



*Giving a decisive
edge to America's
men & women
in uniform*



Operation Iraqi Freedom

**Developmental Test Command
provides vital support to war
against terrorism in Iraq**

DTC is a pivotal player in programs to test the Stryker and Future Combat Systems. To prepare Stryker Brigade Combat Teams for deployment to Iraq, DTC tested slat armor to be added on to their vehicles.



Developmental testers strive to ensure soldiers have systems that work

By Mike Cast

Public Affairs

Developmental Test Command

The soldiers and civilians playing a supporting role in America's fight against terrorism and weapons of mass destruction may be less visible than U.S. war fighters, but they are nonetheless making a vital contribution to the nation's war efforts. Among them are the engineers, scientists, technicians and specialists who work for the Army Developmental Test Command, or DTC, the technical tester for the Army Test and Evaluation Command.

Headquartered at Aberdeen Proving Ground, Md., where its Aberdeen Test Center is also located, DTC oversees diverse test centers throughout the United States, enabling the command to subject military systems to rigorous testing in a full range of natural and man-made environments. DTC tests everything from new boots to

the latest precision-guided weapons, and its testers work under all weather conditions to collect and record the accurate, impartial test data that Army evaluators need to analyze system performance and report their findings to Army decision makers.

Test support is not limited to the Army. The command conducts tests for the Defense Department and tests weapons and equipment designed for joint-service use. DTC test centers also provide technical support to other government agencies, including those responsible for homeland defense and law enforcement.

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Testing is only one of DTC's three key missions. Another is to verify the operational safety of military systems and document any concerns about the safety of items to be used by troops. Between October 2001 and April 2003, Developmental Test Command issued "Safety Confirmations" to support the "urgent materiel release" of 43 systems in support of America's war fighters. DTC test centers often had only a short time to complete their work to support the development of safety documentation.

The command's other key mission is to develop and acquire new test technologies. A large percentage of DTC's budget is invested in this effort, particularly in technologies designed to simulate operational environments. Through investments in this "Virtual Proving Ground" and

other initiatives, DTC is helping war fighters meet their current technology requirements and preparing for the testing needed to make Future Combat Systems a reality.

Brig. Gen. Keith McNamara, DTC's commander, cited one of the command's recent efforts, the testing of Stryker slat armor for the first Stryker Brigade Combat Team deploying to Iraq.

"The command basically conducted an integrated Stryker developmental approach, and during the last 18 months our test centers have operated in a battle rhythm, working two 10-hour shifts a day, six days a week," he said. "When requested, they have worked above and beyond that to support the Army's effort to rapidly deploy the initial (Stryker) brigade in support of Operation Iraqi Freedom."

Aberdeen Test Center

Since World War I, the Army has been testing weapon systems at Aberdeen Proving Ground, Md., home to DTC headquarters. At this proving ground, where the forerunner of today's modern computer was once used to calculate firing tables, DTC's



Photo courtesy of Aberdeen Test Center

The anti-tank Stryker fires a Tube-launched, Optically-tracked, Wire-guided (TOW) Missile in ATC testing. Testers throughout DTC work jointly to test the Stryker.

Aberdeen Test Center employs the expertise of scientists, engineers and technicians to test major combat vehicle systems as well munitions, small arms, components of uniforms, tents, and even vessels used by the Navy and Marine Corps. The M1 tank and Bradley Fighting Vehicle that soldiers have relied upon so heavily in Iraq underwent extensive developmental testing at ATC.

As the Army geared up for Operation Iraqi Freedom, ATC

provided a wide range of technical support that contributed substantially to the war effort, and ATC technical expertise supports ongoing operations.

When an armor vulnerability of the Abrams M1A1 tank was discovered, ATC reacted quickly to help design, fabricate and test prototype add-on armor for the tank. ATC's team needed only seven days to help develop a concept and fabricate the armor enhancement.

The 3rd Infantry Division found it needed to enhance the situational awareness and passing of messages from tank to tank using the Force XXI Battle Command, Brigade and Below (FBCB2) communications system. The Blue Force Tracker, a satellite-based FBCB2 system, was added to 3rd ID tanks to meet this need. ATC extensively tested the system to ensure it would not be adversely impacted by electromagnetic interference and did the tests needed to certify the safety of the equipment.

