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Contents

- ▶ [CECOM Logistics Reps Support Troops in Iraq, Kuwait](#)
- ▶ [Robots Search for Enemy Soldiers in Iraq](#)
- ▶ [Army Research Lab Soldier Deployed to Middle East](#)
- ▶ [Science Advisors Lend Expertise to Operation Iraqi Freedom](#)
- ▶ [AMC Provides What Forces Need from Ammunition to Zippers](#)
- ▶ [ARDEC Media Tour Showcases Weapons Supporting Iraqi Freedom](#)
- ▶ [Edgewood Center Receives Patent for New Virus Detection System](#)
- ▶ [Combat Boot Testing Keeps Soldiers in Step](#)
- ▶ [Spotlight on Aviation](#)
- ▶ [TARDEC Demos Vehicle Electronics Technologies](#)
- ▶ [ARDEC Opens World-Class Energetics Rheology Lab](#)
- ▶ [Edgewood Center, Vanderbilt Develop Chem Bio Detector](#)
- ▶ [Command News Briefs: Identifying & Defeating Terrorist Activities:](#)
 - ▶ [Homeland Defense Vehicles Get Enhanced Vision](#)
 - ▶ [End-of-Service Life Indicators Developed for Mask Filters](#)
 - ▶ [New Sensor Wipe Can Detect Nerve Agent](#)
 - ▶ [ARL Studies Eye and Face Identification Technology](#)
 - ▶ [Robots Will Improve Vehicle Inspections](#)
 - ▶ [Plasma Decontamination Effectively Neutralizes Chemical and Biological Agents](#)

[Archives](#)

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"We're here to support the mission and be successful in the mission, and we believe in what we're doing."

Ken Hagie, logistics assistance representative

CECOM Logistics Reps Support Troops in Iraq, Kuwait

By Timothy L. Rider

Camp Virginia, Kuwait—When many of the ground soldiers who would participate in Operation Iraqi Freedom were preparing to commence operations, Ricardo Chan and Ken Hagie received a mission. Chan and Hagie, logistics assistance representatives with the Communications-Electronics Command, were tasked to assist soldiers in repairing a remote communications vehicle one kilometer south of the Iraqi border.

As they moved by armed convoy



[Back to top](#)

north toward the border, Chan and Hagie had to maneuver on a path that led between a field of unexploded ordnance on the right and an unmarked minefield on the left. “We had one access road to get to the remote access unit,” said Chan, who said Iraq was in visual range.

Power and Environmental Logistics Assistance Representative Craig Youngblood (background left) discusses repairs to a tactical quiet generator with Sgt. 1st Class Luke Law, while Staff Sgt. Derrick Brown (foreground) works on the portable power plant at Camp Virginia, Kuwait.

During the course of the repair, American forces crossed into Iraq at full force. “We weren’t worried about the Iraqis crossing the border,” said Hagie.

They returned from their successful mission 22 hours later, with Operation Iraqi Freedom in full swing. They knew at this critical time that the communications hardware they repaired would connect to units supporting soldiers in the combat zone.

Chan and Hagie are Department of the Army civilian employees who specialize in various fields of electronic equipment. They are assigned to the 22nd Signal Brigade on three-year overseas tours to lend specialized support, including training soldiers in repair and electronic systems maintenance and lending logistical support so parts are on hand to keep communications systems up and running.

Normally, such duty means living in relative comfort at the 22nd Brigade’s home in Darmstadt, Germany. However, charged with the task to provide communications support, the brigade and its battalions now make home a tent in Kuwait or even a spot under the stars far north in Iraq.

“We live, eat and sleep in the same conditions as the soldiers,” said Chan. “We have guys with 3-ID forward,” he said, referring to the Army’s 3rd Infantry Division, whose units were among those that entered Baghdad.

In addition to sharing living conditions, CECOM civilian representatives share the risks of combat. Chan said a logistics representative, who asked not to be identified, was struck by an Iraqi mortar fragment while supporting a battalion of the 22nd Brigade. Chan has since heard that his comrade is recovering at a German hospital.

“That alone explains the danger of our job,” said Chan.

Hagie does not focus on the hardships of field conditions, such as minimal showers and little downtime for relaxation. “We’re here to support the mission and be successful in the mission, and we believe in what we’re doing.”

[Back to Top](#)

Robots Search for Enemy Soldiers in Iraq

By Timothy L. Rider

The Packbot is equipped with remote infrared and optical cameras that operators can use to closely examine caves, rooms or airfields while at a safe distance.

[Back to top](#)

Najaf Air Field, Iraq— While airborne robots, otherwise known as unmanned aerial vehicles, first gained notoriety in Operation Desert Storm, a treads-on-the-ground cousin, known as the



The Packbot searches for booby traps at Najaf Airfield.

