



COMPETITION

UAV Forge is a multidisciplinary engineering senior design project dedicated towards creating a fully autonomous, competitive, mission-based UAV. Since Fall 2017, UAV Forge has begun pursuing a competition called Student Unmanned Aerial Systems (SUAS) by the Association for Unmanned Vehicle Systems International (AUVSI) Seafarer Chapter.

Where: **Webster Naval Air Station, in Patuxent River, MD**

When: **June 12th to 15th, 2019**



OBJECTIVES

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

- Mission Demonstration tasks**
 - Autonomous Flight and Waypoint Capture
 - Object Detection, Classification, and Localization
 - Air Delivery: Drop UGV (Unmanned Ground Vehicle)
 - 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 55 lbs
- Aircraft must be able to operate in 15 to 20 knot winds
- Must fly autonomously for at least 3 minutes
- Operate at 1 Hz for aircraft telemetry
- Flight time: 30 minutes maximum
- Avoid cylindrical objects with radius between 30 ft and 300 ft and height between 30 ft and 750 ft
- Teams must be able to operate without competition provided electrical power for up to 10 minutes

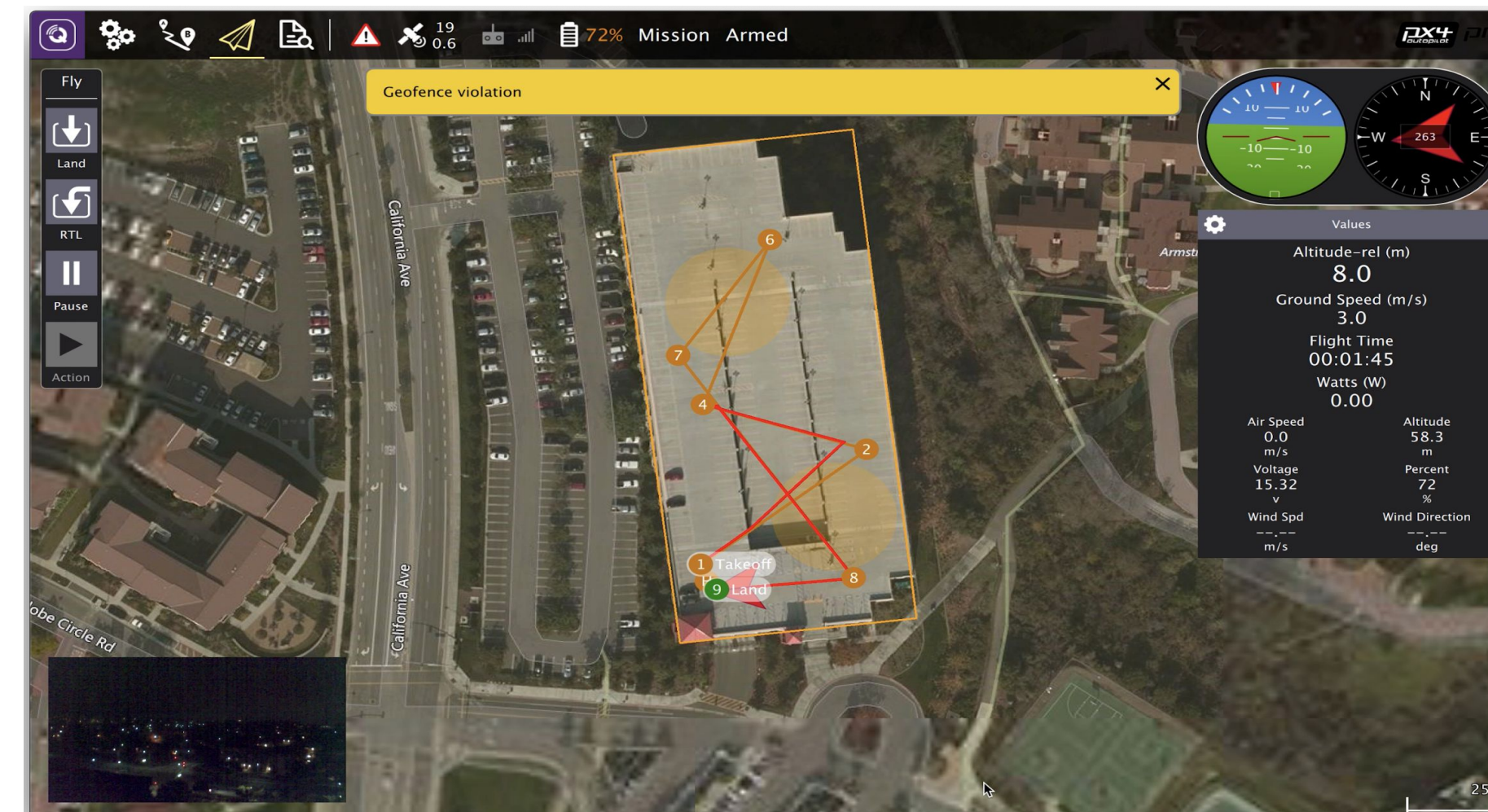
ENGINEERING APPROACH

Competition Aircraft: Avistar Sport https://images-na.ssl-images-amazon.com/images/I/71EJCTmq8BL_SX522_.jpg. [image].

