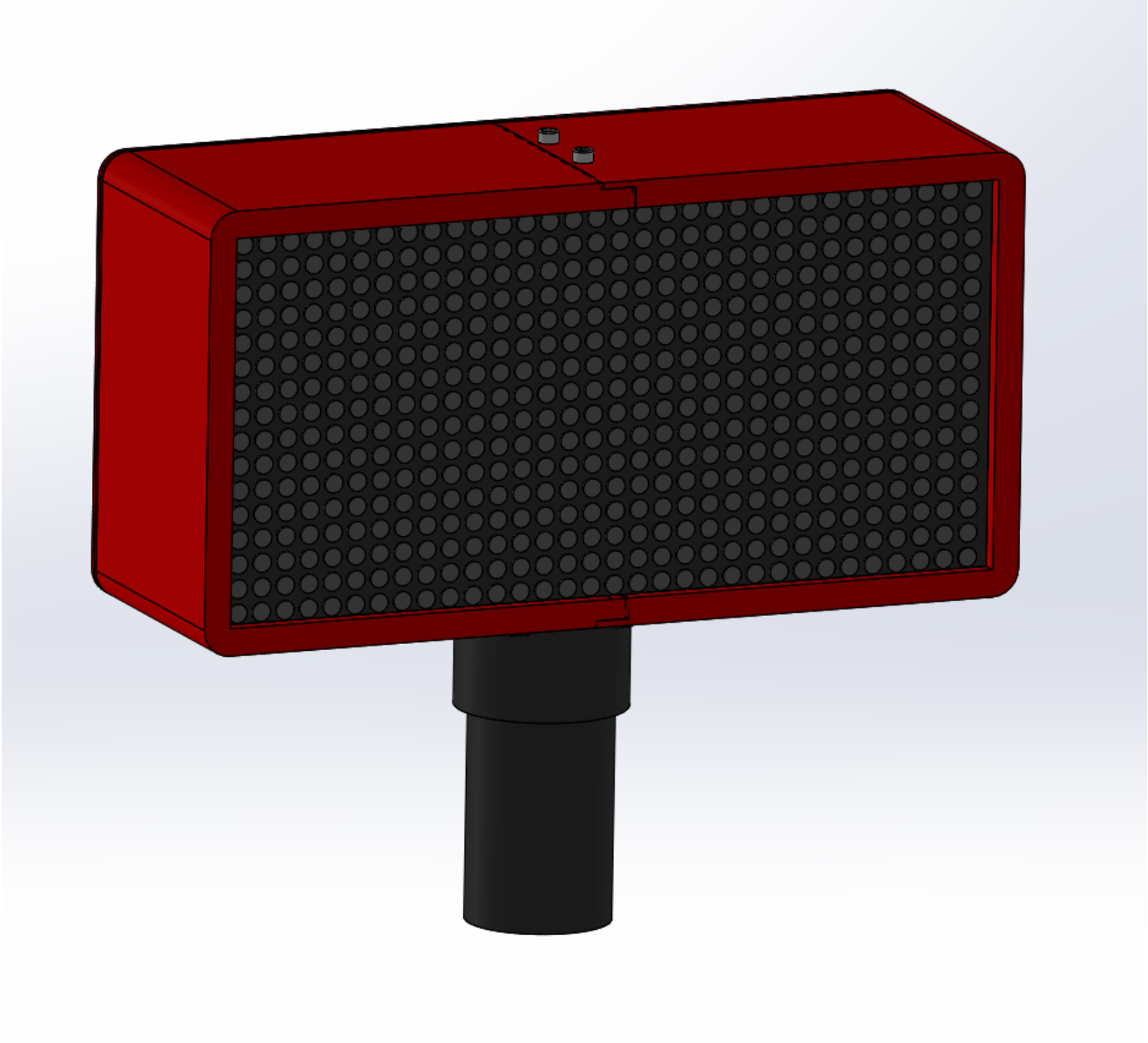

Open Source Rover

Head Assembly Instructions

Jet Propulsion Laboratory
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Contents

1 3D printing

There are a few components that need to be 3D printed to make the head assembly. Provided are a the STL files necessary for these prints, as well as a few different orientations of printing pads to help with thermal contraction if necessary as shown in Figure 1. These pads help hold the corners down and reduce the warping of the pieces. A file is also included with no pads for all files as well.

