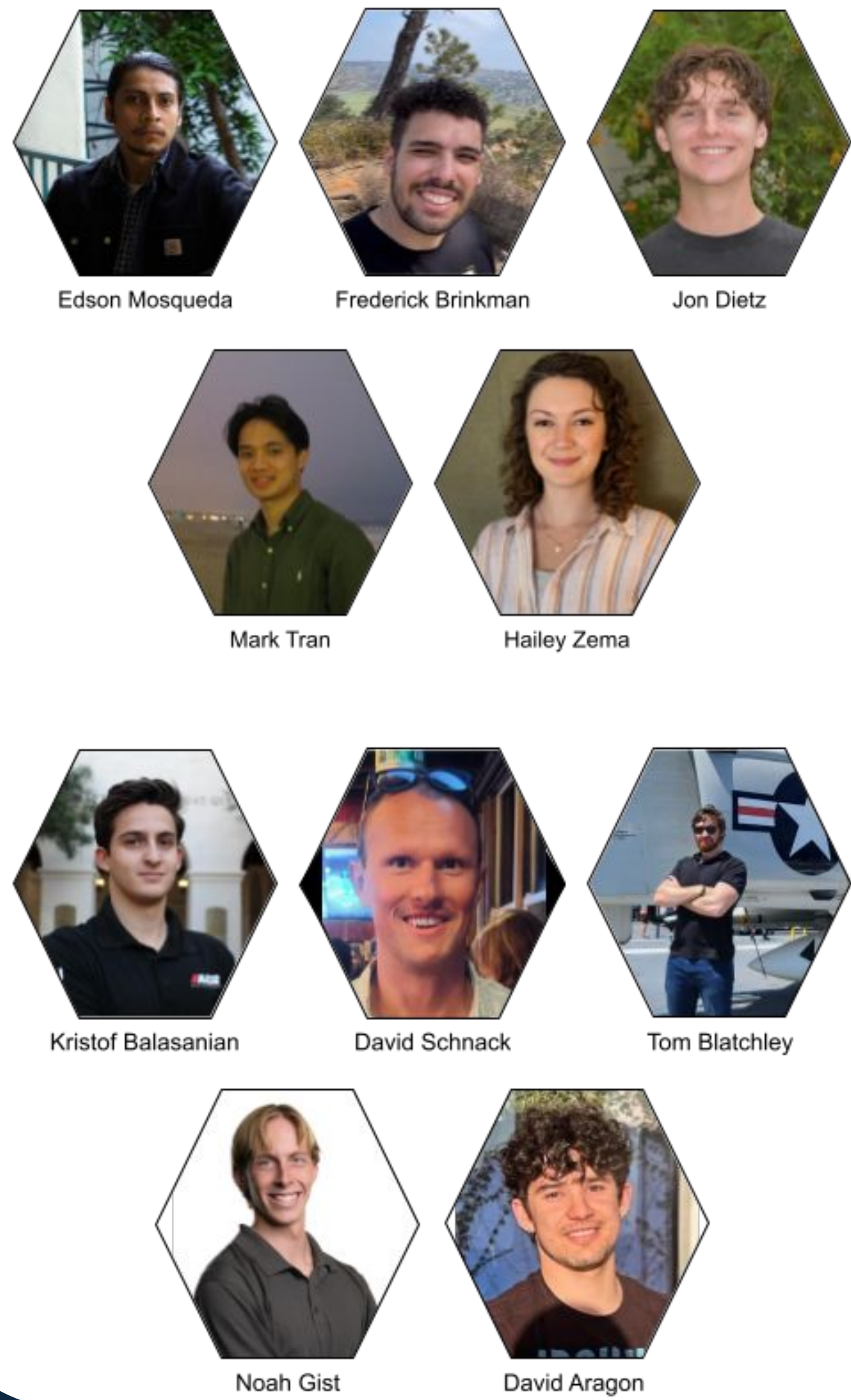
