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## October at-a-Glance

During the month of October, our team refined our initial design iterations and began prototype construction for the rocket and payload. We have also decided on the names of this year's project, rocket, and payload.

**Project Name: Aquila (The Eagle Constellation)**

**Rocket Name: Altair (The Eagle)**

**Payload Name: Tarazed (Balance)**

We are thrilled to announce that we have officially been accepted into the IREC competition and our team is eagerly anticipating the coming months of construction and competition.

Thank you to everyone who reached out or donated throughout WPI's Giving Day fundraising event in support of our team, your generous contributions will have a tremendous impact on our project. In addition, thank you to our sponsor Ensign-Bickford Industries for providing another generous donation to the team and two amazing mentors.

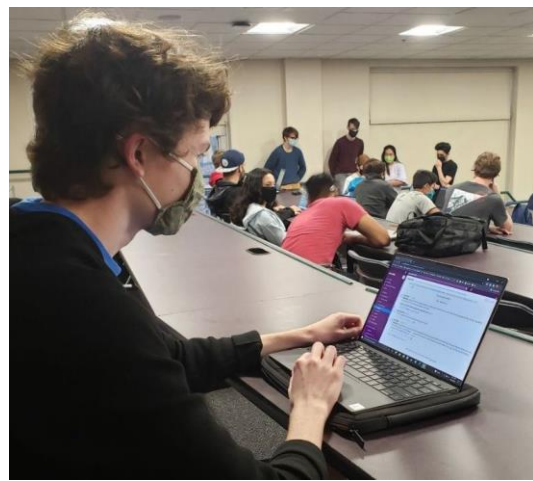
Lastly, we are excited to welcome our newest sponsor: Matias Campos of Astralintu Space Technologies, based in Quito, Ecuador. Matias helped revitalize our AIAA chapter at WPI back when he was an undergraduate, and we are excited to see him return to support us in our current endeavors!



Members of the couplings subteam calculating the stresses that the couplings will need to withstand.



Our Airbrakes team discussing possible deployment mechanisms for this year's airbrake system.

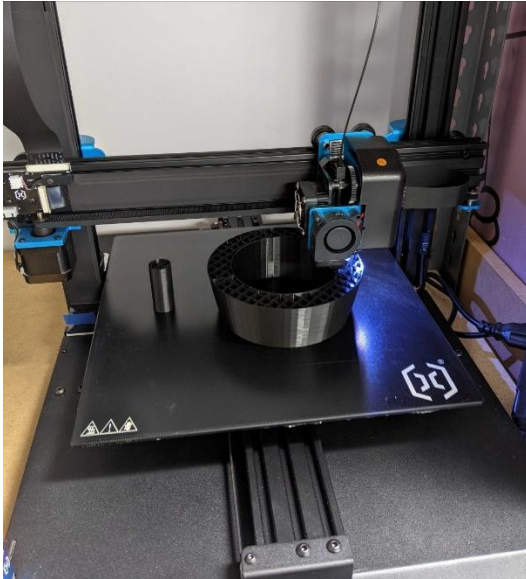


Members of the electronics and programming team working on electronics design at sub-team meeting

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## Rocket Division

Altair



### Aerostructures

Our team has finalized our tailcone design as well as begun material, COTS parts, and epoxies selection for the composites. We are currently 3D-printing the mold for the tailcone and laser cutting materials for practicing composite layups. We have also started on analysis and some side projects, such as creating a fin alignment jig.

### Airbrakes

Over the past few weeks, we have been focused on four primary areas for the airbrakes system: design, MATLAB analysis, CFD simulation, and Controls. We are currently creating the airbrakes mechanism CAD, setting up the flight profile for the CFD simulation, learning how to conduct an RK4 analysis, and investigating methodologies for control system design.





## Couplings

We have been hard at work finalizing the CAD model of our coupling mechanism and we have recently finished our first 3D printed functional prototype for this design. We are now beginning to design the motor retention system and plan on machining a coupling for initial testing purposes.