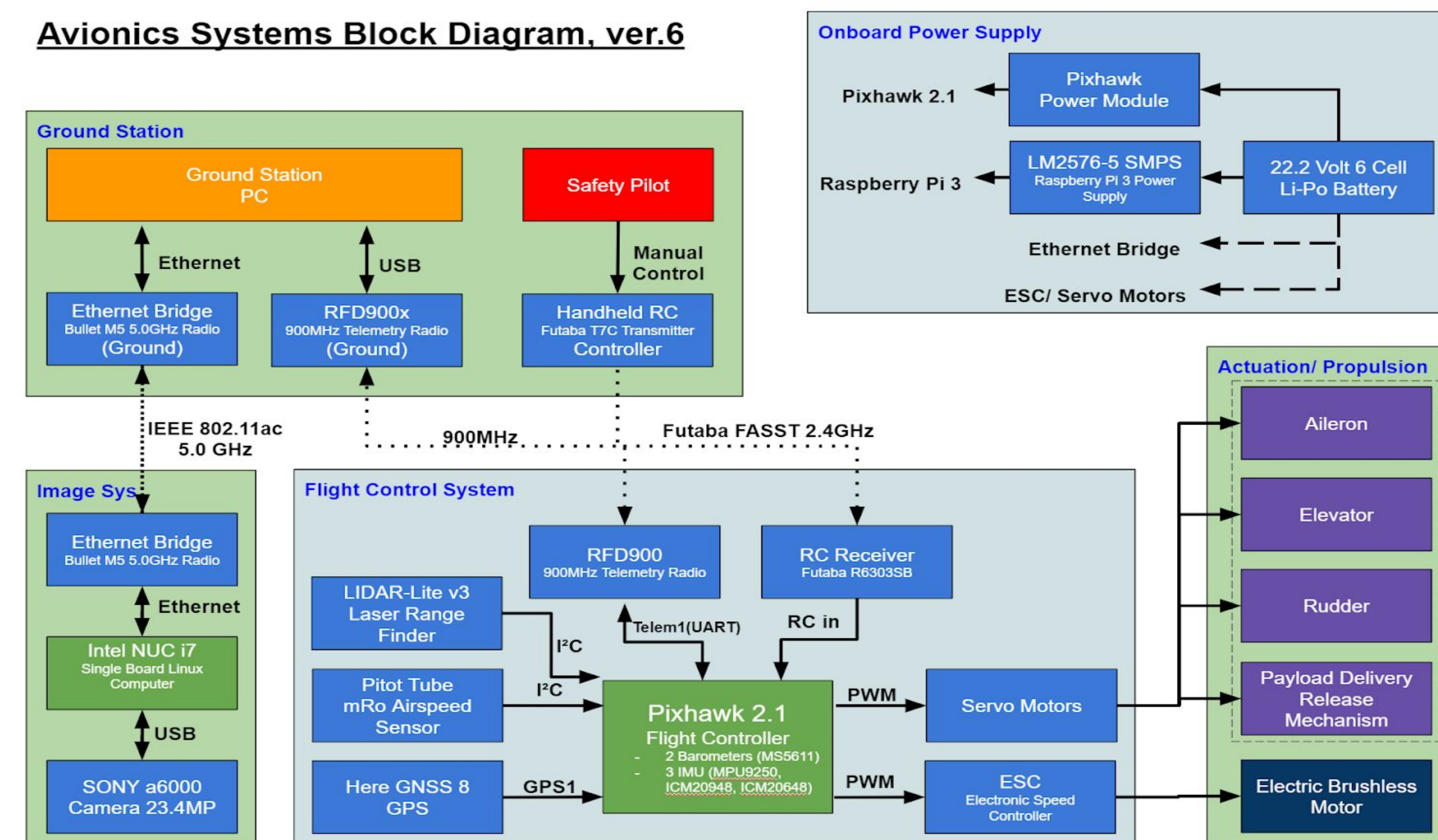
- A high wing aircraft configuration allows for a more stable flight
- Wing Area: 1448 in²
- Wing Loading: ~2 lb/ft²
- Wingspan: 90.5 in
- Motor: SUNNYSKY X5320
- Max Static Thrust: 80.41 N



