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MSU research lab developing new style UAV for broad uses

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STARKVILLE, Miss. - The Raspet Flight Research Laboratory at Mississippi State is developing an ultra-light, long-endurance unmanned aerial vehicle designed to improve U.S. surveillance and communication capabilities for battlefield and border-patrol operations, the university says.

Ground tests and initial manned flight-testing of the UAV prototype _called the Owl because of its quietness - were completed last year. The research lab at Starkville's Bryan Field is preparing to begin flight-testing the concept demonstrator this summer.

"This program ultimately will result in a platform that can stay aloft for more than 24 hours and eventually be flown at altitudes up to 65,000 feet," said David Lawrence, Raspet's director. "Its primary mission is to improve communications on the battlefield, but it may spin off a vehicle for other missions such as homeland security and border patrol."

The Ultra Light Sensor Platform Research Project, which has received support from Rep. Roger Wicker, R-Miss., and other members of Mississippi's congressional delegation, was funded initially with \$3 million in the fiscal year 2005 defense appropriations bill. The funding was channeled through the Advanced Technology Directorate of the Army's Space Missile Defense Command in Huntsville, Ala., and a program review was completed last fall.

More recently, Mississippi State received \$8 million in additional funding for 2006. The new money includes \$2.8 million for the Ultra Light Sensor Platform project and \$5.2 million for an MSU-operated UAV test bed.

The Defense Department has used UAVs in military operations since the 1950s to provide reconnaissance, surveillance and intelligence of enemy forces without risking the lives of an aircrew. The remotely piloted aircraft can carry cameras, sensors, communications equipment, weapons, and other payloads.

Raspet, which specializes in lightweight composite technology, is a unit of MSU's department of aerospace engineering, which is a part of the Bagley College of Engineering.

"The UAV project has transformed the operation at Raspet," said Tony Vizzini, who heads the department. "The Aerospace Technology and Development Building is now bustling with dynamic testing of the wings, a best benchmark for the development of the control and sensor platform. A flight-tested Owl is waiting for the next level of tests."

The flight research facility is a nationally recognized design and development resource for high-performance sailplanes and full-scale turbine powered aircraft.

By utilizing carbon fiber and epoxy composites, as well as sailplane design techniques, Lawrence said he believes Raspet can produce a UAV that is both lighter and stronger than existing models, carry larger payloads and maintain longer flight duration.

Geneva Aerospace Inc. of Dallas, Texas, has been contracted to help develop a command-and control package for the new class of UAV. Flight controls for the UAV will be based on Geneva's flightTEK flight control computer, which transforms air vehicles into highly autonomous and precise unmanned machines.

Wichita State University and Ice Management Systems of Temecula, Calif., also are providing expertise in development of the UAV's ice-protection system.

The ultra-light UAV powered glider was designed and built by Windward Performance of Bend, Ore. It is expected to be less expensive than the \$10 million per-vehicle cost of the current UAV systems operated by the U.S. Army and Air Force.

With a wing span of less than 40 feet and weight of only 155 pounds without equipment, the Owl has a climb rate of about 700 feet per minute and is expected to operate initially at altitudes from 10,000 to 20,000 feet.

"A small engine will keep it aloft when needed, but most power will be provided by thermal updrafts and other atmospheric winds," said John Johnson, Raspet's senior program engineer.