

Open Source Rover: Mechanical Integration Assembly Instructions

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1 Mechanical/Structural Assembly

At this point we have every major sub assembly created and they just need to be linked together to create the rover. Here we will attach all the corner motors and wheels, the rocker-bogie, the differential pivot, and the head.

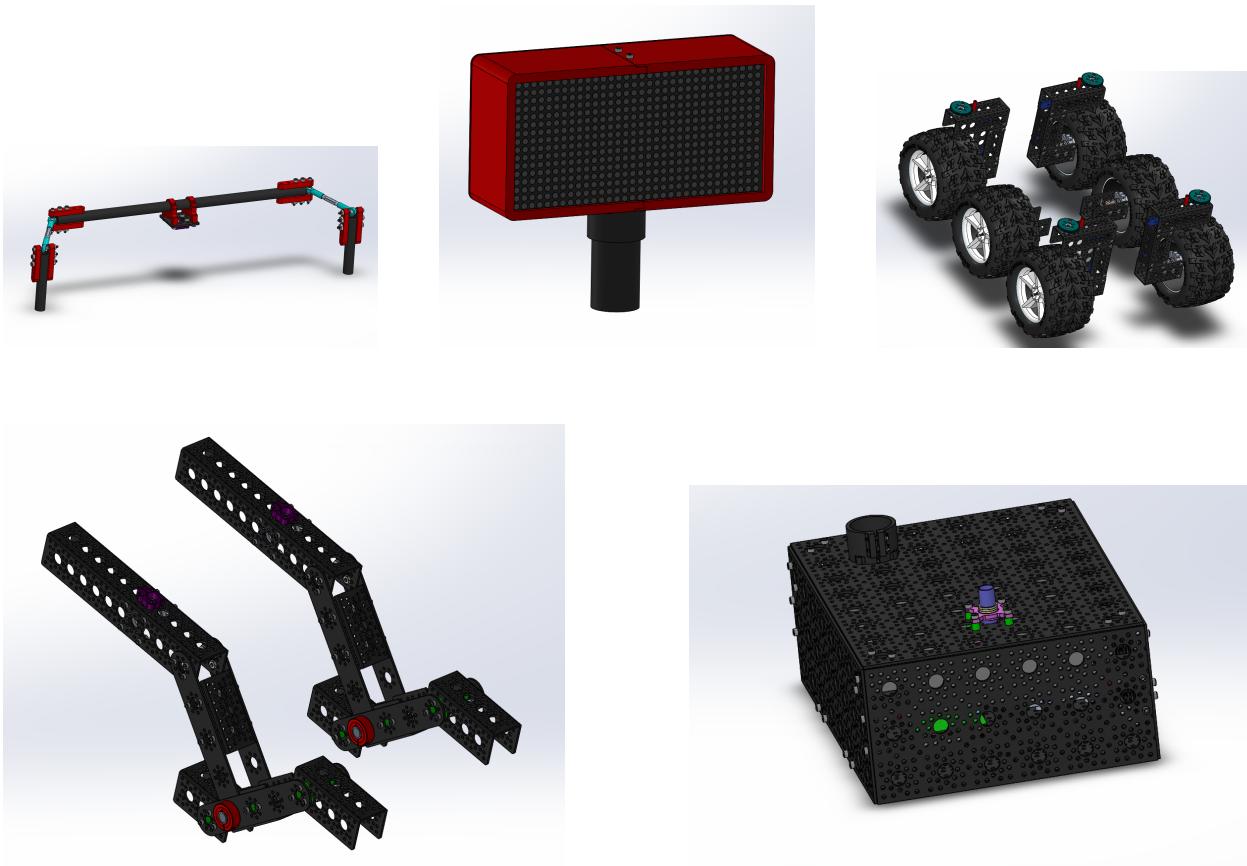


Figure 1: Mounting the middle wheel

Parts/Tools Necessary

Item	Ref	Qty	Image	Item	Ref	Qty	Image
1.5 Inch Channel	S1	2		0.5 Inch Plastic Washer	W3	3	
Chanel Connector	S6	14		6-32 x 1/4 Button Head Screw	B1	52	
0.5 x 15 Inch Aluminum Rod	S16A	1		Allen Key set	N/A	1	
0.5 x 2 Inch Aluminum Rod	S19	1		Wrench set	N/A	1	
Collar Clamp	S22	7					

1.1 Mounting Wheels

1. **Mounting the Middle Wheel:** Using Channel Connectors **S6** and a 1.5 inch channel **S1** connect one of the remaining wheel assemblies as shown below.