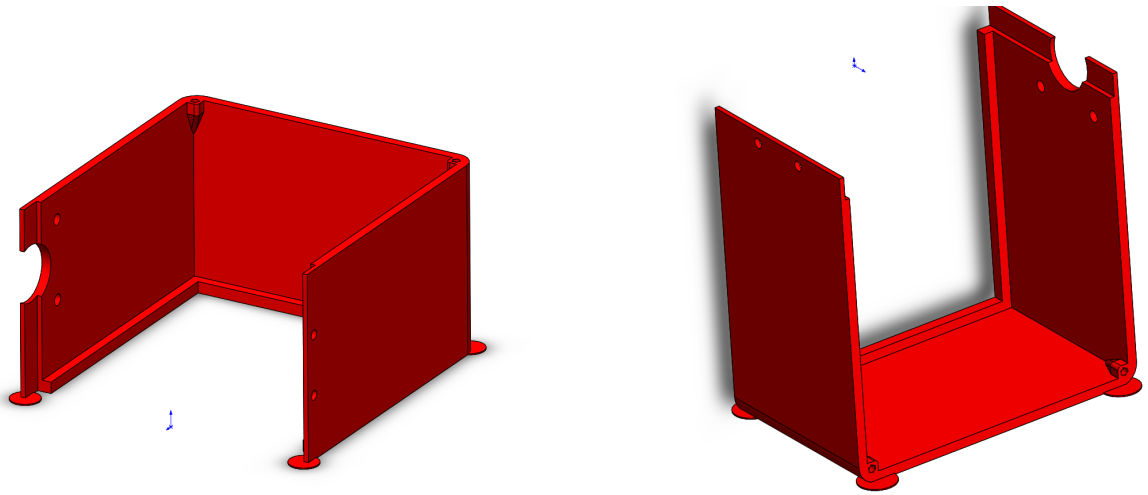

Figure 1: Printing Pads

If you do not have a 3D printer there are a number of online 3D printing services available, an example of which can be found at:

- https://www.makexyz.com/

2 Mechanical Assembly

Parts/Tools Necessary

Item	Ref	Qty	Image	Item	Ref	Qty	Image
Head Left Back	NA	1		6-32 x ⅜ Button head Screw	B2	4	
Head Right Back	NA	1		4-40 x ¼ Button head Screw	B8	12	
Head Left	NA	1		4-40 Locking Hex Nut	B12	4	
Head Right	NA	1		LED Matrix	E8	1	
1 Inch PVC Clamp Bottom Bore	S24	1		Alley Key Set	NA	1	
PVC Pipe	S29A	1		Wrench Set	NA	1	
Logic Shifter PCB		1					

1. **Insert the LED matrix into the head:** Start by taking the LED Matrix **E8** and inserting it on the ledges in the two sides of the 3D printed head. Using Screws **B8** screw together the two sides of the head [1].

[1] The size of the holes should be such that you can use an allen wrench to "thread" the 3D printed holes. If it is too tight you can use a drill/file to very slightly open up the hole if the screw will not thread fit

