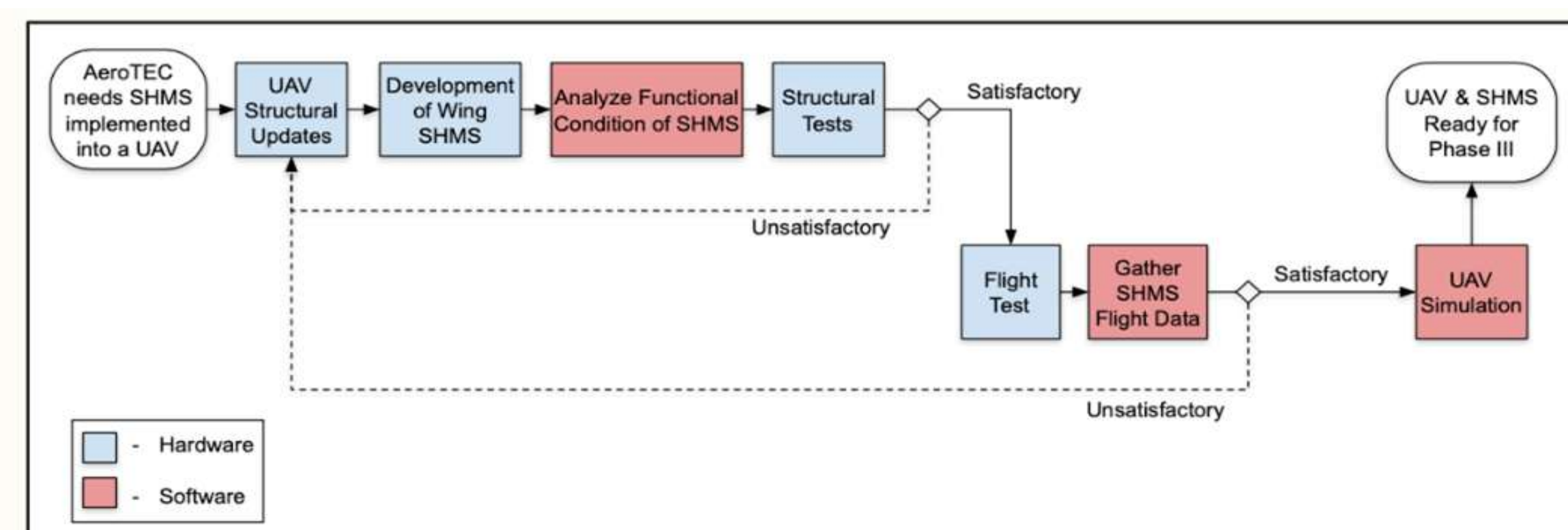


## Mission Objectives

- 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

