

Scramjet
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manufacturing the engine, airframe and fuel systems in addition to integrating the vehicle in preparation for flight. ATK and NASA are not the only ones eyeing scramjet technology.

In January, the U.S. Air Force Research Laboratory (AFRL) selected Pratt & Whitney and Boeing Phantom Works to “explore the air-breathing system-level potential of scramjets through multiple flight tests that will begin in 2007-2008.”

According to Pratt & Whitney, the company ground tested an actively cooled, hydrocarbon-fueled scramjet engine. “During numerous runs at Mach 4.5 and Mach 6.5 conducted September 2002 through June 2003, the ground demonstrator engine, known as the GDE-1, reliably produced significant net positive thrust.”



Dr. Allan Paull, HyShot program leader at the University of Queensland Centre for Hypersonics, and his team successfully launched a scramjet in 2002.

Courtesy of University of Queensland, photographer Chris Storey

such a success that the university research team – the first in the world to successfully flight test a supersonic air-breathing scramjet engine – received an Australian Research Council grant of \$1.8 million to continue their work.

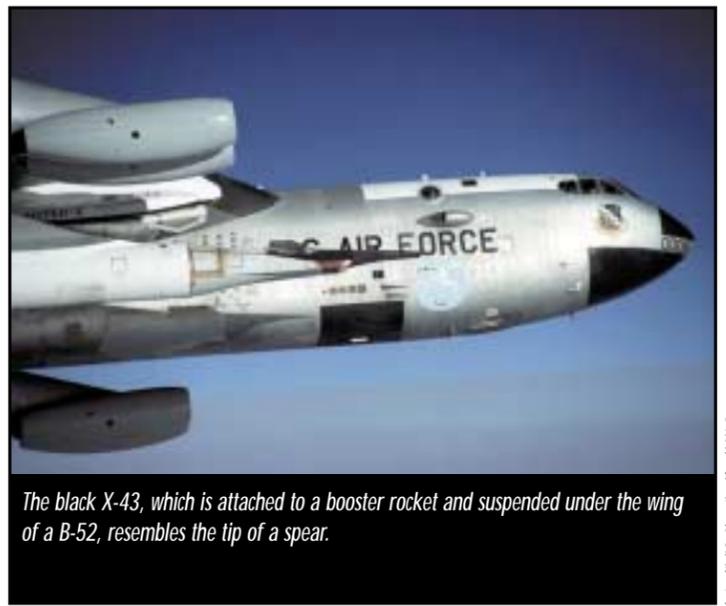
PROMISING FOR AVIATION

The scramjet’s ability to deliver remarkable power at a very low weight and with few moving parts means the engine is



During ground testing, NASA's 2,800-pound, 12-foot X-43A scramjet resembles a large, black sled.

Courtesy of the National Aeronautics and Space Administration



The black X-43, which is attached to a booster rocket and suspended under the wing of a B-52, resembles the tip of a spear.

Courtesy of the National Aeronautics and Space Administration

likely to become a staple in the aviation industry, especially for long-range, high-altitude flying. Imagine getting from New York City to Tokyo in just over an hour or from Chicago to Paris in just under an hour. Once the scramjet details are worked out, we’ll be flying across the globe as casually

as though we were heading two states over for a family vacation. At that point, engineers will be on to even better things such as the matter-antimatter propulsion system, another amazing, sci-fi-like concept currently being studied by scientists around the world.



Aircraft Painting
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After that, it is moved back to the paint booth to be re-masked with clean paper, blown with air and wiped with a solvent. Finally, the surface is wiped with tack cloths to remove any residue or lint left on the aircraft surface.

During this prepping process, the high-tech paint booth can be set to maintain optimal temperature and humidity regardless of what the weather is doing outside. At last, the painting begins.



When the base color has been applied, the computer-controlled booth goes into Dry Mode at ambient temperature and humidity for two or three hours to let the paint “breathe.” Then it switches to Dry Mode 2 and the temperature goes up to 110 degrees for six hours, after which it shuts down automatically.

When the base coat is dry, the stripes used in the aircraft paint color scheme are ready to be laid out, starting with application of tape to define the stripes. The rest of the aircraft is then masked off and the stripes are painted, completing the design. Now the aircraft can be “unwrapped” and the detailing started, including the application of all aircraft placards.

With that, the job is complete. All it took was experience, advanced technology and a proven process.



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