3D Printed Aircraft Competition
by Plane Jane

Team Members
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Problem Statement
Design a primarily 3D printed aircraft with the goal of maximizing flight duration. Its path of flight must not deviate for more than 3 seconds outside of a designated 300’ x 160’ x 30’ space. Motor power may only be used during the initial 8 seconds of flight.

Final Product

CAD Design

Tests
Wing loading tested to see how strong our wing was, where the wing would break, and how much weight it would take to break it. Our goal was to have our wing withstand twice the weight of our whole plane because the maximum force it would undergo during flight is two g’s. Our wing actually held almost 4x the weight of our plane!

Prototype Process

Design Analysis

Three airfoils were analyzed in ANSYS. The SD7037 and ALB6020 performed the best with the lowest static pressure acting on them. The SD7037 had the highest lift-drag ratio at a 7 degree angle of attack. The ALB6020 had the highest lift-drag ratio at a 0 degree angle of attack.

Stress Distribution in Expected Flight Conditions

SD7037
ALB6020
NACA64(1)-212

1. Determine objective
2. Manufacture and identify risks
3. Test and identify issues
4. Plan the next iteration

Foam Plane
1st Wood Wing/1st 3D Fuselage
2nd Wood Wing/2nd 3D Fuselage
1st 3D Wing/1st Topology Fuselage
2nd 3D Wing/2nd Topology Fuselage