Sikorsky Successfully Flies Rotor Blown Wing UAS In Helicopter And Airplane Modes

Tail sitter drone can be scaled to larger sizes with hybrid-electric propulsion

Sikorsky proves a rotor blown wing tail sitter drone can transition easily between helicopter and fixed wing flight modes. Photos by Sikorsky, a Lockheed Martin company.

STRATFORD, Conn, March 10, 2025 – Sikorsky, a Lockheed Martin company (NYSE: LMT) has successfully validated the advanced control laws to successfully fly a 'rotor blown wing' uncrewed aerial system (UAS) in both helicopter and airplane modes. Powered by batteries, the 115 pounds (52kg) twin prop-rotor prototype has demonstrated operational stability and maneuverability across all flight regimes, and the potential to scale the unique vertical take-off and landing (VTOL) design to larger sizes requiring hybrid-electric propulsion.

"Combining helicopter and airplane flight characteristics onto a flying wing reflects Sikorsky's drive to innovate next-generation VTOL UAS aircraft that can fly faster and farther than traditional helicopters," said Sikorsky Vice President and General Manager Rich Benton. "Our rotor blown wing platform is a prime example how we are leveraging the breadth of our 102-year aviation heritage to develop new designs that meet the emerging missions of commercial and military operators."

View the video.

Innovation Breakthrough

Sikorsky Innovations, the company's rapid prototyping group, heads the effort to develop and mature the rotor blown wing design. In just over a year, Sikorsky Innovations has progressed through preliminary design, simulation, tethered and untethered flight to gather aerodynamic, flight control and quality data.

Breakthrough was achieved in January 2025 with the 10.3-ft composite wingspan aircraft when Sikorsky Innovations successfully completed more than 40 take-offs and landings. Notably, the aircraft performed 30 transitions between helicopter and airplane modes, the most complex maneuver demanded of the design. In horizontal flight mode, the aircraft reached a top cruise speed of 86 knots. Simultaneous wind tunnel tests were conducted on a 1:1 scale model providing valuable validation of the newly developed control laws by correlating them with real-world experimental data.

"Our rotor blown wing has demonstrated the control power and unique handling qualities necessary to transition repeatedly and predictably from a hover to high-speed wing-borne cruise flight, and back again," said Sikorsky Innovations Director Igor Cherepinsky. "New control laws were required for this transition maneuver to work seamlessly and efficiently. The data indicates we can operate from pitching ships decks and unprepared ground when scaled to much larger sizes."

Applications of future UAS rotor blown wing aircraft include search and rescue, firefighting monitoring, humanitarian response, and pipeline surveilling. Large variants will enable long range intelligence, surveillance and reconnaissance, and piloted drone teaming (crewed/uncrewed teaming) missions.

All rotor blown wing variants will include Sikorsky's MATRIX™ flight autonomy system to navigate the aircraft during flight.

Family of Systems

The rotor blown wing design is one of a future family of systems in development by Sikorsky. The family will include winged VTOL UAS and single main rotor aircraft.

Also in development by Sikorsky is a 1.2 megawatthybrid-electric demonstrator (HEX) configured with a tilt wing and a fuselage to carry passengers or cargo across long distances. A HEX power system test bed is expected to demonstrate hover capability in 2027.

For more information, see https://lockheedmartin.com/sikorskyinnovations

About Lockheed Martin

Lockheed Martin is a global defense technology company driving innovation and advancing scientific discovery. Our all-domain mission solutions and 21st Century Security® vision accelerate the delivery of transformative technologies to ensure those we serve always stay ahead of ready. More information at Lockheedmartin.com.

# # #

Media Contact:

Frans Jurgens, +1 203-615-8293, frans.m.jurgens@lmco.com

Additional assets available online: Photos (2)