



JETOPTERA HIGH SPEED VTOL WIND TUNNEL TESTS YIELD EXCITING RESULTS

News / Manufacturer



Jetoptera is getting exciting results in the wind tunnel! In support of our USAF sponsored Phase II Small Business Technology Transfer program, Jetoptera worked with AeroTEC and Scaled Composites to design and build an engineering test article model specifically for wind tunnel testing. Jetoptera sub-contracted the University of Washington and the Kirsten Wind Tunnel team to carry out these tests.

Jetoptera CEO, Andrei Evulet commented: "We completed our wind tunnel test campaign under our fifth US Air Force contract. The results support our proprietary solution of a High-Speed VTOL vehicle using the "3-in-1" Adaptive Fluidic Propulsive System. In collaboration with Pratt & Whitney GATORWORKS, the vehicle is a single-engine design based on a Pratt & Whitney turboshaft engine driving a high-performance compressor that can perform VTOL and is predicted to reach twice the speed of tilt rotor aircraft in forward flight. The current STTR Phase II program validates the predicted performance of this HSVTOL aircraft concept. Separately, Jetoptera remains one of a handful of companies involved with the HSVTOL Challenge Program launched 2 years ago by AFWERX."

Jetoptera adaptive FPSTM-powered aircraft wind tunnel model is a 30% scale of the single engine concept developed under a 2022 Direct to Phase II Small Business Innovation Research Program, on which the company teamed with subcontractor, Scaled Composites. Predicted 5000 lbs Vertical Take Off and Landing aircraft powered by a single turbocompressor driven by an existing 2500 HP-class turboshaft will be capable of speeds of up to Mach 0.8. The Adaptive FPSTM system and the single engine aircraft are scalable to larger applications. This design is just one example of the novel capabilities FPSTM brings to advanced aviation propulsion;

The 30% HSVTOL wind model was built with help from AeroTEC. Additive manufacturing produced 50% of the model components, including the compressed air propulsion system – conduits, valves and thrusters. We tested the design at various wind and compressed-air conditions with three configurations involving stowable FPSTM thrusters of various sizes, distributed optimally over the wings and fuselage. The three main configurations are VTOL, transition, and high-speed forward flight (representing the “3-in-1” FPSTM deployment, respectively.)

Wind tunnel data collected included forces, moments, pressures, flow-field surveys, and flow visualization. FPS™ and Upper Surface Blown-Wing were deployed in the powered-lift configuration for VTOL feeding compressed air to our proprietary thrusters (for VTOL and transition to horizontal flight). A High-Speed Nozzle configuration was deployed for the high-speed forward flight part of the mission. The tests covered regimes up to 200 mph wind at Sea Level with a measured output of the HSN jet speeds of up to 700+ mph. Data will be used to assist with building a 6 Degrees of Freedom model and further explore the flight envelope and the performance of the multiple HSVTOL concepts. Jetoptera will also apply the data to develop other concepts ranging from Wing in Ground Effect and ISR to large HSVTOL, General Aviation, Urban Air Mobility, Cargo VTOL aircraft and FPSTM-powered Parafoils.

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