

Cargo Plane

Advisor: Professor John C. LaRue

Design

The design of the aircraft is primarily focused on creating as much lift as possible while staying also light. To accomplish this the aircraft will utilize the Selig 1223 airfoil and gurney flaps.

Background

The purpose of this project is to design a cargo aircraft to compete in the SAE Aero West competition on April 24, 2016.

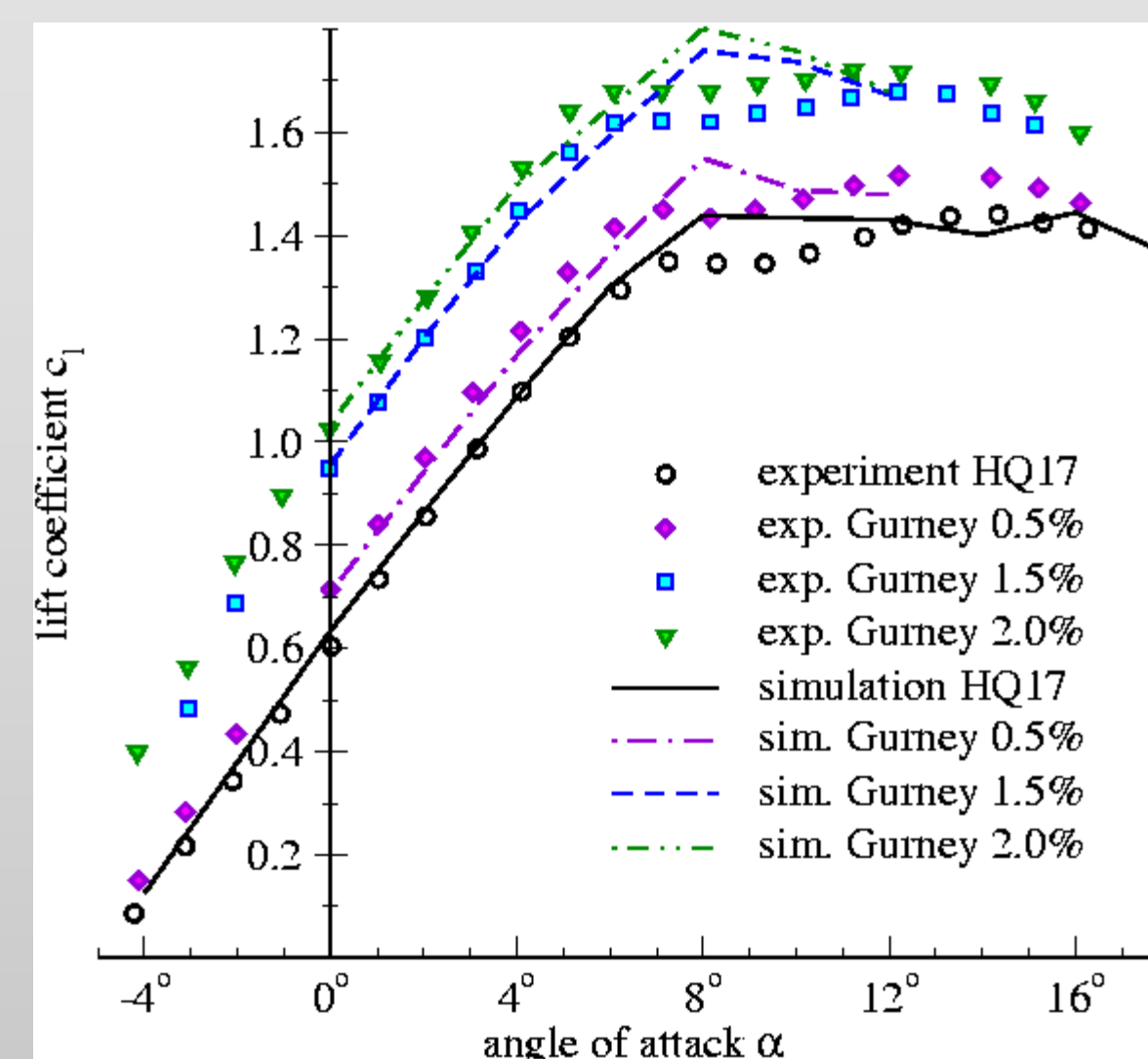
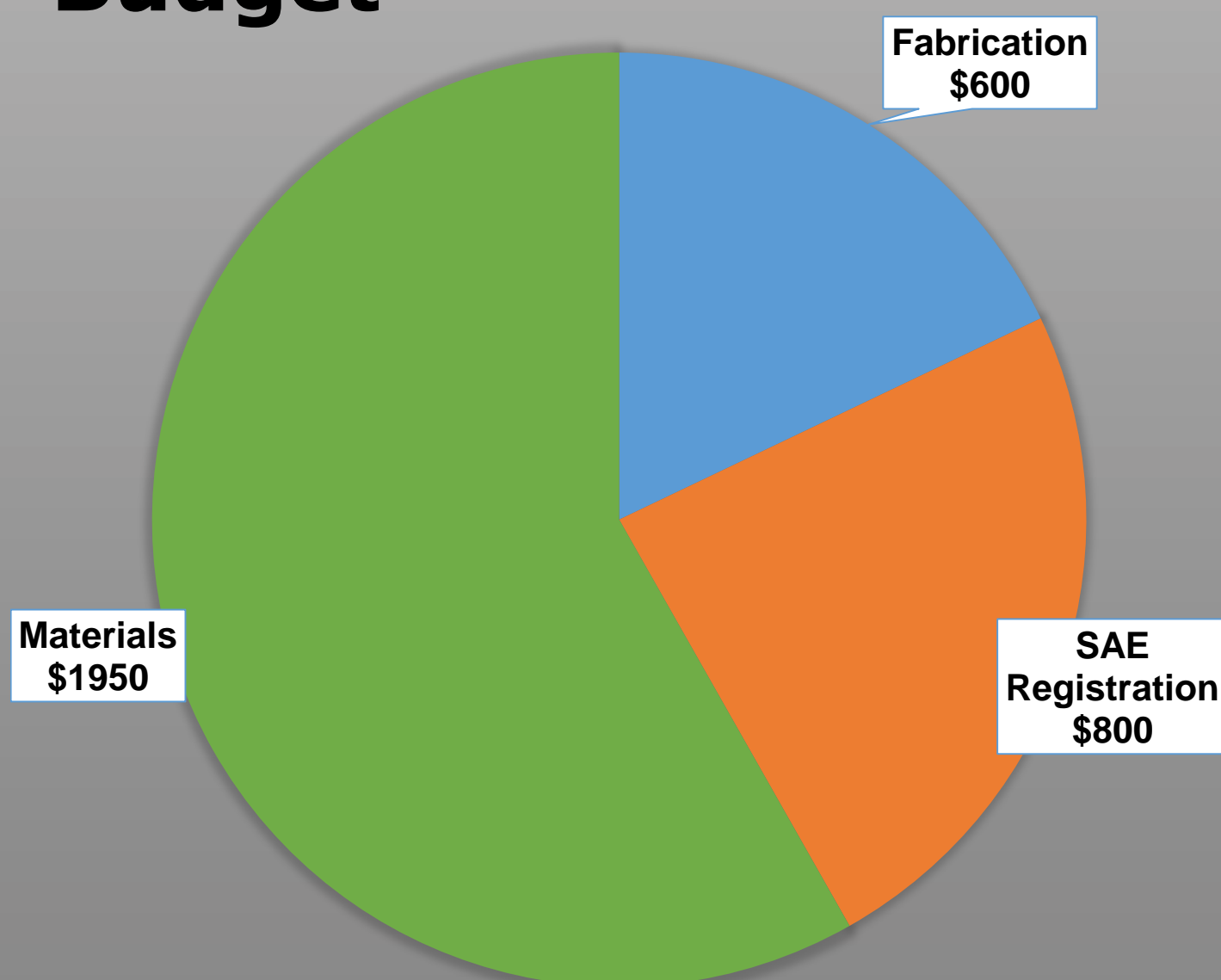
Goal

