



April Newsletter

Welcome to the first WPI HPRC Newsletter of 2021!

One of our team's objectives for this year is to increase engagement with our community of sponsors, mentors, and alumni. Through these monthly newsletters, our team will share updates on the progress of the design, construction, and testing of our rocket and payload.

Thank you for your continuous support of HPRC!

April at-a-Glance

Over the course of April, our members have been hard at work manufacturing, testing, and assembling sections of the rocket and payload. On April 24th, six HPRC members launched our sub-scale rocket at the CMASS Amesbury launch site. The rocket was successfully launched and recovered.

We're looking forward to our next launch on May 22nd, where six new members will take the same sub-scale rocket to CMASS Acton for another launch!



Pictured above are the six team members who took our sub-scale rocket to CMASS Amesbury on April 24th!



During April, HPRC began conducting most of our general body, division, and sub-team meetings in person!



Sirius & Polaris

Divisional Updates

Rocket Division

Sirius



Pictured above is the full-scale rocket with the sub-systems laid out on the side.



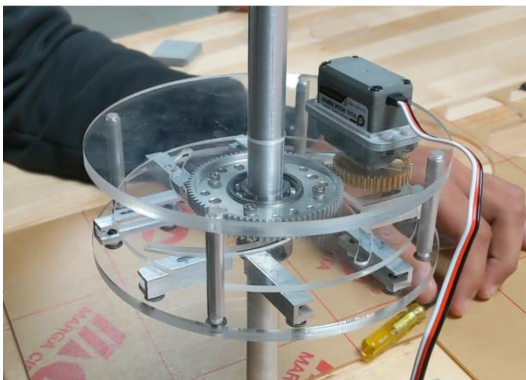
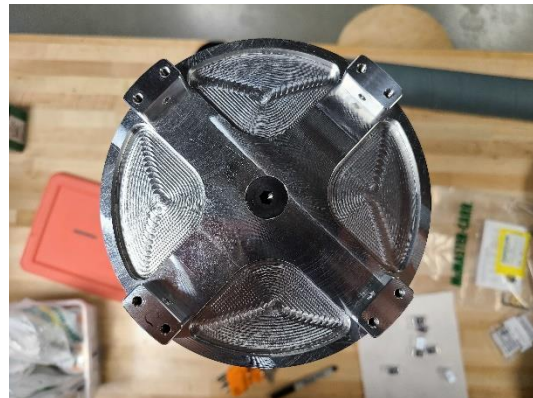
Aerostructures

We completed the carbon fiber layup of our fins. We have prepared the nosecone for assembly, completed the final 3D print of the tail cone, and slotted the lower airframe for the fins. Next up is drilling holes in the airframe!



Propulsion

We finished machining all necessary components for the fin can and motor retention system. In addition, we conducted a test assembly for the lower airframe and are on track to complete the final lower airframe assembly very soon.



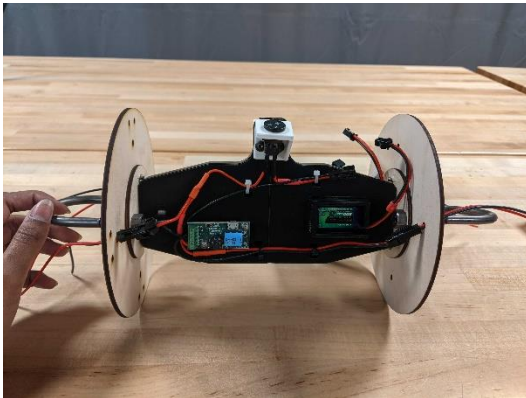
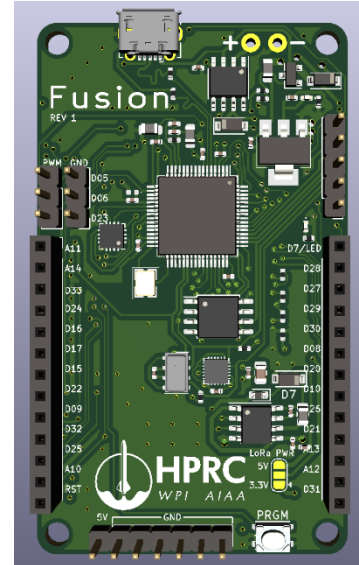
Mechanical

We assembled a prototype of the airbrake system, which we ran some basic tests on to ensure the system worked as expected. We machined various parts for the final system, including the spine for the avionics bay, and the fin rails. We 3D printed

all of the parts we will need and have begun the final assembly.

Avionics

We completed our full circuit board, which included picking all the components, laying them out, and connecting them all with traces. Aside from that, we have also made a couple of upgrades such as drastically increasing the amount of GPIO, upgrading the IMU, and adding a new power system to transmit at full power.

