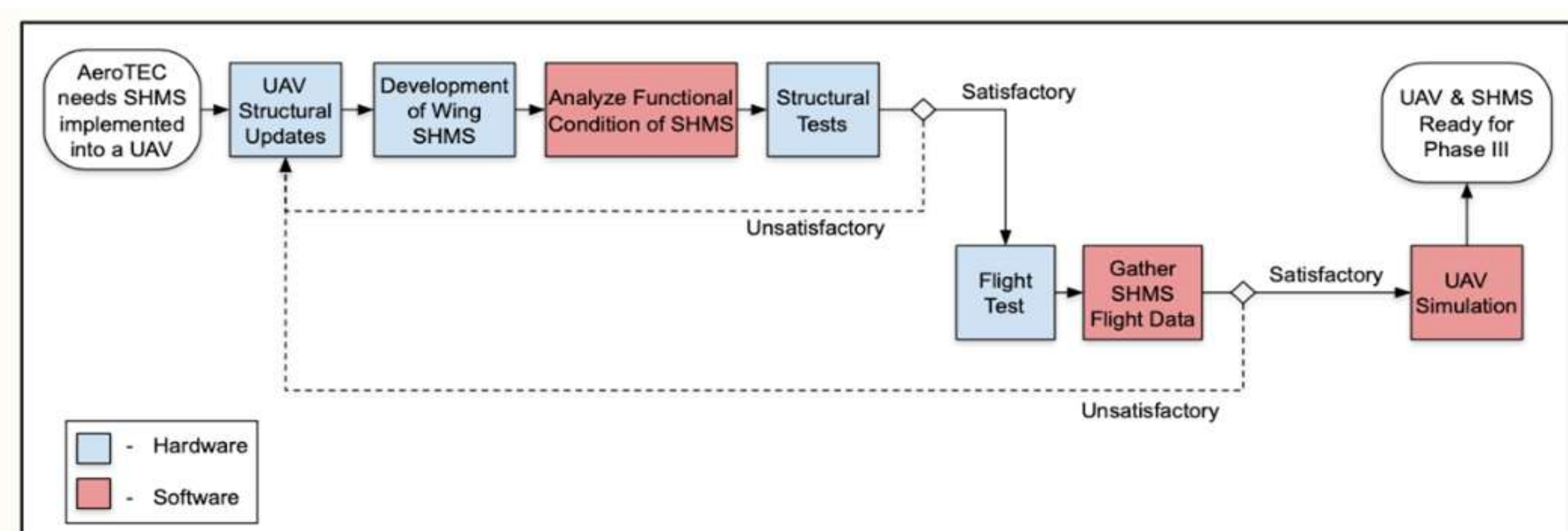


STUDENTS: Nathaniel Chang, Ronnie Chen, Nathan Chilcott, Arthur Chong, Sydney Lennemann, Nattapon Oonlamom, David Ramirez Vadillo, Ali Vucenovic, Ryan Wang, Maia Willebrand

Mission Objectives

- MO.1:** To **reactivate** one of the UWAA department's senior design **flight test vehicles** such that it can complete a **flight test** while conforming to the safety and operational **standards** of 14 CFR 107 regulations from the Federal Aviation Administration (FAA) and AeroTEC.
- MO.2:** To **update** the existing AeroTEC X-Plane 12 **flight simulator** developed by the 2023 UW Capstone Team such that **system conditions align with flight data** within 20% of error from wind tunnel and flight test data.
- MO.3:** To **develop a telemetry system** for the test vehicle for **in-flight data acquisition** that supports Beyond Line of Sight (BLOS) capabilities and verify its function through both ground and flight test.
- MO.4:** To **develop a structural health monitoring system (SHMS)** that determines if flight loads have exceeded limit loads by comparing the expected response from analysis data to in-flight data.



