

# Mid-Point Review

**S.U.A.S.**

**Student Unmanned Aerial System**

**Senior Design Team# 14**

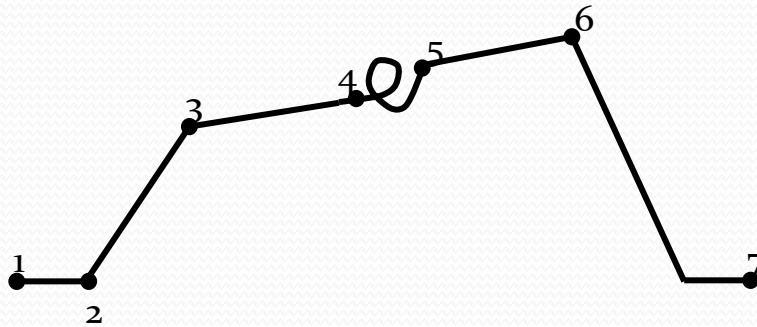


# Project Scope

## Primary Objectives:

- Systems Engineering approach for the design and manufacture of an Unmanned Aerial System (UAS)
- UAS able to complete specified mission.
- UAS design compliant with the 2012 AUVSI Student UAS Competition requirements.

# Mission Profile



1. Warm-up & Take-off
2. Climb
3. Waypoint Navigation
4. Autonomous Area Search
5. Waypoint Navigation
6. Descent
7. Landing

(Constant Target Recognition)

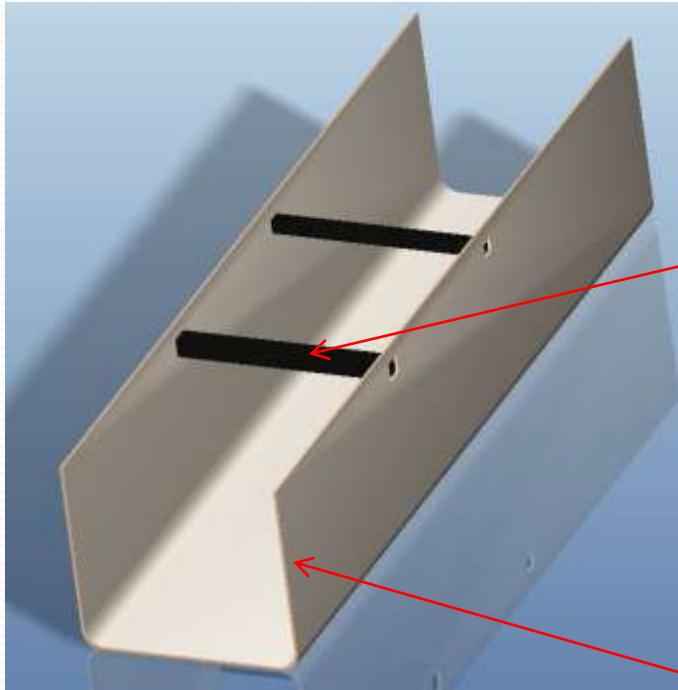


# Project Status:

## Aircraft Construction

- Telemaster Senior test plane assembled and ready to fly.
- Hotwire assembly for foam cutting finished.
- Initial plug for fuselage mold constructed.

# Modified Fuselage Structure



**Internal Shear Box**



**Key Hole for extra support**

**Three Layer Core**



**Fiberglass – balsa - Fiberglass**

# Hot Wire Foam Cutting

- Wing templates will be cut from aluminum.