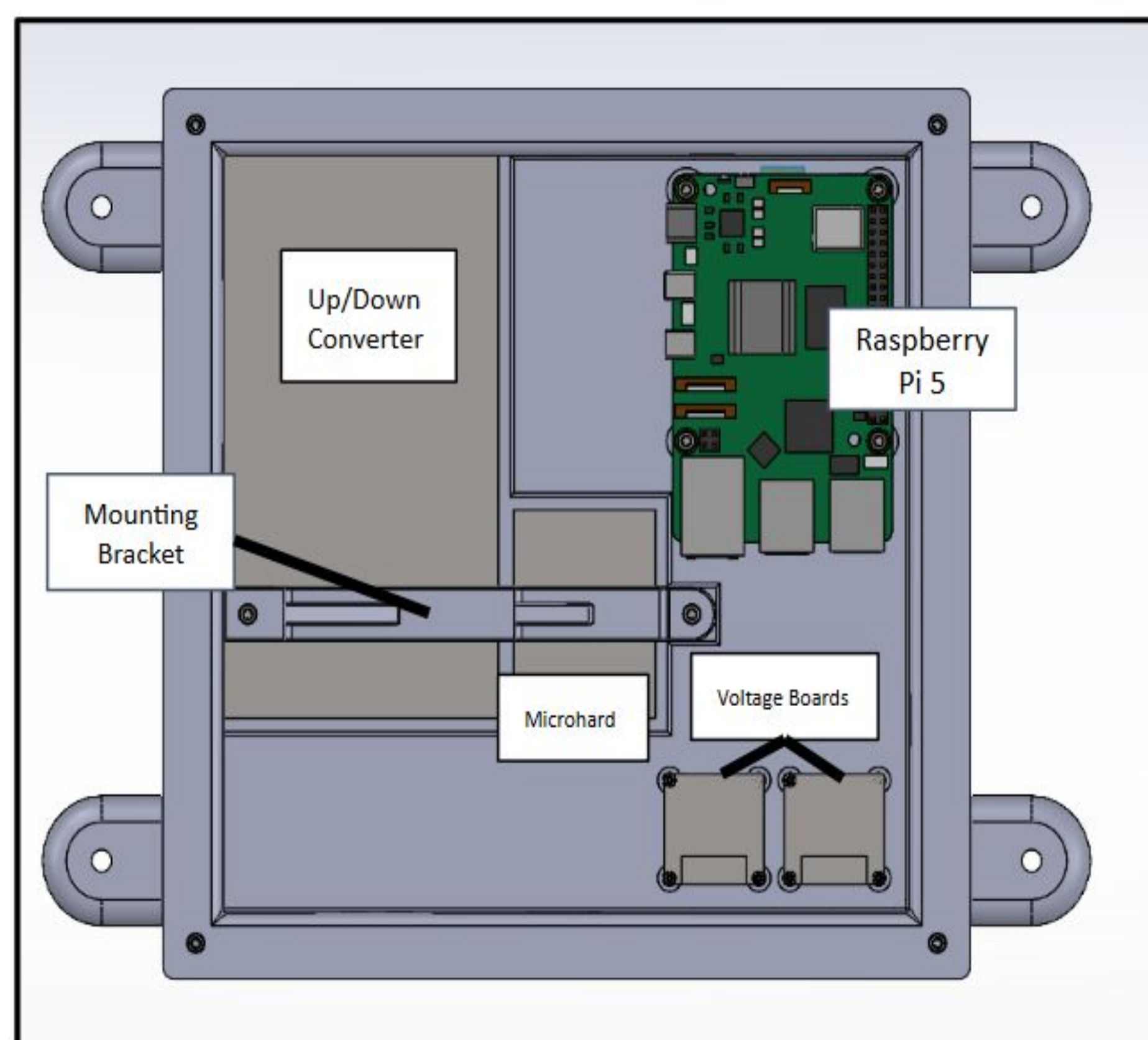