Wing Design

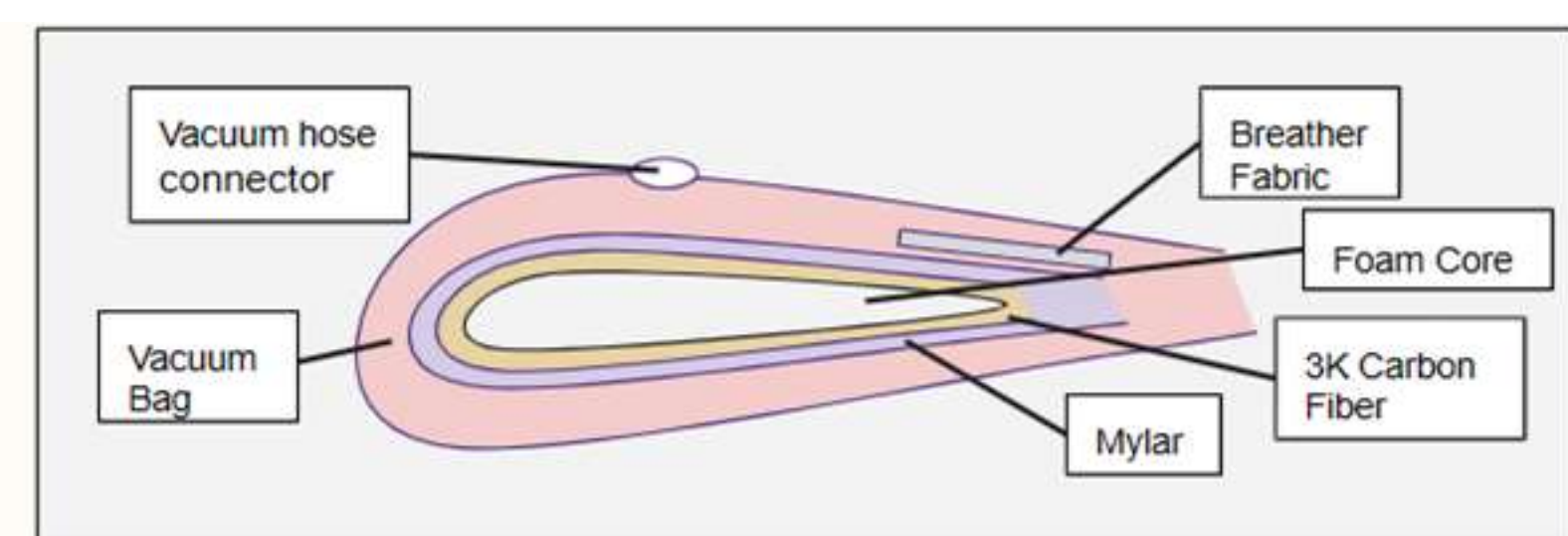
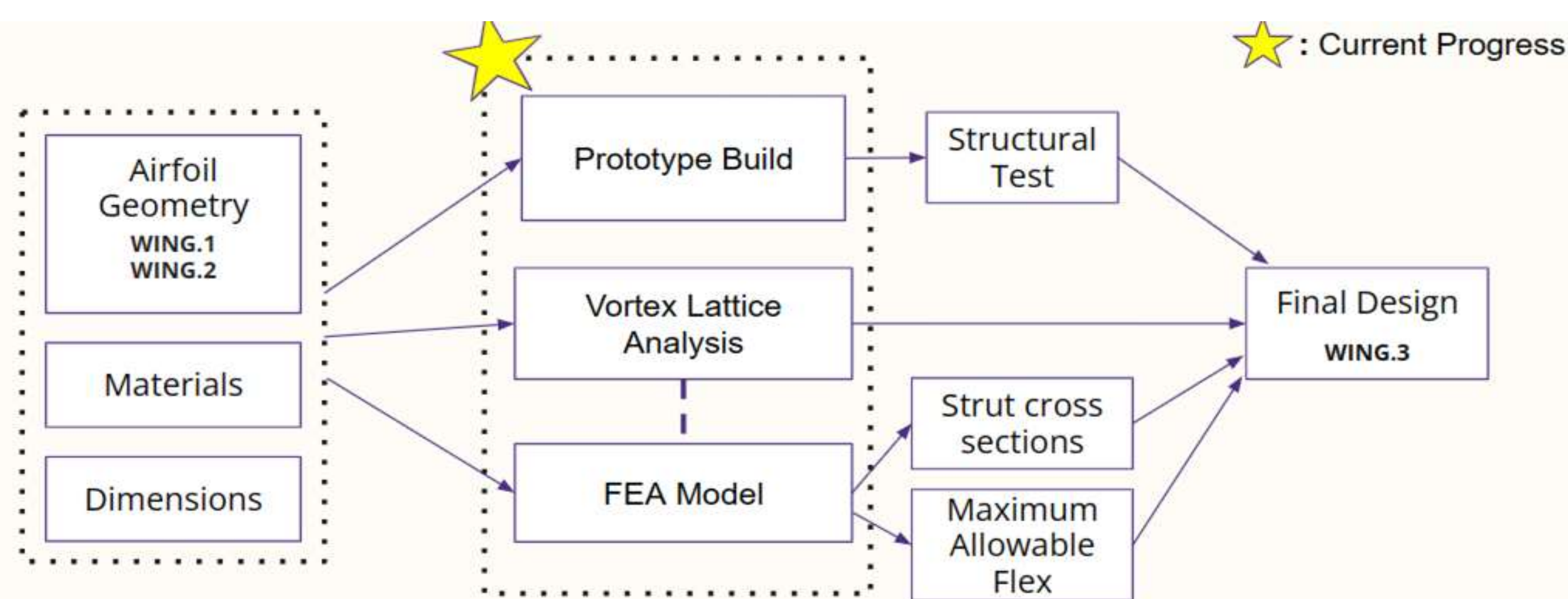