Hot Wire



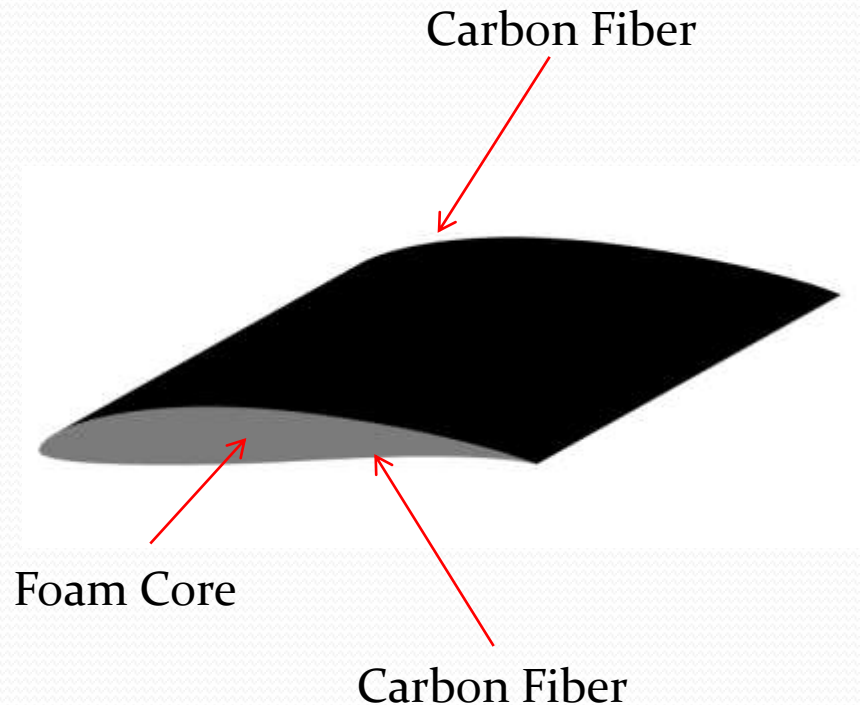
# Hot Wire Foam Cutting



# Composite Layup Schedule

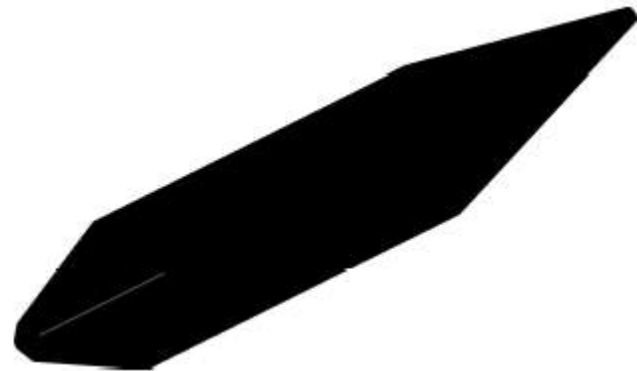
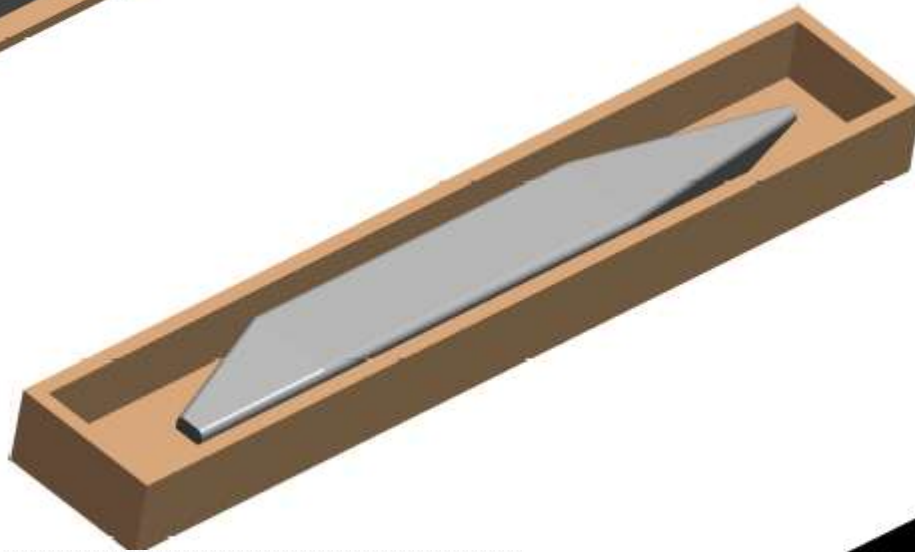
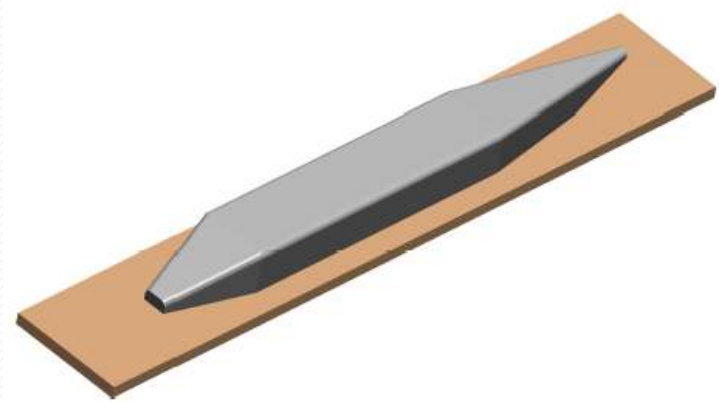
Three Layer Core:

- Carbon Fiber
- Foam Core
- Carbon Fiber





# Fuselage Construction



# Project Status: Electronic Systems

- **Electronics Tested:**
  - Imagery System
  - AutoPilot System
  - Propulsion System
  - Power Supply System
  - Ground Station Interfaces

# Imagery System Testing

- Test Rig:
  - 1280 MHz UHF Wireless Data Link
  - Sony KX-181 Camera

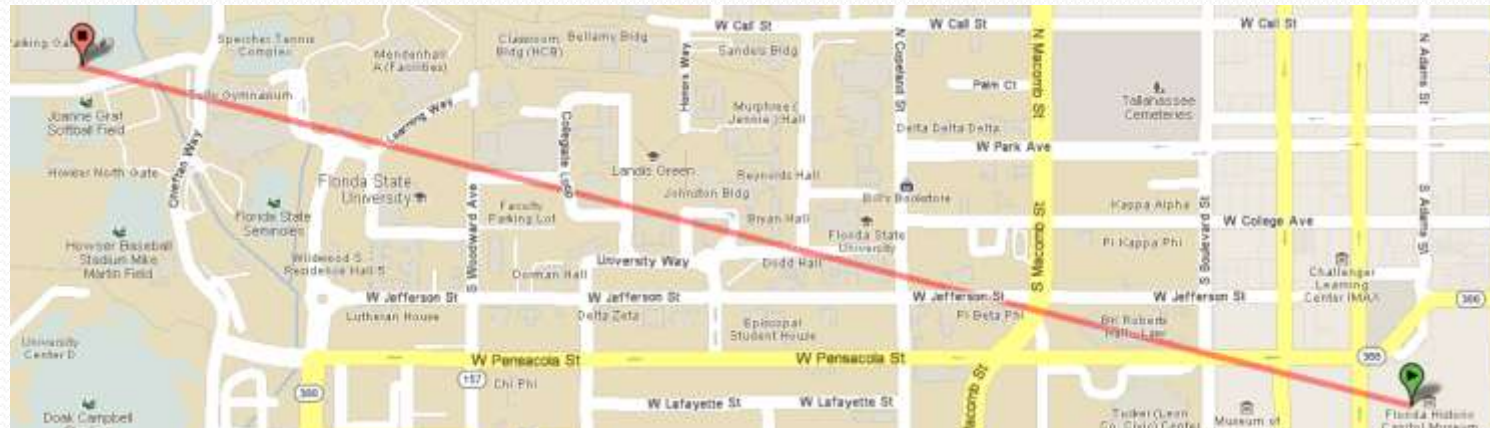


# Imagery System Test Results

- Successful Range Test Performed from Tallahassee Capital Building to FSU Parking Garage #3



Range = Appx. 1.5 Miles





# Autopilot Testing Results



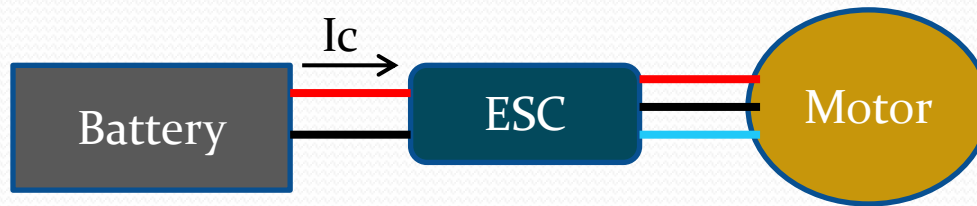
# Autopilot Future Testing

- Waiting on Telemetry
- Full hardware simulation without aircraft



# Propulsion System Testing Results

- Motor operation testing (no propeller)
  - Full Throttle,  $I_c = 2.03 \text{ A}$
  - $\frac{1}{2}$  Throttle,  $I_c = 1.46 \text{ A}$
  - $\frac{1}{4}$  Throttle,  $I_c = 1.01 \text{ A}$





# Propulsion System Future Testing

- Test with propeller, on mission profile.
- Test mounted on Telemaster Test Aircraft





# Power Supply System Testing

- **Determined Consumption of:**
  - Video Tx = 450 mA
  - Test Camera = 90 mA
  - Autopilot Board = 140 mA
  - Brushless DC motor = max 2A