ATC conducted electromagnetic interference testing of additional radios placed in a 1st Armored Division brigade commander's M1A1 Command Vehicle. ATC technicians traveled to Germany to assist in the modification of the commander's tank. Other 1st AD brigade commanders would use vehicles outfitted with similar equipment. ATC also tested the equipment and completed a safety certification.

The Army's System Enhancement Package for the Abrams M1A2 tank included new software for the tank's nuclear, biological and

chemical protective system. Software improvements to FBCB2 databases and maps of Iraq were included in the package, tailored to the needs of the 4th Infantry Division and 1st Cavalry Division. ATC also tested this software to certify its safety for use in the field.

ATC received a contract to fabricate 16 containers used to transport spare vehicle power packs around the world. Its Welding and Machine Shop copied the designs of existing containers, ordered the needed materials and quickly began fabricating the containers when the materials arrived.

The test center's Support Equipment Team tested the Improved Ribbon Bridge, deployed with military units in February 2003 in support of Operation Iraqi Freedom. They also tested the Dry Support Bridge and the Wolverine Bridge, deployed so forces could cross gullies and low spots throughout the Iraqi desert.

ATC provided a wide range of other types of support before and during U.S. military operations overseas, often working long hours to get the job done as quickly as possible.

White Sands testing

In the Tularosa Basin of New Mexico, on a vast tract of land surrounding White Sands National Monument, sits DTC's White Sands Missile Range. The range has a long history of conducting missile and rocket tests for the Army, Department of Defense, the military services of U.S. allies and even NASA. White Sands tested an array of critical systems as the United States prepared for recent military operations, including the Multiple Launch Rocket System, the Patriot Advanced Capability 3 Missile, Joint Direct Attack Munitions, and the Army Tactical Missile System.

"White Sands has made a tremendous contribution toward fighting the war on terrorism, war in general, and homeland security," said former White Sands commander, Brig. Gen. (retired) William Engel, in an interview with the Las Cruces Sun-News. "The credit for that has to go to the 3,500 civilian and contractor employees who work every day out here on the range. The workforce has performed magnificently, and people should know that."

The improved effectiveness



Photo by Tech. Sgt. Rich Freeland

A bomber pilot signs one of the Joint Direct Attack Munitions on his aircraft. White Sands Missile Range tested this weapon.

of the Patriot Missile since the Gulf War in 1991 is due in large part to testing that took place at White Sands. Some tests have involved the simultaneous launch of multiple missiles and targets, a technically complex feat that White Sands technicians accomplished in coordination with numerous participating organizations and local authorities.



Photo courtesy of WSMR

DTC's White Sands Missile Range in New Mexico conducts testing on the Patriot Advanced Capability 3.

The Navy's Tomahawk cruise missile, first launched from Navy vessels offshore during the 1991 Gulf War, has been aggressively tested at White Sands, Engel told the Sun-Times. Many of the Navy's weapon systems have been launched from the "USS Desert Ship," a totally land-based missile-launch facility at White Sands that resembles a real ship.

White Sands has used Scud missiles in tests, enabling U.S. military planners to clearly understand the Scuds threat. Its

testers constantly worked on improving missile detection and delivery systems, giving U.S. forces an overwhelming missile-defense edge over Iraq.

In the war against terrorism, the Aerial Cable Range at White Sands, the largest unsupported cable span in the world, was used to test an air-defense system that would enable large aircraft to detect and avoid attacks from shoulder-launched missiles. Suspended between two mountain peaks, the cable provides a path for target vehicles that can weigh up to

20,000 pounds. It is used to test bombs, sensors, missiles, prototype aircraft, electronic equipment, and munitions smaller than missiles.

The Army's Training and Doctrine Command has used White Sands test facilities to conduct computer modeling and simulation for disaster control, and the Defense Threat Reduction Agency has used facilities there to test bunkers against car and truck bombs.

Testing at Redstone

Redstone Arsenal in northern Alabama is the home of DTC's Redstone Technical Test Center, which has the expertise and technical capabilities to test a wide

variety of missiles, including the Javelin and Hellfire, both used in Operation Iraqi Freedom.

