Saving the lives of Soldiers is priority No. 1

America's global war on terrorism

Army testers & evaluators are dedicated to fielding superior systems for Soldiers

Test center programs focus on effectiveness, suitability, survivability

As America's armed forces combat terrorism in Iraq and Afghanistan, the people who test and evaluate everything from boots to ballistic missiles are focused on helping the Army provide Soldiers with systems that will pass the crucial test when needed most.

The Army Test and Evaluation Command (ATEC), which is headquartered at Alexandria, Va., has been doing much of this work within tight deadlines while the Army moves as quickly as possible to field new systems or upgraded versions of those already fielded.

In June 2003, Maj. Gen. Robert Armbruster, then

Photo by Sgt. 1st Class Milton Robinson

A Soldier assigned to A Company, 2/505th Parachute Infantry Regiment, 82nd Airborne Division, provides security while his unit searches for a large cache of weapons in Afghanistan.

DTC Page 2

Photo by Spc. Clinton Tarzia

Soldiers of the 2nd Infantry Division conduct reconnaissance with the aid of the Stryker in Iraq. The Developmental Test Command tested the Stryker's slat armor to ensure it was capable of protecting Soldiers from attacks by rocket-propelled grenades and other weapons.

ATEC commander, directed the Developmental Test Command to pursue a prototype bolt-on armor for the Stryker.

Cooperation among DTC headquarters; its Aberdeen Test Center (ATC) in Maryland; the Program Manager, Brigade Combat Team (PM BCT); the Army Research Laboratory (ARL); and General Dynamics resulted in an armor enhancement for eight of the 10 Stryker variants.

The goal was to reduce Stryker vulnerability to

rocket-propelled grenades, or RPGs. The solution, called “slat armor,” resembles a cage made of metal slats.

After Army officials approved the design in July 2003 and ordered the first kits, ATC began fabrication and testing, teaming with the Stryker manufacturer, General Dynamics Land Systems (GDLS), to integrate the added armor onto the eight variants. DTC also brought the Training and Doctrine Command Systems Manager into the program to obtain user input.

ATC built the first 20 slat armor kits for the infantry-carrier Stryker and shipped them to Fort Lewis, Wash., in August 2003. The receiving Brigade Combat Teams installed the kits immediately so they could train with them before deploying to Iraq in October 2003.

ATC conducted ballistic tests and a variety of automotive tests of Strykers equipped with slat armor to determine how the added armor could impact vehicle handling and performance. Human-factors engineering tests helped the Army assess potential safety hazards, including emergency entrance and exit, the effort required to open and close hatch doors,

Photo courtesy of Aberdeen Test Center

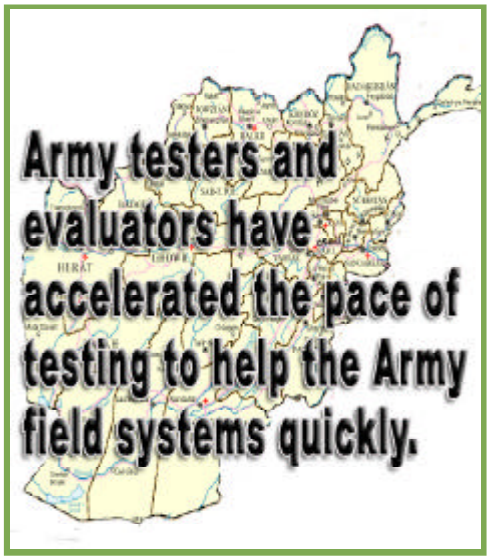
The Army's new Stryker combat vehicle underwent rigorous testing at various Developmental Test Command test centers. In the photo above, the Stryker Mobile Gun System undergoes a live-fire test at the Aberdeen Test Center at Aberdeen Proving Ground in Maryland.

Photo by Yolanda Canales

Joe Tardiolo, a project engineer at Yuma ProvingGround, briefs Maj. Gen. Robert Armbruster, former ATEC commander, about Stryker testing at Yuma Test Center.

and how the armor might affect night vision devices and fields of fire for onboard weapons.

Two Stryker vehicles outfitted with slat armor traveled some 25,000 grueling road miles over gravel roads, pavement, cross-country courses, and rough desert terrain at Yuma Proving Ground in Arizona.



