



News Release

Defense Advanced Research Projects Agency

3701 North Fairfax Drive
Arlington, VA 22203-1714
www.darpa.mil/newsroom.html

IMMEDIATE RELEASE

April 27, 2009

INTEGRATED SENSOR IS STRUCTURE PROGRAM BEGINS DEMONSTRATION PHASE

The Defense Advanced Research Projects Agency (DARPA) has selected Lockheed Martin Aeronautics Co., Palmdale, Calif., to develop the [Integrated Sensor Is Structure](#) (ISIS) phase 3 demonstration system. Raytheon Co., El Segundo, Calif., is a key team member.

DARPA's ISIS program is developing a sensor of unprecedented proportions that is fully integrated into a stratospheric airship. ISIS will revolutionize theater-wide surveillance, tracking and fire-control, and enable engagement of hundreds of time-critical air and ground targets simultaneously in both urban and rural environments.

DARPA's ISIS program is making significant advancements in the nation's technology and manufacturing capabilities in order to successfully fabricate the extremely large, very lightweight radars that an operational ISIS would use. In an operational system, these radars would be approximately 6,000 square meters in size (the size of 15-story building), and would be embedded into the structure of the airship, which would cruise in the stratosphere (at altitudes of more than six miles above the earth) and stay on station for years. An operational ISIS would be able to detect and track extremely small cruise missiles and unmanned aerial vehicles that are up to 600 kilometers away, dismounted soldiers that are up to 300 kilometers away, and small vehicles under foliage up to 300 kilometers away – capabilities not possible from existing or planned air or space assets.

This phenomenal performance centers on the physics of radar. As the radar aperture grows larger, the tracking performance of the radar system increases exponentially. DARPA's ISIS program takes advantage of the large amount of space available on a stratospheric airship to enable a very large radar aperture and provide a revolutionary level of performance. In addition, the program envisions operating the stratospheric airship using a satellite-like logistics model where the airship will be launched and operate autonomously. This will provide a decade of operational flight with no logistics tail, which will make ISIS a completely new way to provide military intelligence, surveillance and reconnaissance (ISR) capabilities.

Phase 1 of the ISIS program consisted of a feasibility study. During phase 2, contractors developed systems designs and critical technologies such as low areal density hull materials, lightweight low-power-density radar arrays, extremely low-power transmit-receive modules, and regenerative power systems. In phase 3, which DARPA will conduct jointly with the Air Force, the program will develop a subscale flight demonstration system using the technologies and manufacturing techniques demonstrated in the earlier phases of the program. The subscale system will consist of an X-band radar system that will be roughly 100 square meters in size

(more)

(half the size of a roadside billboard) and a UHF-band system that will be approximately 600 square meters in size (roughly equivalent to the size of a soccer field). These sizes will be large enough to validate manufacturing and calibration for the objective system and will provide an early glimpse of the air and ground target tracking performance possible with an operational system. Demonstration flight tests are expected to occur in FY 2013.

“DARPA and the Air Force have maintained a long-standing partnership on tracking radars beginning with Pave Mover [the genesis for the Air Force Joint Surveillance Target and Attack Radar System, JSTARS], through today’s joint ISIS program,” notes DARPA Program Manager Tim Clark. “The Air Force’s commitment to partner with us for the development and flight test of a demonstration system validates the close relationship that we’ve had with them from the outset. ISIS will provide the Air Force with a revolutionary new ISR capability for the future battlefield.”

-END-

Media with questions, please contact Jan Walker, (703) 696-2404, or jan.walker@darpa.mil.
Contractors or military organizations, contact Tim Clark at (703) 248-1520.