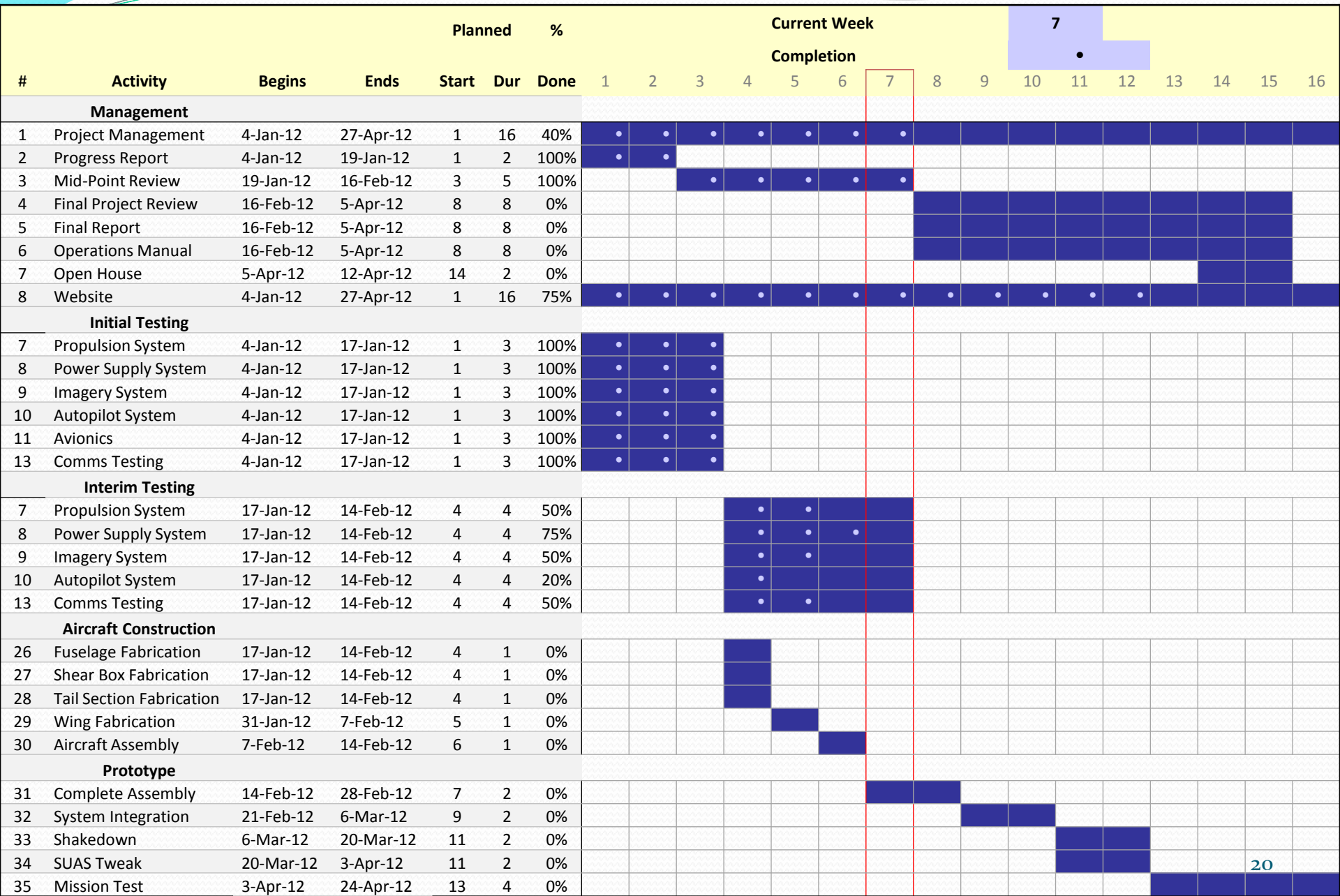
# Power Supply System Test Results

- Tested batteries with loads
- Charged/Discharged batteries successfully
- Current Consumptions are within bounds.



# Issues

- Video TX running hot
  - Added Fan to test rig
- Autopilot Telemetry arriving late
  - Test over spring break
- BEC not integrated in ESC
  - Purchase separate BEC



# Summary

- Aircraft Construction Underway
- Video Feed Functional
- Power Supply System Semi-Operational
- AutoPilot Telemetry Arriving Soon
- Block Camera Testing Begun
- System Testing on Telemaster Aircraft Begins Soon

# End of Presentation



“Winging It”