

## **X-36 Proving Its Agility In Flight Testing**

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Through the end of Phase 2 flight testing this month, the X-36 tailless research aircraft continues to perform exceptionally well and is proving to be more agile than the most maneuverable fighter aircraft in the world today.

"After 22 flights, the aircraft continues to perform flawlessly and exceed performance expectations," said Boeing X-36 program manager Gary Jennings. "The maneuvers it has performed so far go beyond the capabilities of the F/A-18 Hornet -- the top standard for agility in fighter aircraft."

Research Center in California. The flight also completed Phase 2 testing, which began Aug 6.

During Phase 2 testing, the X-36 successfully completed all of its planned low- and high-g agility maneuvers, which demonstrate the aircraft's ability to quickly perform under a wide range of aerodynamic loads. These maneuvers included 360-degree rolls at angles of attack (AOA) up to 15 degrees and rapid turning-rolling maneuvers at up to 35 degrees AOA.

To date, the tailless research aircraft has flown a total of 10 hours and 54 minutes and has performed at maximums of 4.86 g, 40 degrees AOA, 177 knots air speed and 20,500 feet altitude.

After flight control software is updated with Phase 2 results, the X-36 will begin Phase 3 testing later this month. In this final test phase, scheduled to conclude in November, the aircraft will demonstrate how it performs maneuvers at lower speeds and high AOA.

Boeing has produced two 28-percent-scale aircraft for the X-36 program. The tailless design offers greater agility and stealth than current fighter aircraft, as well as less weight and drag. The design also explores new flight control technologies, such as split ailerons and thrust vectoring.

The X-36 prototype is remotely controlled by a pilot in a ground station cockpit that receives an "out the window" view from a camera in the aircraft, complete with a head-up display. This approach eliminates the need for expensive autonomous flight control systems and allows for a fast-paced, aggressive flight test program.

"In both Phase 1 and Phase 2 testing, we have been able to put the X-36 in the air up to five days in a row," said Mark Sumich, NASA X-36 project manager. "This is an unprecedented feat in the world of flight testing remotely piloted vehicles, and it has helped us keep ahead of schedule and under cost for the program."

Phase 1 testing, which ran from May 17 to July 29, verified the aircraft's control software, ground station, data system and air data calibrations in preparation for the aggressive agility testing in Phase 2.

The X-36 program is led by NASA's Ames Research Center, Moffett Field, Calif., and is funded under a roughly 50/50 cost sharing arrangement with Boeing.

The combined cost for developing, fabricating and flight testing the X-36 is about \$20 million, which is less than one-tenth the cost of developing and testing a full-scale, manned aircraft.

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