Fig. 14 Carbon Fiber Wet Layup Schematic

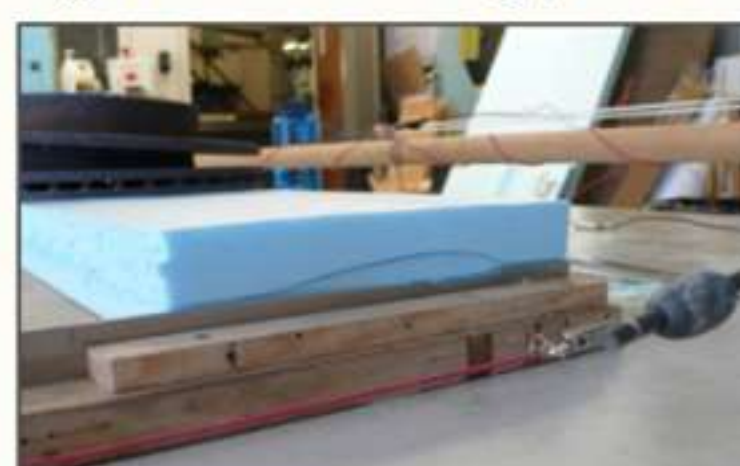


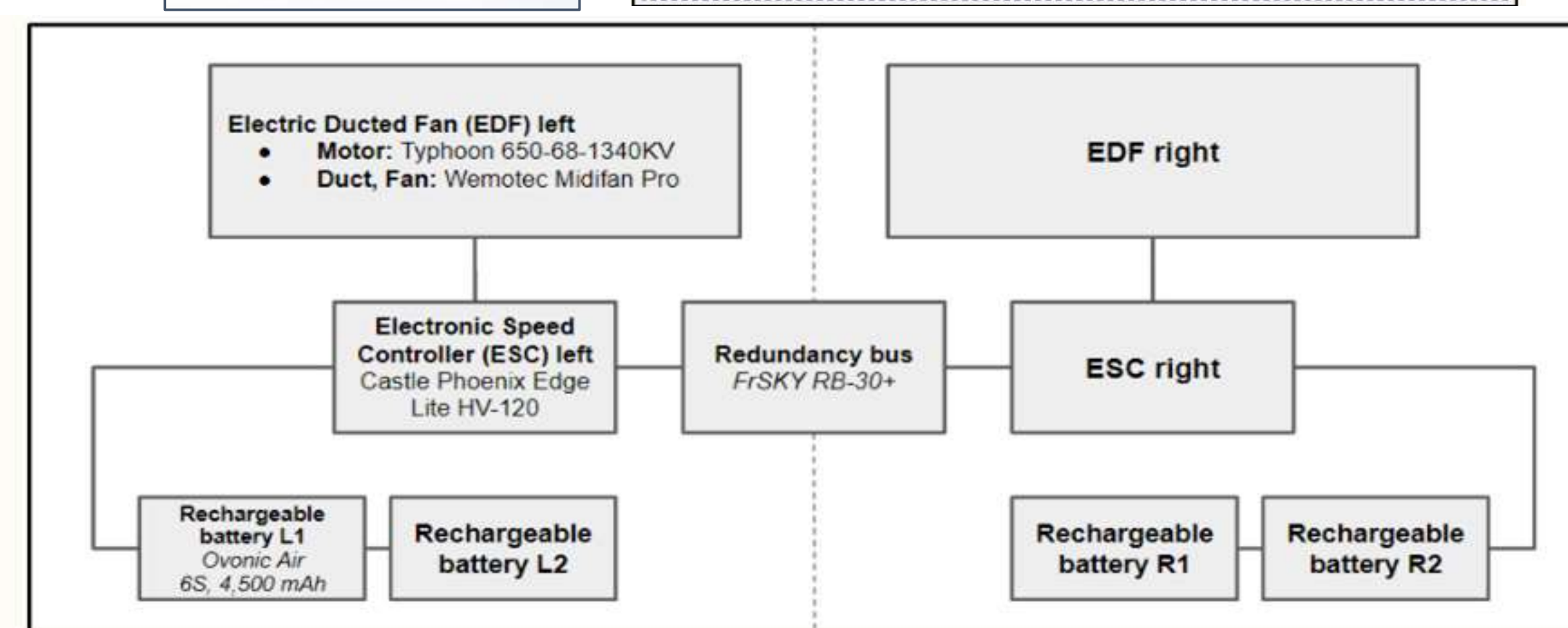
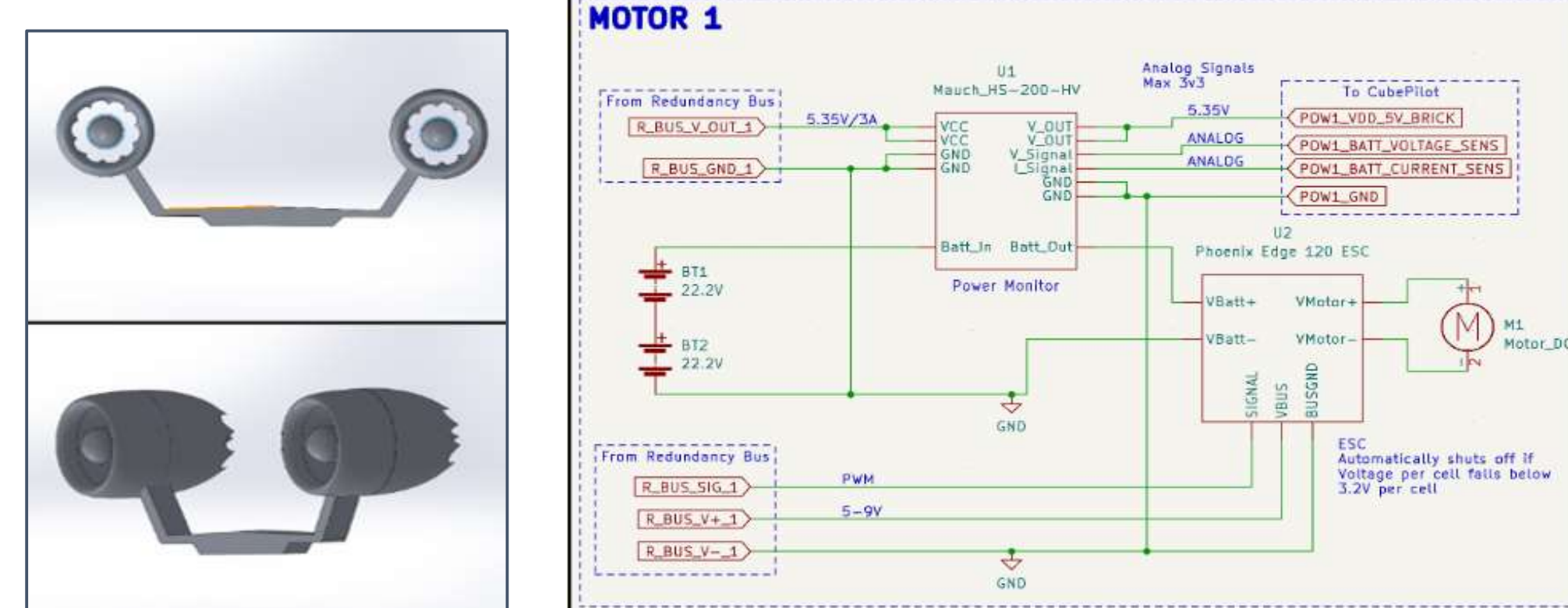
Fig. 15 2011 Hot Wire Setup [2]