Slat armor was tested under combat conditions in February 2004 when insurgents in Iraq fired a rocket-propelled grenade at a Stryker. The slat armor deflected the blast, preventing injury to the crew.

Photo by Staff Sgt. Marvin Daniels

This High Mobility Multipurpose Wheeled Vehicle (HMMWV) was damaged by an improvised explosive device during an attack in Iraq.

'Humvee' Armor

The Army had started adding armor to its High Mobility Multipurpose Wheeled Vehicle, or "Humvee," years before Operation Iraqi Freedom. But attacks from small arms, rocket-propelled grenades and "improvised explosive devices" prompted the Army to place an urgent priority on shortening production schedules and augmenting protection for vehicles already in the field.

ATC began a program in 2003 to test an "up-armored" version of the Humvee as well as numerous add-on armor kits that the Army and manufacturers provided for testing. In October 2003, Armbruster called the key players together to go over the planning needed for the Humvee armor test program, and in mid October the ATC had begun ballistic and automotive testing of kits developed by the Army and various manufacturers.

ATC completed enough testing for these kits to enable them to arrive in Iraq before the end of October. Col. John Rooney, DTC's chief of staff and chairman of the team overseeing this test program, said he was

gratified that round-the-clock testing at ATC had enabled the Army to make a decision to buy the kits in less than two weeks.

By November 2003, the design of the Army's Humvee armor kit was essentially complete, and production was accelerated. ATC testers then began receiving armor kits designed for the Heavy Expanded Mobility Tactical Truck, the Family of Medium Tactical Vehicles, the Palletized Load System and other tactical wheeled vehicles.

Accelerated testing continued. Nearly 7,000 of the retrofit armor kits for the Humvee had been shipped to Soldiers in Iraq by the summer of 2004.

ATC also has been involved for more than two years in testing prototypes of the Common Remotely Operated Weapon Station (CROWS). In November and December 2003, DTC completed the work needed to provide a safety confirmation for prototype CROWS mounted on four M1114 Humvees sent to Iraq, where Soldiers conducted an operational assessment of the system.

Photo courtesy of TACOM Public Affairs

The Army Developmental Test Command has been testing the "up-armored" HMMWV as well as armor kits designed for installation on the HMMVW and other tactical wheeled vehicles.

Test capabilities

The Aerial Cable Range at White Sands Missile Range in New Mexico, the longest unsupported cable span in the world, was used to test Large Aircraft Infrared Countermeasures, a defensive system designed to enable large aircraft to detect and avoid attack 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 also used to test bombs, sensors, missiles, prototype aircraft, electronic equipment, and munitions smaller than missiles.

DTC supports the Defense Threat Reduction Agency (DTRA) at White Sands by providing range space and technical support as needed for DTRA programs to test and evaluate the lethality of conventional and advanced weapons against various targets.

These tests are assisting the development of technologies that may reduce the threat of weapons of mass destruction. DTRA also uses mock enemy targets at White Sands, including deeply buried and

Photo by Tech Sgt. Janice Cannon

An Airman with the 40th Expeditionary Maintenance Squadron secures a GBU-31 Joint Direct Attack Munition (JDAM) to a B-52 Stratofortress for a bombing mission. The Army Developmental Test Command has tested the JDAM as well as similar "smart" military weapon systems.

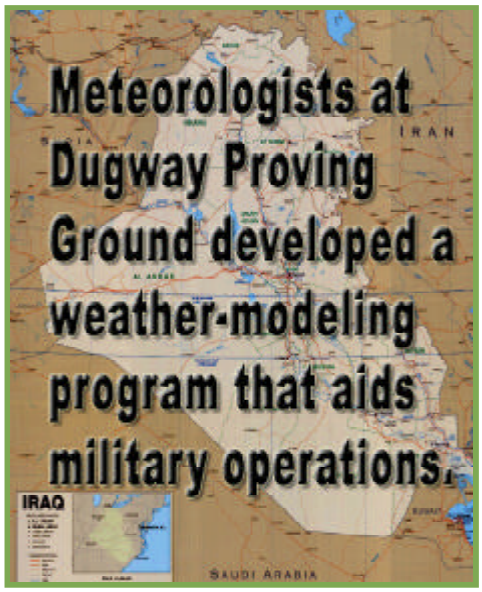
Photo courtesy of WSMR Public Affairs

White Sands Missile Range tests a broad variety of weapons - including missiles that can be fired by a single Soldier and strategic systems.

concrete-reinforced structures, to test weapon systems. Counterterrorism tests at DTRA's White Sands test bed examine measures to protect people and property against terrorist attacks.

