

OBJECTIVES / REQUIREMENTS

- Update previous design for flexibility, durability, and visibility
- Remotely move a variety of performers and their instruments (300-400 lbs)
- Support movement in any direction for 20 minutes
- Perform remote-controlled light shows
- Create dolly for transportation to the Kibbie Dome

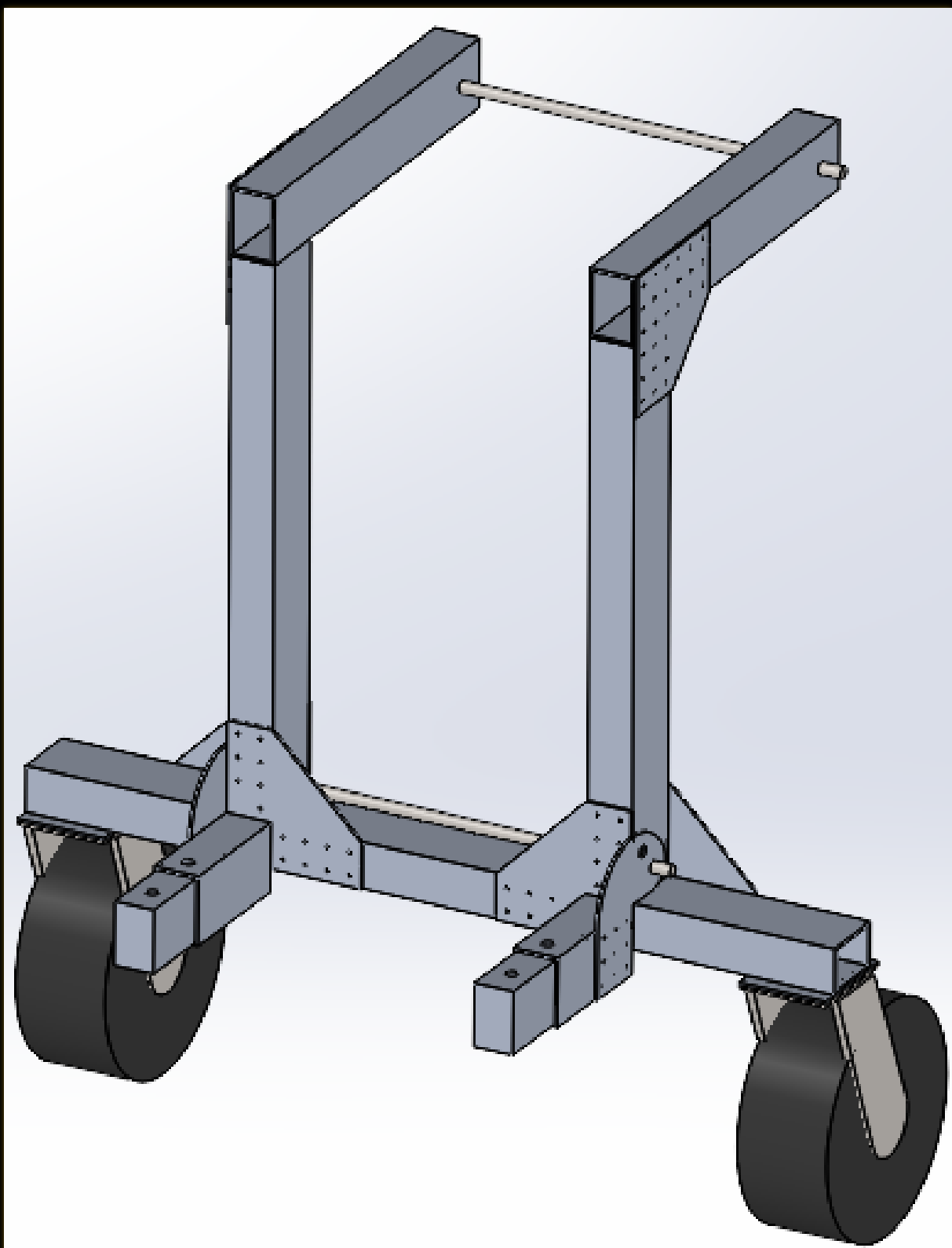


Figure 1: Dolly used to transport the platform to the Kibbie Dome.



Figure 2: Gear motor and omni-wheel assembly.