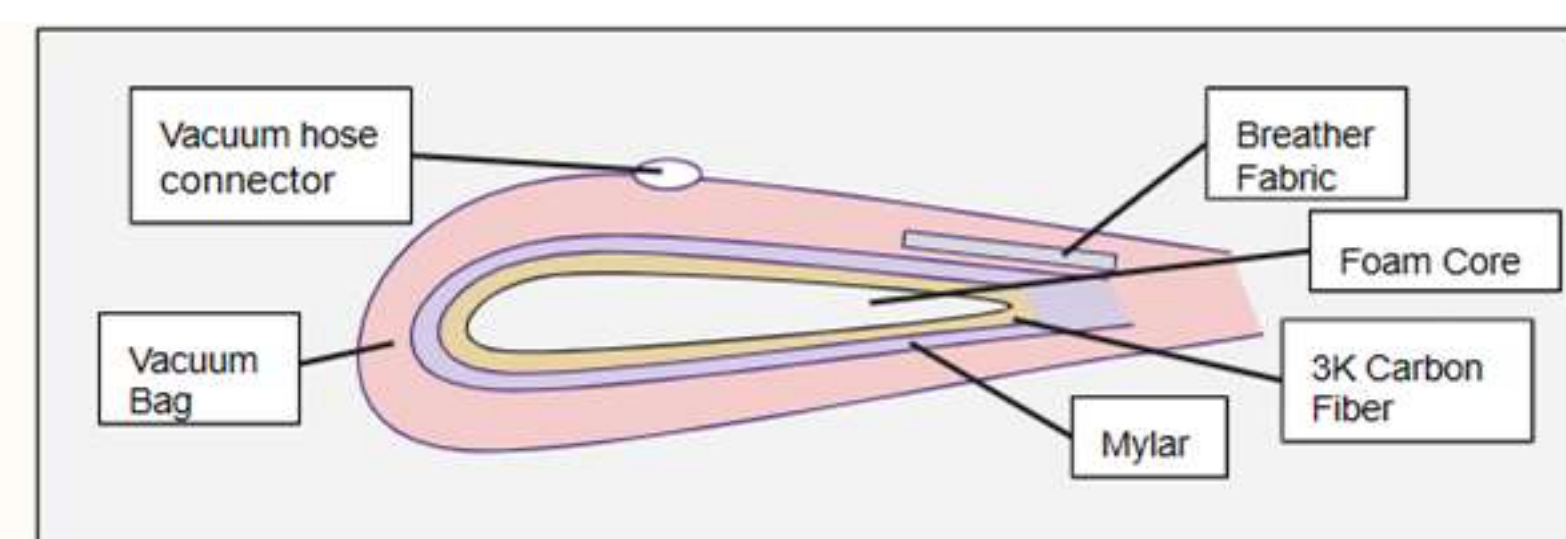
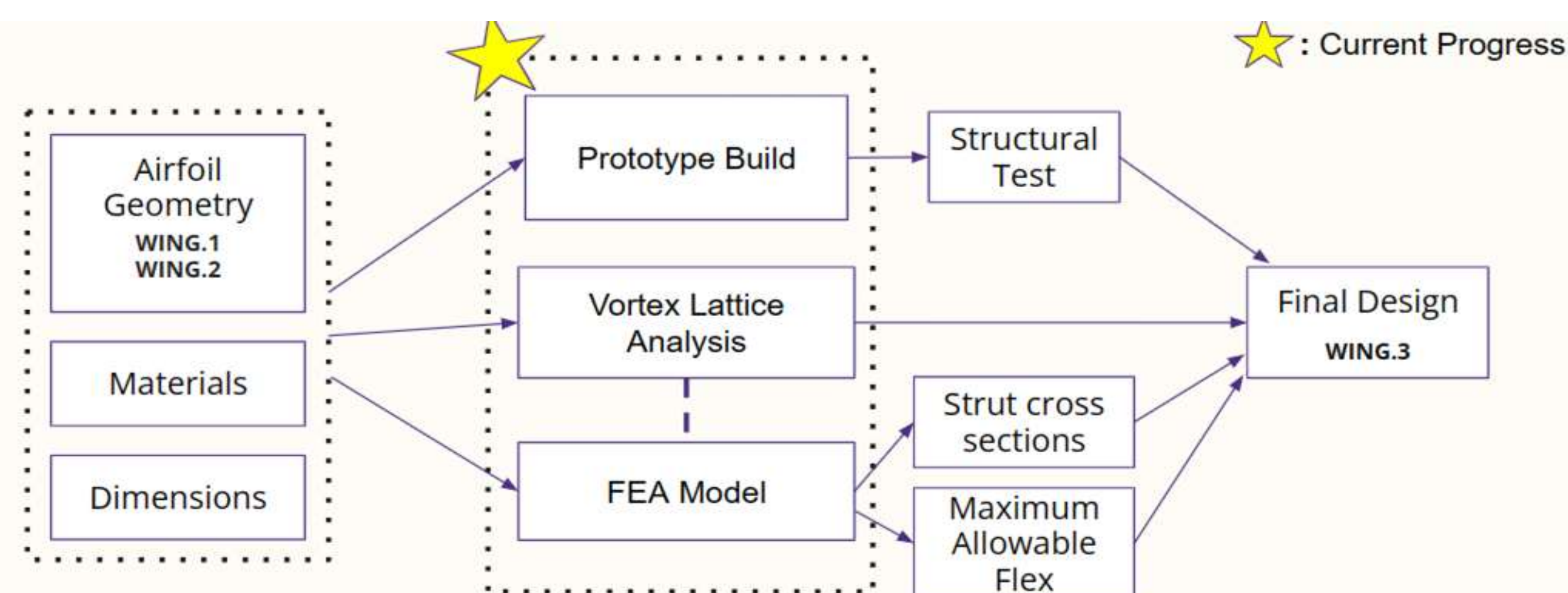


