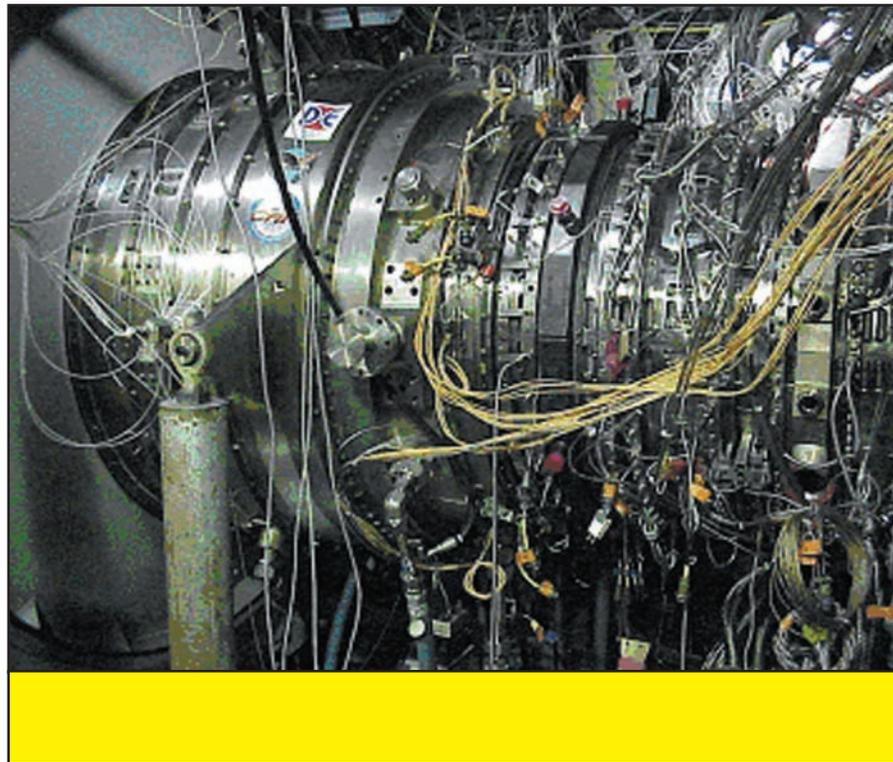




## **Success Story**

### **COMPRESSOR DEMONSTRATES TECHNOLOGY FOR ADVANCED FAMILY OF TURBINE ENGINES**



The Propulsion Directorate successfully tested a turbine engine compressor representing nearly 20 years of research at the directorate's Compressor Research Facility. New technologies incorporated in this compressor demonstrate dramatic performance gains over existing operational engines and will lead to high-performance, high-efficiency engines for both military and commercial users.



Air Force Research Laboratory  
Wright-Patterson AFB OH

### **Accomplishment**

Built by team member Pratt & Whitney, this compressor represents an Integrated High Performance Turbine Engine Technology (IHPTET) Phase III compressor, the final phase of this multi-year effort. This four-stage compressor does more work, more efficiently, than the F 100's 10 stages in the current compressor in the F-15's F100 engine. The compressor performs with a drastically reduced parts count and reduced overall engine length and weight. To accomplish performance gains, the IHPTET team incorporated advances in compressor aerothermodynamics, understanding of secondary flow losses, high stage loading approaches, advanced structural and manufacturing concepts, and advanced materials. These improvements benefit all end users, military and commercial, by reducing maintenance and acquisition costs.

### **Background**

The IHPTET program is an on-going national effort to double US military aircraft propulsion capability. The IHPTET team coordinates the gas turbine engine research and development activities of the Army, Navy, Air Force, National Aeronautics and Space Administration (NASA), Defense Advanced Research Projects Agency, and six US turbine engine manufacturers.

IHPTET team member, NASA Glenn Research Center, provided computational fluid dynamics' simulations in support of this test. Researchers used the joint industry/NASA Glenn-developed multistage turbomachinery code, APNASA, to quantify design changes that will ultimately lead to more improved compressor performance.

According to sources at Pratt & Whitney, the engine manufacturer will use derivatives of this compressor in engines such as the PW7000 developed for military users and the PW6000 for commercial users. An additional IHPTET demonstration of this compressor technology will involve the Advanced Turbine Engine Gas Generator core, designated XTC67/1, in early 2001.

Propulsion  
Emerging Technologies  
Support to the Warfighter  
Technology Transfer

### **Additional information**

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTT, (800) 203-6451 and you will be directed to the appropriate Laboratory expert. (01-PR-02)