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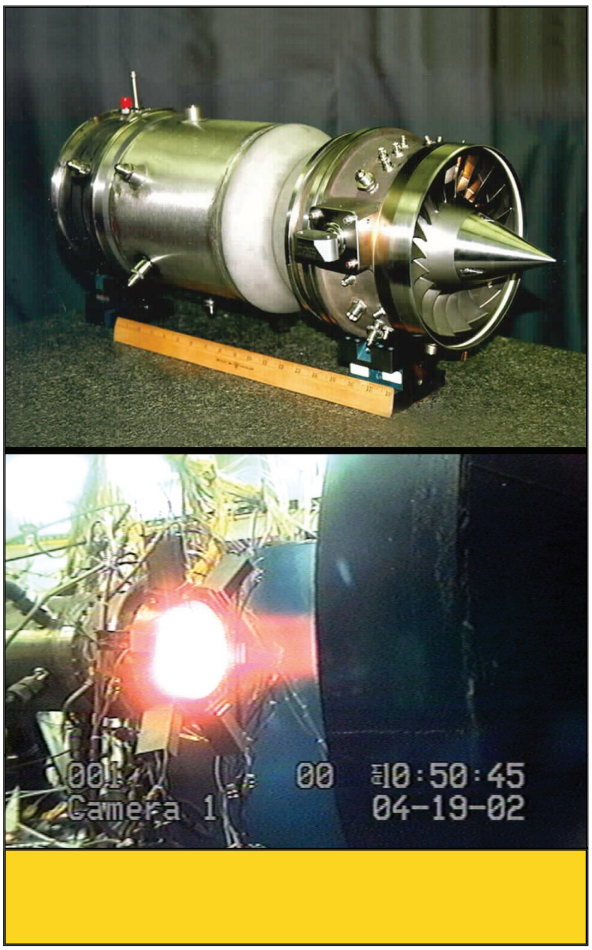
Science and Technology for Tomorrow's Air and Space Force

Success Story

NEW GENERATION ADVANCED ENGINE SUCCESSFULLY TESTED



Williams International's XTL86/2 engine, a small turbojet developed under the Integrated High Performance Turbine Engine Technology (IHPTET) program, demonstrated dramatically improved performance over conventional missile engine designs. This engine is capable of providing the thrust, without afterburner, necessary to reach the Mach 3+ speeds required for future missile operations.

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Accomplishment

Williams International recently tested a new generation advanced engine. This small turbojet engine will provide support to the Propulsion Directorate's and Department of Defense's (DoD) high-speed air vehicle programs, as well as the National Aeronautics and Space Administration's (NASA) low-cost access-to-space plans, at Williams International's Walled Lake, Michigan facility.

Background

The cooperative DoD/NASA/industry IHPTET program develops advanced material and component technologies for future Mach 3+ missile and air vehicle applications. The IHPTET program also advances those technologies to double the performance of all classes of military turbine engines.

IHPTET's Phase II goals call for an aggressive 70% increase in specific thrust over its baseline turbine engine and the capability to run turbine temperatures 900˚F hotter than normal without extracting compressor air to cool the hot section of the engine. The XTL86/2 engine recently achieved both of these goals in a single demonstration run.

IHPTET also has an aggressive goal for engine cost reduction. Engine manufacturers must design demonstrator engines, such as the XTL86/2, to sell for 45% less than baseline turbine engines. The XTL86/2 met that goal with its design simplicity, minimal part count, and use of advanced ceramic composite hot section materials. The turbine nozzle, turbine rotor, and exhaust nozzle assembly are all made from new composite materials that can operate at very high temperatures without incurring the complexity, performance, and cost penalties associated with air cooling.

Propulsion
Emerging Technologies

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (02-PR-08)