Fig. 14 Carbon Fiber Wet Layup Schematic

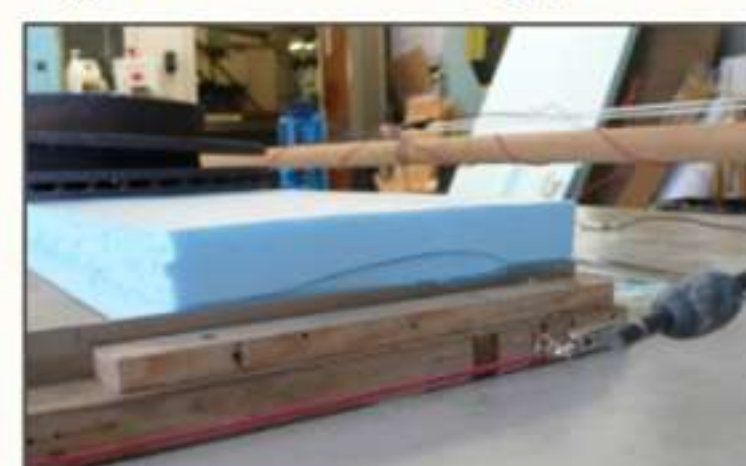


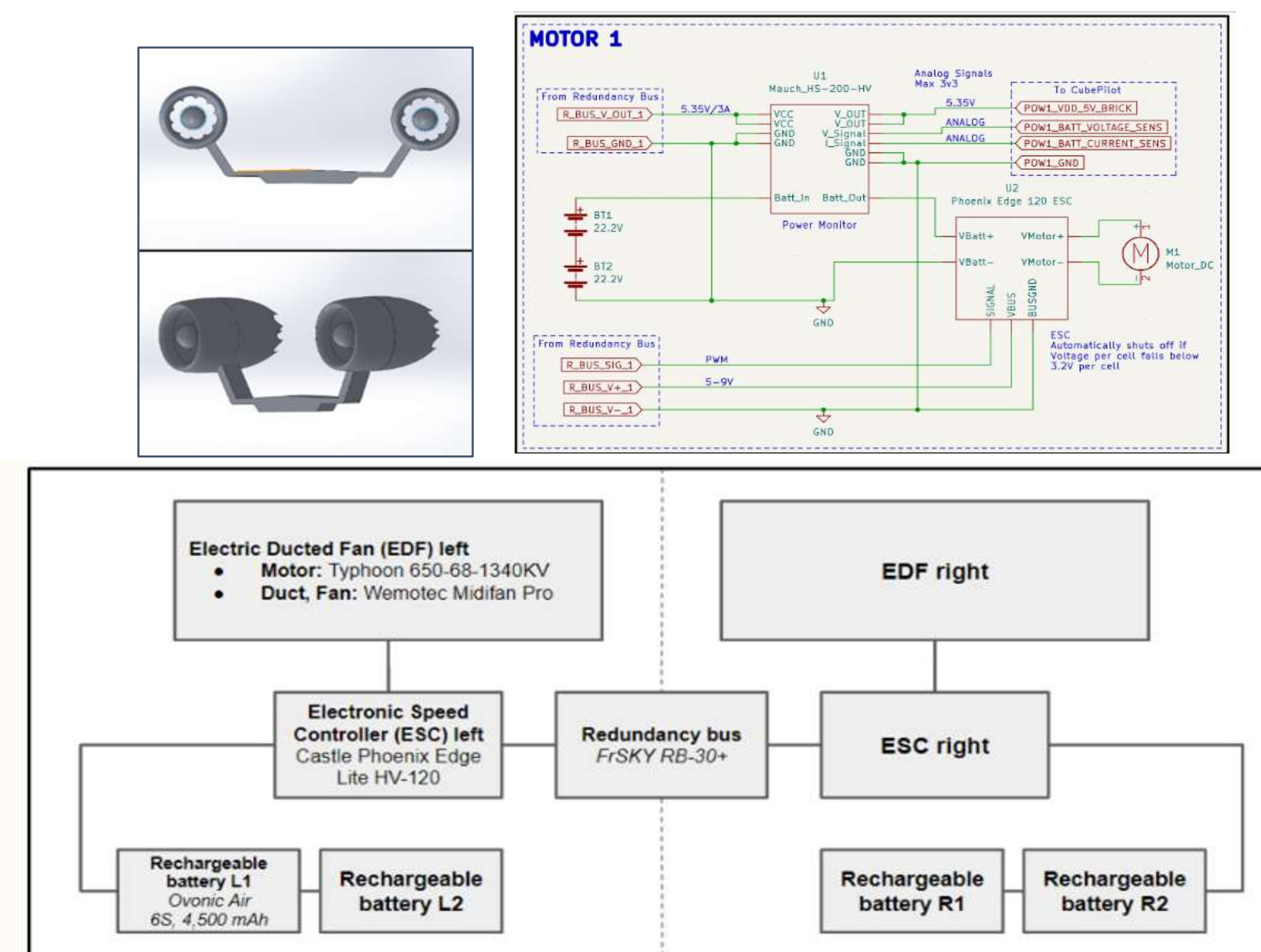
Fig. 15 2011 Hot Wire Setup [2]