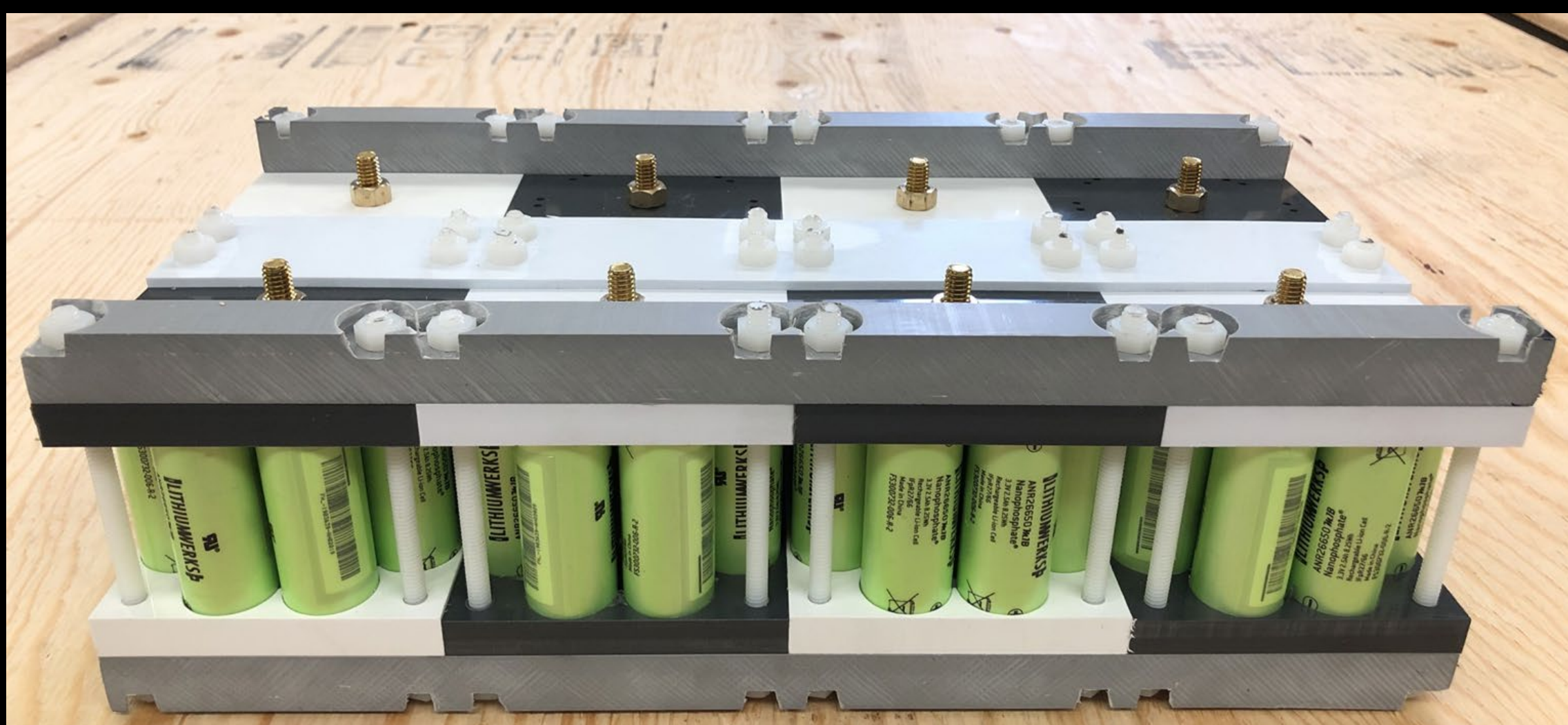


Figure 3: Battery pack contains 8 cell packs in series. The cell packs, with 8 cells in parallel, consist of 2 PVC battery caps that each have a copper flower to connect the cells in parallel. There are PVC plates, PVC side rails, and nylon threaded rods to hold the cell packs together.