Goals:

- Validate manufacturing methods
- Build full-scale structural test wing

Prototype Part #	Name
1	Practice Method of Cutting Foam Core
2	Carbon Fiber Layup - Half Wing Section
3	Cutouts
4	Full-scale Wing

Propulsion Design



Telemetry Design

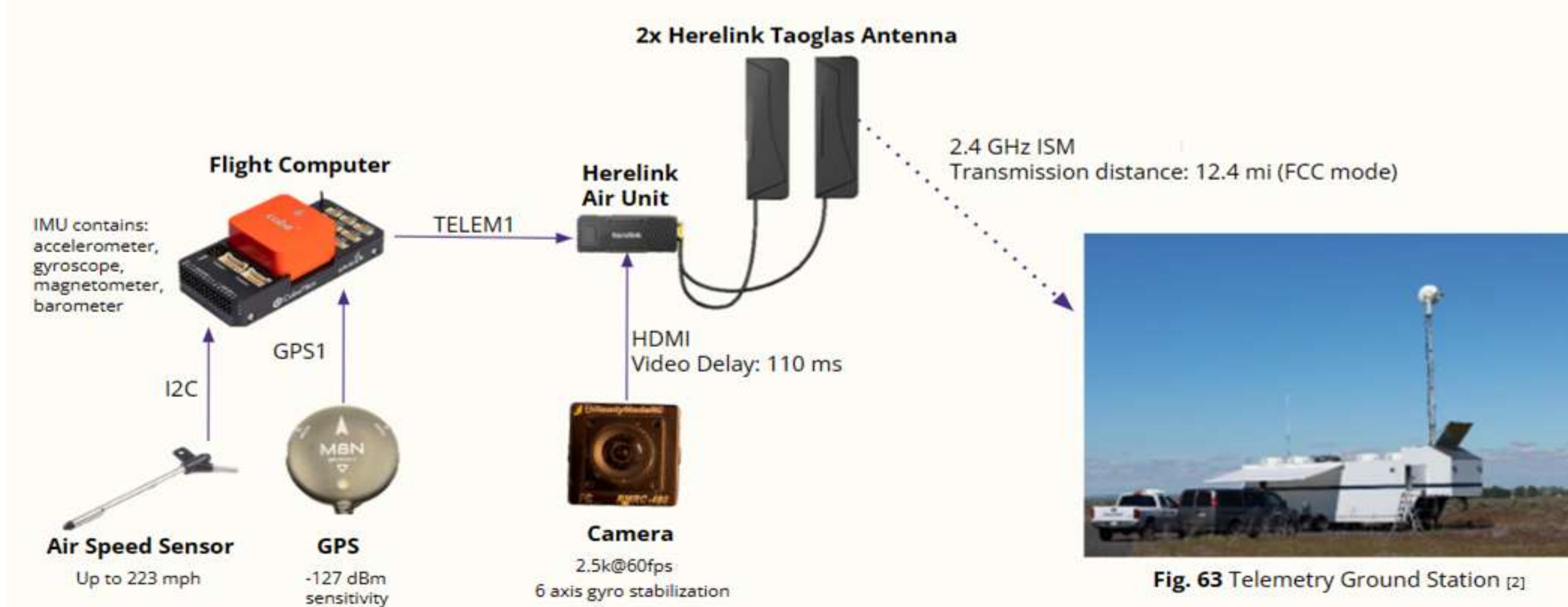


Fig. 63 Telemetry Ground Station [2]

