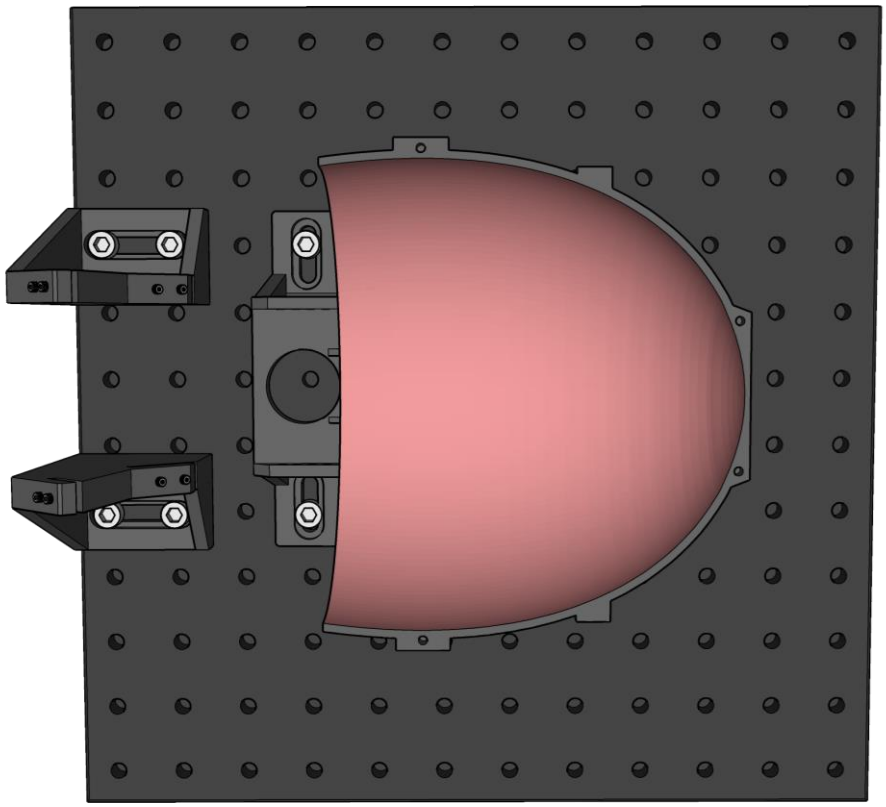
3. mounting the screen to the screen holder

Often in resin based 3d printed parts its required to cut the threads before screwing in. Use two cylinder-head M3/6mm metric screws to connect the Screen to the Screen holder.



4. mounting the mirror holder and the screen holder on the breadboard.

Use 6 cylinder-head M6/10mm screws to assemble the components on the breadboard. Use the same mounting grid visible in the image.

