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UAV FORGE

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COMPETITION

UAV Forge is a multidisciplinary engineering senior design project dedicated towards creating a fully autonomous, competitive, mission-based UAV. Since Fall 2017, UCI UAV Forge has been pursuing the SUAS competition held by the Association for Unmanned Vehicle Systems International (AUVSI) Seafarer Chapter.
Where: Webster Naval Air Station, in Patuxent River, Maryland
When: June 17th to 20th

OBJECTIVES

Determine the most optimal UAV design that satisfies the AUVSI SUAS requirements and complete the following:

- Mission Demonstration tasks
 - Autonomous Flight and Waypoint Capture
 - Object Detection, Classification, and Localization
 - Air Delivery: Drop UGV
 - Interoperability: Real-time data transfer to and from judges
- Technical Design Paper
- Flight Readiness Review

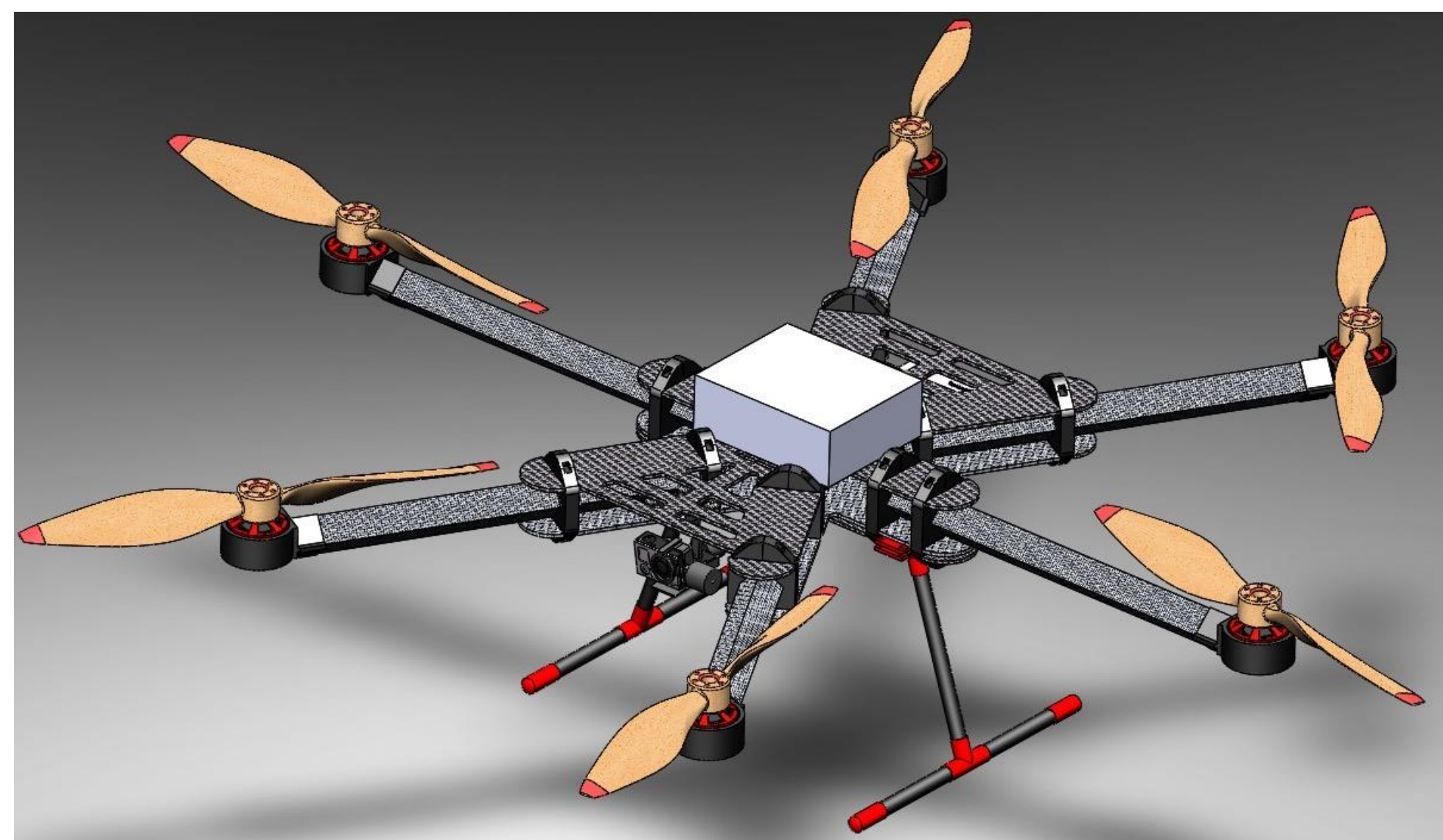
DESIGN REQUIREMENTS

To accomplish the Mission Demonstration tasks, the design specifications for our UAV are the following:

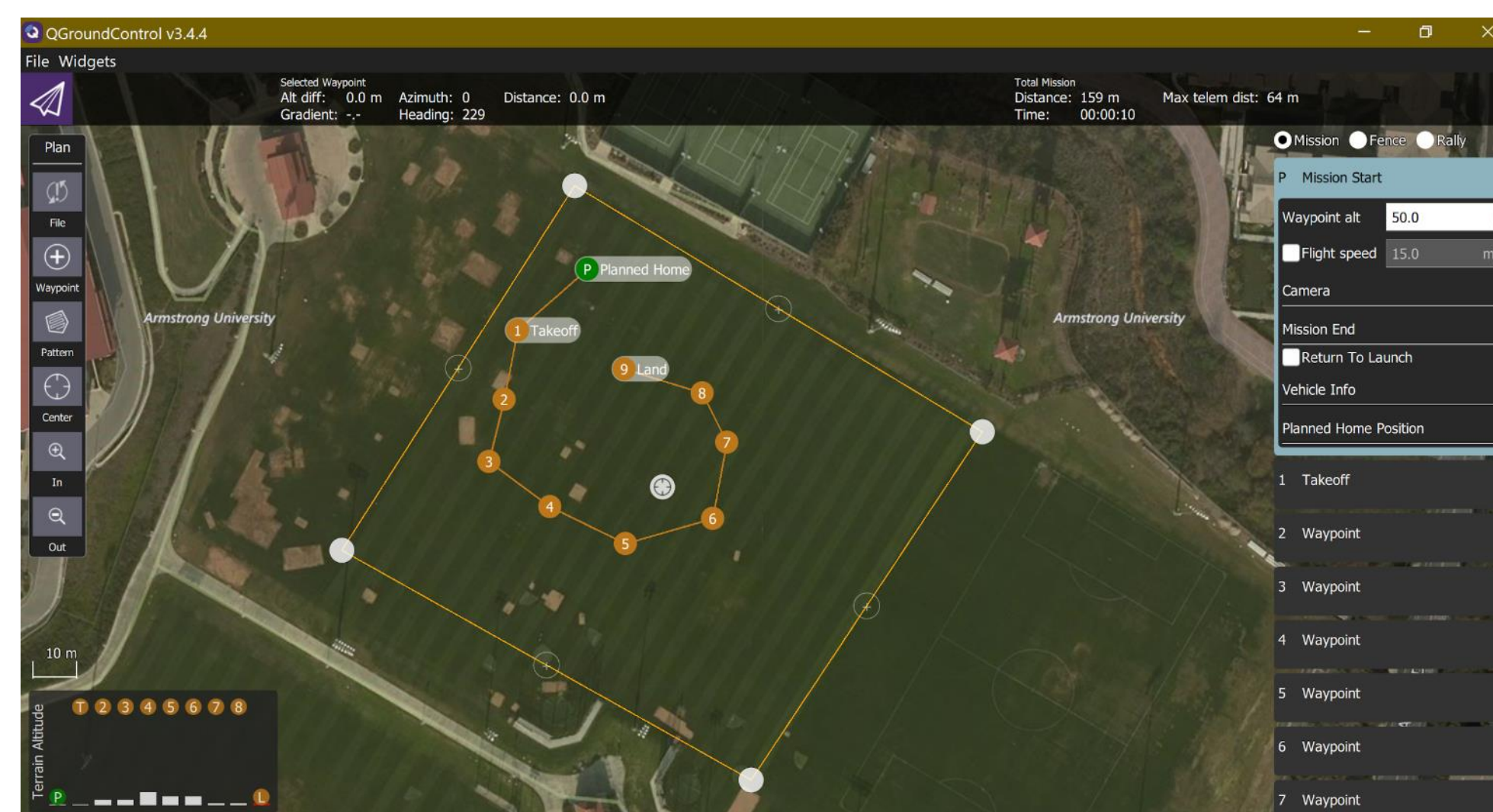
- Max takeoff weight is 55lbs
- Aircraft must be able to operate in 15 to 20 knot winds
- UAS must fly autonomously for at least 3 minutes
- Entire payload can weigh up to 64 oz
- Operate at 1 Hz for aircraft telemetry
- Flight time: 30 minutes maximum
- Avoid cylindrical objects with radius between 30ft and 300ft and height between 30ft and 750ft
- Teams must be able to operate without competition provided electrical power for up to 10 minutes

