

Hawaiian Trade Winds

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University of Hawaii at Manoa, SAE Aero Regular Class

MISSION STATEMENT

To place in the top ten of all teams at SAE Aero West by flying with 20 pounds for at least 50% of all flight rounds.

OBJECTIVES

To design a RC aircraft to carry as much payload as possible with restrictions in power and size.

MATERIALS

Propulsion

- Motor: E-flite Power 60 brushless motor
- Propeller: 18x5.5
- Battery: Turnigy 3000 mAh, 30C 6-cell

Wings

- Balsa Wood for the ribs
- Aluminum 6061 hollow tubing for main spar
- Wooden dowels for the end of the main spar
- Monokote as skin for the ribs
- EXI Digit D122F for the aileron servos

Empennage

- Balsa Wood for the ribs

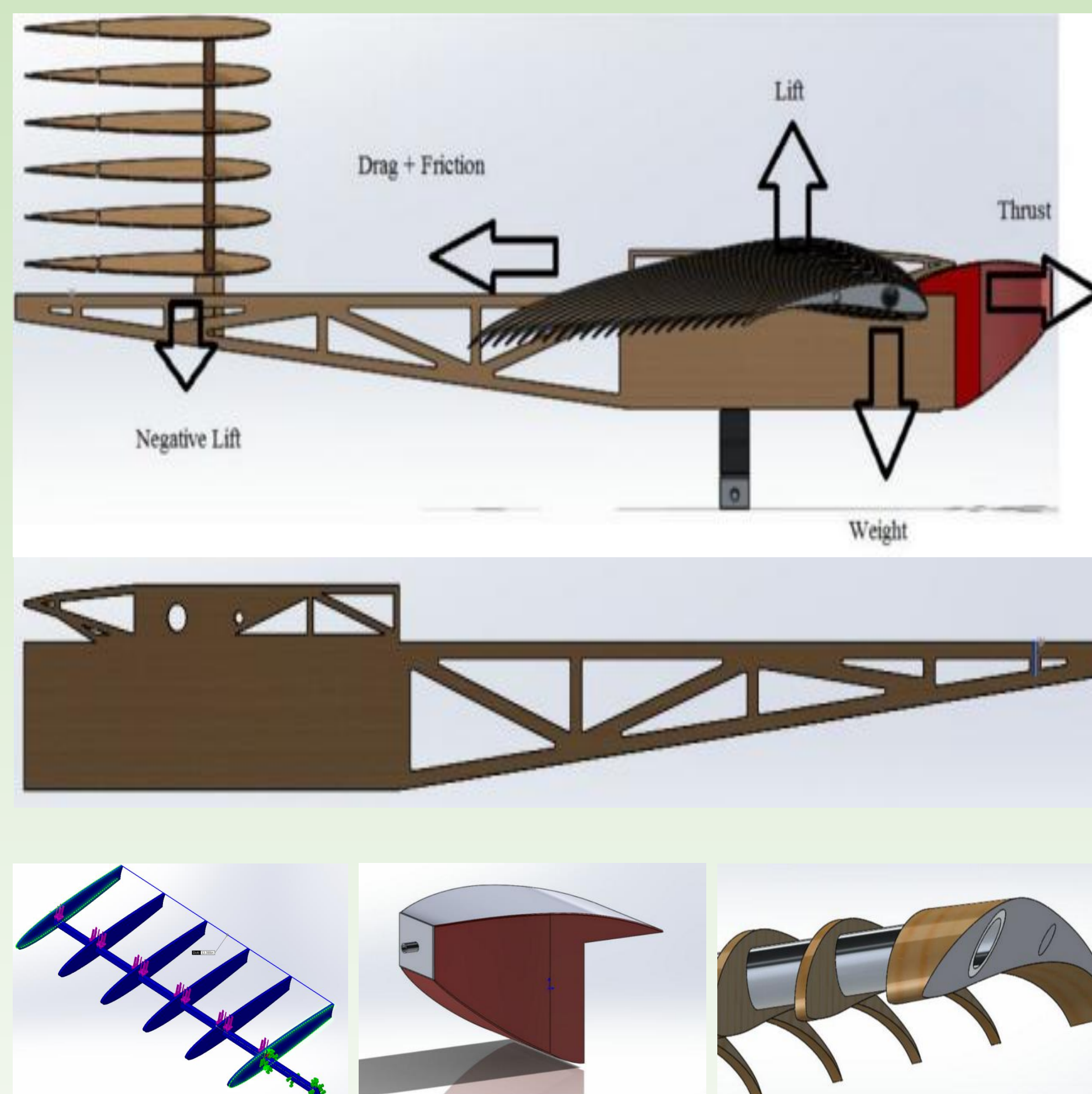
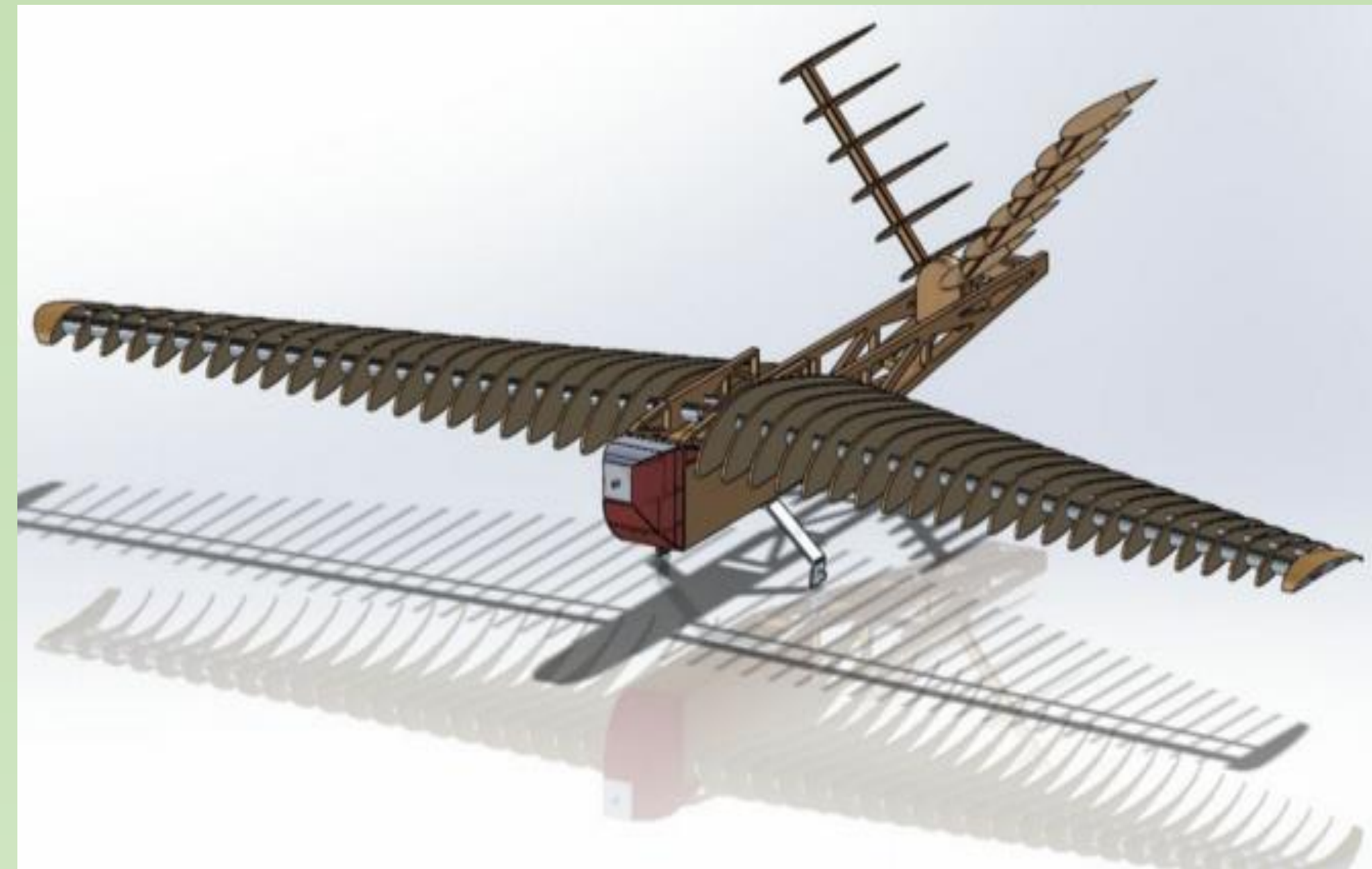
Fuselage

