DARcorporation

Design • Analysis • Research

November 2021

Announcement

AIAA Paper Presentation At SciTech 2022

A collaborative US Air Force AFWERX effort between Auburn University and DARcorporation resulted in the following paper to be presented at AIAA SciTech on January 5, 2022 in San Diego, CA.

Design and Sizing of a Dual-Purpose Hybrid-Electric Ducted Fan Lift-Plus-Cruise Aircraft

Imon Chakraborty, Aashutosh Aman Mishra, Cameron B. Leonard, and Noah S. Miller

Vehicle Systems, Dynamics, and Design Laboratory (VSDDL),
Department of Aerospace Engineering, Auburn University, Auburn, AL, USA

Dennis van Dommelen and Willem A.J. Anemaat

Design, Analysis and Research Corporation (DARcorporation)
Lawrence, KS, USA

Session: ACD- 12/EAT-09/TF-03, Electric and Hybrid-Electric VTOL Aircraft Design (2:00 PM - 3:40 PM)

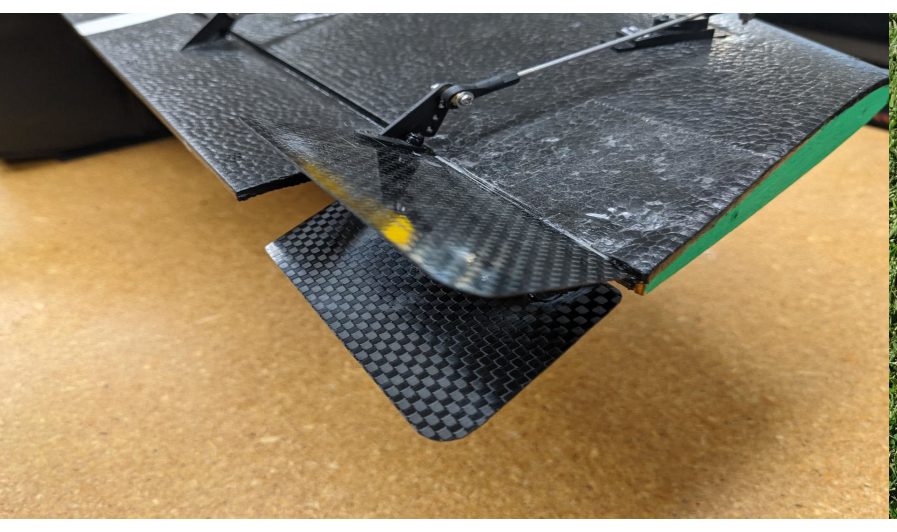
Featured Product

Flight Control Test Aircraft

DARcorporation has developed a low-cost flight controls test bed to support a VTOL UAV development effort. The UAV flight controls consist of an elevon on each wing with a split surface “B-2” style drag rudder on each wing tip. To set up the flight controller configuration, an off-the-shelf RC flying wing model is modified to implement drag rudders. The SonicModell AR Wing Pro is a one meter wing span EPO foam flying wing with a single elevon on each wing. The outer 25% of each elevon is replaced with a pair of flat carbon fiber surface hinged to the trailing edge. The surfaces only deflect open from a faired position, they do not pass through a faired position like an aileron. No vertical tail surfaces are present.

The new surfaces serve several functions:

- Opposing surfaces, e.g. left upper and right lower contribute to rolling moments in addition to the elevons.
- Same side surfaces open together to generate a yawing moment.
- All four surfaces can be commanded to full deflection to act as airbrakes. This function will also be used to increase wing tip clearance in VTOL mode.



Dan Diedel and Dr. Bruno Moorthamers join our team!

Dan Diedel is an experienced CAD designer with over 35 years of experience in the mechanical, plastics and structural industries. In the short time that Dan has been at DARcorporation, he has been an integral part of the NASA SBIR MAVRIK team and our US Air Force Explore project. Dan is an expert in Siemens NX and creates all of our 2D and 3D manufacturing drawings for the prototypes we are building for different customers.

Dr. Bruno Moorthamers will be involved in the Advanced Aircraft Analysis (AAA) software development, FlightStream® technical support, CFD analysis using FlightStream® and STAR-CCM+ and other engineering consulting tasks. Dr. Moorthamers holds a M.S.A.E. degree from the Delft University of Technology in The Netherlands and a Ph.D. in aerospace engineering from Utah State University.

2022 KU Aerospace Short Courses and Webinars

Join Dr. Willem Anemaat in person or online for one of his KU short courses.

- Airplane Flight Dynamics

  San Diego, California
  September 19-23, 2022

- Conceptual Design of Unmanned Aircraft Systems

  Kansas City Metro
  April 25-27, 2022

History of Airplane Design Webinar Series (free for all participants) presented by Dr. Jan Roskam:

- Overview of Unusual Airplane Configurations, Part I

  March 16, 2022 - 11:00 a.m. Noon CT

- Overview of Unusual Airplane Configurations, Part II

  April 20, 2022 - 11:00 a.m. Noon CT

- The Beginning, Rise and Decline of the Wichita, Kansas Aircraft Industry

  May 18, 2022 - 11:00 a.m. Noon CT

- Airplanes I Worked on That Did Not Make It and Why

  June 15, 2022 - 11:00 a.m. Noon CT

- Airplane Design Lessons Learned the Hard Way

  July 20, 2022 - 11:00 a.m. Noon CT

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