



AFOTEC

AIR FORCE OPERATIONAL TEST AND EVALUATION CENTER

**VALUE OF
TEST AND EVALUATION
TO THE WARFIGHTER**

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VALUE OF TEST AND EVALUATION TO THE WARFIGHTER

by Dr. Stephanie Smith

The Air Force Operational Test and Evaluation Center (AFOTEC), the Air Force Test Center (AFTC), and the U.S. Air Force Warfare Center (USAFWC) contribute significantly to acquisition by executing test and evaluation of new capabilities and upgraded systems. Nothing that they do, however, directly benefits them.¹ Instead, all that the test personnel of AFOTEC, AFTC, and USAFWC accomplish serves to support the warfighter.

One example, from Edwards AFB, illustrates the importance of test and evaluation, as well as the consequences of failing to answer essential questions. In 1953, aerospace manufacturer North American Aviation produced the YF-100 Super Sabre, the first production aircraft to reach Mach 1. Developmental testers at what is now the AFTC, including Maj Chuck Yeager, recommended substantial modifications when the airframe exhibited serious high-speed, directional, stability, and control issues. However, the threat posed by the Soviet MiG-15 led the Air Force to “forgo more cautious, prudent, and successful design and procurement practices.”² Neither the contractor nor the using command, the Tactical Air Command (TAC), agreed with the recommendations. The Air Force received the first F-100A production aircraft on September 27, 1954, only sixteen months after the YF-100’s first flight. Less than a month later, on October 12, North American test pilot George “Wheaties” Welch died flying the ninth production F-100A (serial number 52-5764) when inertia coupling caused the airframe to disintegrate mid-flight. By November 1, 1954, the aviation community had suffered six major mishaps and lost two pilots. The Air Force grounded all F-100As in 1955 for a lengthy period of redesign, followed by retrofits of existing airframes.³ Despite these efforts, the F-100A continued to have severe issues, and by the time the Air Force began phasing it out, the service had lost 47 aircraft.⁴

1 (U) Disc (U), Maj Gen James R. Sears, Jr., AFOTEC/CC with AFOTEC C&S, July 14, 2022.

2 (U) Michael E. Weaver, “The F-100 Super Sabre as an Air Superiority Fighter,” *Air Power History* 67, no. 1 (Spring 2020): 5

3 (U) Brig. Gen. Frank K. Everest, Jr., and John Guenther, *The Fastest Man Alive*, 2nd ed. (New York: Bantam Books, 1990), pp 1-6, 11-13, 103; Brig. Gen. Chuck Yeager and Leo Janos, Yeager: an Autobiography (New York: Bantam Books, 1985), pp 183-5; Report, “Phase II Flight Test of the North American YF-100A Airplane, USAF No. 52-5754,” (No. 53-33), December 1953, pp ii, 1-5; Joe Mizrahi, “F-100 Super Sabre: First of the Supersonic Century Series,” *Wings* 21, no. 3, (June 1991), pp 17-24, 33; History of the AFFTC: 1 Jan-30 Jun 1954 (U), pp 55-67; Marcelle S. Knaack, *Encyclopedia of U.S. Air Force Aircraft and Missile Systems: Vol. 1, Post-World War II Fighters*. (Washington, D.C.: Office of Air Force History, 1978), p 112-33.

4 (U) Article (U//Dist. A), AFFTC, “May 25, 1953: George Welch Took North American’s YF-100A

In 2009, AFOTEC demonstrated the value of routine operational test and evaluation to the warfighter when an assessment of the Tactical Air Control Party-Modernization Vehicular Communication System (TACP-M VCS) revealed its unsuitability. The U.S. Army had installed the TACP-M VCS, a system for calling in air support, in a High Mobility Multipurpose Military Vehicle (HMMMV). The center's testers demonstrated conclusively that design of the VCS did not permit safe egress of fully equipped combat air controllers. In response, the U.S. Army shifted the TACP-M system to the larger Stryker vehicle.⁵



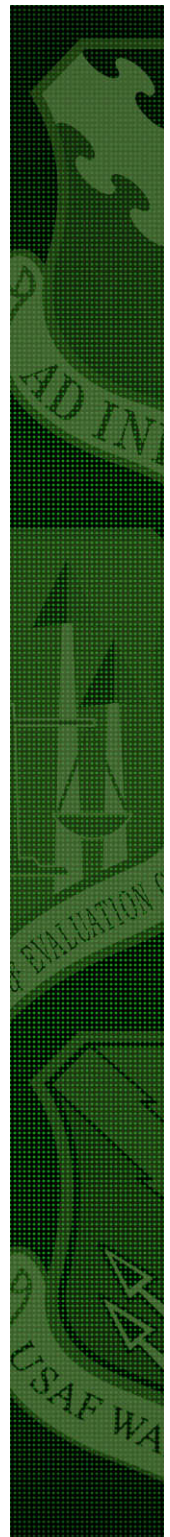
Screenshot from an AFOTEC video demonstrating that a forward combat air controller in combat gear could not exit a High Mobility Multipurpose Military Vehicle with the Tactical Air Control Party-Modernization Vehicular Communication System installed. (Image courtesy AFOTEC).

