

Static and Fatigue Testing of Full-Scale Aircraft Structures

For more than 20 years, Southwest Research Institute® (SwRI®) has conducted static and fatigue testing for full-scale aircraft structures and major components. Technical staff members use their extensive knowledge of aircraft structures and in-flight loading to produce cost-effective and timely test programs. These test programs use state-of-the-art equipment to provide hydraulic load and fuselage pressurization control combined with data acquisition hardware for high channel count monitoring and recording of loads, deflections, strain and crack growth.

KEYWORDS

Aircraft Structural Testing
Static Structural Testing
Fatigue Structural Testing
Full-Scale Aircraft Structures Testing
Aircraft Components Structural Testing
Life-Assessment Testing
Strain Gage Applications
Strain Gage Instrumentation

Capabilities

SwRI develops comprehensive aircraft structures test programs tailored to client needs that can include loads development, test procedures, test fixtures, load frame, test setup, instrumentation, test monitoring, nondestructive inspection (NDI), data analysis, teardown and post-test documentation. The Institute routinely designs and fabricates the load frame, whiffle trees, and hydraulic load systems. Customized software and data processing are also developed to meet clients' unique monitoring and measurement reporting needs.

Experience

- T-37** ■ Full-scale fatigue testing
- T-38** ■ Full-scale fuselage fatigue testing
 - Wing fatigue testing
 - Flap testing
 - Horizontal tail testing
- T-39** ■ Wing fatigue testing
- C-130** ■ Skin panel fatigue testing
 - Landing gear attachment frame fatigue testing

Facilities

- Temperature and humidity controlled structures test building with 7,000 square feet of completely unencumbered test floor
- Total test floor coverage by 30-ton bridge crane with 30-ft hook height plus 10-ton independent secondary hook
- Hydraulic power supplies of up to 80 gpm at 3,000 psi
- Air pressurization system up to 375 cfm at 150 psi
- MTS AeroST hydraulic controller supported by customizable LabVIEW® data acquisition systems



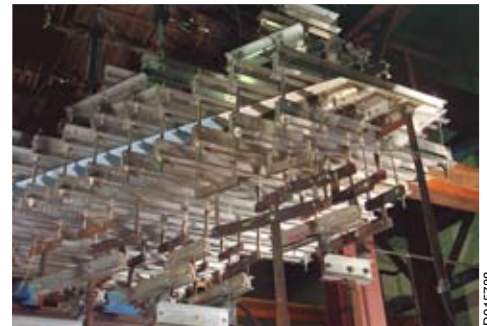
Full-scale fuselage testing

DO15725



Custom test rigs designed, fabricated and used by SwRI for structural testing

DOE134383



Example of a distributed wing load test

DO15788

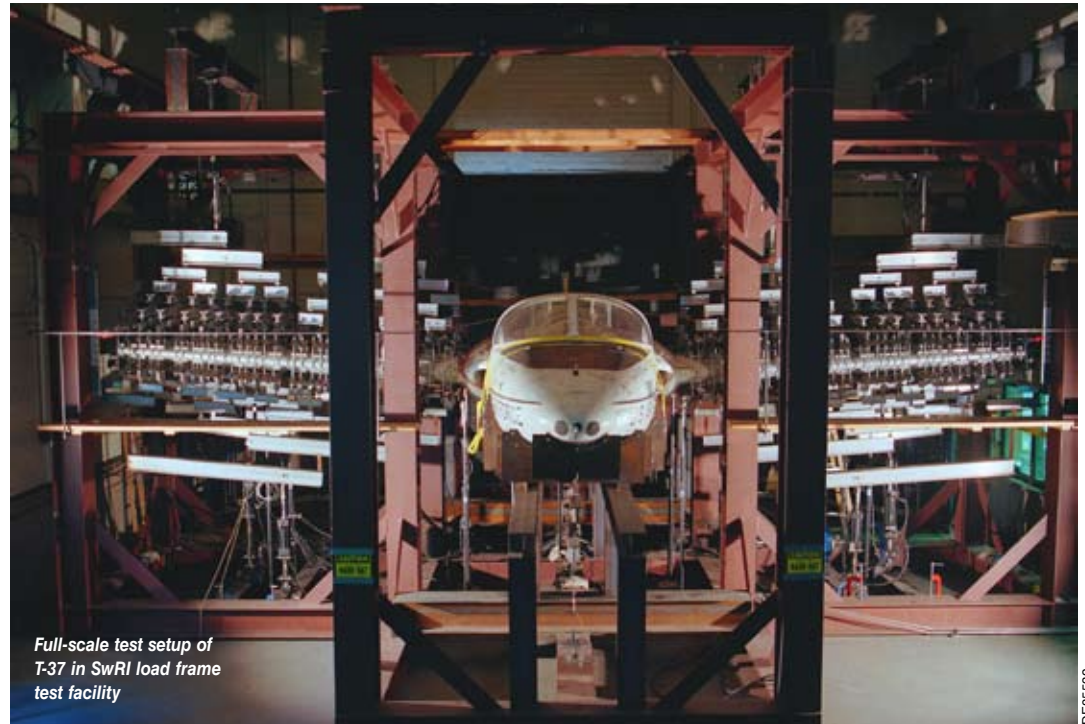


Wing section of T-39 trainer undergoing fatigue testing

DO 15789



Benefiting government,
industry and the public
through innovative
science and technology



Full-scale test setup of
T-37 in SwRI load frame
test facility

DE85532



Southwest Research Institute is an independent, nonprofit, applied engineering and physical sciences research and development organization using multidisciplinary approaches to problem solving. The Institute occupies 1,200 acres in San Antonio, Texas, and provides more than 2 million square feet of laboratories, test facilities, workshops and offices for more than 3,000 employees who perform contract work for industry and government clients.

**We welcome
your inquiries.**

**For additional
information,
please contact:**

Mark Jones, Senior Research Engineer
Aerospace Structures
(210) 522-8328 • Fax (210) 522-3042
mark.jones@swri.org

Kenneth E. Griffin, Ph.D., Manager
Aerospace Structures
(210) 522-6873 • Fax (210) 522-3042
kenneth.griffin@swri.org

Department of Structural Engineering
Mechanical and Materials Engineering Division
Southwest Research Institute
6220 Culebra Road (78238-5166)
P.O. Box 28510 (78228-0510)
San Antonio, Texas

www.swri.org
www.aerospacestructures.swri.org

An Equal Opportunity Employer M/F/D/V
Committed to Diversity in the Workplace