### Goals:

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

Table 4 Prototype Parts	
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

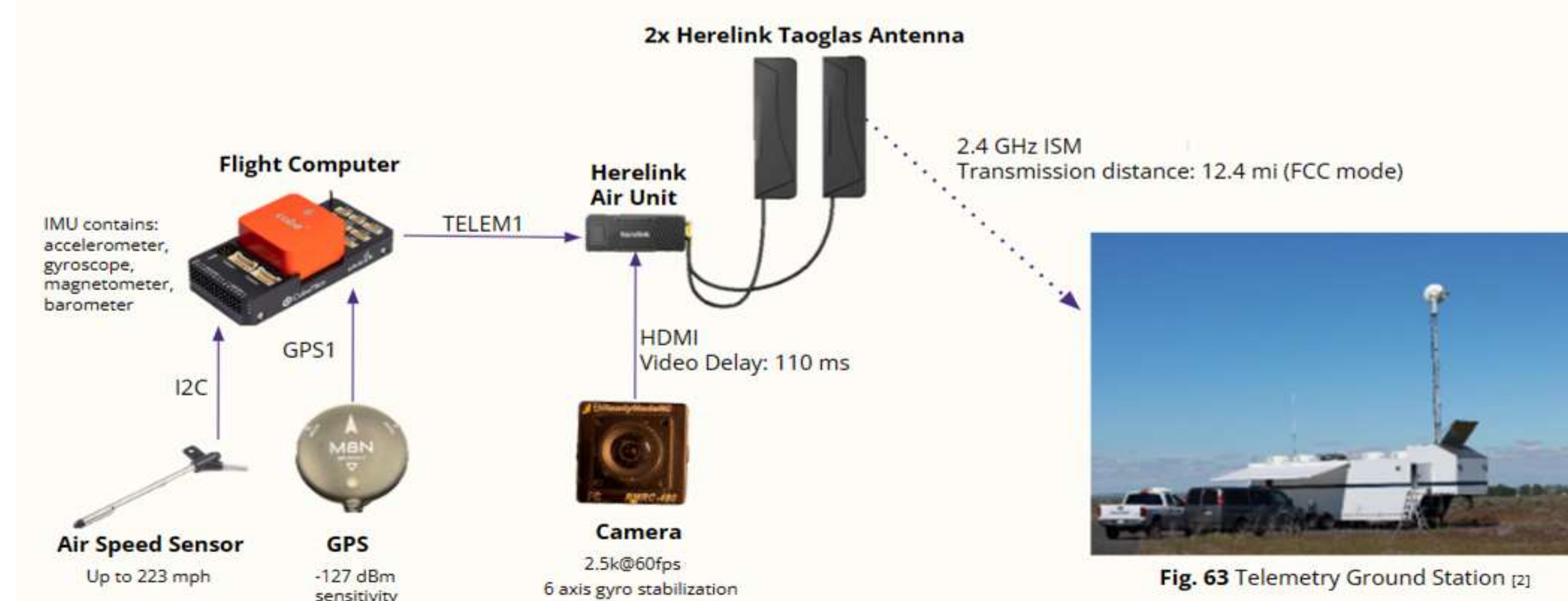


Fig. 63 Telemetry Ground Station [2]