Weather models

The Meteorology Division at Dugway Proving Ground developed and deployed new components of Dugway's Four-Dimensional Weather System, or 4DWX. A key component is the Global Meteorology on Demand system, which provides high-resolution weather analyses and forecasts for Afghanistan and Iraq. This system was used to support ***Joint Urban 2003*** in Oklahoma City, Okla., the largest urban agent-dispersion study ever conducted. The test, financed by the DTRA, the Department of Energy and the Department of Homeland Security, provided a better



Launched Cruise Missile, the Joint Direct Attack Munitions, and the Joint and Service Operational Weapon, as well as tests involving the B-1B bomber.

The Aviation Technical Test Center (ATTC) at Fort Rucker, Ala., helped the Army develop the Ballistic Protection System, designed to shield understanding of how chemical and biological agents might disperse in urban areas. The Meteorology Division used atmospheric-dispersion modeling to support tests that simulated nuclear, chemical and biological effects on Strykers bound for Iraq.

Meteorology Division staff also supported tests of systems used in Afghanistan or Iraq, including the Advanced Cruise Missile, the Air

Photo by Al Vogel

A Soldier takes part in training at Dugway Proving Ground during a NATO-sponsored exercise on methods to deal with biological-warfare threats.

Para-rescuers from the 101st Expeditionary Rescue Squadron practice their fast-rope techniquee from an HH-60 Black Hawk Pave helicopter during a search and rescue training exercise at Baghdad International Airport. DTC's Aviation Technical Test Center tested the Ballistic Protection System, a crew-protection system in use in Black Hawk and Chinook helicopters.

Photo courtesy of Joint Combat Camera Center

aircraft crew from small-arms fire. The system is currently used on modified Black Hawk and Chinook helicopters of the Special Operations Command. ATTC assisted with efforts to integrate this system into the Chinook helicopter during testing in January 2004 at Hunter Air Force Base, Georgia. ATTC safety testing will enable DTC to provide a safety confirmation for each configuration of this system for each aircraft type it will be used on.

The Redstone Technical Test Center, located at Redstone Arsenal in Alabama, has tested the Javelin Missile and other weapon systems used in combat.

Photo courtesy the Joint Combat Camera Center

RTTC volunteers

Redstone Technical Test Center (RTTC) at Redstone Arsenal, Ala., sent the chief of the center's Static Test Branch and four other volunteers to Iraq in July 2003 to help the Army safely dispose of missiles abandoned throughout the countryside by Iraqi forces.

The team removed oxidizer from Iraqi SA-2 and Russian-made Al Samoud missiles, for safe transport, and accompanied the explosive-ordnance-disposal convoy to the disposal site, where they put the oxidizer into 55-gallon drums. Soldiers used plastic explosive to destroy the drums and 51 missiles.

Photo courtesy of Redstone Technical Test Center

A Javelin Missile is fired at night during a test at the Redstone Technical Test Center in Alabama.

The Yuma Test Center at Yuma Proving Ground in Arizona has been key player in the Stryker test program. The rugged desert terrain at the proving ground also provides a good training environment for military special forces units.

Photo courtesyof YPG Public Affairs

Desert testing

Yuma Proving Ground testers began working seven days a week on a round-the-clock basis to test eight variants of the Stryker armored vehicle, beginning in April 2002. Focusing on the vehicle's durability and performance, Yuma's testers put 150,000 grueling road miles on the Stryker over gravel roads, pavement, and rough cross-country terrain. This road testing is enabling the Army to evaluate the impact of a rugged desert environment on engines, transmissions, universal joints, and various other mechanical parts.

The Stryker variants fired well over 100,000 rounds from weapons mounted on the vehicles, including nearly 40,000 120mm projectiles from the Stryker Mortar Carrier. Testers generated 13,000 test incident reports and 25

recommendations for safety releases during this time.

