Design/Build/Fly 2026
"Fowl Play"

AIAA

GALLOGLY COLLEGE OF ENGINEERING
SCHOOL OF AEROSPACE AND MECHANICAL ENGINEERING
The UNIVERSITY *of* OKLAHOMA

Team

Srikanth Bashetty	Faculty Advisor
Steffanie McGee	Program Manager
Anthony Vo	Financial Manager
Luke Sparlin	Chief Engineer
Gautham Chandra	Aerodynamics Lead
Stevens Oulon	Stability & Mass Properties Lead
Jetty Brandon	CAD Lead
Carson Wilson	Structural Analysis & Landing Gear Lead and Systems Lead
Chris Ochoa	Structures Lead
Deepak Jha	Propulsions Lead
Eleanor Rouswell	Manufacturing and Composites Lead



From left to right: Carson Wilson, Gautham Chandra, Deepak Jha, Luke Sparlin, Chris Ochoa, Jetty Brandon, Stevens Oulon, Steffanie McGee

Project Description & Design Constraints

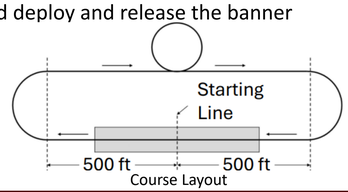
"The objective for this year is to design, build, and test a banner-towing bush plane, conduct charter flights to pay for the airplane, and start a banner-towing business." – 2025-2026 AIAA DBF

Mission Objectives:

- ❑ Ground Mission - Fastest time to load passengers & cargo and install the banner.
- ❑ Mission 1 – Complete 3 laps within 5 minutes (Completion)
- ❑ Mission 2 – Complete as many laps as possible with passengers & cargo
- ❑ Mission 3 – Complete as many laps as possible and deploy and release the banner

General Constraints:

- ❑ Wingspan cannot exceed 5 feet
- ❑ Aircraft takeoff weight must be less than 55 lb.
- ❑ Must carry passengers and cargo (3:1) in separate



Course Layout

Design Specifications

Wingspan	5 ft (60 in)
MAC (ft)	1.5
Wing Airfoil	Eppler 398
Tail Airfoil	Eppler 398
Wing Washout (°)	5
MTOW (lbs)	M1 (15), M2 (23.4), M3 (15.6)
Motor	Scorpion SII-4025-520 Kv
Battery	Ovionic 4S-6700 mAh



Passengers and Cargo

Design Process

Conceptual Design

- ❑ Scoring sensitivity analysis: Prioritize performance under high drag
- ❑ High-wing
- ❑ Dual-propeller
- ❑ Boom tail
- ❑ Rectangular wing.



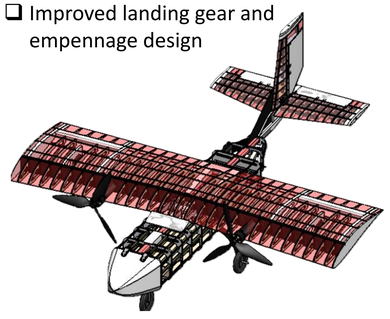
Preliminary Design

- ❑ Aircraft configuration was sized
- ❑ Wing, fuselage, and empennage geometry were defined
- ❑ Wing twist to promote root-first stall
- ❑ Tests showed the design met performance needs

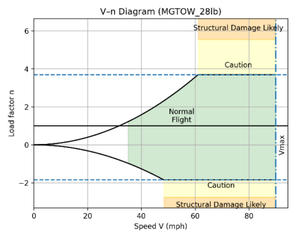


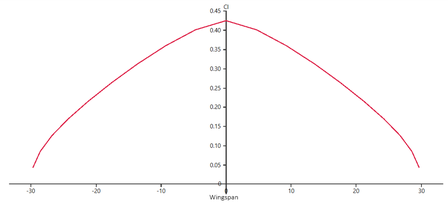
Detailed Design

- ❑ Optimized design & materials for weight reduction in the fuselage and empennage.
- ❑ Dorsal fin for directional stability
- ❑ Improved landing gear and empennage design