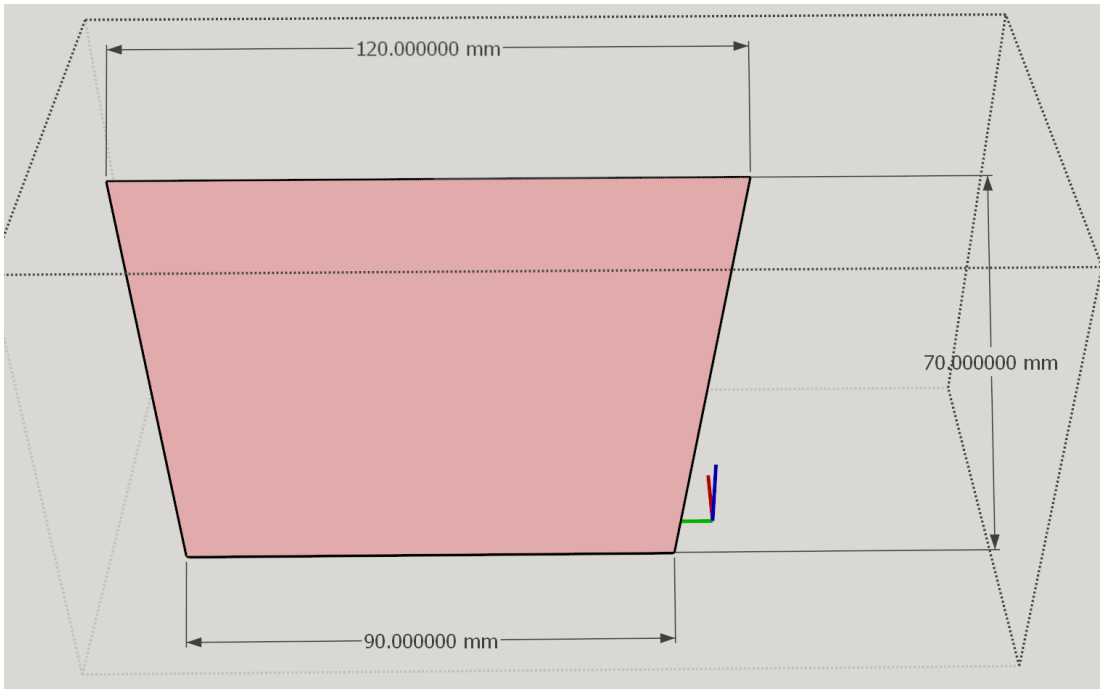


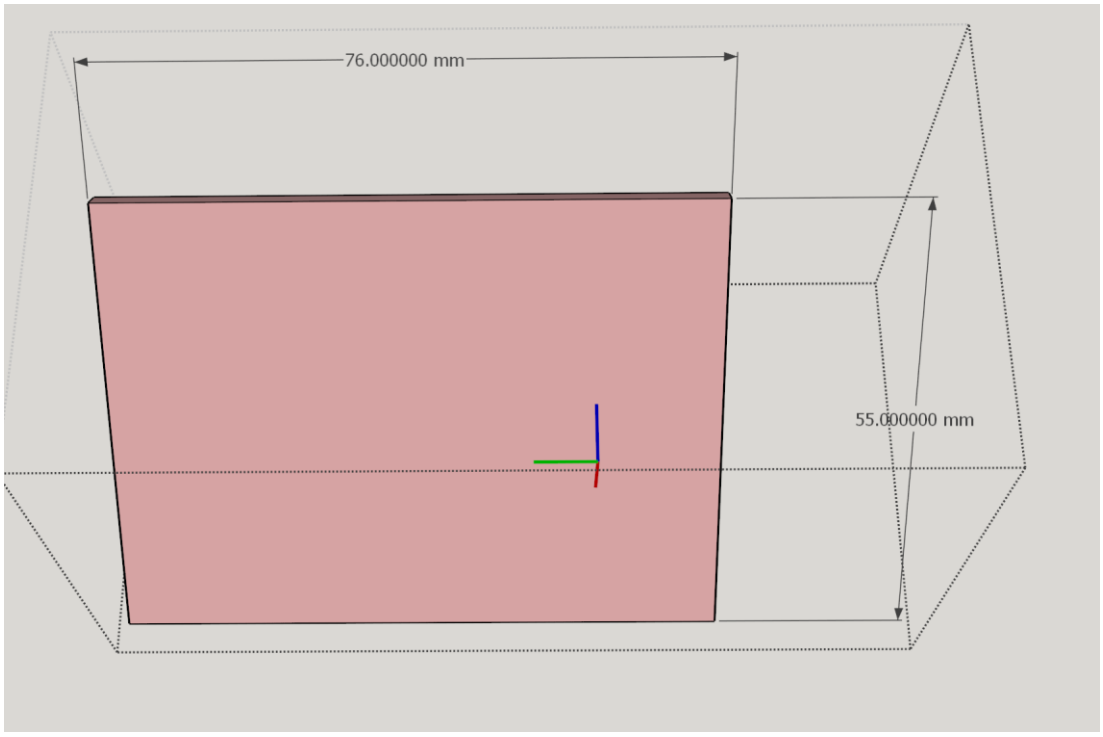
5. Inserting the mirrors

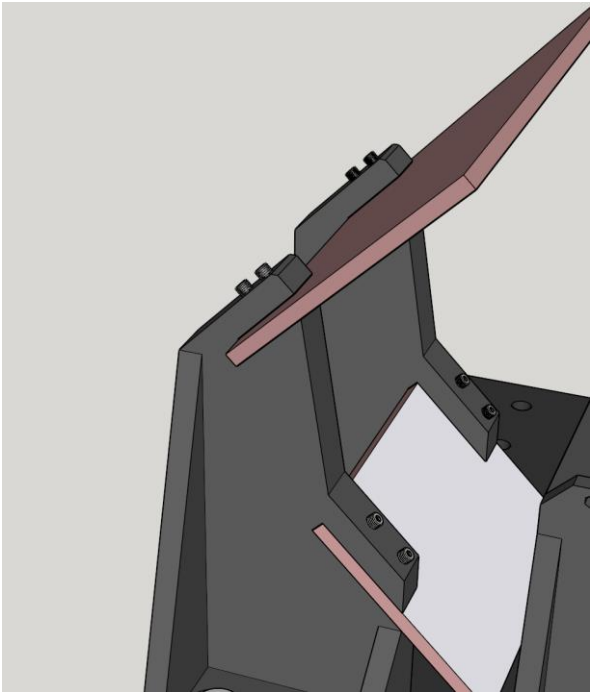
Mirror:

https://www.thorlabs.com/thorproduct.cfm?partnumber=ME8S-G01

To get the mirrors to the right size, you can either commission a local glass workshop or cut them yourself with a glass cutter hand tool. Be careful, however, as the edges are very sharp.


120.000000 mm
70.000000 mm
90.000000 mm


76.000000 mm
55.000000 mm

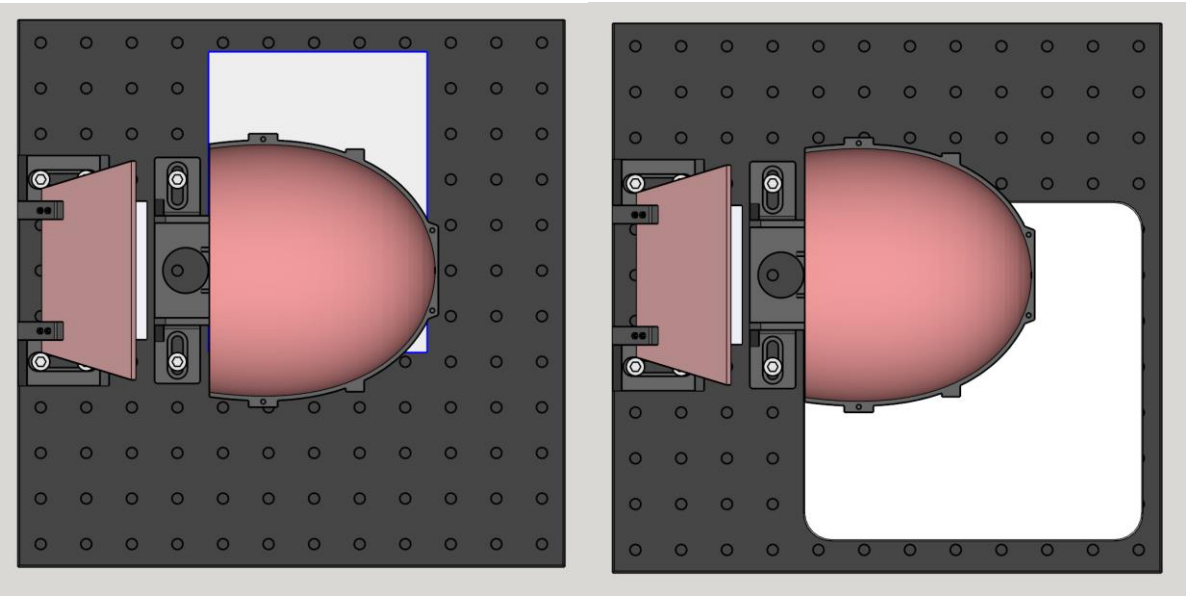


Insert the mirrors into the holders. If the gap is too narrow and the mirrors can only be inserted with a great deal of force, the gaps must be enlarged slightly. If the slots are too wide and the mirrors barely hold, rubberized M3 setscrews can be used to hold them in place.

https://www.thorlabs.com/thorproduct.cfm?partnumber=SS3MN6

6. placing the projector.

The arrangement of the two projectors can be seen in the picture. once they have been adjusted, it is recommended to fix them in place.



To get the exact height, the rotatable stands of the ViewSonic projector must be removed. With the lg projector, however, a 2mm spacer must be added to the bottom of the stands. To achieve approximately the same projection conditions, the digital zoom must be used with the ViewSonic projector.