RTTC tested two versions of the Hellfire for use on the Predator unmanned aerial vehicle. The launchers for this missile were also tested at RTTC and modified to fix a problem with one of the launch mechanisms.

A Hellfire went off course during range training, prompting the Army to require a larger danger zone for Hellfire training, something most ranges can't accommodate. RTTC testing, as well as modeling and simulation, determined the root



Photo by Sgt. Mauricio Campino

The Javelin, used by soldiers in Iraq, is just one of the weapons tested by Redstone Technical Test Center.

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cause of the errant missile. Follow-on testing resulted in approval to use the missile at the original training ranges, with some restrictions.

The test center also conducted product-assurance testing of repair parts for missiles. About 10 percent tested in 2003 (at the time this article was prepared) were in the “war-expedite” category. Although testers at Redstone generally test some items designated as critical, the war in Iraq caused a surge in this type of expedited testing.

The Blue Force Tracker on U.S. aviation systems provides real-time situational awareness by showing the location of friendly forces, referred to as Blue Forces. RTTC conducted electro-magnetic effects testing on the Blue Force Tracker for UH-60, CH-47 and Apache helicopters, enabling these types of aircraft to be declared airworthy and deploy to the Iraq theater of operations.

RTTC also deployed surveillance vans to Kuwait to check performance parameters on Stinger, Javelin, Hellfire and Multiple Launch Rocket System missiles. This was required to assess the stockpile readiness of the missiles and to return some missiles to the

RTTC deployed vans to Iraq to check how the Stinger, Javelin, Hellfire and Multiple Launch Rocket System weapons were performing. Some missiles were returned to the inventory; some taken out of commission.

Army’s inventory while taking others out of commission.

DTC’s testers at Redstone conducted the essential testing needed to deploy the Army Airborne Command and Control System for Operation Iraqi Freedom. In May 2003, they completed safety-of-flight tests on components of the system and electromagnetic compatibility testing on the system. The test schedule was compressed by a year to meet the needs of war fighters.

Although a fully functional system was not ready until mid May because problems were pinpointed in testing and redesign efforts, two prototype systems were available for use in Iraq. At the time this article was written, RTTC was conducting additional airworthiness testing on the system. Full system qualification testing at RTTC is scheduled for fiscal year 2004.

Electronic testing

DTC's Electronic Proving Ground (EPG) at Fort Huachuca, Ariz., is the Army's test center of expertise for command and control, communications, computers, intelligence, surveillance and reconnaissance – C4ISR in military jargon. EPG plays a crucial role in U.S. military operations by rigorously testing systems that make war fighters dominant in C4ISR.

Because of EPG's extensive

knowledge of state-of-the art communications testing, the test center was requested to provide support to soldiers deployed to Camp Doha, Kuwait, during the first quarter of fiscal year 2003. To support that mission, an EPG engineer assisted in developing compatible C4I networks using systems in Kuwait as well as newly deployed C4I systems. These modifications required extensive work in an EPG laboratory during a compressed testing period.



Photo by Capt. Timothy Beninato

Sgt. 1st Class Kenneth Dawson of the 3rd Infantry Regiment at Fort Lewis, Wash., checks the map on his Force XXI Brigade and Below (FBCB2) system. DTC testers conducted various FBCB2 tests as the war in Iraq loomed.

The Electronic Proving Ground was asked to support the 4th Infantry Division at Fort Hood, Texas, before the unit deployed. EPG's Fabrication Facility at Fort Hood overhauled several tactical operation centers (TOCs) for the 4th ID, meeting the division commander's specifications before the unit deployed. Two technicians from this facility were sent to Iraq to provide technical assistance to 4th ID. Despite various technical challenges, the work was completed on or ahead of schedule.

EPG testers completed electromagnetic compatibility safety checks on the Bradley Command on the Move vehicle at Yuma Proving Ground, Ariz., in January 2003 and at Fort Hood in March 2003. They also completed intra-system electromagnetic compatibility and safety tests on Bradley Fighting Vehicles at Yuma and Fort Hood. These short-suspense evaluations were needed for safety releases on vehicles that had already deployed.

