

# **651 TEST SYSTEMS SQUADRON**

## **MISSION**

The 651st Test Systems Squadron is responsible for the execution of restoration, modernization, and improvement projects to deliver enhanced AEDC RDT&E capabilities. The squadron provides program management for system design, procurement, fabrication, installation, construction and checkout. These efforts provide the mechanism to meet future test needs while right-sizing the test infrastructure, reducing test systems maintenance and cutting operational costs.

## **LINEAGE**

651 Test Systems Squadron

## **STATIONS**

Arnold AFB, TN

## **ASSIGNMENTS**

## **COMMANDERS**

## **HONORS**

**Service Streamers**

**Campaign Streamers**

**Armed Forces Expeditionary Streamers**

**Decorations**

## **EMBLEM**

## **EMBLEM SIGNIFICANCE**

## **MOTTO**

## **NICKNAME**

### **OPERATIONS**

Fiscal Year 2008 Highlights: The scope of the 4T Modernization project was to improve weapons separation simulation, acoustic measurement system, upgrading high angle-of-attack measurement system, updating the flex nozzle control system and data acquisition system hardware. It also included modernization and automation of process air controls and test section controls. The overall effort was comprised of several programs, each designed to achieve the necessary and required modernization.

The 4T test facility was originally developed to provide a lower cost option for air vehicle aerodynamics and weapons separation risk mitigation. Operational in the early 1960s, only a few of the key components and control systems were modernized in the intervening years. Key subsystems include the nozzle actuators and control system and the Captive Trajectory System (CTS). The existing CTS is nearing the end of its useful service life and does not have adequate structural load bearing capability as required by newer weapons systems.

Additionally, the 651st TESS conducted a System Requirements Review (SRR) to establish requirements for the 4T Flex Nozzle. Concept alternatives were evaluated and rated for the CTS replacement. Additionally, a planning review was conducted on the 4T Data System as well as a System Requirements Review (SRR) to establish requirements to increase Mach number capability in 4T from 2.0 to 2.46.

Another effort underway was a modernization activity on Tunnels A, B and C. The scope of the effort over the next six years is to provide modernization and standardization through substantial upgrades for Transonic Tunnel 4T, the Supersonic Tunnel A, Hypersonic Tunnels B and C and the von Karman Plant (V-Plant) at AEDC.

Also, an additional effort will be to revitalize and upgrade the infrastructure of Tunnels A/B/C in order to provide enhanced operation, reliability, measurement, and simulation capabilities. The data acquired in these tunnels have contributed to the development of everything from the X-planes that stretched the boundaries of flight to the latest aircraft and missiles in the DoD inventory.

The Propulsion Consolidation & Streamlining project was a \$36.6 million effort that executed from fiscal year 2004 through fiscal year 2008. This project upgraded the AEDC Engine Test Facility (ETF) Test Cells to take advantage

of the AEDC C-plant capability by improving plant systems reliability/availability and mitigating single point failures throughout plant systems and reducing engine installation and removal cycle time. Completing this project was an important step in allowing AEDC to realize the benefits of consolidating to a single ETF plant by reducing AEDC reliance on aging infrastructure that is past its design life.

These improvements will provide benefits to all military engine programs tested at AEDC as well as commercial customers. Some of the programs supported include FIDO, F110, Rolls-Royce Trent, P&W GP7200, P&W 6000, F119 and the F135 and F136 JSF engine programs.

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Air Force Lineage and Honors

Created: 16 Jun 2020

Updated:

Sources

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