## Simulator Design



## Future Work and References

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

## Avionics and Controls Design

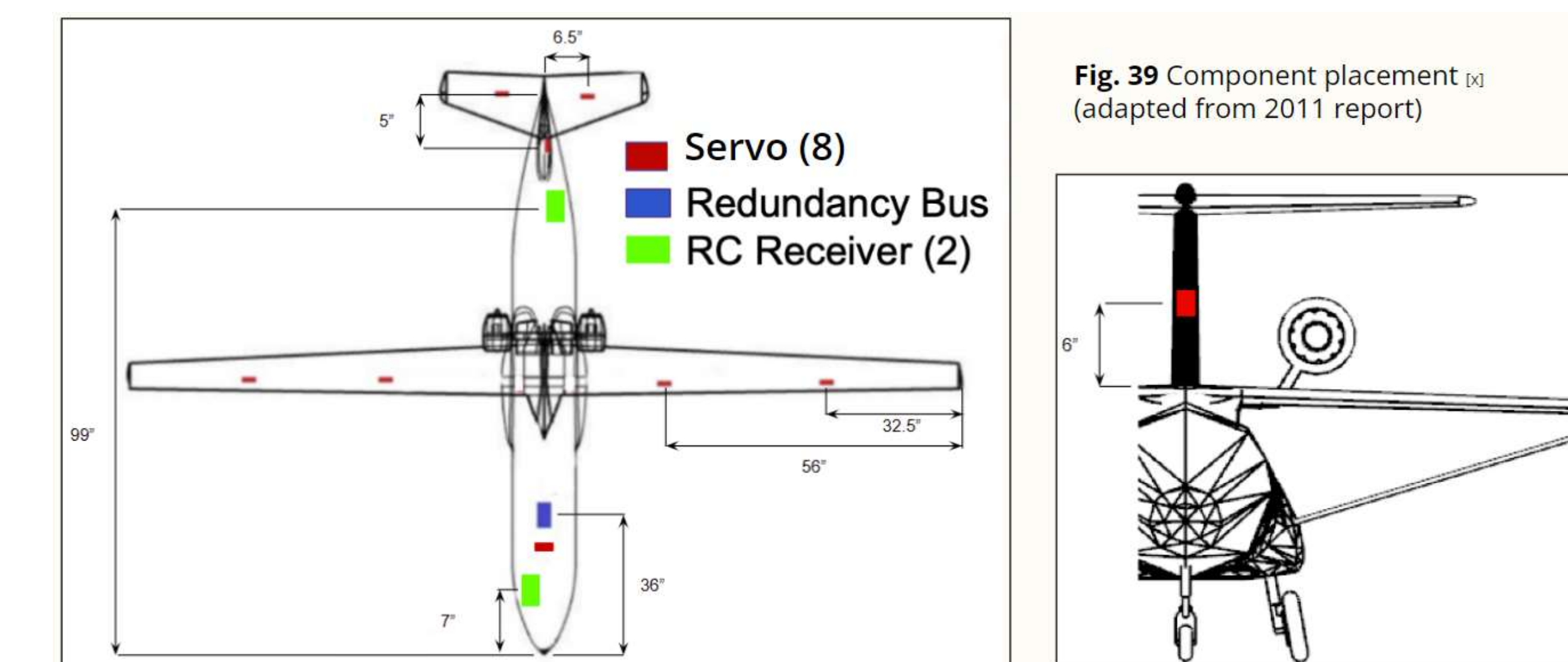
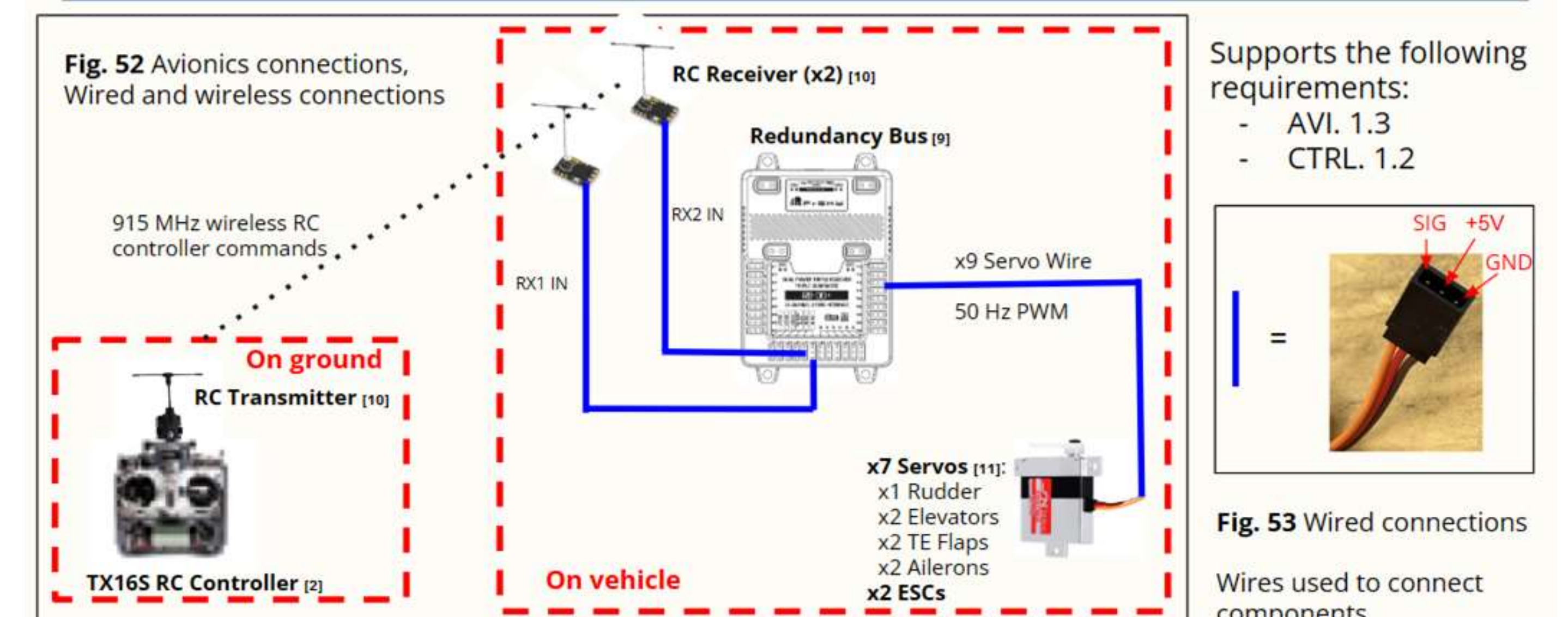