Figure 2: Mounting the middle wheel

2. **Mounting the Middle Wheel Cont:** Using Channel Connectors **S6** connect the 1.5 inch channel to the bottom of the rocker bogie assembly. At this point the Rocker-Bogie assembly is done for one side. **In order to build the other side it is identical up until step 11, which is mirrored about the assembly such that you produce**

1 MECHANICAL/STRUCTURAL ASSEMBLY

the opposite side geometry as shown below.

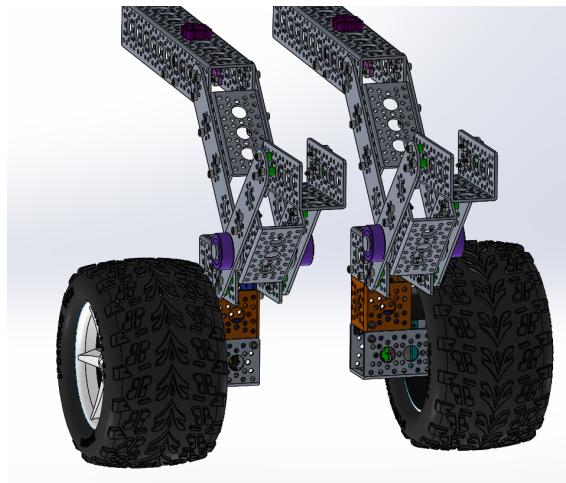
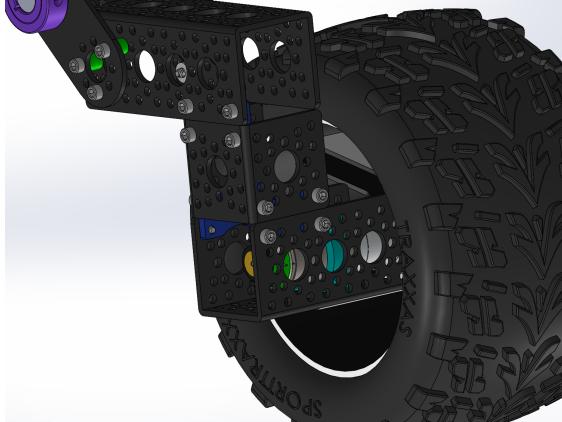


Figure 3: Final Rocker-Bogie assem

1.2 Attaching Corner Steering Assembly

3. **Corner Steering Attachment:** Using channel connectors **S6** and screws **B1** attach a corner steering assembly to the rocker bogie assembly. Make sure when doing this that you pick the corner steering assembly that has the encoder facing outwards (same direction as the wheel in rocker bogie assembly).

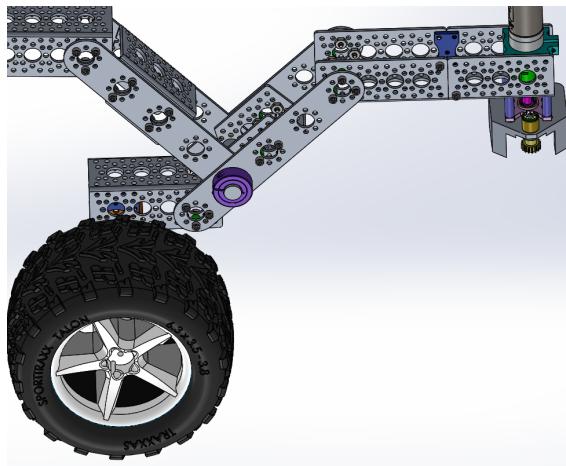
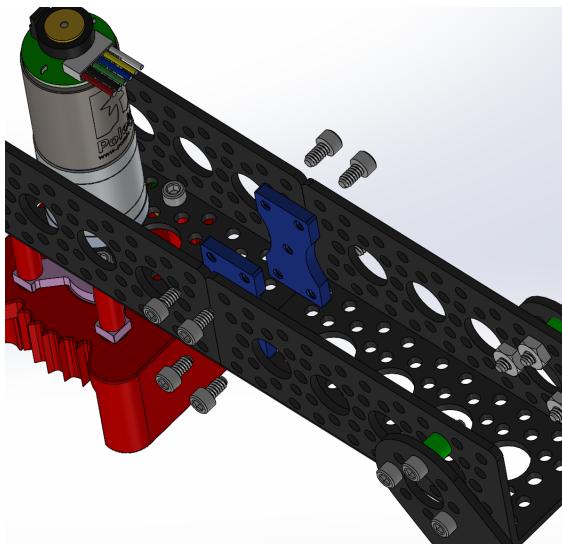