Ground Station User Interface with Geofence



Avionics Systems Block Diagram, ver.6



TIMELINE

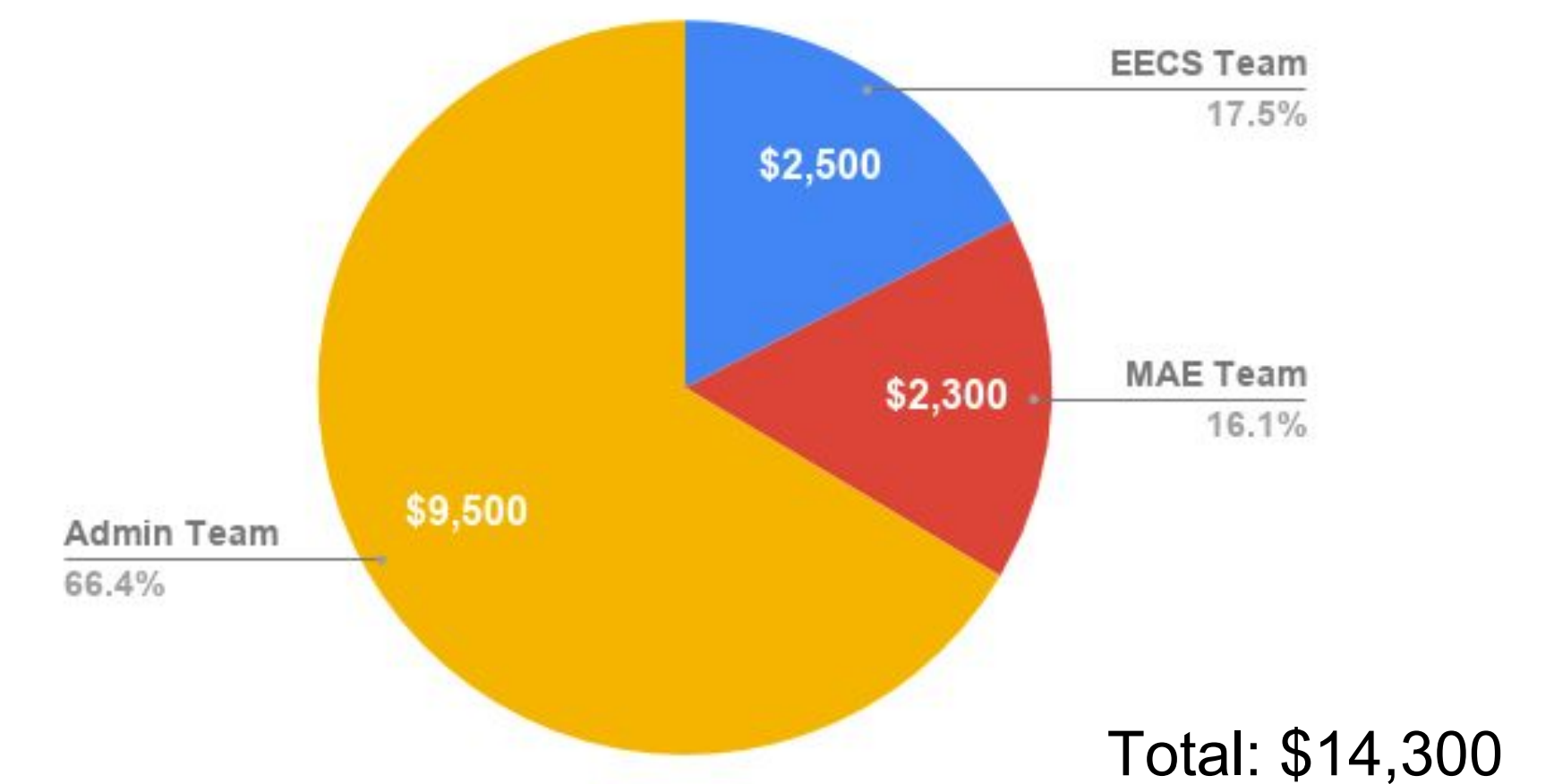
Fall Quarter Goals:

- Finish structural assembly of Avistar Sport 30-35cc
- Complete ground testing
- Install avionics equipment onto plane

Winter Quarter Goals:

- Complete a weighted remote control flight test
- Complete an autonomous flight test

BUDGET



TEAM STRUCTURE

