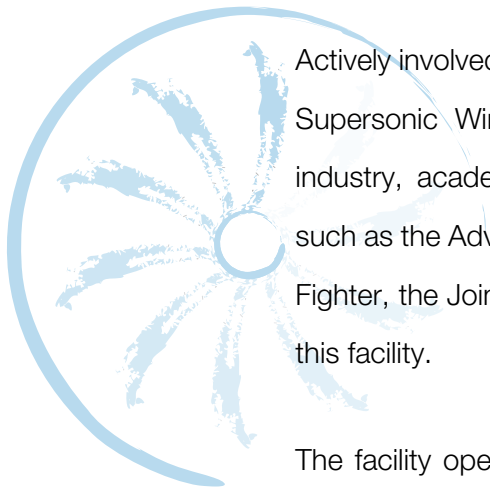




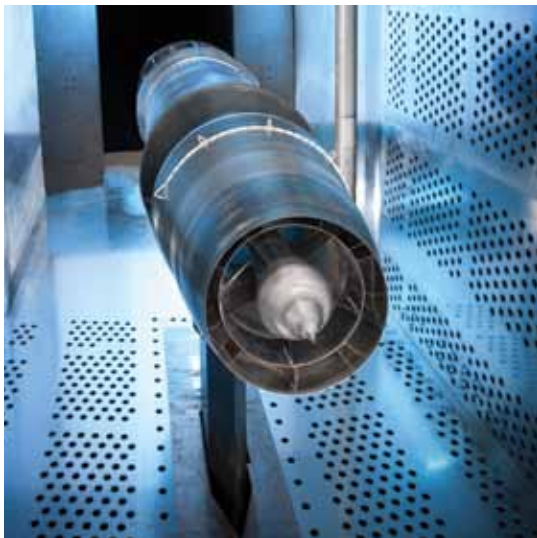
NASA's Aeronautics Test Program

8- by 6-Foot Supersonic Wind Tunnel

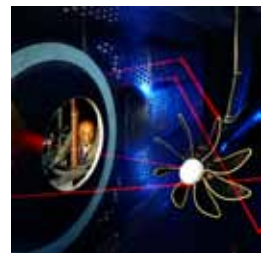


Actively involved in research and development testing for over 60 years, the 8- by 6-Foot Supersonic Wind Tunnel is NASA's only transonic-propulsion wind tunnel, serving industry, academia, and NASA's own community of aerospace researchers. Aircraft such as the Advanced Turboprop, the National AeroSpace Plane, the Advanced Tactical Fighter, the Joint Strike Fighter, and the High-Speed Civil Transport have been tested in this facility.

The facility operates either in an aerodynamic closed-loop cycle, testing aerodynamic performance models, or in a propulsion open-loop cycle that tests live fuel-burning engines and models.



From left to right: Low Boom supersonic inlet, National AeroSpace Plane (NASP) nozzle, Space Shuttle Return-to-Flight cable tray ramp removal test, and SR-7A turboprop.



Facility Benefits

- Supports research testing of advanced aircraft and launch vehicle concepts
- Real-time data acquisition and display in both alphanumeric and graphical format
- Standardized data acquisition systems at all Glenn wind tunnel facilities
- Integrated data acquisition and model actuation system provides for efficient, cost-effective testing
- Aerodynamic and propulsion cycle operating modes
- Model support systems (hydraulics, exhaust, high-pressure air, fuels, etc.)
- Flow visualization systems—Schlieren, oil flow, and pressure-sensitive paint
- Experienced staff of technicians, engineers, researchers, and operators
- When coupled with NASA Glenn’s 10- by 10-Foot Supersonic Wind Tunnel, provides aerodynamic and propulsion test capabilities from low-subsonic through high-supersonic Mach range



Facility Applications

- Aircraft and missile development
- Next-generation launch vehicles
- Jet and rocket engines
- Supported programs and projects including the National AeroSpace Plane (NASP), Joint Strike Fighter (JSF), Advanced Ducted Propeller (ADP), space shuttle, Advanced Tactical Fighter, High-Speed Civil Transport, and Orbital Space Plane (OSP)

Characteristics

Test section dimensions	8 ft high by 6 ft wide by 23.5 ft long
Speed	Mach 0 to 0.1 and 0.25 to 2.0
Relative altitude	1,000 to 35,000 ft
Reynolds number	3.6 to 4.8×10^6 per ft
Temperature	520 to 720 °R
Dynamic pressure	200 to 1,340 psf
Stagnation pressure	15.3 to 25 psia
Fuels	Gaseous hydrogen

Data Acquisition and Processing

Steady State Data Acquisition	Real-time acquisition and display of up to 288 engineering unit converted data channels and up to 8,000 calculated channels in tabular or graphical formats with 1 to 2 updates per sec. Analog input accuracies of better than $\pm 0.05\%$ of range (± 5 to 10,240 mV) are provided. Custom application-specific features (customer system integration, remote data access, secure testing, to name a few) are available upon request.
Dynamic Data Acquisition	Engineering unit converted data channels (63) and calculations are acquired and displayed on real-time tabular, X–Y, FFT, scope, and other displays. Un-aliased bandwidths of 420 Hz to 44 kHz are provided by a 24-bit A/D per channel sampling at 1,000 to 200,000 samples/sec. Data can be transferred in near real-time to customers in standard or custom data formats. Channels can be added, in groups of 63, to meet customer requirements.

Instrumentation

Pressure measurement Electronically scanned pressure (ESP) system	384 ports
Temperature measurement Thermocouples	48 (type J, T, or E)
Flow visualization	Schlieren system, sheet laser, pressure-sensitive paint, and high-speed video
Test article controls	Digital model control system with graphical interface and automated test article sequencing system

Contact Information

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