## Recovery

Our recovery team solidified their design ideas for this system. We have also created an OpenRocket model with updated masses from each subteam that we'll use for calculations and simulations to size our drogue parachute. We have CAD for the first iteration of our EBAY as well

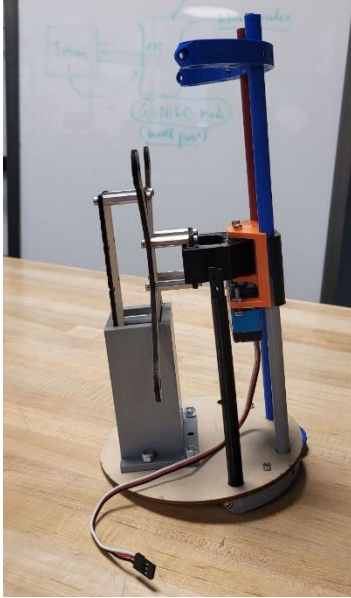
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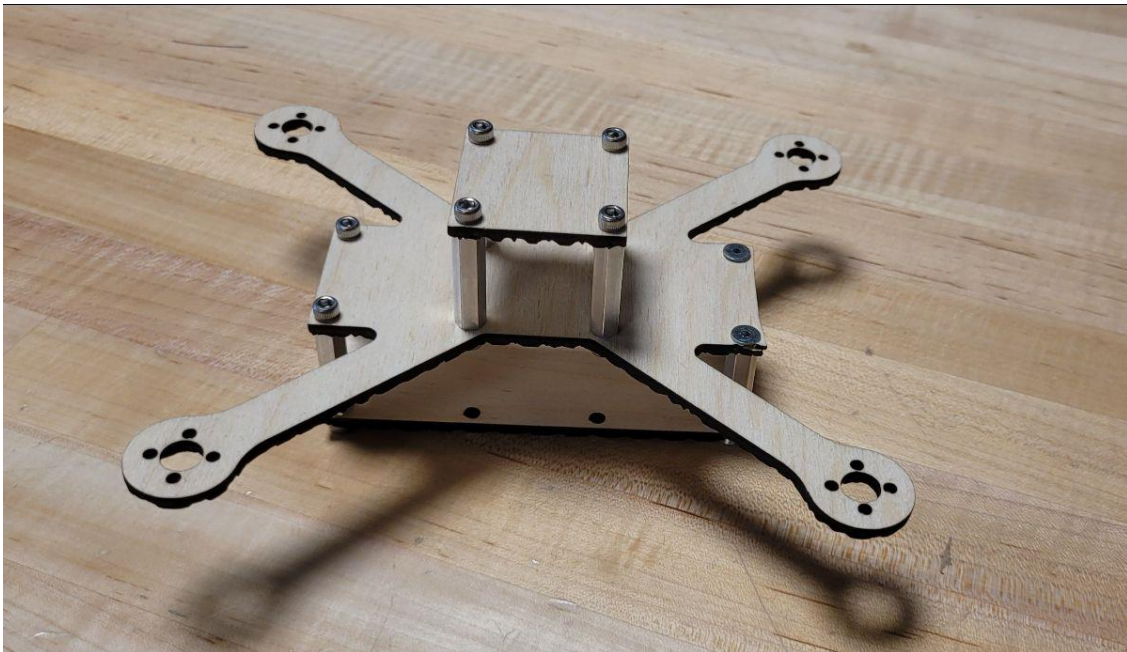
## Payload Division

Tarazed



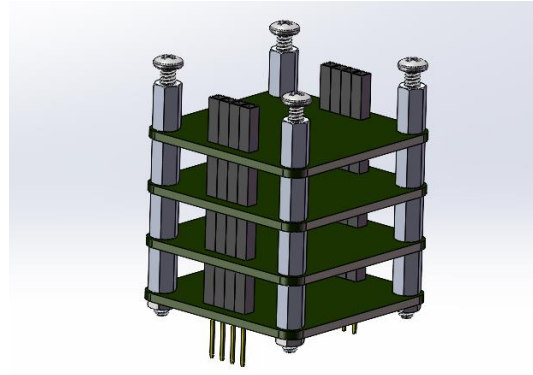
The payload team is currently divided into three smaller groups to investigate the effectiveness of a quadcopter and two styles of fixed wing aircraft to complete our payload mission.

Each group is preparing a prototype to make a proof of concept of the major systems, including the retention system for the quadcopter and the wing movement for the fixed wings.



## Electronics and Programming Team

This month, our electronics and programming team finalized component selection for all of the custom boards and filled in the functional block diagram outlining the operation of the system. Members have been busy building skills in Altium Designer and working on the schematic design for the PCBs.



## Software

Our software group's embedded programming team has continued testing with breakout boards for the sensors that will go on the rocket. The ground station team has further refined their plans and is looking to start work on an early prototype. Members have also been working on completing the electronics and software for last year's rocket and payload to prepare for a planned C-Term launch.

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