Test and evaluation also supports test of rapid acquisition projects required for U.S. contingency operations and those of the nation's allied partners. Such requests provide quick turn test programs to speed required capabilities to the warfighter. Contingency operations in Iraq and Afghanistan frequently relied such rapid acquisition actions to procure necessary materiel. These programs enhanced the U.S. Air Force's protection of its personnel, weapons systems, Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities, navigation, and its ability to minimize civilian casualties and damage to non-military structures.

On December 24, 2009, U.S. Central Command (USCENTCOM) called for an urgent test project in support of a Very Low Collateral Damage Weapon (VLCDW). USCENTCOM personnel hoped that such a weapon would, by minimizing noncombatant casualties

Super Sabre on its First Test Flight," 25 May 2021, accessed May 24, 2022 at <https://www.af.mil/News/On-This-Day-in-Test-History/Article-Display-Test-History/Article/2562762/may-25-1953-george-welch-took-north-americans-yf-100a-super-sabre-on-its-first/>.

5 (U) Email (U), Robert P. Bubello, AFMC ESC/HNAC, to Lt Col Timothy P. Cogger, AFOTEC Det 2/CS, "RE: VCS Future," September 21, 2010.



and collateral damage in irregular conflicts, aid in maintaining goodwill among local populations. On March 29, 2010, the Office of the Secretary of Defense's Joint Rapid Acquisition Cell directed execution of a Quick Reaction Capability (QRC) in answer to the request. This test effort furthered development and test of a Precision Lethality (PL) Mk82 equipped with a BLU 129/B warhead, designed to enhance lethality in the impact area while ensuring lower lethality farther afield. Integrated developmental and operational test and evaluation supported production deliveries of the warheads in 2011, only 18 months after tasking.⁶ These updated weapons resulted in two to three times less collateral damage than the original Mk82.⁷

A recent test and evaluation effort conducted by the U.S. Air Force Warfare Center via the 422d Flight Test Squadron (422 FLTS) promised significant potential benefit to the warfighter. Tests of a first truly mobile command and control (C2) system took place between 9 and 13 May 2022 during Black Flag 22-1, an exercise of large weapons and capabilities at the Nevada Test and Training Range. The personnel of the 422 FLTS combined existing commercial off the shelf (COTS) and military components with a commercial sport utility vehicle to create the first-ever mobile tactical C2 vehicle. Existing C2 systems had become targets, making them less viable in a future fight, while potential future deployment of a new, agile capability held the potential to revolutionize agile C2.⁸



Mobile Command and Control SUV at Black Flag 21-1, May 2022, at the Nevada Test and Training Range (USAF photo by SrA Zachary Rufus, 57 Wing/PA.)

6 (U) Article (U), "BLU-129/B – Very Low Collateral Damage Weapon (VLCDW)," GlobalSecurity, June 12, 2017; Pamphlet (U), Department of Energy, "Advanced Conventional Weapons," April 23, 2019.

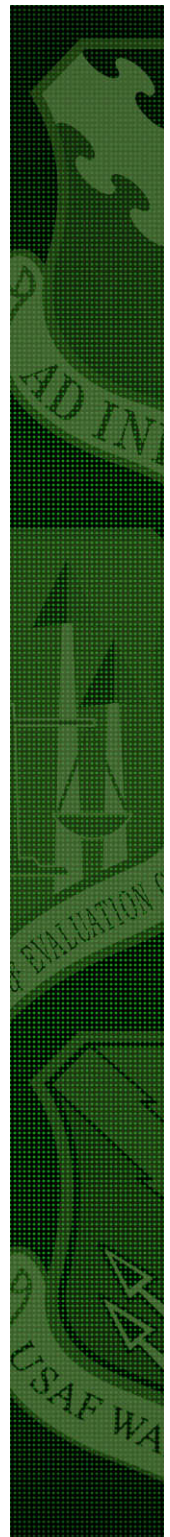
7 (U) Report (U), Director, Operational Test and Evaluation, "Air Force Programs: Joint Direct Attack Munition (JDAM)," 2011; Article (U), "USAF's Ultra-Lethal Carbon Fibre Bomb Approved for Export," FlightGlobal.com, June 29, 2015.

8 (U) Article (U), Kimberly Underwood, "Mobile C2 Gets Tactical." Signal (May 24, 2022) accessed July 18, 2022 at <https://www.afcea.org/content/mobile-c2-gets-tactical>.

The issues that plagued the YF-100 Super Sabre, the revealing operational tests of the TAP-M VCS HMMM V, quick turn tests of the VLCDW, or the potential of mobile C2 for a future fight demonstrated the need for test and evaluation professionals and their work. Whether conducted to verify safe aircraft operations, to test the utility of ground systems in realistic combat conditions, to supply joint urgent operational needs, to provide a weapon to meet both military and political requirements, or to equip personnel with mobile communications, these projects provided no direct advantage to testers. They could prove crucial to the warfighter in the field.

GLOSSARY

AFOTEC	Air Force Operational Test and Evaluation Center
AFTC	Air Force Test Center
C2	Command and Control
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
COTS	Commercial Off-the-Shelf
FLTS	Flight Test Squadron
HMMM V	High Mobility Multipurpose Military Vehicle
PL	Precision Lethality
QRC	Quick Reaction Capability
TAC	Tactical Air Command
TACP-M VCS	Tactical Air Control Party-Modernization Vehicular Communication System
USAFWC	U.S. Air Force Warfare Center
USCENTCOM	U.S. Central Command
VLCDW	Very Low Collateral Damage Weapon



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