Figure 4: Final Assembly Step 1

- 4. Corner Steering Attachment Cont:** Repeat step 1 with the other rocker bogie assembly, again making sure to choose the encoder mount that corresponds to outward facing encoder.

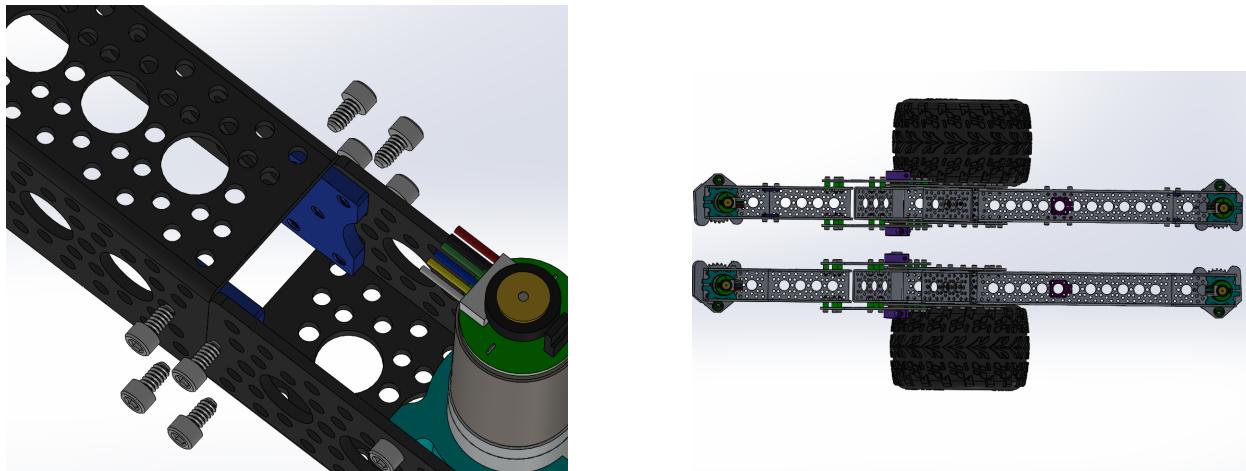


Figure 5: Final Assembly Step 2

1.3 Attaching Corner Wheels

- 5. Corner Wheel Attachment:** Take any corner wheel assembly and attach it to any of the corner steering assemblies, they are all symmetric at this point. Spin the encoder gear to mesh with the motor shaft gear if they are not aligned yet. Repeat this process for all 4 corner wheels.



Figure 6: Final Assembly Step 3

1.4 Mounting Body to Rocker-Bogie

6. **Mounting Body:** Using 15in aluminum rod **S16A** and collar clamps **S22** mount the body of the rover to the two separate rocker-bogie legs. Make sure to note the order to put the collar clamps in to fully lock all assemblies along the rod. The rod will go through the pillow blocks on each rocker-bogie leg, and it should pass through the 4th from the back and 2nd up hole on the body, see picture below.

