

Engine Components Research Laboratory at NASA Glenn Research Center

The **Engine Components Research Laboratory (ECRL)** has the capabilities and expertise to perform high-quality and high-performance testing supporting research in combustor and afterburner concepts, as well as small turbine engine research and development.

Facility Description

This facility is extremely useful to the research community because it provides flexibility of testing a wide variety of test hardware configurations.

There are two separate test rigs that each specialize in a unique area of engine technology research: Advanced Combustor Rig (ECRL-1B) is used to test and evaluate combustor and propulsion concepts. This facility has supported testing of pulse detonation engine concepts, rocket-based combined cycle (RBCC), joint strike fighter augmentors, combustor instability, and material durability research.

Small Turbine Engine Rig (ERCL-2B) is used for turbine engine research. Past test programs have investigated ceramic and brush seal technology, thermal inlet distortions, active vibration control, and digital fuel control technology. Current testing is evaluating active stall control.

Facility Benefits

- Full-scale combustor rig with flexibility to test a wide variety of test hardware configurations
- 150 psig combustion air up to 60 lb/sec
- Altitude exhaust simulation up to 50,000 ft
- Gaseous hydrogen and oxygen testing capability
- Accommodates in-house and private industry research programs
- Experienced staff of technicians, engineers, researchers, and operators

Commercial Applications

- Aircraft engines

Programs and Projects Supported

- Fundamental Aeronautics Subsonic Rotary Wing
- Joint Strike Fighter Augmentor Development
- RBCC
- Pulse Detonation Engine (PDE)



ECRL-2B T-700 Active Stall Control Test.



Technicians monitor a test from the control room of the ECRL.

Facility Testing Information

<http://facilities.grc.nasa.gov>

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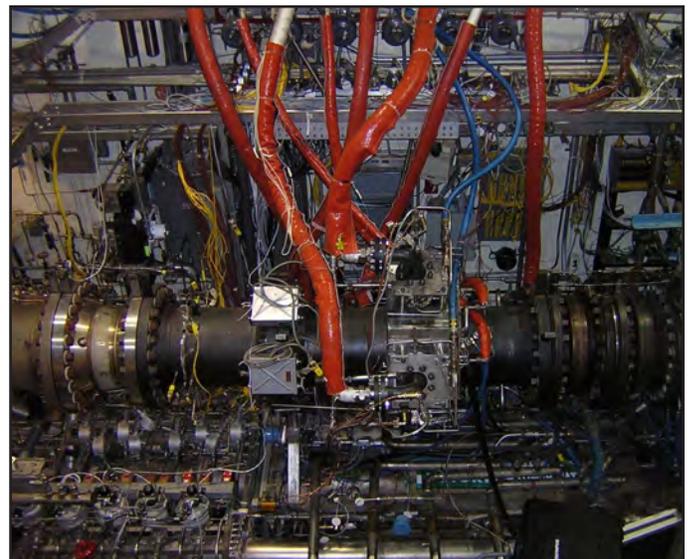
Capabilities

Combustor Facilities—Engine Research Building (ERB), ECRL, and Advanced Subsonic Combustion Rig (ASCR)

Facility	Test emphasis	Maximum pressure, psig	Maximum airflow, lb/s	Nonvitiated heated air, °F	Maximum exhaust temperature, °F
CE-5B-1	Sector	60 to 275	2 to 12	500 to 1,350	3,200
CE-5B-2	Flametube	60 to 400	0.6 to 5	500 to 1,350	3,200
CE-9B-A	Sector	120 to 450	5 to 30	750 to 1,100	3,400
CE-9B-B	Flametube	120 to 450	1 to 15	750 to 1,100	3,400
ASCR Leg 1	Sector	50 to 900	3 to 50	500 to 1,200	3,400
ASCR Leg 2	Flametube	50 to 900	1 to 10	500 to 1,200	3,400
ECRL-1B	Augmentors	5 to 150	5 to 60	100 to 625	1,900



Technicians prepare the T-700 Active Stall Control demonstration in the ECRL Cell 2B.



Joint Strike Fighter Augmentor Test in the ECRL Cell 1B.