EPG played a role in the final customer test for the Semi-active LASER Brilliant Antitank Munitions in February

2003. An earlier customer test had revealed deficiencies with a component of the LASER system.

The Arizona-based test center also supported safety checks of missile systems in March 2003 and a software development that was used by the 11th Signal Brigade at Fort Huachuca to assist in planning and maintaining its communication network.

Testing at Dugway

The West Desert Test Center at Dugway Proving Ground, some 80 miles from Salt Lake City, tests chemical and biological protective systems for the Army and other military services. The rigorous test program there ensures that U.S. forces in Iraq and elsewhere have the best protection available against chemical and biological threats.

Concerned about potential threats to troops in Iraq, the Army's Central Command issued an "urgent need statement" for a new decontaminant to replace one that was fielded. The Defense Department began testing at Dugway to determine if a foam product developed by Sandia National Laboratory would be effective as a replacement. In



Photo by Ray Rudie

Personnel at the West Desert Test Center (WDTC) wash equipment with a decontaminant spray. The Army's Central Command issued an "urgent need request" for a new decontaminant, and the WDTC tested a new foam.

November and December 2002, Dugway testers used chemical-warfare agents and a biological-warfare agent simulant to challenge the effectiveness of the replacement decontaminant. Dugway also tested protective clothing to determine if new decontaminants would affect its performance.

The U.S. Marine Corps Systems Command was concerned that a new

decontamination system might hinder the detection capabilities of fielded chemical-agent detectors. The command's Program Manager for Nuclear, Biological and Chemical Defense expressed an "urgent operational requirement" for an interim chemical- and biological-agent decontaminant. Dugway conducted a series of tests to evaluate use of this decontaminant in conjunction

with several chemical and biological detectors and chemical-warfare agents.

As the Iraq offensive began, a test program called the Joint Service Additional Source Qualification was in progress at Dugway, to determine an alternate production source for material used in chemically protective suits. Manufacturers provided suits made of the new materials, and Dugway conducted stringent tests to determine their effectiveness.

More recently, Dugway technicians were asked to verify the performance of drink tubing in a protective system used by troops. Testers will expose the tubing to nitric acid and then chemical warfare agents, to determine if it will still offer full protection after exposure to corrosive materials.

Dugway specialists have provided a variety of technical support to government and law enforcement agencies to bolster America's homeland defense. The National Guard's Weapons of Mass Destruction Civil Support Teams, who would assist local authorities in the event of an attack, have been training at Dugway for the past couple of years.

Dugway's Meteorology

Dugway technicians were asked to verify whether or not the drink tubing in soldiers' protective suits could withstand the corrosive effects of chemical agents.

Division has been testing a new component of its Four-Dimensional Weather System, a capability called Global Meteorology on Demand, or GMOD. This system employs a weather model developed jointly by Pennsylvania State University and the National Center for Atmospheric Research, to provide forecasts anywhere in the world at short notice. For troops in Iraq, the GMOD system yielded high-resolution analyses of current conditions and 24-hour forecasts updated every three hours. The output included information used by the Defense Threat Reduction Agency to Predict And Assess Hazards.

Arizona desert testing

Yuma Proving Ground, located in one of the most arid, remote and rugged regions



Photo courtesy of YPG Public Affairs

On the same day it was contacted for support, DTC's Yuma Test Center completed some requested Hellfire Missile tests. This resulted in enhancements to a weapon that gives the Apache its ferocity in combat.

of Arizona, is home to the Yuma Test Center, which tests systems in a harsh desert climate. Technicians at Yuma have been heavily involved with a variety of tests in support of U.S. military operations in Iraq.

Before newly manufactured ammunition is shipped to troops, samples of it are tested at Yuma's firing ranges. Yuma tested the XM983 and the XM930120-millimeter infrared illuminating cartridges and expedited a recommendation for a safety confirmation, to support the "full materiel release" of the XM983. Less

than a week before the start of the war in Iraq, testers at Yuma conducted a rapid-turnaround lot-acceptance test of this projectile, working around the clock to get it done. They also expedited the safety confirmation recommendation of the XM930 cartridge.

Yuma tested the Hellfire Missile that gives Apache attack helicopters their ferocity in combat. The tests were completed within about six-and-a-half hours on the same day Yuma was contacted for support. Within another four hours, the tests prompted enhancements to the Apaches



Photo by Gary Fesperman

The rugged desert terrain in southwestern Arizona is a natural testing environment for the Yuma Test Center.

in the theater of operations.

