News Release

Defense Advanced Research Projects Agency

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MICRO AIR VEHICLE SETS ENDURANCE FLIGHT RECORD

The WASP micro air vehicle used multifunctional structure/power materials to set an endurance flight record during tests this summer. The WASP flew for one hour 47 minutes, more than three times the previous micro air vehicle endurance record of 30 minutes set two years ago.

The WASP design replaces separate battery and wing structure components with a multifunctional structure/battery material system that supplies electrical energy for propulsion while carrying mechanical and aerodynamic wing loads. The WASP is the first in a series of developmental micro air vehicles designed to demonstrate performance enhancement through the use of these unique multifunctional materials.

The WASP is being developed under DARPA's Synthetic Multifunctional Materials program, which is exploring materials that combine the function of structure with another critical system function such as power, repair, or ballistic protection. The combination is expected to optimize system performance and realize improved or new capabilities for military systems.

The WASP is a radio-controlled vehicle with a "flying-wing" design. The wingspan is 13 inches and the combined wing structure/battery pack weighs 120 grams. The total weight of the vehicle is 170 grams (six ounces). The vehicle uses off-the-shelf components and lithium-ion batteries, which produce the highest energy density among all rechargeable battery systems. The energy density of the battery structure was 143 watts per kilogram, with an average output power of over nine watts during the flight.

The aircraft is stable and simple to fly using manually operated ground control of the aircraft's throttle, rudder, and elevator surfaces. The next generation of WASP will incorporate a simple autopilot and carry a color video camera payload.

The aircraft design, fabrication, and flight test were performed by AeroVironment Inc., Simi Valley, Calif. Telcordia Technologies, Red Bank, N.J., contributed to the conceptual design of the wing structure-battery and supplied the custom-designed, plastic lithium-ion battery materials that were incorporated into the WASP wing. The Naval Research Laboratory, Washington, D.C., contributed to the conceptual design of the wing structure-battery and helped to coordinate the prototype development.

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Media with questions, please contact Jan Walker, (703) 696-2404, or jwalker@darpa.mil . Photos of the vehicle are available at www.darpa.mil/body/news.html .