Featured Services and Products

DARcorporation Kill Switch

DARcorporation has designed and implemented a dual function UAV Kill System to be utilized as either a safety device during test and operational flights or a test tool during flight test evaluation. The Kill System functions as an independent failsafe for all flights. In the worst-case scenario, a complete loss of communication with the vehicle, the onboard Kill System components will initiate a shutdown of all engines, causing a complete loss of propulsive power, preventing a runaway situation where the vehicle continues uncontrolled flight until the batteries are depleted. As a test tool, the Kill System is capable of shutting and restarting a user-defined engine.

The airborne component of the Kill System is installed as a portion of the flight controller and engine loop. A continuous "heartbeat" message between the airborne component and the ground station prevents the Kill System from activating to kill all engines. Failure of the heartbeat message will result in the Kill System initiating a shutdown of all engines causing a complete loss of propulsive power. The Kill System complete shutdown can also be initiated by the ground station operator hitting the KILL button.

The second function of the Kill System, as a flight test tool for engine out performance evaluation, allows the operator to select a specific engine to be shut. The operator can select which engine to shut down. The operator then initiates a shutdown of the individual engine by hitting the Single Engine KILL button. Disarming the single engine kill function will restart the engine, returning the vehicle to normal operation.

The Kill System is currently undergoing functional and acceptance testing on current DARcorporation UAV projects. The range is expected to be at least 15 miles, subject to final testing in the field.

After acceptance testing is completed, the Kill System will be available for purchase.

VTOL Transition Trainer

DARcorporation has developed a low-cost VTOL Transition Trainer vehicle for use in developing control software and pilot experience in the vertical/horizontal transition flight regime. The vehicle is a modified SonicModell AR Wing Pro. The original aircraft is a flying wing powered by a pusher propeller. The pusher propeller is replaced by two tractor motors installed on CNC cut motor mounts placed between the fuselage and outer wing assembly. The stock winglets have been replaced with endplates that also serve as VTOL landing gear. The original motor mount is used to mount LIDAR and optical flow sensors for precision altitude measurement. A ProFiCNC Orange Cube autopilot handles stability augmentation and switching behavior between VTOL and conventional airplane modes The initial analysis and aerodynamic validation utilizing the AAA software has been completed. The initial flight testing took place in late July.

SonicModell AR Wing Pro

VTOL Transition Trainer

Software News

New AAA Tutorials Release

Loads Module Tutorial
- The loads module tutorial covers the V-n diagram, internal loads and lateral gust loads modules in AAA.
- Located at:
  https://youtu.be/lEg6kPWmrPg

Dynamics Module Tutorial
- The dynamics module tutorial covers the longitudinal and lateral-directional transfer functions and flying qualities.
- Located at:
  https://youtu.be/o7Sbe1I5RK0

FAR23 Loads Report Now Available At Our Online Store:

LOADS REPORT
Cessna 182L and 182M

This 146 page Cessna 182L and 182M Loads Report is available for purchase at our online store. It includes:

- Geometry of All Flight Surfaces
- Structural Speeds
- Wing Aerodynamic Coefficients
- Flight Loads for 3 Altitudes
- Cruise and Landing Configurations
- V-n Diagrams
- Critical Loads for Wing, Horizontal Tail, Vertical Tail and Fuselage
- Aileron and Flap Loads
- Engine Mount Loads
- Landing Loads

Upcoming Short Course on Airplane Flight Dynamics

Instructor: Dr. Willem Anemaat
Dates: September 13 - 17, 2021

- Outline, Fee & Registration
- Video Preview

This course provides an overview of airplane static and dynamic stability and control theory and applications, as well as classical control theory and applications to airplane control systems. An overview of flying qualities and regulations is included.

DARcorporation welcomes Rob Zernickow and Zachery Steele to the team!

Rob Zernickow is an aerospace engineering graduate from the University of Kansas. His knowledge in testing analysis and design is a great addition to our engineering staff. Recently, Rob has been heavily involved in the rapid prototyping process of our UAV design projects, as well as assessing component design as a result of testing wing loads.
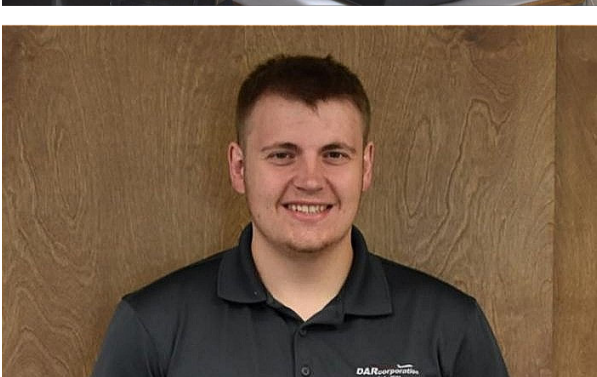
Zachary Steele, a recent graduate of Purdue University, is one of the newest additions to DARcorporation. He has an extensive background in aerospace design and is an advanced user of multiple CAD software. We are happy to have Zachary join our engineering team!