- Al 2024-T3 latch clasp for payload bay
- Plywood for the body
- Basswood for the tail

Landing Gear

- Al 2024-T3 for the main gear strut

SOLIDWORKS MODEL



DESIGN PARAMETERS

2016 SAE Aero Regular Class Competition:

- Maximum combined length + width + height is 175 in.
- Total gross weight must be under 55lbs.
- Power will be cut off with a power limiter at 1000W.
- Carry a the maximum amount of payload possible for a safe successful flight for maximum points

BUILT PLANE



WINGS

Tapered Design (Ratio: .375)
Planform Area: 1650ft²
Wing Loading: 117.5 lbs
Lift: 67.2 lbs
Drag: 7.4 lbs
Stall Speed: 12.5 mph
Factory of Safety: 1.2
Bending Moment: 1468.9 lb-in.
Number of Ribs: 48 (24 half sizes)

PROPULSION

Take off velocity: 37.5 mph
Total flight lifetime of battery: 4 minutes

LANDING GEAR

Factory of Safety: 1.2
Height: 4in
Clearance Angle: 20
Max take-off rotation angle: 20
Overturn Angle: 54

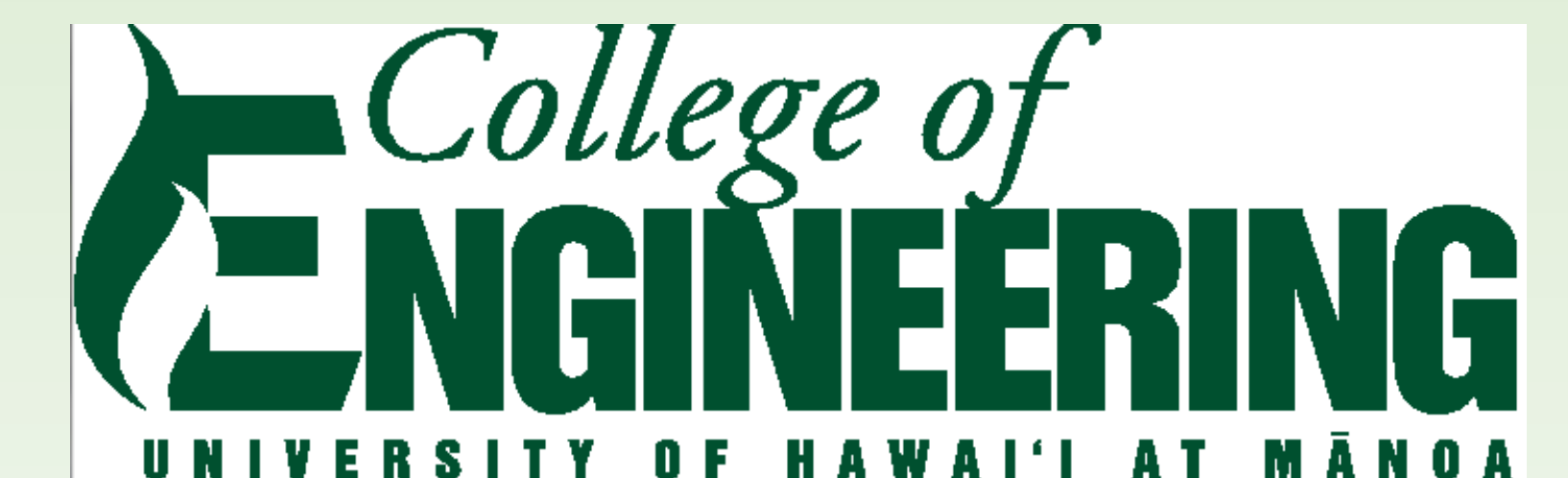
EMPENNAGE

Airfoil: NACA0009
Span Length: 13.3in
Chord Length: 12.8in
Number of Ribs: 12
Factory of Safety: 1.2
Ruddervator Length: 11.97in

FUSELAGE

Warren Truss Design
Center of Gravity: 16.10in
Factor of Safety: 1.2
Total load: 114 lbf

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