

## TEST AND EVALUATION (T&E)

The term test means a dedicated effort to collect, verify and share data to ensure a weapon system is capable of performing its mission as part of America's defense. Testing is a critical component in system development and integration. Weapon systems must be affordable and able to perform in the expected operational environment. Test data is used to confirm satisfactory performance. The data collected during test is evaluated to ensure the operation of the system is fully understood and the need for correction of deficiencies is balanced against the cost of those fixes.

## TYPES OF TESTING

**Integrated Test and Evaluation (IT&E).** IT&E is conducted as the weapon system is put through its paces by government developmental testers and operational testers integrating activities to provide key information on weapon system maturity. That is the weapon system's design stability and dependability. This information is used to determine readiness for dedicated Operational Test and Evaluation.

**Early Operational Assessment (EOA).** Conducted very early in a program, an EOA provides insight into a new system's progress toward proving it meets its operational effectiveness, suitability, and mission capability requirements.

**Operational Assessment (OA).** The focus of an OA is on significant trends noted in development efforts, programmatic voids, areas of risk, adequacy of requirements, and the ability of the program to support adequate operational testing. Operational assessments may be made at any time, but are not a substitute for the independent operational test and evaluation needed to support full production decisions.

**Operational Test and Evaluation (OT&E).** The field test, under realistic combat conditions, of a system or system component of a weapon, equipment, or munition to determine its effectiveness and suitability for use in combat by typical military users. The data collected during OT&E is also evaluated, reviewed, and compared with other information for consistency and accuracy.

**Qualification Operational Test and Evaluation (QOT&E).** If a potential new system is available commercially and requires little or no research and development, then the IOT&E of this off-the-shelf technology is called a QOT&E.

**Follow-on Operational Test & Evaluation (FOT&E).** The OT&E that may be needed after IOT&E to ensure any problems found were fixed before a system is declared ready for full-scale production.

**Multiservice Operational Test and Evaluation (MOT&E).** If two or more of the military services are buying the same system, they may work together on an MOT&E. The purpose of a multiservice OT&E is to make sure each service can use the system to meet their unique needs, while consolidating test resources.

## THE HISTORY OF AFOTEC

For more than 36 years AFOTEC has served as the focal point for Air Force operational test and evaluation. The United States Air Force activated the Air Force Test and Evaluation Center (AFTEC) at Kirtland AFB, N.M., in January 1974 as a Separate Operating Agency reporting directly to the Chief of Staff of the Air Force. AFTEC was initially organized as a small management headquarters and tested only major weapon systems, while monitoring the testing done by the major air commands for less costly acquisition programs.

In April 1983, the Air Force renamed AFTEC the Air Force Operational Test and Evaluation Center to more accurately reflect its mission – operational testing. Later, as part of an Air Force-wide reorganization, the Air Force re-designated AFOTEC in February 1991 as a direct reporting unit to the Chief of Staff of the Air Force. In late 1991, the Air Force broadened the Center's responsibilities by re-assigning all initial, qualification, and selected follow-on operational test and evaluation from the major commands to AFOTEC. The center maintains five geographically separated detachments, five liaison officers at Headquarters Air Force and the product centers, and several operating locations across the United States supporting the operational testing mission.



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# AFOTEC

AIR FORCE OPERATIONAL  
TEST AND EVALUATION CENTER

## MISSION

AFOTEC Tests and Evaluates new war-fighting capabilities in operationally realistic environments, influencing and informing national resource decisions.

## VISION

Premier testers arming the warfighter with operational truth.

## Key AFOTEC Messages:

**"Testing is the conscience of acquisition"**

- William Perry  
19th Secretary of Defense  
February 3, 1994 – January 23, 1997

✓ **Operational test is one percent of a program's cost.**

**Testing doesn't cost, it pays.**

Some testers are focused on making the headlines to decide the outcome.



## THE ROLE OF TESTING

The Department of Defense acquisition framework takes a system from concept to operations to system disposal. AFOTEC plays an important part in this larger process by conducting operational test and evaluation (OT&E) of weapons, equipment, or munitions. Starting as an early concept, a new technology is developed and matured. AFOTEC plays a critical role in early influence, helping operators develop testable and measurable requirements. Often an early operational assessment (EOA) is conducted to assess the progress of the new system before it passes the Milestone B decision point to enter the engineering and manufacturing development (EMD) phase. After the new system passes the critical design review, an operational assessment (OA) is conducted to assess the new system's progress prior to moving through the rest of the EMD phase. If it passes its Milestone C decision point, it will move into the production and deployment phase.