Testers at Yuma also came to the aid of the Marine Corps. Yuma technicians tested the M198 Towed Howitzer to identify problems occurring during high-zone elevation firing. Test results from Yuma helped the program manager fix the problem on the same day the test center was asked for help.

Yuma Proving Ground is a place to train as well as test. Dozens of Special Forces units have used its rugged desert terrain to train for military operations in similar topography and climate. The Special Operations Command's Military Freefall School at Yuma trains students from all services in advanced freefall parachuting techniques. Many

of the Army's Special Warfare troops have received this training and put their skills to use in the deserts of the Persian Gulf. Training continues today. Marine engineers who built combat bridges across rivers in Iraq trained before the war on the Colorado River at Yuma Proving Ground.

Army aviation testing

While U.S. Army forces and their comrades in arms slugged it out on the ground, Army aviation assets gave them a decisive edge over their adversaries. The Aviation Technical Test Center, located with the Army's aviation school at Fort Rucker, Ala., is DTC's technical tester for aircraft and

aviation systems. ATTC ensures the safety and effectiveness of aircrews through rigorous testing. The center manages a "Lead the Fleet" program to confirm the safety of aircraft already in the Army's inventory as well as the safety of equipment upgrades.

To ensure the safety of the friendly forces on the battlefield, the Army needed to test integration of the Grenadier Beyond-Line-of-Sight Reporting and Targeting System with the Blue Force Tracking System in the UH60A/L helicopter. ATTC testers supported material release of this system by gathering data needed to



Photo by Paul Reynolds

Aviation Technical Test Center pilots have conducted a variety of performance and safety tests on the Apache attack helicopter at Fort Rucker, Ala.

confirm its safety.

ATTC also conducted safety testing on the UH60A/L with the Airborne Agent Detection System installed and issued a recommendation for safety confirmation.

The center tested a targeting and navigation system for the AH-64A Apache attack helicopter that was equipped with the Embedded Global Positioning System, Inertial Navigation System. The test team conducted tests with differing configurations of

navigation enhancements to demonstrate the performance of the attack helicopter when using these systems.

The test center's pilots tested the handling qualities of the AH-64D under instrument meteorological conditions, or weather that requires the use of instruments because of reduced visibility. They also tested the aircraft's handling when flying by instrument flight rules, which are standardized procedures for flying by instruments because weather



Photo By Master Sgt. Robert R. Hargreaves Jr.

An Army UH-60 helicopter removes a destroyed Iraqi anti-aircraft gun from a building near Baghdad International Airport. Aviation Technical Test Center pilots tested upgraded UH-60A/L avionics systems.

reduces visibility.

ATTC tested the new internal auxiliary fuel system on the AH-64D. ATTC testers examined the form, fit and function of the AH-64D, and they evaluated the compatibility of an external 230-gallon auxiliary fuel tank with the new internal system. They assessed the safety of this system so it could be fielded.

The test team conducted a preliminary airworthiness evaluation on the CD-12 aircraft designed for foreign counter-intelligence. The test was used to collect data on the aircraft's handling qualities, complete a limited performance validation, and substantiate the airworthiness of the aircraft - steps needed to recommend a safety confirmation before the CD-12 is fielded.

