

# Propulsion Research Facility offers J85 test capability



Customers looking for a cost-effective way to test propulsion diagnostics technologies prior to application in larger scale turbine engine testing have had great success at the J85 turbojet test stands located in middle Tennessee.

The AEDC instrumentation and diagnostics team partnered with the University of Tennessee Space Institute (UTSI) personnel to establish the sea-level-static test stands, which are located in the UTSI Propulsion Research Facility (PRF).

The test stands have served as technology development platforms using the J85-GE-5 turbojet engine.

A key element in the development of turbine engine diagnostics is the demonstration and/or validation of the diagnostic technologies in a relevant or operational environment prior to their transition to complex engine test programs. Developmental evaluations of the diagnostics in large scale turbine engine test facilities are less desirable because the test programs are generally held to a rigid schedule and the operational environment is not conducive to diagnostics development. In addition, the access to the engine components or flow-field region of interest on these large test programs is difficult.

The J85-GE-5 engine is utilized in the PRF test stand because of its economical operation and readily avail-

able replacement parts, as well as its capability of providing a high-temperature exhaust stream representative of larger augmented gas turbine engine configurations.

Since the establishment of the initial test stand in 2004, more than 70 test programs for government and commercial organizations have been accomplished, and the facility has been expanded to support a second test stand for advanced augmentor configurations.

Test efforts in the PRF have included flow-field probes, laser-based and optical diagnostics, embedded sensors, emissions measurements, heat shield materials, engine stall margin performance and advanced augmentor components. Future plans include the addition of a GE F404 engine test stand to meet turbofan test needs, such as turbine blade structural diagnostics development.

The PRF test stands are expected to play a key role in the development and transition of gas turbine engine diagnostic systems, instrumentation, materials and test techniques for the foreseeable future. The stands are available to qualified customers who wish to perform turbine engine studies of a similar scale.



AEDC's upgraded J85 Augmentor Rig coupled to GE's developmental augmentor assembly.



The J85 operating at maximum augmentor conditions

## Key Points

- ✓ Cost-effective, flexible schedule turbine engine testing
- ✓ Over 10 years of operational success
- ✓ J85 engines with standard and modified configurations
- ✓ Advanced measurement and data systems available
- ✓ Addition of F404 turbofan test stand in the near future



Flow field probing hardware positioned in the engine exhaust