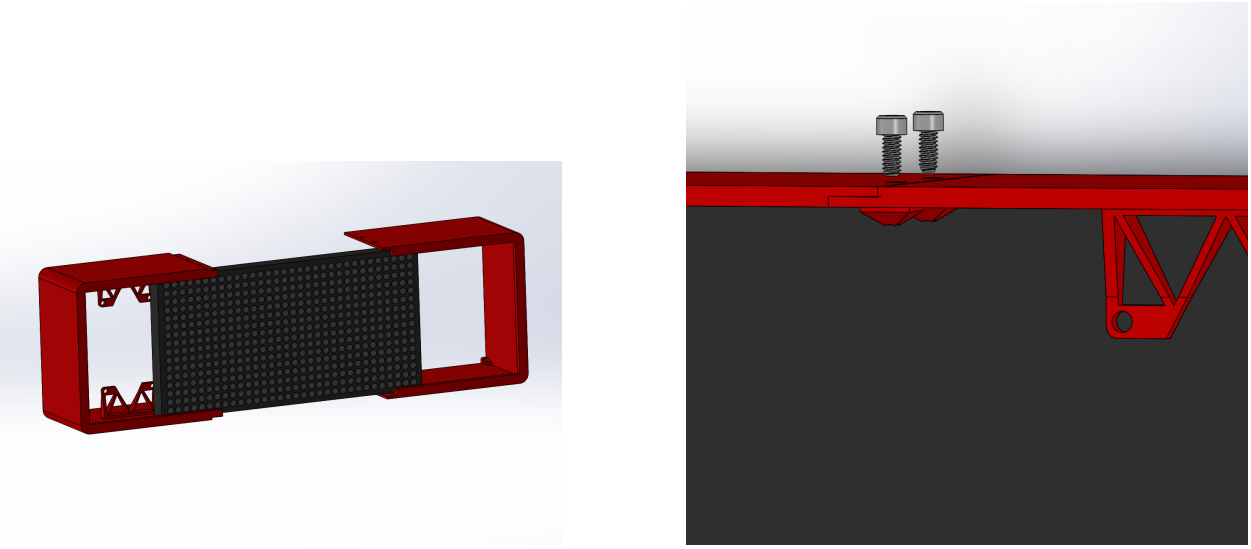

Figure 2: Inserting LED Matrix

2. **Attach the PVC Clamping Hub:** Using screws **B2** attach the 1 Inch PVC Clamping Hub **S24** to the bottom of the head.

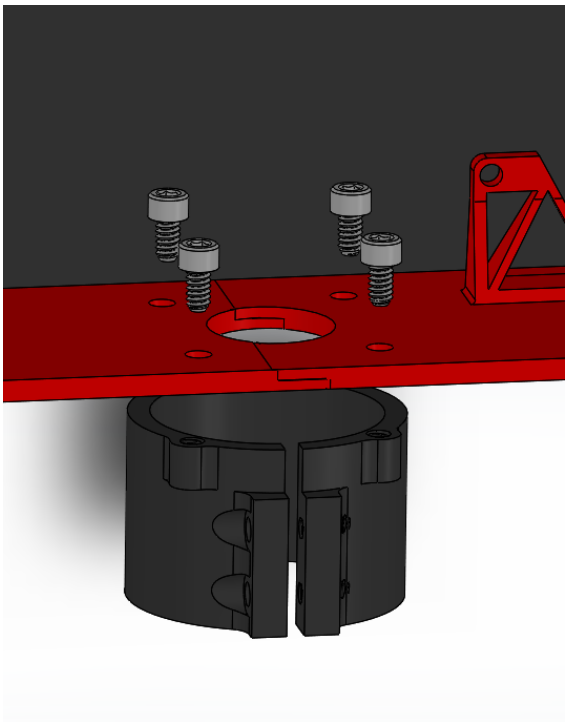

Figure 3: Attach the PVC Clamping Hub

3. **Mounting the Logic Shifter PCB:** Using screws **B8** and hexnuts **B12** attach the

Logic Shifter PCB to the support structure in the 3D printed head.

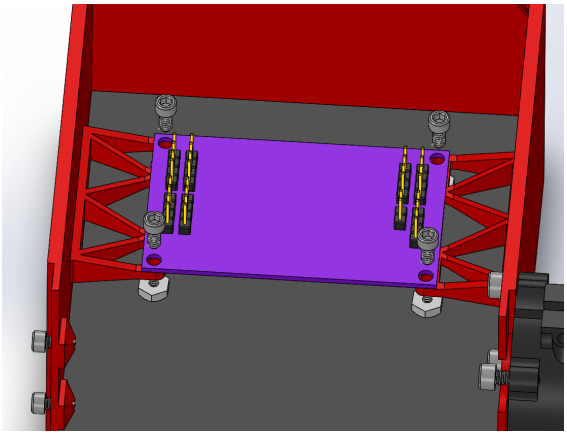

Figure 4: Mounting the Logic Shifter PCB

4. **Connecting to back plane:** Using screws **B8** attach the two back pieces together.