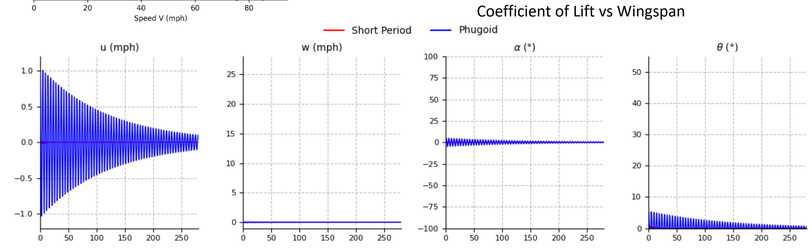


Aerodynamic & Stability Analysis



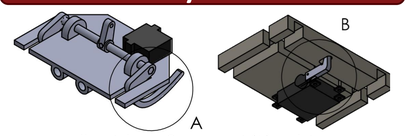


Coefficient of Lift vs Wingspan

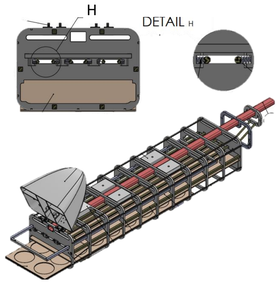


Longitudinal Stability Modes Time Response

Subsystems

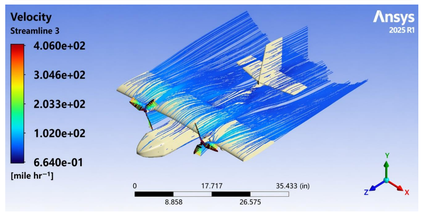


Towline Release Component (A) and Banner Deployment Mechanism (B)

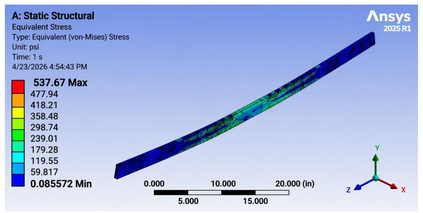


Payload Mechanism and Passenger Constraint System

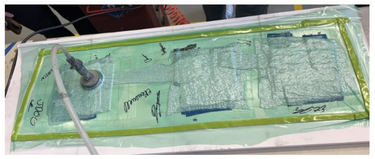
Engineering Analysis



Analysis	Condition	Result
CFD (Aircraft) ↑	Cruise_V≈60 mph	Smooth flow
FEA (Wing Spar)↓	25 lb load	σ_max≈537 psi FOS ≈ >15



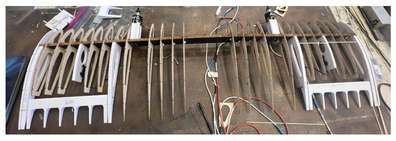
Manufacturing



Layup Composite Testing for Honeycomb Sandwich Spar



Internal Fuselage Structure

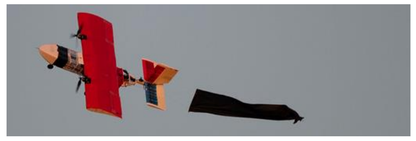


Wing Spar and Airfoil Rib Integration without Skin

Final Design



Final Design



Mission 3: Banner Tow



Level Taxi in 20 mph Winds

Engineering Standards

Standard	Application
AIAA S-119-2016	Airfoil Selection and Aerodynamic Characteristic
SAWE – RP8	Weight and Balance Data Reporting
MIL-F-8785C	Dynamic Stability Characteristics
FAA Dot § 25.307 & NASA-STD-5001B	Factors of Safety and Structural Analysis
UN 38.3	General LiPo Safety Practices
IEEE 385-2006	Wiring and Electrical System Integration Guide
ASTM E8 & ASTM E18	Material Standards
ISO 31000	Risk Management and Safety Standards
ISO 9001	Quality Management Guidelines
ASME Y14 14.5-2018	Technical Drawings, Dimensions, and Tolerances
14 CFR Part 107	Safe Small UAS Operational Practices
AIAA DBF 2025-2026 Rules	Mission Requirements and Scoring Criteria

Results

Final Rank	38th of 98
Ground Mission	5.33 Minutes
Mission 1	Completion
Mission 2	12 Ducks and 4 Pucks
Mission 3	DID NOT TEST

Sponsors & Budget

Budget Totals		Major Expenditures	
Income	$11,675.00	Travel	$4,000
Expenses	$5,188.92	Structural Materials	$4,346.35
Carryover	$25,955.55	Propulsion/Electrical	$664.00
Balance	$16,766.63	Team Merchandise	$767.20

Composite Envisions · Boeing · Master Airscrew · SOLIDWORKS · Blazers Ice Centre · Mikado Model Helicopters · Northrop Grumman · Scorpion · USA Hockey NYSAHA · NoxNumis · SGA