ENGINEERING APPROACH

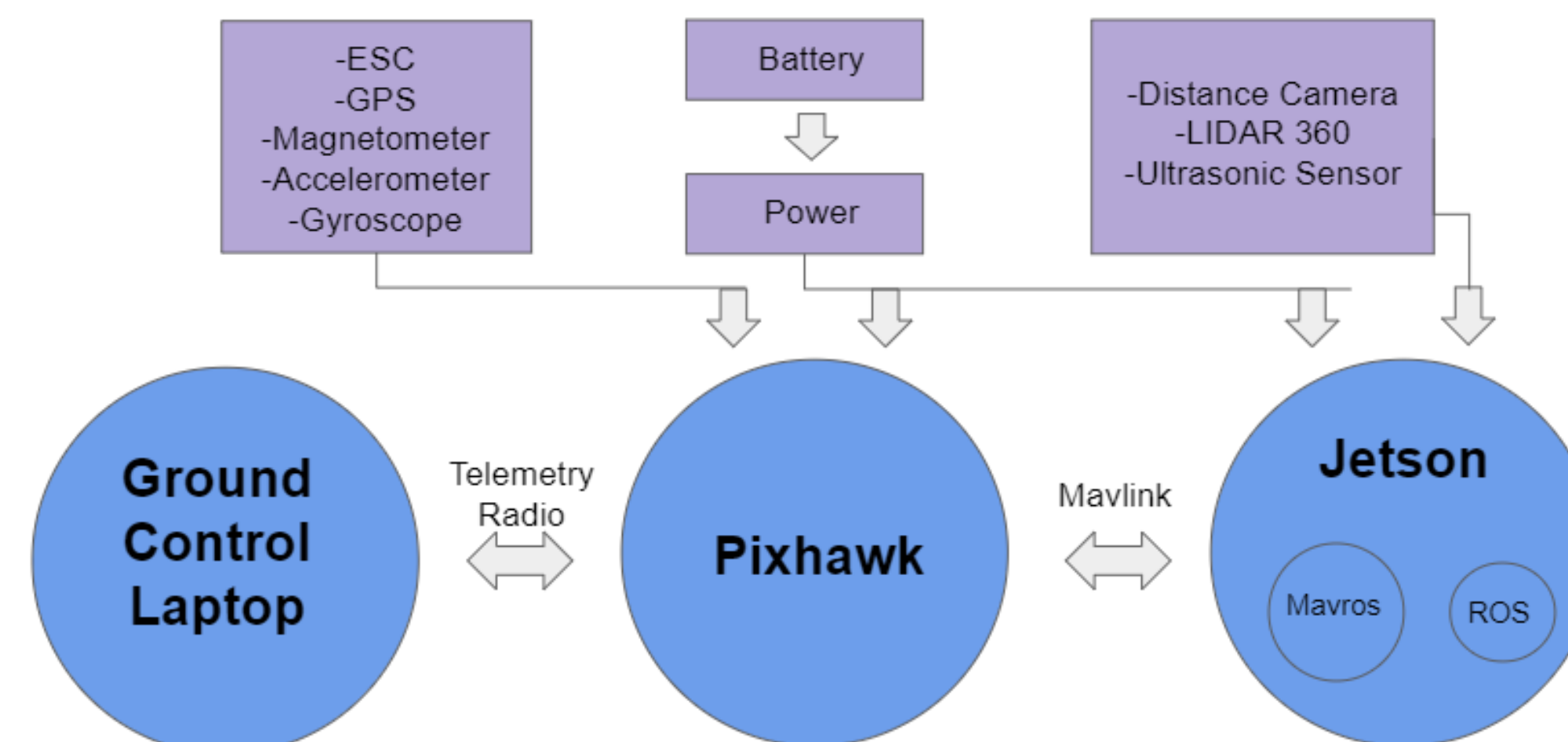
Competition Aircraft: Zotcopter



Ground Station User Interface with Geofence



Avionics Systems Block Diagram



TIMELINE

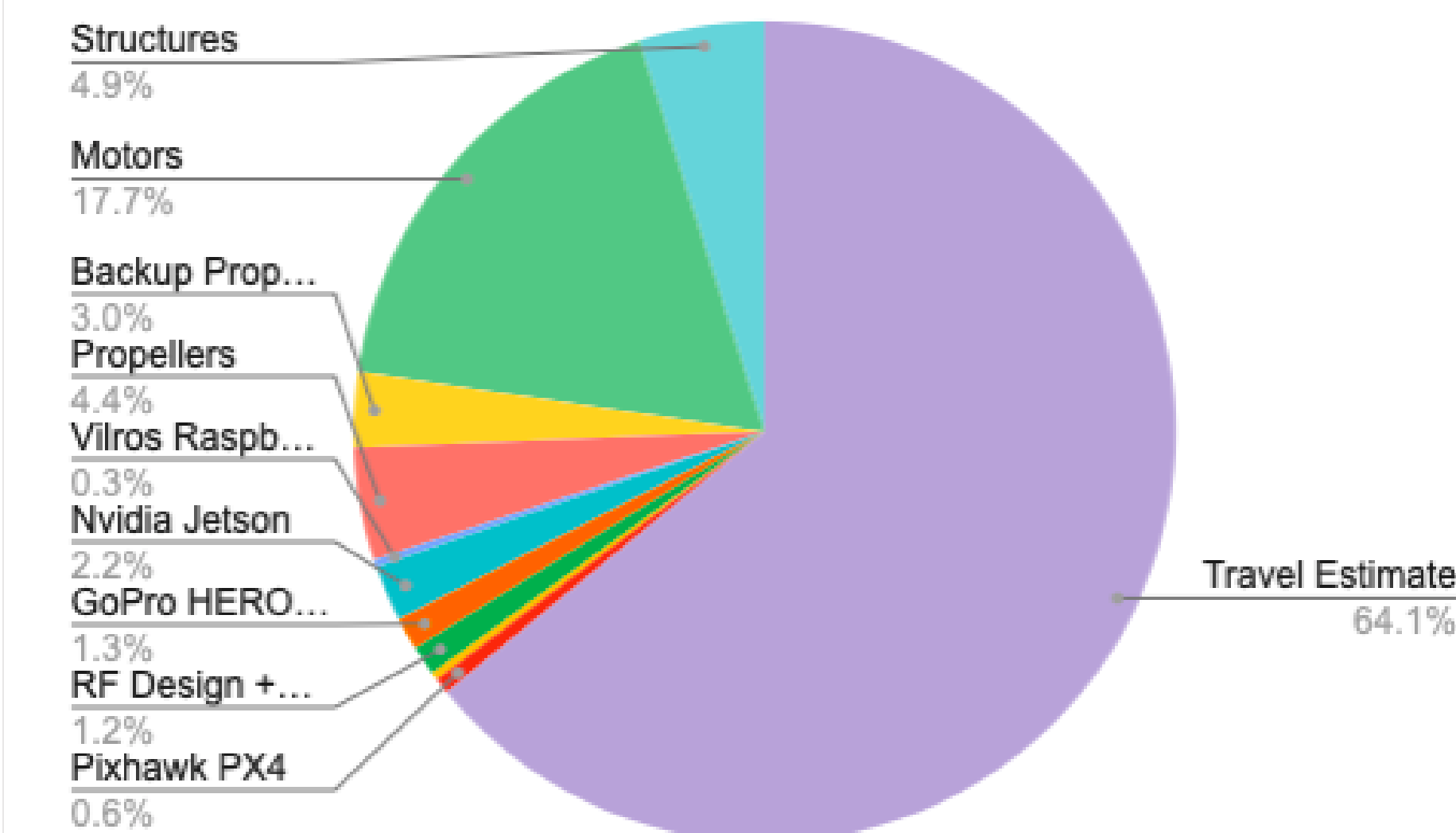
Fall Quarter Progress:

- UAV CAD model finalized, fabrication initiated
- UGV release mechanism prototypes complete
- Flow analysis and flight time calculations in progress
- Operating systems and sensors calibrated and tested
- Successful manual flight

Winter Quarter Goals:

- Integrate autonomous features
- Complete test missions on finalized hexcopter

BUDGET



TEAM STRUCTURE