YPG has been involved with testing dozens of unmanned aerial vehicles, or UAVs, in many shapes and sizes. Test items ranged from the hand-held Snake Eye and Pointer UAVs to the much larger Pioneer. The Tern, Mako, and Hawkeye UAVs also underwent testing at YPG.

Some of these systems are launched from helicopters and fixed wing cargo aircraft, and all of the aerial testing takes place in the skies over YPG.

More than 50 variants of UAVs and sensor systems have come to Yuma for testing over the past year, and three-fourths of them deployed to the Persian Gulf.

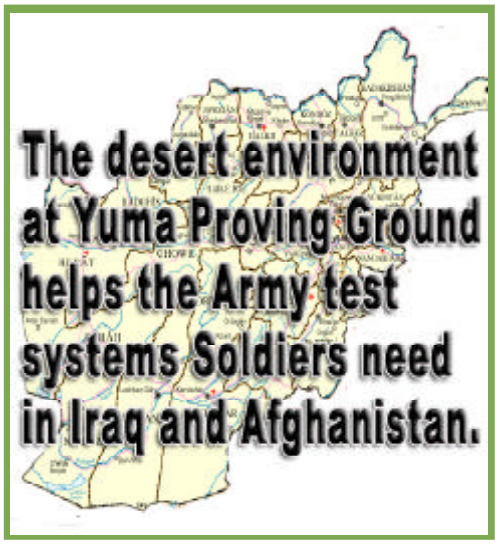
Photo by Riley Williams

Yuma Proving Ground in southwestern Arizona is an ideal place for conducting rigorous desert testing - a place where the extreme heat, aridity, grit and dust, and rugged range roads provide a challenging environment for military systems. The proving ground has the infrastructure required to fully and realistically test weapon systems designed for ground combat.

A Bradley Fighting Vehicle fires a Tube-launched, Optically-tracked, Wire-guided (TOW) Missile during testing at one of the ranges on Yuma Proving Ground. The Bradley and TOW are key weapon systems in the U.S. military arsenal.

The Yuma Test Center at Yuma Proving Ground is one of the DTC test centers that have played a role in the development of various unmanned aerial vehicles (UAVs). UAVs have helped U.S. forces gather intelligence, pinpoint targets and reduce collateral damage during strikes against adversaries of the United States.

Photos courtesy of YPG Public Affairs



UAV testing at Yuma most often involves expendable vehicles, which are generally in the low cost range. These vehicles are used for surveillance and for perimeter watches.

A variety of resupply pods have been developed at YPG, for mounting on the undercarriages of UAVs designed to resupply friendly forces. These pods can carry a variety of items, including medical supplies, food and ammunition.

Dozens of military personnel have undergone training with UAVs at Yuma over the past year to give them the knowledge and real-world experience needed in combat situations in Afghanistan and Iraq. Training classes are normally one to two weeks long, with course completion taking place on a Saturday. Troops have been deployed by the middle of the following week.

DTC's other test site in Arizona, the Electronic Proving Ground (EPG) at Fort Huachuca, has worked closely with program managers and other services to test UAVs. The Aberdeen Test Center has been involved in UAV testing as well.

Located on Yuma Proving Ground's Cibola Range, the Office of the Secretary of Defense (OSD) Joint Experimentation Range Complex greatly expands the proving ground's ability to conduct specialized tests, many directly in support of the

Photo courtesy of YPG Public Affairs

Yuma Test Center, at Yuma Proving Ground in southwestern Arizona, conducts a wide range of live-fire tests, including this test of the Hellfire Missile launched from an Apache Longbow attack helicopter.

America's war on terrorism. The range is located in remote desert terrain, and its airspace has fully controlled access. The complex includes a realistic rural and urban environment.

The range also provides a comprehensive environment for testing advanced sensor technologies. It contains several miles of varying road surfaces, including dirt and gravel roads, paved two-lane and four-lane roads, paved cross streets and dozens of buildings meant to simulate a small town or city. Buildings range from small sheds to two-story structures.

At the range's test track, convoys of military and commercial sport utility vehicles encounter the same conditions and hazards faced by American fighting forces. This area is designed to test sensors and other technology.

Instrumentation for data acquisition at this complex of ranges is highly flexible and capable of being customized for each test or training unit.

Army Developmental
Test Command,
supporting Soldiers
around the world.