

716 TEST SQUADRON



MISSION

Responsible for the flight systems product area. Manages flight systems wind tunnel development and evaluation testing in simulated subsonic, transonic, supersonic, and hypersonic flight envelopes. Serves as primary customer interface and center planning and execution agent for performing the flight systems test mission. Responsible for developing and communicating the strategic roadmap for all aspects and support to the flight systems product area. Responsible for all aspects of the test mission including budgeting, business development, test planning, test execution, and data analysis and reporting. Directs flight systems analysis and evaluation program.

AEDC's 716 Test Squadron (TS) offers aerodynamic ground test capabilities from very low subsonic speeds through Mach 10 in various wind tunnels. These wind tunnels provide essential test and analysis services in support of DoD, national, U.S. industry and international aerospace programs. AEDC operates five active wind tunnels in two primary facilities, the Propulsion Wind Tunnel Facility (PWT) and the von Karman Gas Dynamics Facility (VKF).

Leads a team of more than 150 government and contractor personnel conducting flight systems development and evaluation testing in simulated subsonic, transonic, supersonic and hypersonic flight envelopes to include government, commercial and international aircraft, missile and space systems. Serves as primary customer interface and center planning and execution agent for performing the flight systems test mission. Responsible for developing and communicating the strategic roadmap for all aspects and support to the flight systems product area. Responsible for all aspects of the test mission including budgeting, business development, test planning, test execution, and data analysis and reporting. Directs flight systems analysis and evaluation program

AEDC wind tunnels are used for conducting vehicle aerodynamic performance evaluation and validation, weapons integration, inlet/airframe integration, exhaust jet effects and reaction control systems, code validation, proof-of-concept, large- and full-scale component research and development, system integration, acoustics, thermal protection system evaluation, hypersonic flow physics, space launch vehicles, operational propulsion systems and captive flight.

LINEAGE

6516 Logistics (Test) Squadron designated, 15 May 1986
Activated, 1 Oct 1986
Redesignated 716 Logistics Test Squadron, 2 Oct 1992
Redesignated 716 Test Squadron, 1 Oct 1994
Inactivated, 30 Dec 1997
Activated, 1 Jun 2006
Inactivated, 30 Jun 2010
Activated, 2 May 2022

STATIONS

Edwards AFB, CA, 1 Oct 1986-30 Dec 1997
Arnold AFB, TN, 1 Jun 2006-30 Jun 2010
Arnold AFB, TN, 2 May 2022

ASSIGNMENTS

6510 Maintenance and Supply Group, 1 Oct 1986
6510 Test (later, 412 Test) Group, 10 Mar 1989-30 Dec 1997
704 Test Group, 1 Jun 2006-30 Jun 2010
804 Test Group, 2 May 2022

COMMANDERS

HONORS

Service Streamers

Campaign Streamers

Armed Forces Expeditionary Streamers

Decorations

Air Force Outstanding Unit Award
1 Jan 1996-31 Dec 1996

EMBLEM

On a disc Azure, from dexter chief five concentric arcs radiating throughout and overall issuant from sinister base three shock wave lines terminating to center point Silver Gray, charged with a

flight symbol ascending bendwise Gules emitting a contrail terminating to sinister base Or, all within a border of the same. Attached above the disc, a Blue scroll edged with a narrow Yellow border and inscribed "AD CAELUM PER SCIENTIAM" in Yellow letters. Attached below the disc, a Blue scroll edged with a narrow Yellow border and inscribed "716TH TEST SQUADRON" in Yellow letters. **SIGNIFICANCE:** Ultramarine blue and Air Force yellow are the Air Force colors. Blue alludes to the sky, the primary theater of Air Force operations. Yellow refers to the sun and the excellence required of Air Force personnel. The five silver gray circular dash lines represent the vehicle in a tunnel under test. The red concept vehicle is similar to the one on the Arnold Engineering Development Center emblem and the yellow plume it emits signifies propulsion integration testing performed by the unit. The three silver gray shock waves symbolize the three aerodynamic regions: subsonic, supersonic and hypersonic. (Approved, 16 Jan 2008)

MOTTO

AD CAELUM PER SCIENTIAM--To The Skies With Knowledge

OPERATIONS

The 716th TS generated almost \$15 million of test revenue in fiscal year 2008. Testing in fiscal year 2008 included multiple store separation tests and multiple tests in support of NASA's shuttle replacement program - Constellation. Additionally, several classified programs added heavily to the total workload.

Two new war-fighting tools in America's arsenal joined forces for the first time during simulated store separation testing at AEDC.

A team from Lockheed Martin and Arnold tested the Small Diameter Bomb (SDB) separating from the F-35 Lightning II in the center's four-foot transonic wind tunnel (4T). The primary focus was to assess the SDB and its interactions with this aircraft.

Additional store separation test were conducted in 4T that provided weapons compatibility and separation data for AIM-9X, AIM-120C, AIM-132, GBU-31 and GBU-39 stores on a 1/15-scale model of the F-35 Lightning II.

In the 16-foot transonic wind tunnel (16T), store separation testing was conducted on a model of the Navy's F/A-18. The test provided weapons compatibility and separation data for AIM-120C, AWW-13, GBU-10, GBU-12 F/B, MK-65, MK-83 over a Mach range from 0.6 to 1.5 on a 1/10-scale F/A-18E/F. The testing included two phases; one focused on captive loads entries and the other on captive trajectory system (CTS) entries. The loads phase measured the force and moment of stores mounted on the aircraft.

Testing performed in Wind Tunnel A on the NASA Ares I and 1-X was conducted to obtain stage separation data at Mach numbers 4.5 and 5.5. The Ares I rocket will be used to lift the manned Orion Crew Exploration Vehicle (CEV) into orbit.

Fiscal year 2009 is expected to have an increase of approximately 40 percent above fiscal year 2008 revenues. Multiple miscellaneous store separation tests are expected, including extensive F/A-18E/F testing and some NASA Ares support. Several classified programs are expected to round out the workload.

USAF UNIT HISTORIES

Created: 16 Jun 2020

Updated: 7 Dec 2022

Sources

Air Force Historical Research Agency. U.S. Air Force. Maxwell AFB, AL.

The Institute of Heraldry. U.S. Army. Fort Belvoir, VA.

Air Force News. Air Force Public Affairs Agency.