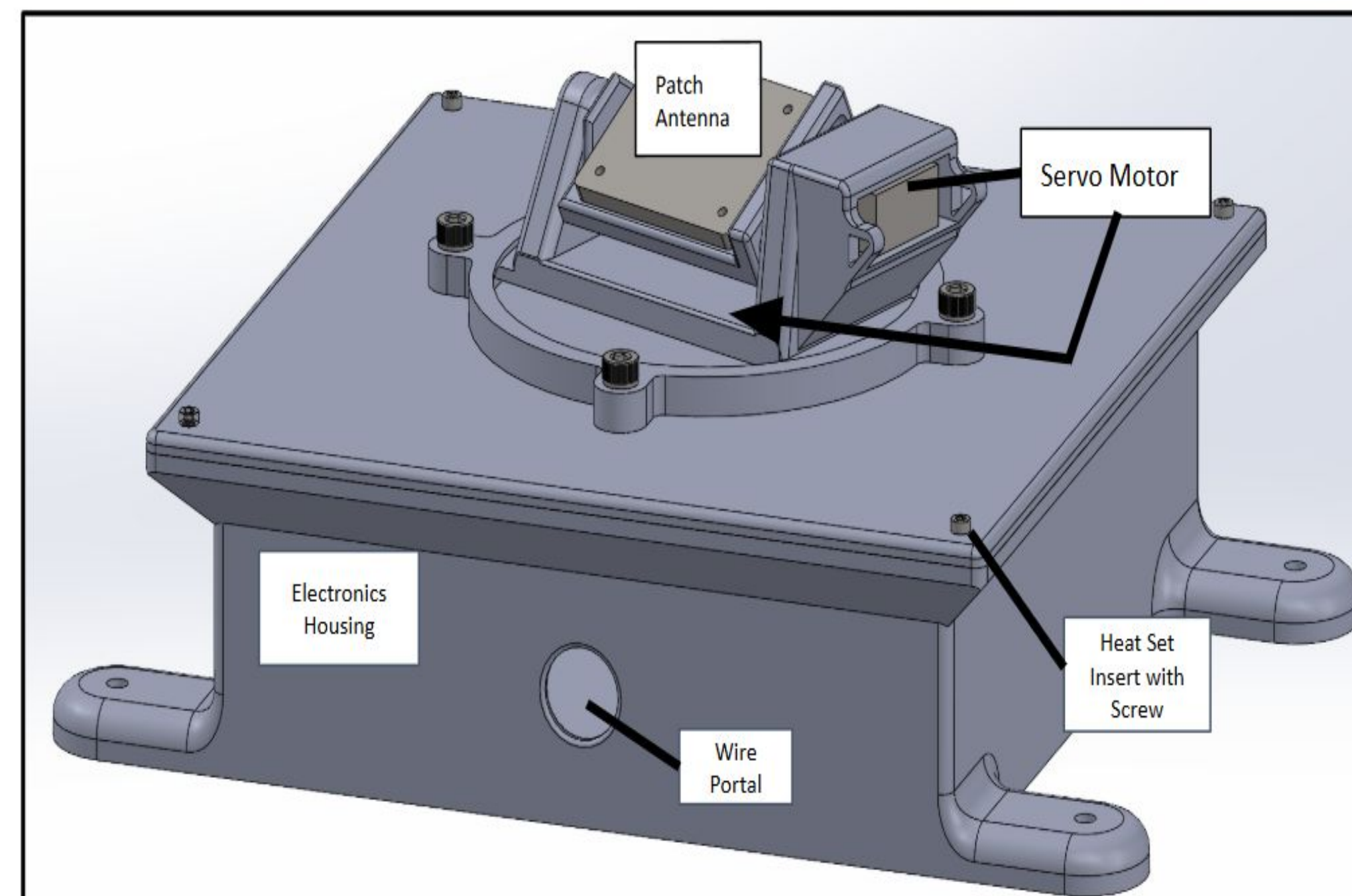




