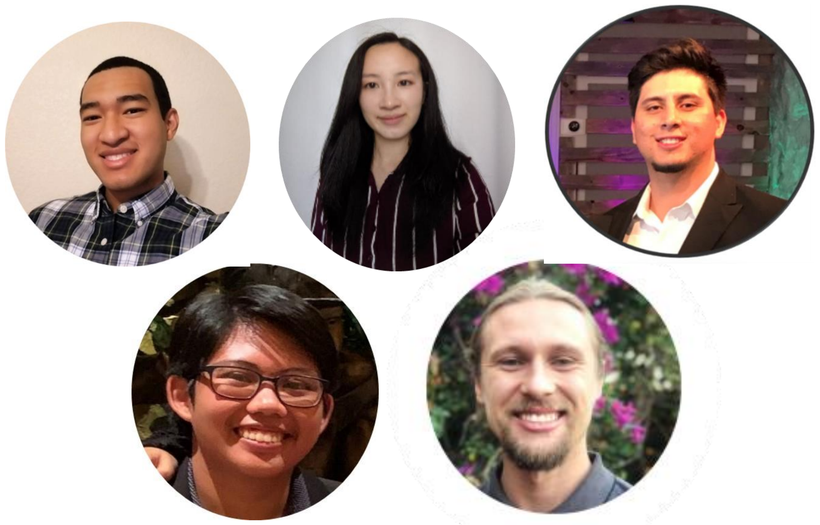
6th Annual 3D Printed Aircraft Competition, July 2022

SAN DIEGO STATE UNIVERSITY

Team Advisor & Mentor

Dr. Scott Shaffar, Dr. Charles Norris

Team AzTex Flight



Daryl Lyons, Joyce Huang, Jesus Ibarra, Maria Patrisha Perez & Alexander Williamson

Funded by:

SDSU Student Success Fee

Project Overview

The University of Texas Arlington 3D Printed Aircraft Competition challenges the team in developing a lightweight aircraft to which all airframe components must be 3D printed with no size, configuration, weight, or material restrictions.
The propeller and electrical components should be purchased off the shelf and operate for 8 seconds for propulsion purposes. The aircraft must operate within a 300 x 160 ft area and remain under 30 ft.
There are 2 categories in which the team can compete which are the Longest Duration Flight and the Most Innovative Design.

