

Boeing Joins X-43C Hypersonic Research Vehicle Team

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As part of its mission to open new frontiers in aerospace, The Boeing Company [NYSE: BA] has teamed with Allied Aerospace to develop the X-43C, an experimental aircraft designed to use innovative air-breathing engine technology to attain hypersonic speeds previously achieved only by rockets.

The X-43C builds on research results from the smaller X-43A Hyper-X vehicle, which Boeing also helped develop.

As with the X-43A program, Boeing Phantom Works will lead the effort to develop specific systems for the X-43C, including vehicle design and thermal protection systems along with flight control and navigation systems.

The X-43C is a joint project between NASA and the U.S. Air Force Research Laboratory, and the cost-plus-fixed-fee completion type contract carries performance incentives and is valued at nearly \$150 million over 66 months. The contract covers all work through completion of a preliminary design review, and a contract option covers the final design, hardware fabrication and all associated support activities.

The three X-43C vehicles to be built will fly at hypersonic speeds from five to seven times the speed of sound. Hypersonic is defined as speeds at or greater than five times the speed of sound. Design and construction is planned from 2003 to 2005, with flight testing in 2007.

The X-43C is a larger than the X-43A with a length of 16 feet versus the X-43A's length of 12.3 feet. The X-43C also has a different scramjet engine, which uses a hydrocarbon fuel rather than gaseous hydrogen as in the X-43A. Hydrocarbon fuels are much denser than hydrogen, allowing an engine test time measured in minutes rather than the seconds available with the X-43A.

"Hypersonic speeds are really at the edge of our knowledge," said Tom Harsha, Boeing Phantom Works X-43C program manager. "We expect to learn a lot from X-43C that will bring us closer to safe, routine and economical access to space."

Commercial aircraft like the Boeing 777 fly at subsonic speeds or less than the speed of sound. High performance military aircraft such as the Boeing F-15 or F/A-18 are capable of supersonic flight or speeds faster than the speed of sound. The only hypersonic aircraft in use is the space shuttle, which flies at 25 times the speed of sound upon re-entering the earth's atmosphere.

Boeing's work on the X-43C adds to its legacy of building the space shuttle and the rocket-powered hypersonic X-15 research craft flown at Mach 6.7 in the 1960s.

To reach hypersonic speeds, a scramjet engine will power the X-43C. Scramjets have few moving parts, are air breathing and have advantages over conventional rocket-powered vehicles carrying oxidizer for the fuel. By eliminating the need to carry oxidizer, smaller and more efficient vehicles can be designed for access to space. Scramjets must have high-speed airflow through them to operate, so the X-43C will be accelerated by a Pegasus rocket launched from an aircraft flown from Edwards Air Force Base, Calif.

X-43C prime contractor Allied Aerospace will integrate and oversee the program. Pratt & Whitney has been selected by Allied Aerospace to provide the scramjet engines.

Boeing Phantom Works is the advanced research and development unit and a catalyst of innovation for The Boeing Company. It provides advanced solutions and innovative, breakthrough technologies that reduce cycle time and cost while improving the quality and performance of aerospace products and services.

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