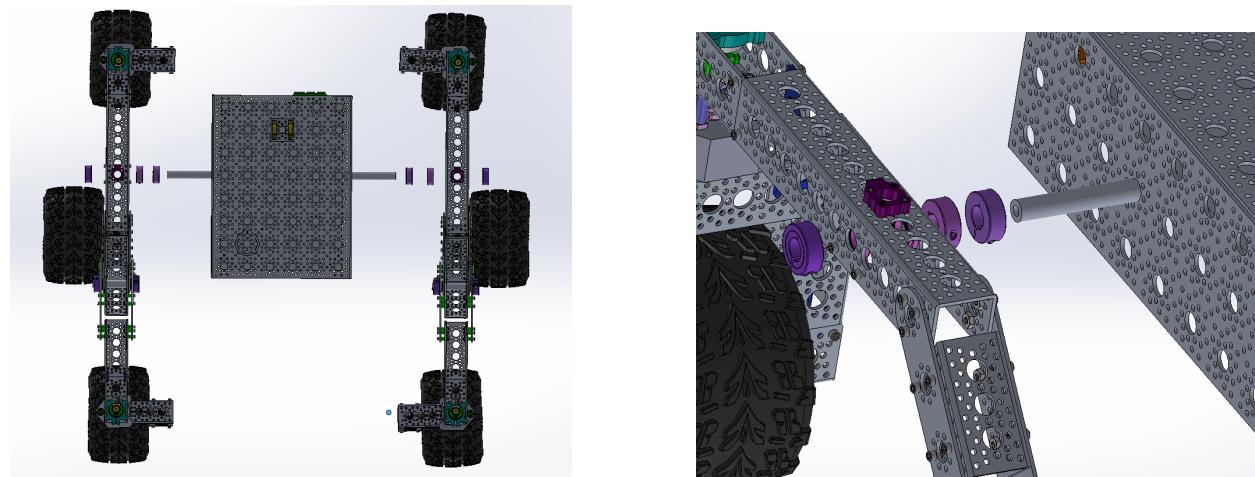


Figure 7: Final Assembly Step 4

1.5 Attach the Differential Pivot

7. Attaching the Vertical Rod Place the 0.5 x 2 inch hallow aluminum rod **S19** through the pillow blocks mounted on the back of the body and secure the bottom with collar clamp **S22**. Then place all three washers **W3** followed by the clamping hub around the top of the rod and tighten down on the clamping screw.



Figure 8: Attaching the pivot rod

8. Attaching the differential pivot: Attach the clamping hub on the differential pivot to the 0.5 inch aluminum tube above the washers. Also attach the the bottom sections of the differential pivot to the 0.5 inch clamping hubs on each of the Rocker-Bogie attachments. Tighten down each of the screws on the clamping hubs once these have been set in.

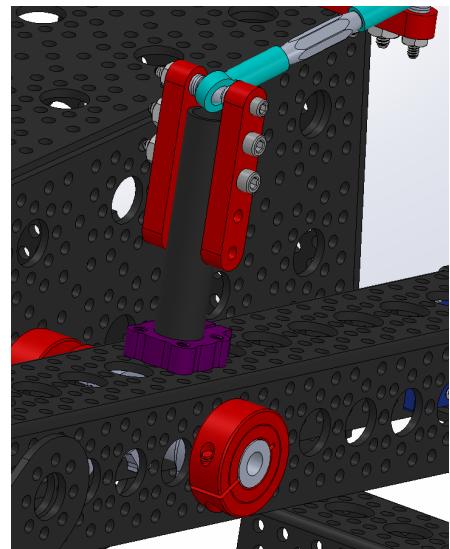
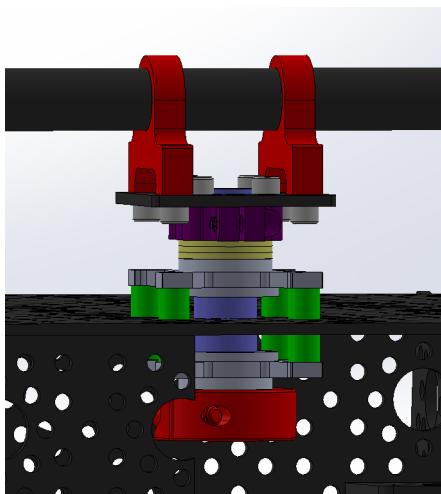


Figure 9: Attaching the pivot rod

1.6 Mounting the Head

9. **Mounting the head to the body:** Slid the PVC pipe at the bottom of the head into the PVC clamping hub on the rover body, then tighten down the clamping screws.

