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# DARcorporation News

June 2019

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## DARcorporation Wins NASA SBIR PHASE II Award!

This award will allow us to continue the NASA 2018 Phase I SBIR award on Evolving and Certifiable Autopilot for Unmanned Aerial Systems into Phase II.

An intelligent flight control system is developed with learning capabilities and a high degree of assurance that can be certified by the FAA and tested on a modular reconfigurable UAS. Existing lack of intelligence, adaptability and high performance of current automatic flight controllers is addressed by taking advantage of high-performance computing platforms, state-of-the-art machine learning and verification algorithms to develop a new intelligent, adaptable and certifiable flight control system with learning capabilities. [\[read more\]](#)

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## New Software Release!



**Aircraft Performance Program (APP) Version 7.0** brings a significant capability to the market: aircraft performance for electric and hybrid electric propulsion. The electric propulsion support includes:

- Generic electric propulsion (serial or parallel), input table based
- Pure electric propeller propulsion
- Serial hybrid-electric propeller propulsion with separate generator dataset
- Battery size defined by energy and mass or by energy density

Other New Features Include:

- New example aircraft: Do228NG with serial hybrid-electric propulsion
- New mission solver: Solve for required trip fuel (take-off mass solver)
- Faster than APP 6 (up to five times)

In addition, APP7 is ready for the future and is compiled with the newest Visual Studio and C++ version. This guarantees Windows 10 support. ALR has made significant progress "under the hood" of APP to secure long-term maintainability of the APP code base. New processes have been introduced to improve quality control.

Additional Information:

<https://www.darcorp.com/aircraft-performance-program-new-release/>



**FlightStream® Version 11.4** is a high fidelity aerodynamics tool perfectly suited for aircraft designers. This latest version includes the following new features:

- Relaxed Kutta Separation Modeling
- Boundary Layer Transition: Improved Viscous Forces Model
- Advanced Aligned Mesher for Anisotropic Quad Meshes
- Automated Pressure-Spike Cleanup
- Steady-State Rotary Solver for Hover
- Extended IGES Entities and CAD Solids Import
- Extended CAD Create Intersection Tools
- New Solver Sweeper Toolbox Export Options for FEA
- Automated Mesh Quality Improvement Tool
- Solver Field Parameter Threshold Selection Options
- Expanded Selection Tools
- Solver Color-map Range Cut-off Tools
- Updated Scripting API

The following fixes have been made:

- IGES CAD Planes Parameterization
- IGES CAD Surface Duplication
- Miscellaneous Bug Fixes

Additional Information:

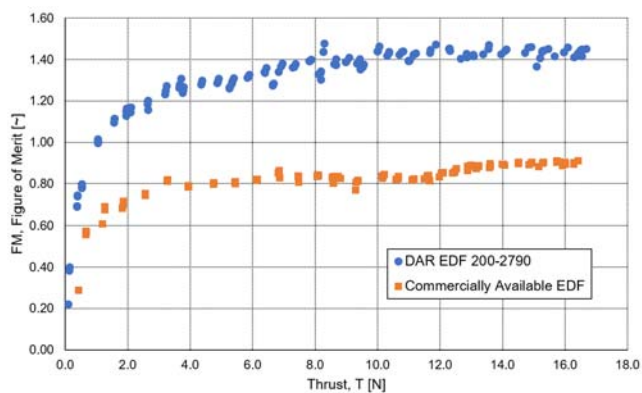
<https://www.darcorp.com/flightstream-new-release/>

## Ribbon Cutting & Open House

DARcorporation welcomed the Lawrence Chamber of Commerce along with friends, colleagues and clients to a ribbon cutting at our new location at 910 E. 29th Street, Lawrence, KS 66046 USA. DARcorporation has been offering aeronautical engineering consulting services, software and books since 1991 and is proud to celebrate our expansion into a 16,000 sq.ft. facility. Guests enjoyed a slide show of the company's history along with guided tours through our 5,000 sq.ft. manufacturing and testing complex, 3-D Printing lab, software training room and technical library.



## Ducted Fan FOM Improvements



Most commercially available fans are designed for forward flight and have poorly optimized duct shape. Many UASs today operate primarily in hover flight. The DAR EDF design takes advantage of improved duct geometry and proper blade twist distribution to achieve large performance gains for hovering shown by the figure of merit comparison. The figure of merit is a direct comparison to ideal lossless power for an open rotor of equal diameter to the actual shaft power used for a given amount of thrust.



### New Webinar

History of Airplane Design  
Wednesday, June 12, 2019  
11:00 AM - 12:00 PM CT US  
Instructor: [Dr. Jan Roskam](#)

Description: Dr. Jan Roskam continues the informative History of Airplane Design webinar series, focusing on specific companies and their contributions to the commercial, military and transport aircraft industries. The June session will focus on DeHavilland and Douglas. This is a free webinar and is presented live and will not be available after the webinar.

[Register](#)



### Paper Presentation at AIAA Aviation Forum

Dr. Willem Anemaat will be presenting at the [2019 AIAA Aviation Forum](#), Dallas, Texas, which will explore how rapidly changing technology, new entrants and emerging trends are shaping the future of flight. The presentation, "Comparison of Methods to Predict Aerodynamic Center Shift due to Bodies", will be included in the High Speed Aircraft Design session on June 20th from 2:00 - 5:30 PM.

DARcorporation is a proud sponsor of the 2019 AIAA Aviation Forum.



### [DARcorporation at EAA AirVenture Oshkosh 2019](#)

July 22 - 28, 2019  
Wittman Regional Airport,  
Oshkosh, Wisconsin

We will be manning a booth at EAA AirVenture 2019 this summer! Grab some shade in Hangar C and come see us at booth [#3159](#), straight inside the hangar door on the right side!



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