Simulator Design



Future Work and References

- PCB design for SHMS
- Further Testing for propulsion power capacity

Avionics and Controls Design

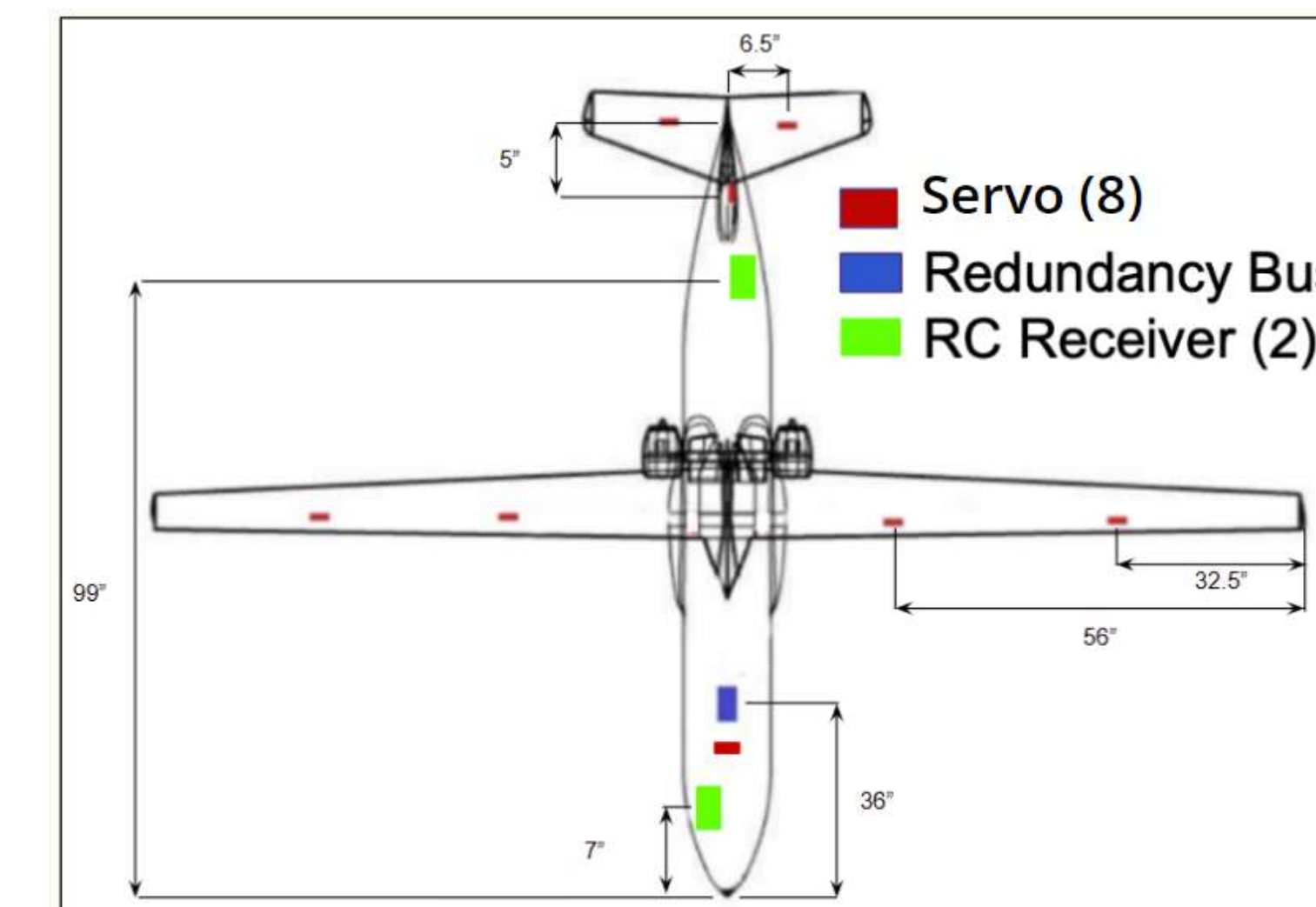
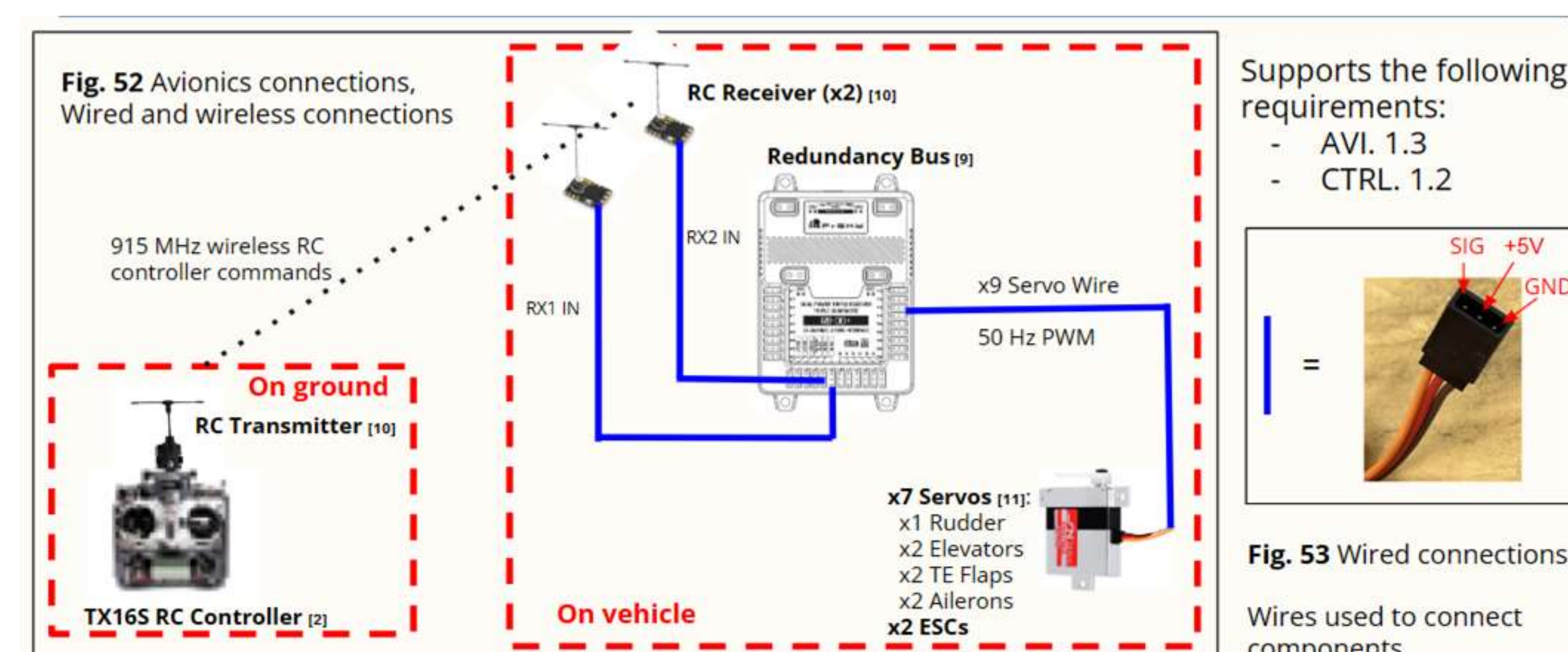


Fig. 39 Component placement [1] (adapted from 2011 report)



Supports the following requirements:
 - AVI. 1.3
 - CTRL. 1.2

Fig. 53 Wired connections
 Wires used to connect components

Structural Health Monitoring System (SHMS) Design