During this phase, systems are put to the test—usually an initial operational test and evaluation (IOT&E) but sometimes, depending on the level of research and development activity needed, a qualification operational test and evaluation (QOT&E) may be used. In some cases, when two or more of the military services are interested in acquiring a system, they will cooperate to conduct a multiservice operational test and evaluation (MOT&E). All of these tests and evaluations draw on the skills of typical users, who put the new system through operations representative of how it will be used in the field. In other words, the system is tested under operationally realistic conditions. The tests evaluate how well the system meets its mission, how vulnerable it is to threats in the battlefield, and whether the system fits with doctrine and tactics normally used in battle. Collectively, these considerations are evaluated as the operational effectiveness of the system. AFOTEC also evaluates a system's reliability, maintainability and compatibility with other systems as part of the new system's operational suitability. Some systems, after their OT&E, are found to have additional or unresolved test issues. These systems may later undergo a follow-on operational test and evaluation (FOT&E) to ensure previously discovered problems are fixed. Operational test and evaluation has one primary purpose, to answer the question; does this system meet its stated requirements by providing its promised mission capabilities? The answer to this question will determine whether a system meets the needs of the war fighter and ultimately decide if the system becomes part of the military's arsenal.

AFOTEC conducts operational test and evaluation to reduce the risks inherent in new designs, to make sure technologies can deliver new capabilities on schedule while minimizing cost and schedule delays. Properly testing and evaluating systems means ensuring the men and women of the military are properly equipped to face threats every day while they protect and defend the United States.



## AFOTEC DETACHMENTS



Detachment 1 is located at Edwards AFB, Calif., and has operating locations at Fort Worth, Texas and Arlington, Va. Detachment 1 will lead Block 2 and Block 3 Initial Operational Testing and Evaluation for the F-35 Lightning II. The Detachment 1 Commander serves as the Joint Strike Fighter Joint Operational Test Team Combined Test Director, leading team members from the U.S. Air Force, U.S. Navy, U.S. Marines, United Kingdom Air Warfare Centre, and Royal Netherlands Air Force in testing and evaluating F-35 operations, training, and logistics.



Detachment 2 at Eglin AFB, Fla., is located on one of the largest land-water ranges in the United States. The detachment tests new and advanced munitions, electronic warfare equipment, mission planning systems, combat support, and command and control systems. Some of the systems tested by Detachment 2 include the extended range Joint Air-to-Surface Standoff Missile, Air Intercept Missile 9X, the Small Diameter Bomb II, Miniature Air Launched Decoy, and the Large Aircraft Infra-Red Counter Measure system.



Detachment 4 is located at Peterson AFB, Colo., and has an operating location at Vandenberg AFB, Calif. Detachment 4 conducts operational test and evaluation of space, cyberspace, information technology, missile, and missile defense systems. Some of the major systems tested by Detachment 4 include the Global Positioning System, Space Based Infrared System, Advanced Extremely High Frequency Satellite Communications, Space Based Space Surveillance, Cobra Judy Replacement, Defense Integrated Military Human Resources System, and the Integrated Strategic Planning and Analysis Network. In addition, Detachment 4 is part of the Ballistic Missile Defense System Operational Test Agency Combined Test Force, supporting test events that evaluate components of the overall Ballistic Missile Defense System.



Detachment 5 is located at Edwards AFB, Calif., and is co-located with the Air Force Flight Test Center. Detachment 5 also has an operating location at Hurlburt Field, Fla. Detachment 5 performs operational test and evaluation of mobility, bomber, and command and control, intelligence, surveillance and reconnaissance weapon systems. Detachment 5's major test programs include the C-5M Super Galaxy, MQ-9 Reaper, RQ-4 Global Hawk, C-130 enhancements, and ongoing system upgrades to the B-1, B-2, and B-52 bomber fleet. Additionally, Detachment 5 manages operational test of the Common Vertical Lift Support Platform, the C-27J Joint Cargo Aircraft, the E-3 Sentry Airborne Warning and Control System, and the KC-46 tanker programs.



Detachment 6 is located at Nellis AFB, Nev., near the Nevada Test and Training Range. Detachment 6 conducts operational test and evaluation of currently fielded Air Force fighter aircraft. Detachment 6 programs include the F-22A Raptor, A-10C Thunderbolt II, F-16C Fighting Falcon, F-15C Eagle, and F-15E Strike Eagle.