Fig. 39 Component placement [4] (adapted from 2011 report)

Fig. 52 Avionics connections, Wired and wireless connections



Supports the following requirements:

- AVI. 1.3
- CTRL. 1.2

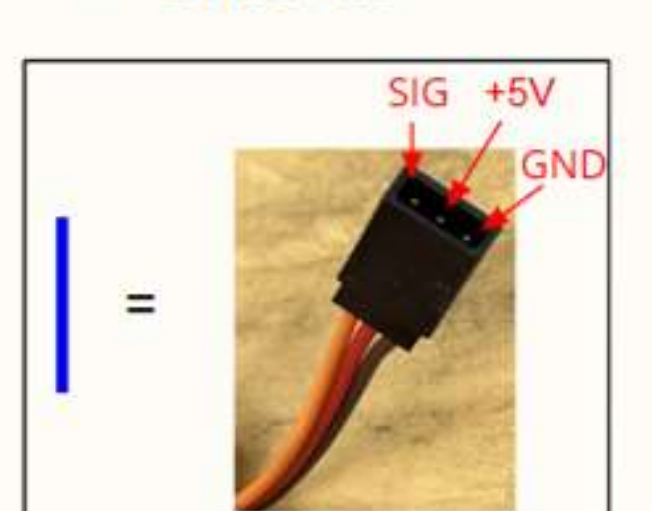


Fig. 53 Wired connections  
Wires used to connect components

## Structural Health Monitoring System (SHMS) Design

