



News Release

Defense Advanced Research Projects Agency

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ORBITAL EXPRESS SPACECRAFT SUCCESSFULLY RENDEZVOUS, REMATE

On Saturday, May 19, after almost 8 days apart, Orbital Express successfully captured the ASTRO servicing satellite with its client spacecraft, NextSat. This achievement follows a critical failure of ASTRO’s primary sensor flight computer (AC-2) and a subsequent loss of relative navigation that made it difficult for the operations team to determine the precise separation between ASTRO and NextSat. Over the past week, the two satellites orbited at distances of up to 6 kilometers from each other. Air Force Satellite Control Network (AFSCN) and MIT Lincoln Laboratory provided ground range data to assist Orbital Express maintain safe separation of the two spacecraft while working to recover onboard relative navigation.

After completing several ground-commanded repositioning thruster burns during the middle of the week, ASTRO was able to close to within 3 kilometers of NextSat, permitting its infrared camera and laser rangefinder to reestablish a reliable track. Late Friday evening, Boeing’s guidance team succeeded in constructing an autonomous guidance profile that was loaded aboard ASTRO and executed on Saturday. “After that, it was all ASTRO’s show,” said Lt Col Fred Kennedy, DARPA’s Orbital Express Program Manager. “We watched in the mission control center as ASTRO performed a series of small maneuvers, bringing it first to within 1 kilometer of NextSat, then 320 meters, 120 meters, and finally into the approach corridor. The actual remate occurred over an area where we did not have high data rate communications, so we had no real-time imagery to watch in the ground station, just low-rate telemetry as the two vehicles autonomously docked.”

Once in the approach corridor, ASTRO’s Advanced Video Guidance Sensor began providing very precise measurements of NextSat’s bearing and range. Just before 11:00 pm EDT, ASTRO reported that it had captured NextSat, using its Starsys capture mechanism. Several minutes later, the vehicles were fully remated; the operations team cheered and, after routine state of health monitoring and data downloads, stood down from scenario operations. An investigation into the cause of failure of the AC-2 flight computer is continuing.

DARPA will conduct a technical review of ASTRO sensor and navigation performance lessons learned from last week’s scenario and will use the results of this review in planning the remaining set of Orbital Express demonstration activities over the next few weeks.

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