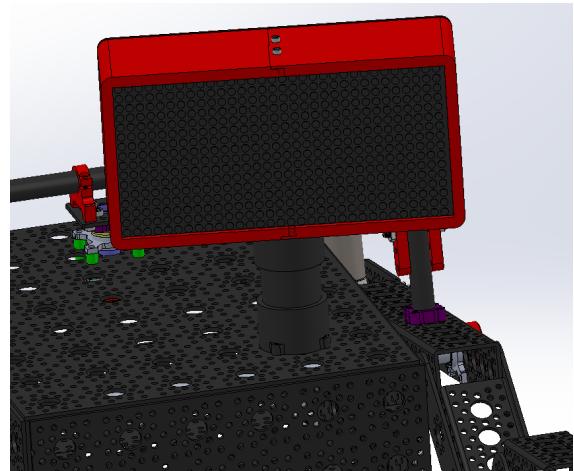
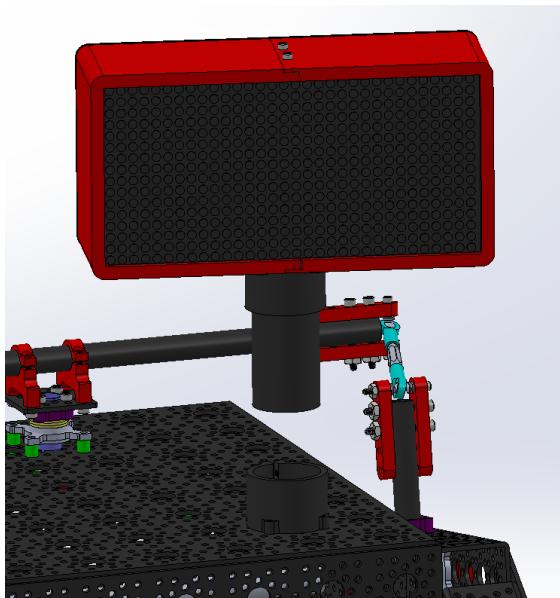


Figure 10: Final Assembly Step 7

10. **Checkpoint:** Here you should now have the fully assembled Rover!

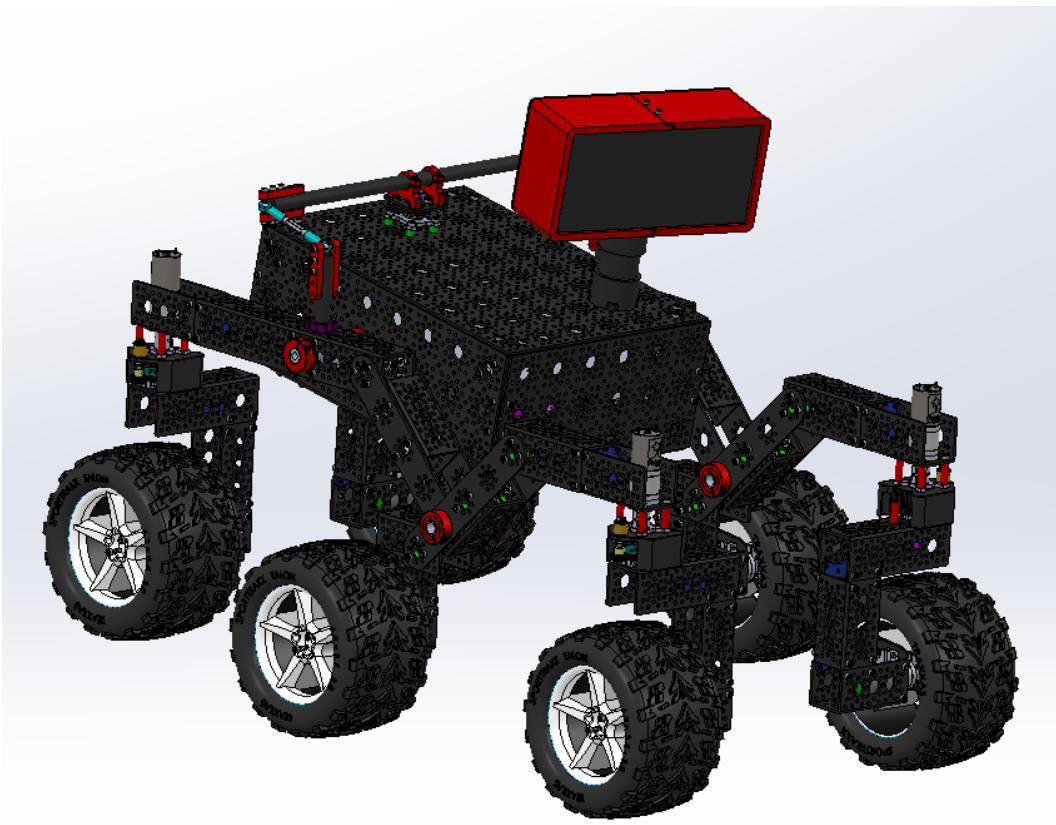


Figure 11: Final Mehcncial Rover