Design Iterations

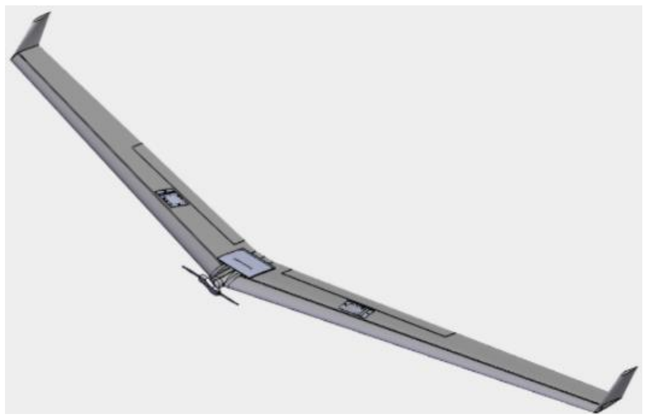


Figure 1: V1 48" Flying Wing

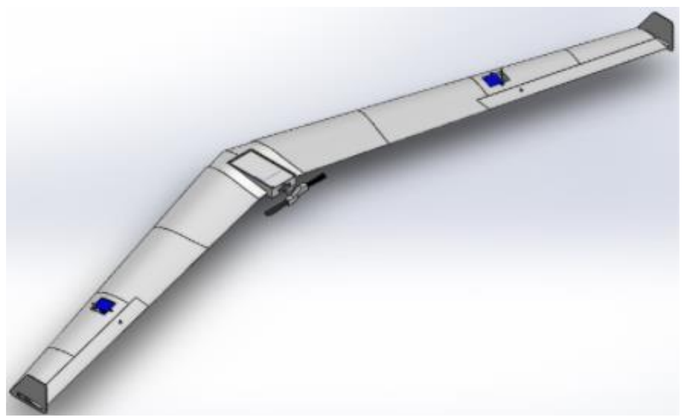


Figure 2: V2 60" Flying Wing

Foam Prototypes and Test Prints

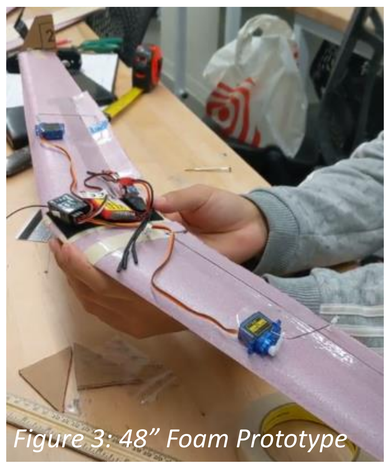


Figure 3: 48” Foam Prototype

Figure 4: LW PLA Wing Section

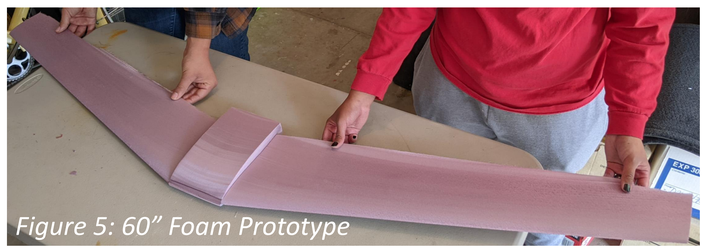


Figure 5: 60” Foam Prototype

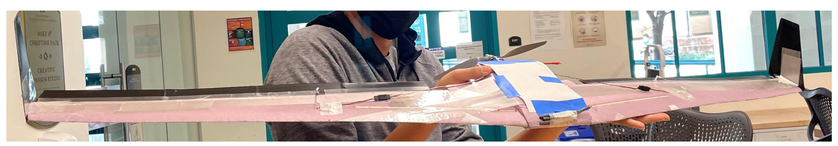


Figure 5: 60” Assembled Foam Prototype

Iteration 3 Specs

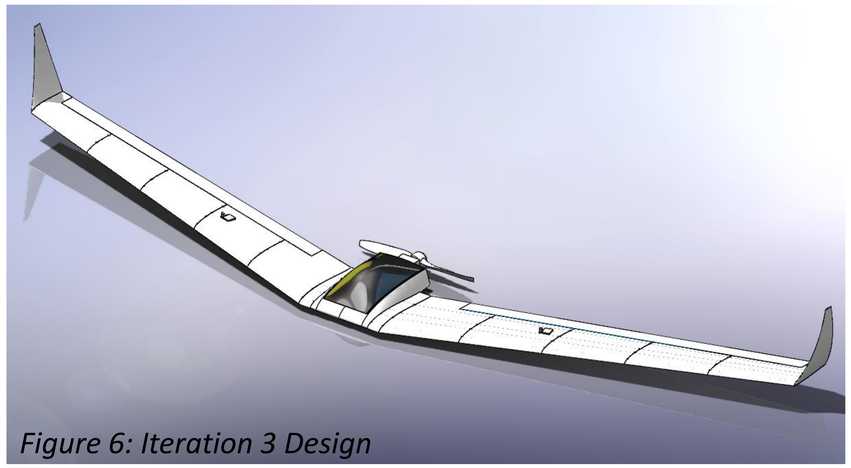


Figure 6: Iteration 3 Design

The tailless aircraft was printed using Lightweight PLA and utilizes a HS 522 airfoil with a 60 in wingspan, 18 degree sweep angle, and 3 degrees dihedral angle. The interior structural design consists of 1 main spar with 3 other supplementary spars that run span-wise the entire length of the wing.

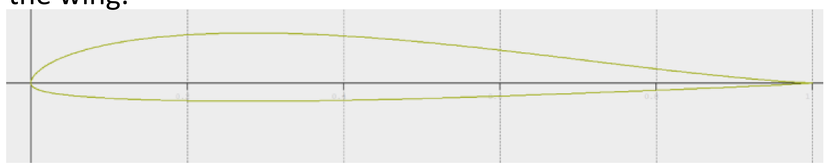


Figure 7: HS 522 Airfoil

Test Flights

Flights were conducted at SDSU and at Black Mountain Park with the guidance of Dr. Norris.

Fabrication & Assembly

Figure 8: 3D Printed Wing of 3rd Iteration

The total components printed were 15 with the elevons, the winglets, the midbody, and the different wing sections. The total print time for all components was approximately 74 hours. They were assembled using CA glue and were printed using the Creality Ender 3 and Ender 3 V2.

Spring 2022