Boeing Demonstrates Future On-Orbit Servicing Capability with Orbital Express

A four-month demonstration conducted in space of the Boeing [NYSE: BA] Orbital Express system culminated in an unqualified success.

The mission, sponsored and led by the Defense Advanced Research Projects Agency (DARPA) to validate on-orbit servicing technologies, tested the system from March 8 to July 2. Orbital Express met or exceeded all of its test objectives to become the world's first spacecraft capable of performing autonomous on-orbit servicing functions.

With the successful demonstration of Orbital Express, Boeing has shown that it can provide satellite customers with a capability to extend spacecraft lifespan through refueling and component replacement, and offer robotic support for space operations.

"Boeing has opened a new market with Orbital Express, and this capability will benefit the satellite industry as well as space exploration ventures," said Alex Lopez, vice president, Boeing Advanced Network and Space Systems. "We see a great future in providing global space customers options they've never had before."

Orbital Express consists of the Autonomous Space Transport Robotic Operations (ASTRO) servicing spacecraft developed by Boeing. Ball Aerospace's NextSat served as a prototypical modular next-generation serviceable client spacecraft.

The demonstration comprised eight scenarios that were performed in different lighting conditions and approaches. Mated operations included battery and fuel transfers and computer replacement. Unmated operations involved separation of the spacecraft to various ranges, far-and near-field rendezvous, proximity operations, approach, capture and mate.

"The purpose of Orbital Express was to demonstrate technologies needed for satellite servicing, autonomous free flight, rendezvous and capture, and transferring fuel and components to a satellite -- and we accomplished that," said Bob Friend, Boeing Orbital Express chief engineer and program manager.

The demonstration successfully validated Boeing's Autonomous Rendezvous and Capture Sensor System. The system identified NextSat more than 400 kilometers away, enabling ASTRO to approach within a few meters of NextSat while determining its exact position, attitude and best mating location.

Boeing sees many applications and benefits of on-orbit servicing and proximity operations that can be accomplished by Orbital Express.

In addition to spacecraft fuel and component replenishment, the open standard interfaces such as the docking and re-fueling systems enable increased value and utility for next-generation spacecraft. The advanced robotic arm can support precision robotics work, on-orbit assembly or contingency operations and can be used to move satellites into proper orbit or position satellites and space debris for safe de-orbit. Orbital Express also supports Operationally Responsive Space needs.

DARPA de-commissioned Orbital Express in mid-July to conclude one of the most complex missions ever attempted in space.

Orbital Express team members included NASA; Ball Aerospace; Northrop Grumman Space Technology; MacDonald, Dettwiler and Associates Ltd.; the Charles Stark Draper Laboratory Inc.; and Starsys Research.

Orbital Express demonstration mission information, photos and videos are available at http://www.boeing.com/orbitalexpress.

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For further information:
Robert Villanueva
Boeing Advanced Systems
(562) 496-5688
robert.s.villanueva@boeing.com