



Competition Guidelines

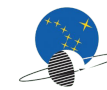
The objective for the aircraft this year is to complete an electronic warfare mission focused on carrying an electronics package in the fuselage and a jamming antenna attached to the wingtip.

Ground Mission: Assemble aircraft in 10 minutes. Perform a wingtip load test. Score is based on weight applied and aircraft weight.

Mission 1: Complete 3 laps in 5 minutes, no payload. Pass/Fail score

Mission 2: Complete as many laps as possible until 10-minute window is up. Payload is electronic surveillance package. Score is based on number of laps flown and weight of the electronics package.

Mission 3: Complete 3 laps as fast as possible in 5-minute window. Payload is jamming antenna mounted on wingtip. Score is based on mission time and antenna length



Design-Build-Fly 2022-2023

The University of Alaska, Fairbanks, Aero Club has been invited to compete in the 27th annual Design, Build, Fly competition. DBF is a contest hosted by the American Institute for Aeronautics and Astronautics (AIAA) that challenges student teams to design, fabricate, and demonstrate the flight capabilities of an unmanned, electric powered, radio controlled aircraft that can best meet the specified mission profile. The DBF fly-off will be held April 13-16, 2023 in Tucson, Arizona.

Team Organization:

The team was broken up into four subsystems to maximize efficiency, providing clear and distinct goals for each member. Each subsystem is managed by a single team lead who keeps the group focused and on schedule.



Preliminary Design: Figures of merit, a sensitivity analysis, and a feasibility study were used to select an optimal design based on the competition guidelines and restrictions.

Solidworks Modeling: The chosen design was modeled using Solidworks which allowed for aerodynamic analysis, necessary adjustments, and detailed dimensions to be selected.

Aerodynamic Analysis: The Solidworks model was used to analyze the lift and drag achieved at different flight configurations including take-off, cruising and landing to insure that the plane would achieve the necessary aerodynamic properties.

Manufacturing & Construction: A prototype was constructed based on the CAD model using foam board, balsa wood, and Monokote. The electronic system was installed.

Testing & Analysis: The prototype was tested and data on its flight was collected using a camera mounted on a drone and an onboard sensor. The data was analyzed which showed where revisions could be made and the design process was repeated.