Engineer a battery powered aircraft capable of carrying a payload of about 30 pounds for the SAE Aero West Competition.

Requirements

- Sum of height, width, and length less than 175 in
- No fiber-reinforced plastic (Landing Gear excepted)
- Single Motor
- 1000 Watt power limiter
- Payload bay dimensions 4" x 4" x 10"

Budget



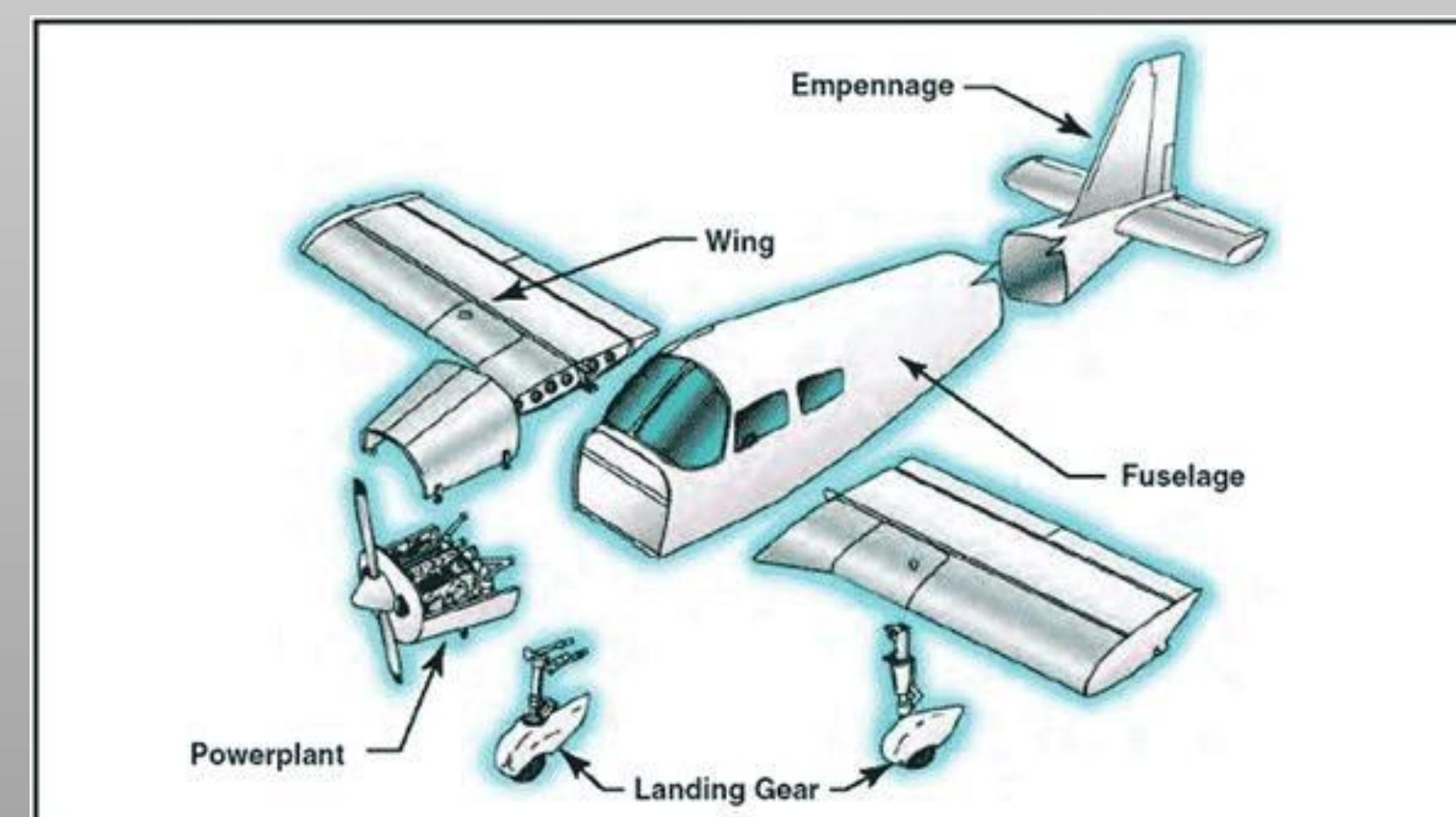
The picture below shows the 11" x 4" x 0.5" model wing during a wind tunnel test to determine optimal GF size. The wooden beam at the bottom is the GF.



Wing - Gurney Flaps (GF)

The GF is a small tab that attaches to the trailing edge of the wing and is normally set perpendicular to the wing.

This picture (left) is evidence of the trade-off between lift and drag. For this aircraft lift is the first priority.



Tail

- Conventional empennage configuration
- Vertical and horizontal stabilizers with servos attached to control surfaces
- Symmetric NACA 0012 airfoil

Fuselage

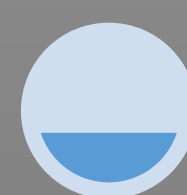
- Materials: Balsa wood with Monokote heat shrink
- Laser cut design
- Fixed payload bay

Landing Gear

- Tricycle (nose gear) Arrangement
- Main gear fixed to fuselage
- Main gear laser cut from aluminum
- Spring design incorporated for shock absorption

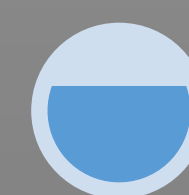
Controls

- Remote Controlled
- Ailerons, Elevator, and Rudders controlled by servos.
 - Servos: small motors that move primary flight control systems



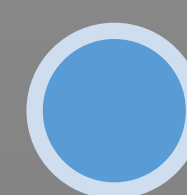
Fall

- Design
- Analysis
- CAD Model
- Test Models



Winter

- Manufacturing
- SAE Design Report
- Final design
- Tests



Spring

- Complete Testing
- SAE Competition
- Final Report

Contact Information:

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Team Breakdown

Tyler Gorman
Madara Wijetunga [Lead]
Kelsey Safar
Michelle Antimie
Ryan Min [Lead]
Stephanie Pearce
Robert Foster [Lead]
Romik Mejlumyan [Lead]
Ronnell Jamir
Santiago Correa [Lead]
Joshua Bae

Team Lead, Landing Gear
Wing
Wing, Fuselage
Wing
Tail
Tail, Laser Cutting
Fuselage
Landing Gear
Motor, Controls
Motor, Controls
Motor, Controls