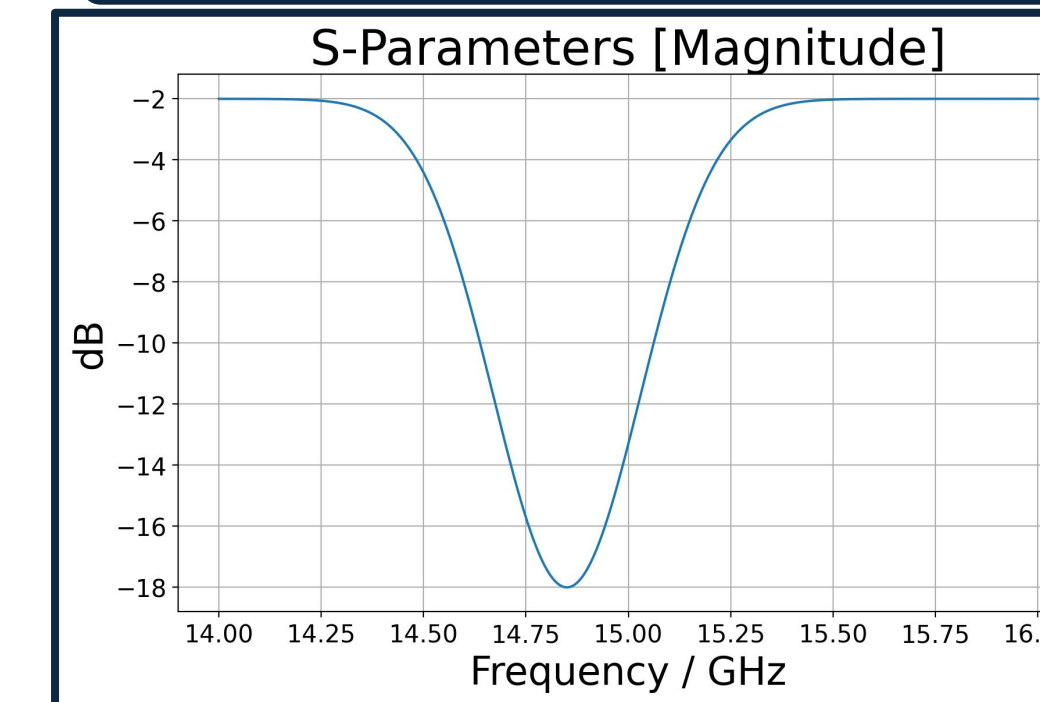
## Team Members



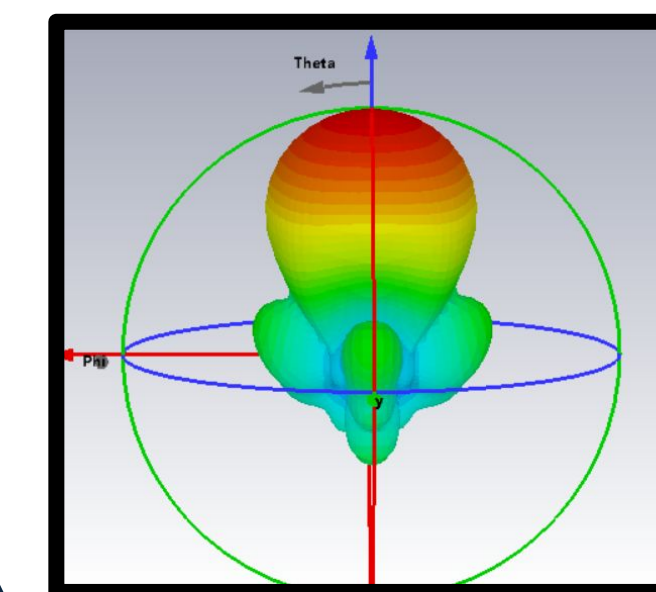
## CAD Design



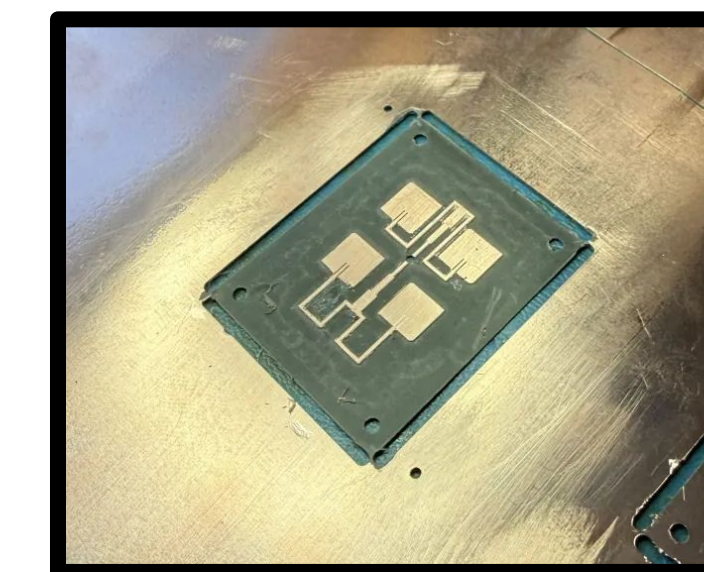
## Patch Antenna



↑ Antenna dB vs Frequency Graph



↑ Antenna Simulation

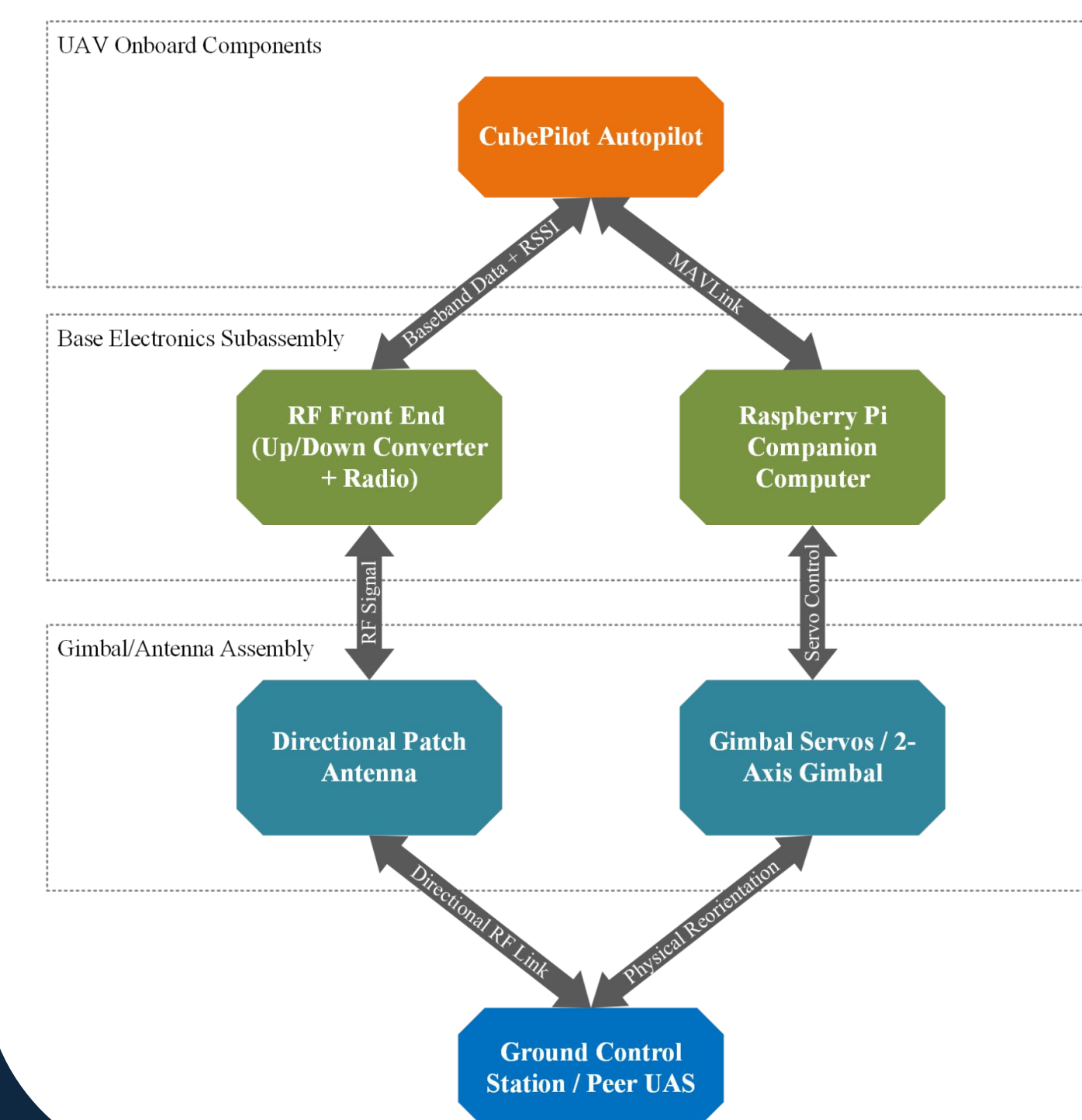


↑ Manufactured Antenna

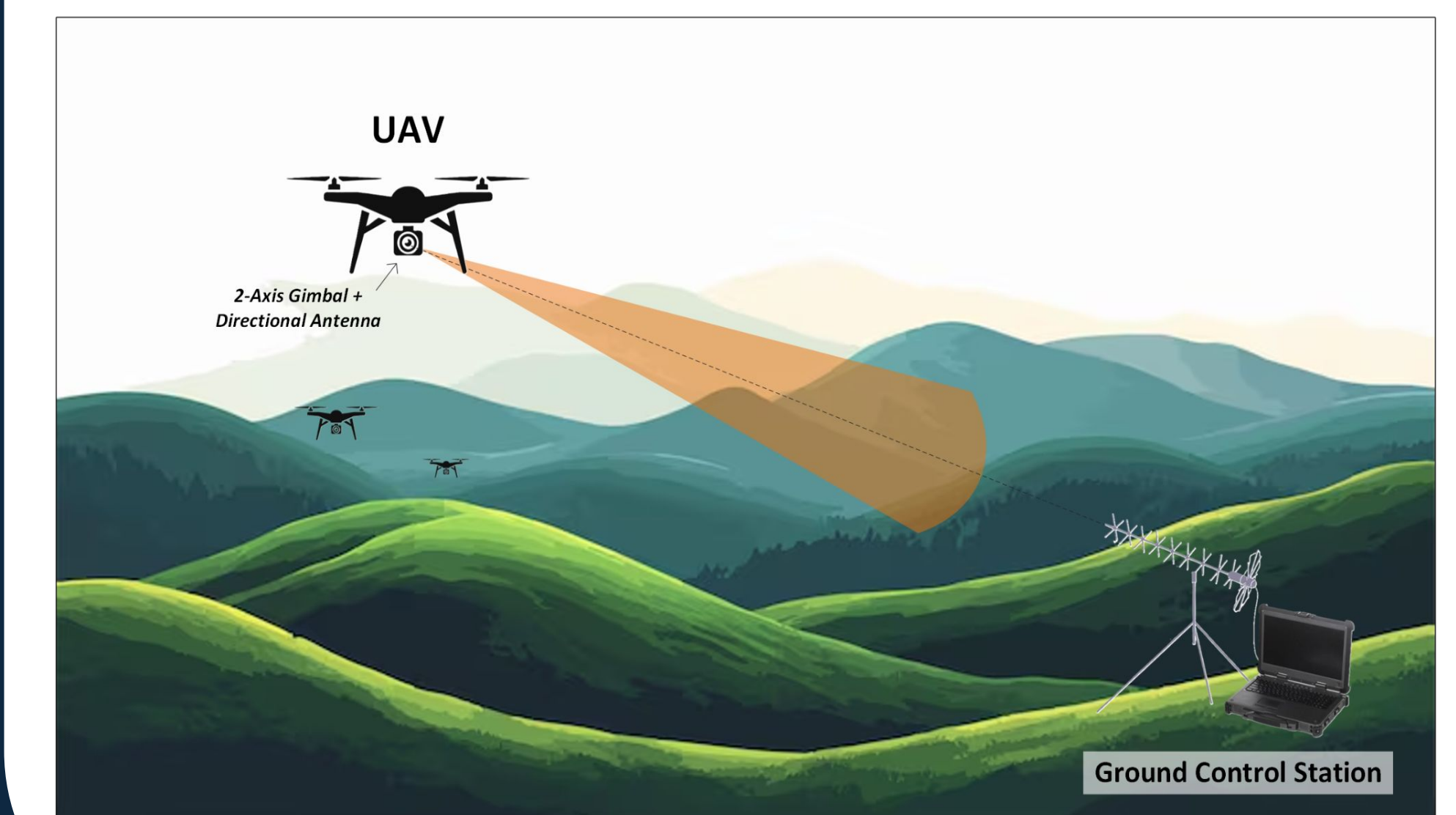
## Project Overview

Small unmanned aerial systems (UAS) operating in swarm environments are highly susceptible to electromagnetic interference and jamming, which can degrade communication reliability. This project develops a lightweight solution using a mechanically steered directional patch antenna mounted on a servo-driven gimbal to improve link performance. By focusing energy in a narrow beam and actively pointing toward a target, the system increases link margin without the complexity of phased-array antennas. The goal is to design, fabricate, and validate an integrated antenna and steering system suitable for small UAS platforms.