Employees deploy

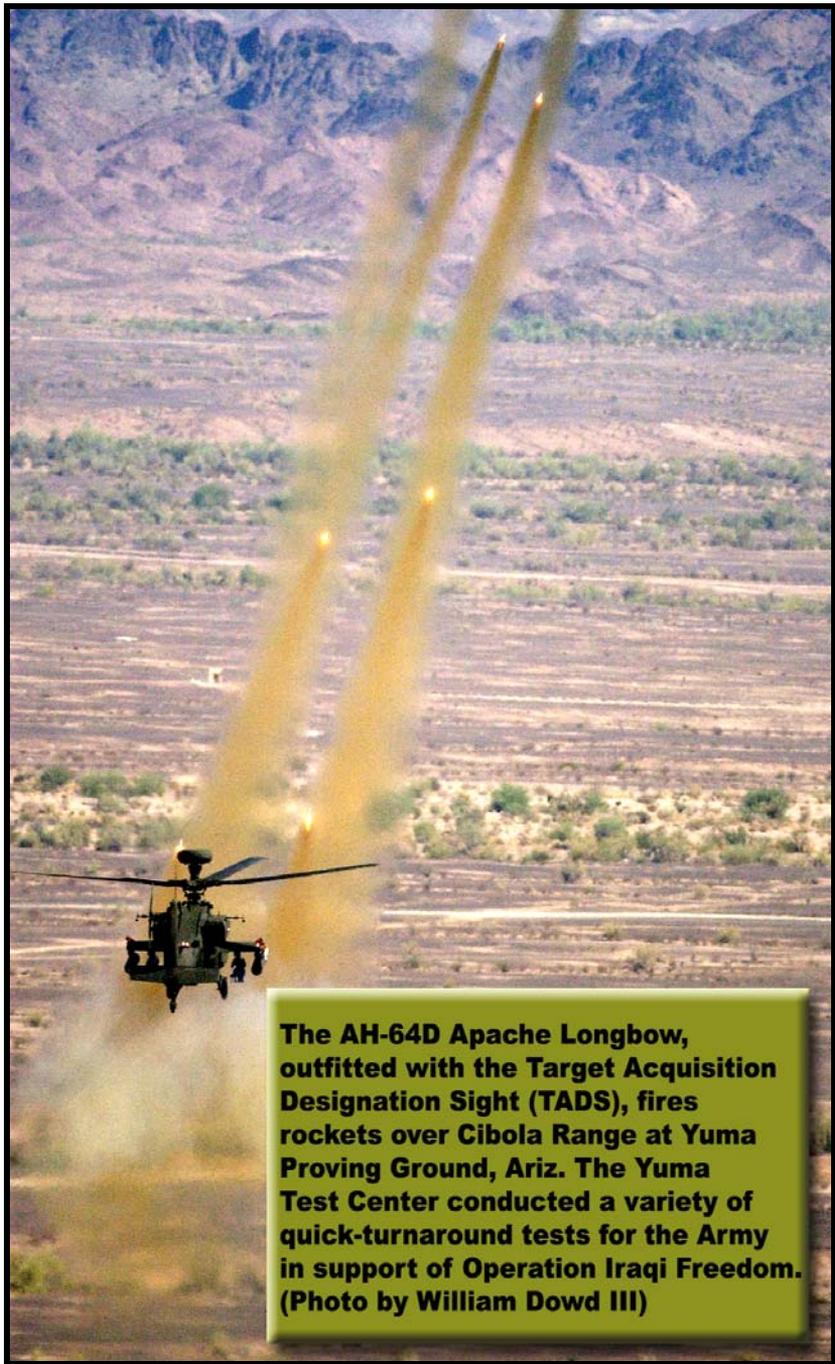
Support for U.S. military operations overseas and for homeland defense has gone beyond the efforts of testers and trainers at DTC. It has involved major funding and human resources, including employees in the reserves being called into active duty in various military units as well as civilian deployments.

At the time this article was written, 19 employees from across the Developmental Test Command had been activated for service in their Reserve or National Guard units either in the United States or abroad, and four DTC employees had been deployed as civilians to assist with military operations overseas.

Summing up the support for the Army's war on terrorism across the Developmental Test Command, Brig. Gen. McNamara, gave credit to soldiers and civilians alike.

"Heroes of the war come in many forms," he said. "There are those risking their lives on point for our nation and those saving the lives of our soldiers by executing quick-turnaround testing activities. DTC had numerous heroes who significantly contributed to the preserving the lives of our soldiers, sailors, airmen and Marines. DTC heroes adapted a 24/7 selfless mindset to ensure our soldiers had the best possible capabilities."

(Editor's note: for more information about DTC test programs and capabilities, visit our web site at www.dtc.army.mil.)



The AH-64D Apache Longbow, outfitted with the Target Acquisition Designation Sight (TADS), fires rockets over Cibola Range at Yuma Proving Ground, Ariz. The Yuma Test Center conducted a variety of quick-turnaround tests for the Army in support of Operation Iraqi Freedom. (Photo by William Dowd III)