Europe Demos Heron UAV In Civil Air Space

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PARIS — The European Space Agency (ESA) and European Defense Agency (EDA) demonstrated a Heron 1 unmanned aerial vehicle (UAV) in civil airspace April 24 from San Javier Air Base in Murcia, Spain.

The joint exercise is a key element of the €1.2 million (\$1.5 million) DeSIRE project, funded equally by ESA and EDA and carried out by an international industry consortium led by Indra of Spain. It includes AT-One of Germany and the Netherlands; satellite fleet operator SES of Luxembourg; Thales Alenia Space of France and Italy; and CIRA of Italy.

The test flight demonstrated the ability of a UAV to share the sky with a conventionally piloted aircraft through communications via satellite. The trial is the culmination of a series of test flights DeSIRE has undertaken to demo the role of satellite communications for integrating remotely piloted aircraft in civil and military airspace through beyond-line-of-sight communications. In particular, the test flight provided a generic terrestrial and maritime surveillance service, demonstrating the dual use of remotely piloted aircraft.

"The aim was to define and test the air traffic control and operation procedures applicable to a remotely piloted aircraft and to evaluate the safety of the satellite link and the reaction capacity of the aircraft's ground pilot, both in routine operation and in emergency situations," ESA and EDA said in a joint press release issued April 26.

The Heron, a medium-altitude, long-endurance drone operated by Israel Aerospace Industries, took off at 11 a.m. local time and completed a 6-hr. demonstration timed to coincide with civil and military flights operating from the San Javier base, which shares facilities with Murcia Airport.

After takeoff, the aircraft switched from its line-of-sight data link to a satellite data link, initiating its operational mission in segregated airspace and transmitting signals to the ground from onboard sensors.

The UAV climbed to 20,000 ft., entering airspace class C managed by AENA, the Spanish air navigation service provider, from Barcelona Control Center. The Heron pilot followed indications issued by AENA air traffic controllers, "acting like any other civil or military aircraft," according to the release. "The difference is that the pilot was not on board and the radio communication with the control center was transmitted from the aircraft to the operator via satellite."

During this phase of the flight, a manned aircraft from Spain's Air Force Academy approached the Heron, simulating frontal and 90° collision trajectories. The pilots of the two aircraft followed separation instructions issued by air traffic controllers, demonstrating the safe operation of remotely piloted aircraft, even in an emergency situation such as the separation of two aircraft on a collision course.

Throughout the exercise, data from Indra's SACTA (AENA's automatic air traffic control system based on secondary radars) was available to the Heron pilot, enabling improved situational awareness of nearby aircraft with more detail and precision than an onboard pilot would have.

During the flight, payload data collected from the Heron's onboard sensors, including an AIS receiver, radar and video, were transmitted in real time to the ground control center pilot via the satellite link and further processed to enable ships' detection and identification.

Information collected during DeSIRE tests will be analyzed and compared with safety requirements being established by the European Aviation Safety Agency (EASA) and operational requirements being set by Eurocontrol. Final results of the project are expected this summer, "with possibly more information on next steps," says EDA spokeswoman Elisabeth Schoeffmann.

UAVs offer the potential to meet a number of civil aircraft requirements, though in Europe no framework exists for enabling remotely piloted aircraft to fly in civil airspace, in particular using beyond-line-of-sight data links.

"This situation is curbing their use and application in the civil sphere, thus making it difficult for the European industry to develop the technologies and equipment that will make their use possible in the future," according to the news release. The DeSIRE demonstration aims to establish common requirements to serve as the basis for a future regulatory framework for remotely piloted aircraft systems in Europe. It follows a number of activities and projects initiated by the two agencies in the remotely piloted aircraft domain, including the Air4All Study and Midcas project managed by EDA and the Sinue and Esprit studies managed by ESA.