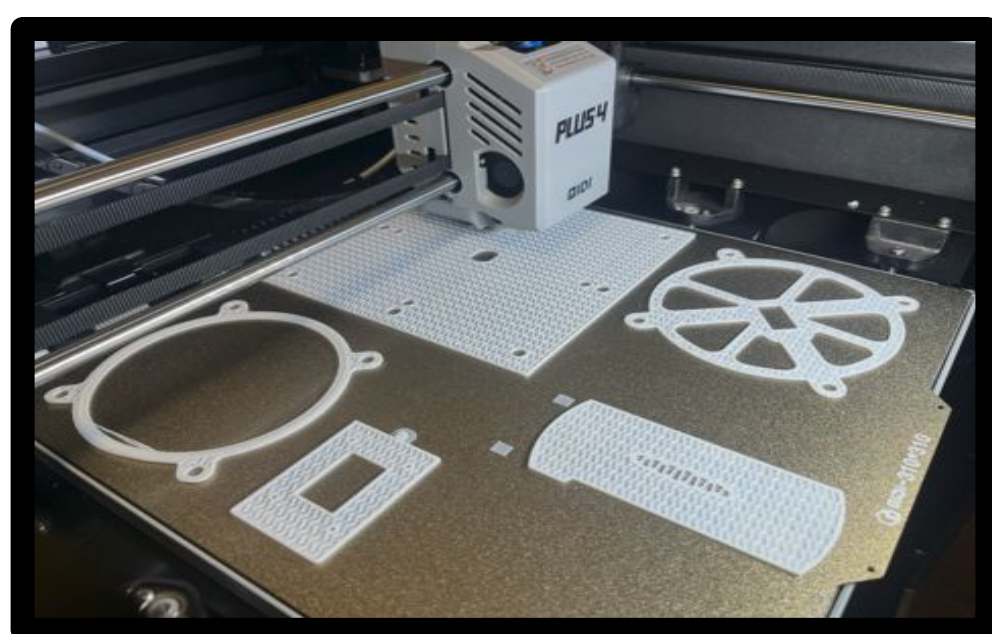
## System Level Block Diagram



## Use Case



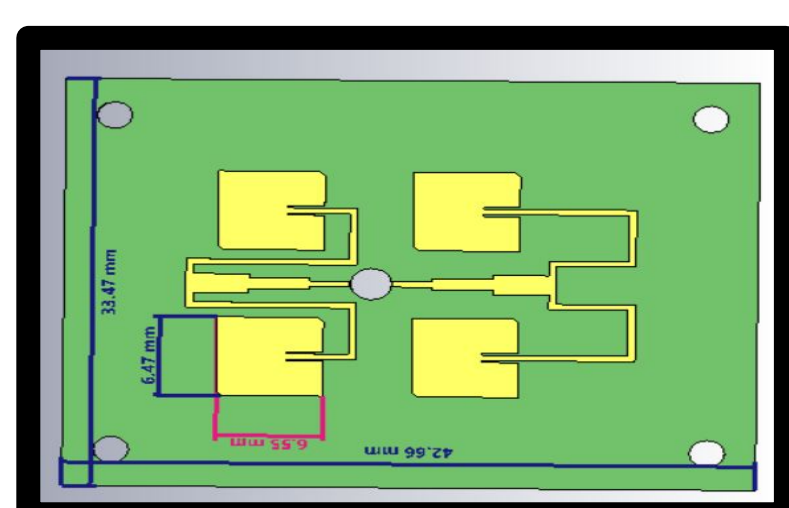
## Manufacturing



↑ 3D Printed Parts

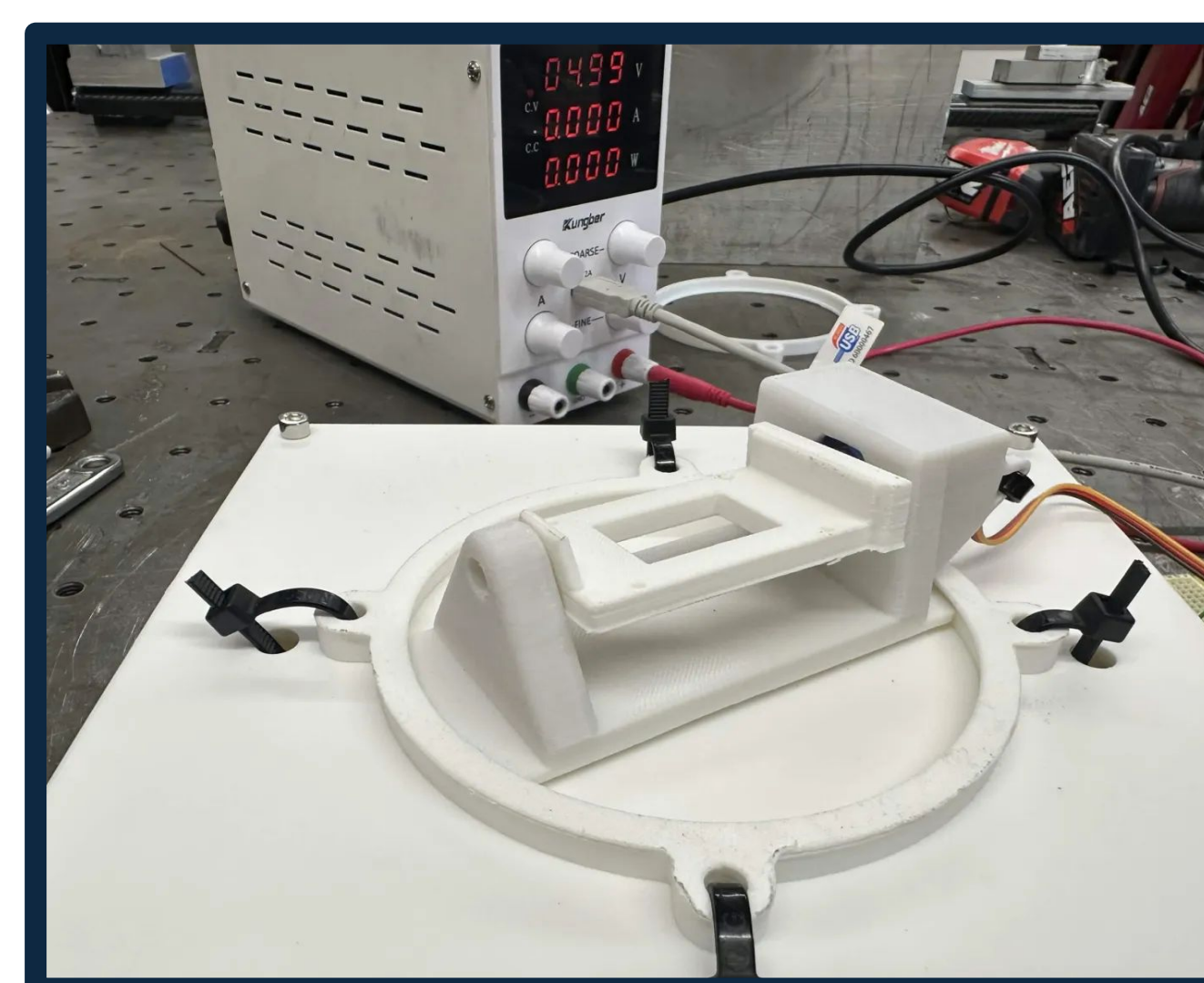


↑ Antenna Manufacturing Machine



↑ Antenna Model

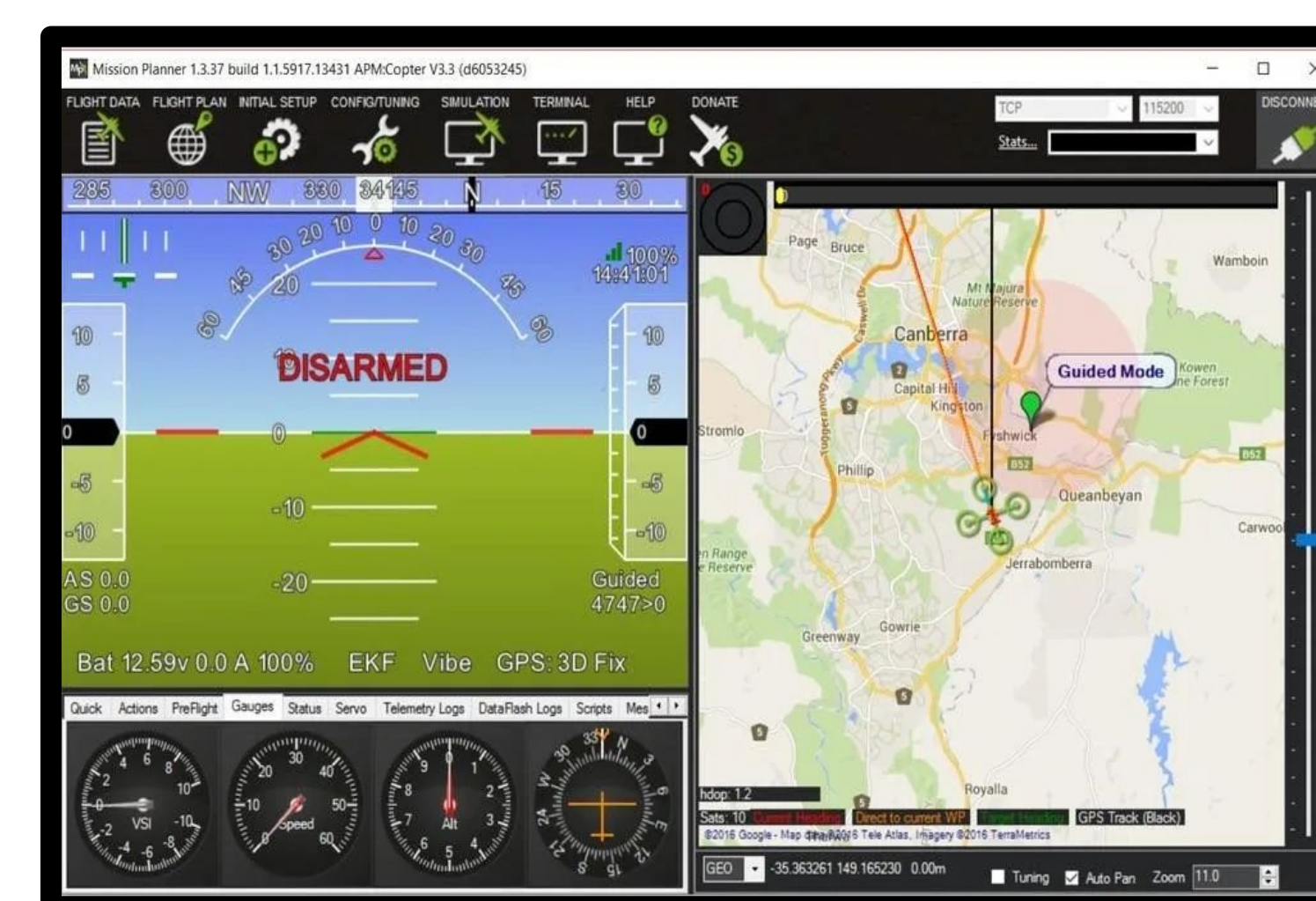
## Testing



↑ Gimbal Rotation Testing



↑ Gimbal UV Testing



↑ UAV Simulations for Controls

## Acknowledgements

We would like to thank the following people for their guidance, mentorship, and support throughout the design and development of Project Theia:

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- Dr. Scott Shaffar
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