FINAL DESIGN

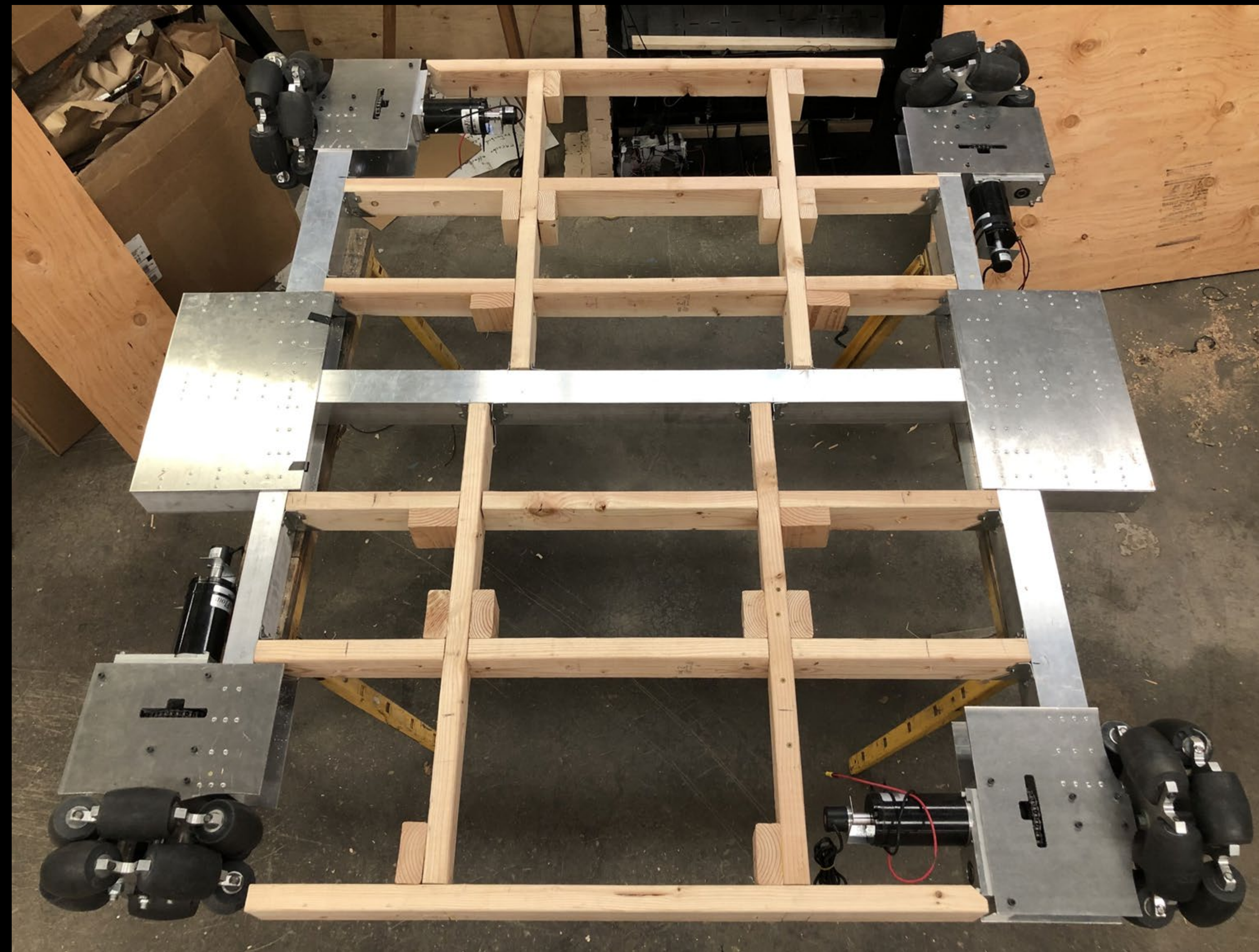


Figure 4: Completed platform frame. Each corner has an individual motor and omni-wheel assembly that allows for multi-directional movement. The frame is made out of an aluminum I beam that was riveted together with $\frac{1}{8}$ " gusset plates and has 2" x 3" wood supports.



Figure 5: Completed platform, with $\frac{1}{2}$ " plywood decking, one of the four battery packs, and light strip attached. Four remote-controlled, battery-powered LED light strips hang on each side of the platform. Light strips can also be attached to instruments.

TOTAL MANUFACTURED PARTS: 357

Gearbox mounts (8)	PVC side rails (16)
Gusset plates (12)	PVC plates (8)
Bearing blocks (4)	Dolly frames (2)
Frame (1)	Dolly forks (4)
Battery caps (64)	Dolly plates (20)
Copper flowers (64)	Dolly fork adapters
Manufacturing jig (2)	
Nylon rods (128)	Dolly rods (4)
Encoder couplers (4)	Dolly pins (12)



Figure 6: PVC battery caps with copper flowers.

GOING FORWARD

- Continued work on battery box packaging to include BMS and motor controllers
- Electrical-Mechanical team collaboration in testing components
- Fixturing for instrument mounting
- Usability testing in Kibbie Dome performances

ACKNOWLEDGEMENTS

Advisors/Mentors: Dr. Steven Beyerlein, Dr. Edwin Odom, Dr. Bob Rinker, Dr. Joe Law, Ian Glasgow, Jack Gonzalez, Chelsey Lewallen, & Bill Magnie

Client: Dr. Edwin Odom, Spencer Martin & UI Vandal Marching Band