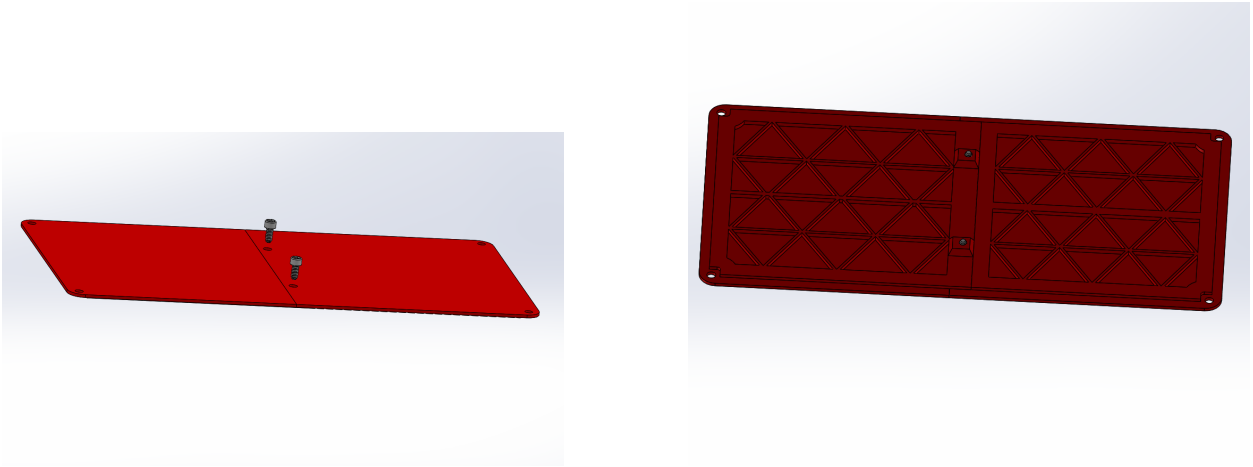

Figure 5: Back Plane connecting

5. **Attaching the Back plane:** Using screws **B8** now attach the back plane to the rest of the head structure.

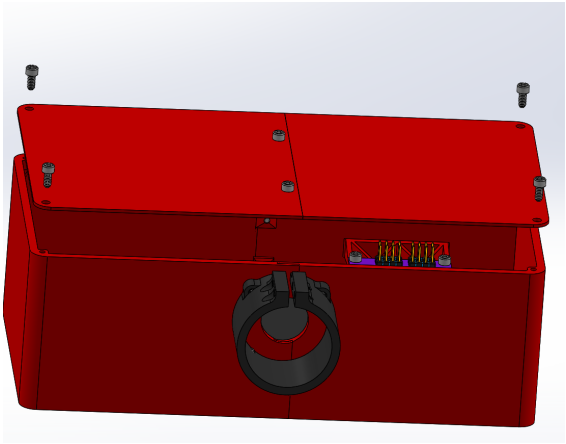

Figure 6: Attaching the Back plane

6. **Attach the PVC pipe:** Slide the length of PVC pipe you want for the neck length into the PVC clamping hub and tighten the screws the secure it.

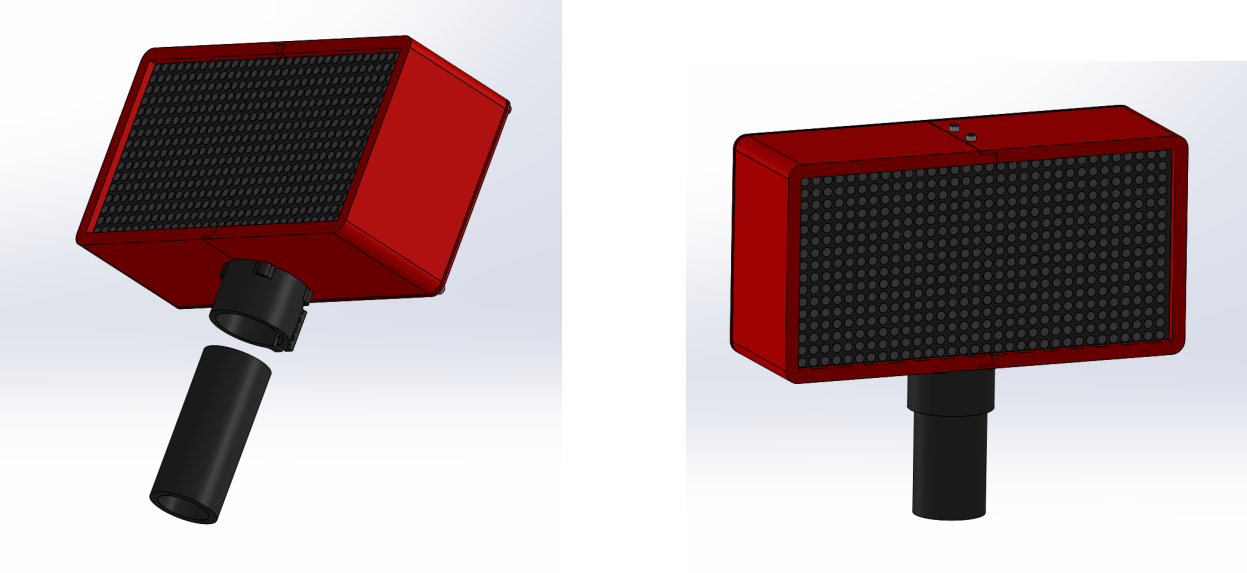

Figure 7: Attaching the PVC pipe