

Test of Futuristic X-48C is Historic Wind Tunnel's Swan Song

September 18 2009, by Kathy Barnstorff



The X-48C test marked the last time the Langley Full Scale Tunnel that was built in 1930 will be used. Credit: NASA/Sean Smith

(PhysOrg.com) -- A historic wind tunnel at NASA's Langley Research Center in Hampton, Va., has been pressed into service one last time to help test the prototype of a new, more fuel-efficient, quieter aircraft design.

Boeing Research & Technology, Huntington Beach, Calif., recently partnered with NASA's Aeronautics Research Mission Directorate and the U.S. Air Force Research Laboratory, Wright Patterson Air Force Base, Ohio, to explore and validate the structural, aerodynamic and operational advantages of an advanced concept called the blended wing body or BWB.

"We have one version of the 21-foot (6.4 m) wingspan BWB prototype, called the X-48B, being flight tested at NASA's Dryden Flight Research Center, in Edwards, Calif.," said Dan Vicroy, senior research engineer at NASA Langley. "The other one we just tested in the Langley Full-Scale Tunnel is the X-48C. It's been modified to make it even quieter. We're assessing the aerodynamic effects of those modifications." Those changes include reducing the number of engines from three to two and the installation of vertical fins to shield the engine noise.

Cranfield Aerospace Ltd. in England built both ground-breaking aircraft scale models to Boeing's specifications. Made primarily of advanced lightweight composite materials, the models weigh about 500 pounds (227 kg) each. They are powered by turbojet engines and can fly up to 138 miles per hour (222 kph) and 10,000 feet (3,048 m) in altitude during flight-testing. The Air Force is interested in the plane's potential as a multi-role, long-range, high-capacity military aircraft.

The Langley test in July and August 2009 was the second time a BWB model was put through its paces at the huge [wind tunnel](#) that was built in 1930 and used to test World War II fighters, the Mercury space capsule, and concepts for a supersonic transport.

In 2006, preliminary tests helped engineers determine how the X-48B would perform during remotely piloted flight tests. Blended wing body designs are different from traditional tube-and-wing aircraft in that the tube and wings are blended for lower drag and better lift, and they rely primarily on multiple control surfaces on the wing for stability and control.

"It was actually a big thrill for me to be back at the Langley Full-Scale Tunnel," said Dharmendra Patel, project manager for the X-48C at [Boeing](#) Research & Technology. "I think it's a big privilege that we were the last test here, that we get to be part of the history of the tunnel. But it

is a little bittersweet that the facility will be closed down."

Langley decommissioned the tunnel in 1995, and then leased it to Old Dominion University in Norfolk, Va., for research and student engineering training. That lease was up this summer and the tunnel is scheduled for demolition because of its lack of national strategic importance, limited testing capability, deteriorating condition and the environmental liability associated with the materials used in its construction.

Provided by JPL/[NASA](#) ([news](#) : [web](#))

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