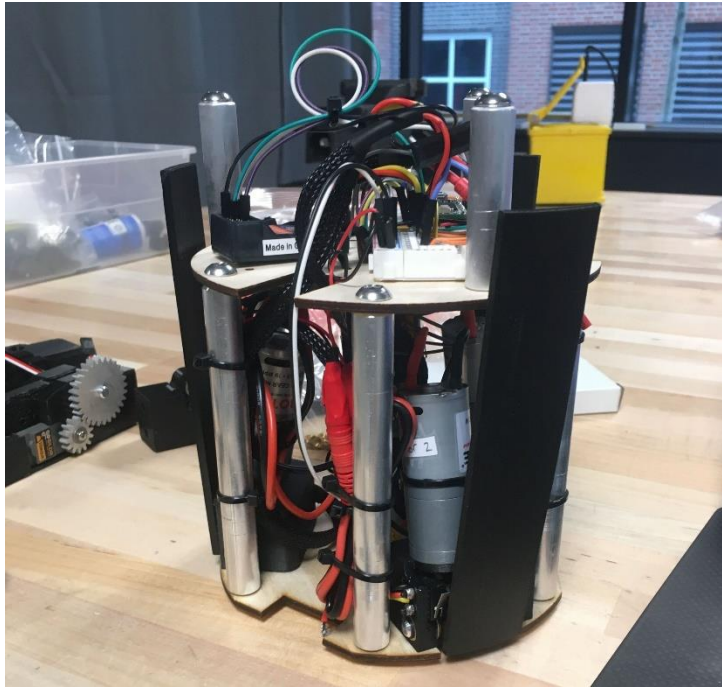


Recovery

We completed the wiring and programming of the altimeters, and are looking forward to conducting testing once the remaining parts for the recovery bay arrive. We also cut the coupler, ejection piston, switch band for the recovery bay, and shock cord for the rocket's parachutes.

Payload Division

Polaris

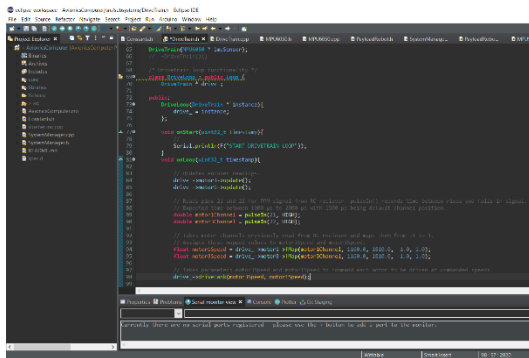
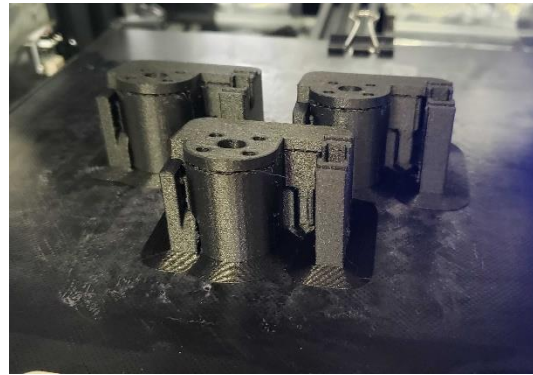


In the payload division, we have been dedicating a significant amount of time to machining and overall manufacturing. We have been using an Electric Discharge Machine (EDM) for its high precision and minimal cutting forces as we manufacture very small components. We also used mills and lathes for manufacturing other components where the precision of the EDM is not required.



Self-Righting & Stabilization

We 3D printed the motor mounts for the self-righting system, which house the bushings, potentiometer, and other key components of the system. We have completed the final stabilization mechanism, allowing us to begin control programming.

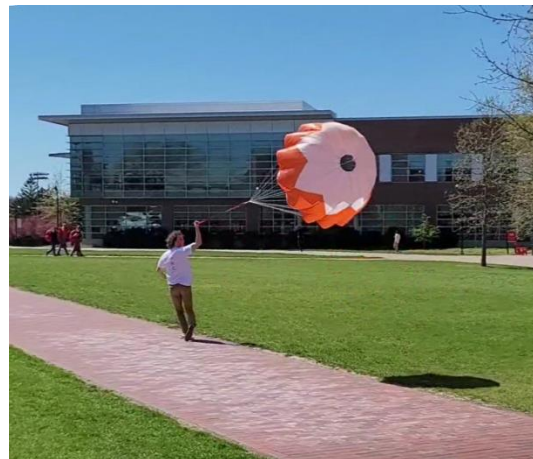


Electronics & Programming

As our programming development continues, we are fixing both mechanical and software issues as we encounter them.

Recovery

For payload recovery, we have received our payload's parachute and completed some preliminary deployment tests. We have also cleaned up our 3D printed parts so that the alignment pins slide easily into the payload.





Thanks to one of our sponsors, Hydrocutter, we were able to waterjet our carbon plates. Some are structural bulkheads, while others are for mounting electronics and other mechanical components.