

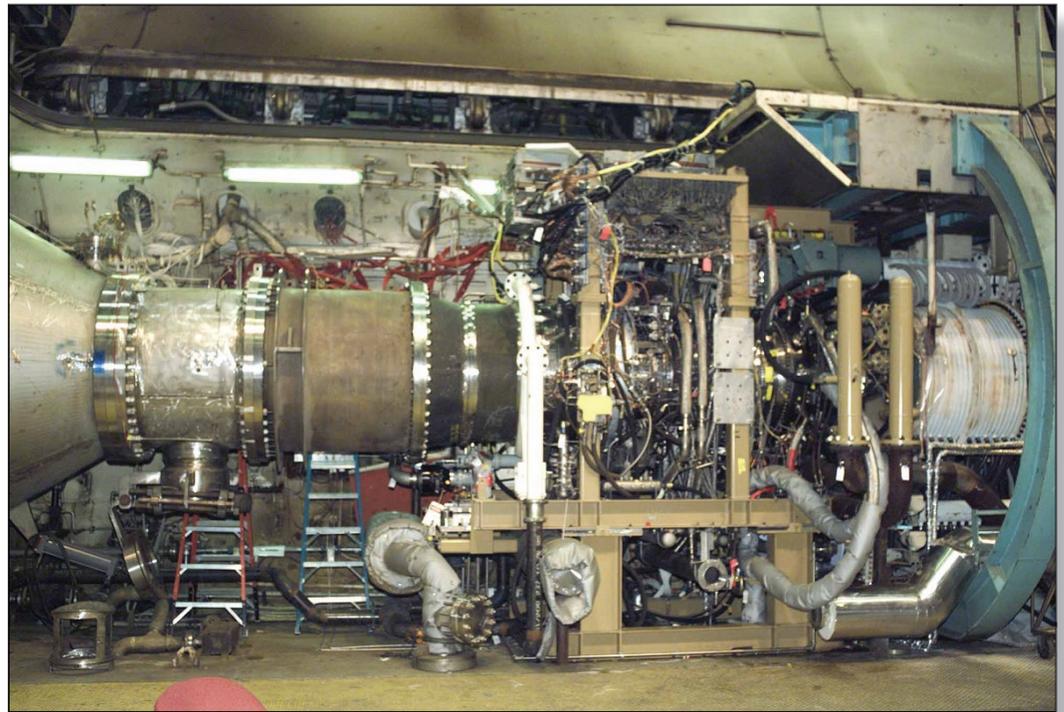


Air Force Research Laboratory | AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

XTC-67 JET ENGINE CORE TEST SUCCESSFULLY COMPLETED



The Pratt & Whitney (P&W) XTC67/1 core demonstrator recently demonstrated the highest steady-state turbine rotor inlet temperature (T_{41}) ever achieved by a P&W engine. The high T_{41} operating temperatures provide increased engine thrust levels and is a key to meeting the Integrated High Performance Turbine Engine Technology (IHPTET) program goal of doubling jet engine thrust-to-weight ratio. The hot section technologies of the core engine have excellent technology transition potential to the Joint Strike Fighter F135 engine and the F/A-22's F119 engine.



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Accomplishment

Propulsion Directorate engineers recently completed 96 hrs of testing at the Arnold Engineering and Development Center validating improvements in thrust to weight ratios and decreases in production and maintenance costs for the P&W XTC67 turbine engine core technology demonstrator. The XTC67 core engine, part of the IHPTET program, met the required test objectives and clears the way for testing the full engine demonstrator, or XTE67/1.

This XTC67 core engine demonstrator also verified the highest steady-state fuel/air ratio ever run in a P&W engine. Key technologies tested include a four stage high pressure compressor with gamma titanium-aluminide stators that incorporate mistuning techniques to help reduce material failures due to high cycle fatigue; high fuel-air ratio floatwall combustor; thinwall supercooled turbine blades; and micro-circuit turbine blade outer air seals.

Background

The IHPTET program is a national collaborative effort among the Air Force, Navy, Army, the National Aeronautics and Space Administration, the Defense Advanced Research Projects Agency and the aerospace industry to double aircraft propulsion capability by 2005. Joint service technology demonstrator core engines like the XTC67/1 validate improvements in advanced design, performance, life, and cost.

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. (03-PR-27)