“Packbot,” has now debuted in Operation Iraqi Freedom.

The Packbot was first used in combat in July 2002 to examine caves and a building complex in Nasarat, Afghanistan, according to Col. Bruce Jette, director of the Rapid Equipping Force. The Communications-Electronics Research, Development and Engineering Center developed the technology.

In Iraq, the Packbot was recently used to remotely look for enemy soldiers thought to be hiding in an agricultural center building. It also was used to remotely examine equipment left on an airfield before engineers from the 101st Airborne cleared the runway for humanitarian relief operations, according to Sgt. 1st Class Tim South, special projects noncommissioned officer for the Rapid Equipping Force.

In both operations, Packbot operators used the robot to verify there were no enemy soldiers in the building or booby traps or mines on the airfield where the enemy was believed to have conducted “airfield denial operations,” said South.



The robots are capable

of maneuvering over and around obstacles, said South. They are

A soldier from A Company 326 Engineers of the 101st Airborne (Air Assault) Division trains on the operation of the Packbot at Najaf Air Field, Iraq.

equipped with remote infrared and optical cameras that operators can use to closely examine caves, rooms or airfields while at a safe distance from what South calls “surprises,” such as booby traps, mines, weapons caches or enemy soldiers.

Operators use a wireless controller to maneuver the robot and control the camera. The view from the cameras is seen through a helmet-mounted eyepiece, according to Maj. Keith McGuire, project leader for the Rapid Equipping Force.

The robot is maneuverable enough to climb stairs and continue even if it is flipped over. It is also equipped with an infrared light so it can maneuver and see in total darkness.

“It pretty much maneuvers over all terrain,” said South.

Robots have been turned over to engineers in the division at the request of the 101st Division commander, said South, who deployed to Iraq with McGuire and the engineers from Camp Pennsylvania to train the division in Packbot operations and maintenance.

[Back to Top](#)

Sgt. Gary Normandin has been an information systems analyst at Army Research Laboratory for two years.

Army Research Lab Soldier Deployed to Middle East

By Tonya Johnson

Adelphi, Md.—War doesn’t scare Sgt. Gary Normandin. In fact, he volunteered to go.

“I joined the Army to serve my country,” said Normandin, 30. “Freedom isn’t free and every man should contribute at some level to secure that freedom.”

At press time, Normandin was awaiting orders to deploy wherever he is needed, which could include Afghanistan, Kuwait or Uzbekistan. He has been stationed at the Army Research Laboratory for two years.

Normandin specializes in information systems analysis, which is critically needed to support the war. His assignment will last at least six months and could possibly be extended a year.

“He’s mission-oriented and wants to support the war effort,” said Master

[Back to top](#)

Sgt. Mark Brzenzinski, non-commissioned officer in charge at the lab. “I believe he’s fully capable of accomplishing any mission he’s tasked. Volunteering for this assignment shows his heart and mind are in the right place.”

“I enjoyed my time at (Army Research Laboratory),” said Normandin. “It was a different environment working with mostly civilians, but it gave me a better outlook of what (Army) civilians do to help the soldier. I now have a newfound respect of what civilians do for the Army.”

A son of a military family, Normandin is from Stafford, Va., and has been in the Army for four years. Normandin plans to become a warrant officer and make a career in the military. This is his first deployment to a combat zone.

[Back to Top](#)

[Back to top](#)

Science Advisors Lend Expertise to Operation Iraqi Freedom

By James F. Gibson

Fort Belvoir, Va.—The Army Materiel Command has created a vital link between soldiers in the field and the Army’s research and development expertise. A team of science advisors is working with senior commanders and soldiers to identify and quickly solve operational problems that have surfaced during Operation Iraqi Freedom. The team, which includes experts from the command’s various elements, is operating out of Southwest Asia.

AMC’s Office of Field Assistance in Science and Technology assigns science advisors throughout the command to ensure a critical, real-time link between lab and field. The science advisors identify material issues that need improvement and assist in the introduction of new technologies in the field.

The Southwest Asia team includes Bill Andrews, who previously served as science advisor to U.S. Special Operations Command in Tampa, Fla.; Maj. Robert Johnston, whose prior assignment was program manager for the Hunter Standoff Killer Team and experimental test pilot for Army Aviation and Missile Command in Fort Eustis, Va.; and Sgt. 1st Class Samuel J. Newland, a member of Natick Soldier Center’s Operations Forces Interface Group in Natick, Mass.

[Back to Top](#)

[Back to top](#)

AMC Provides What Forces Need from Ammunition to Zippers

Army Materiel Command

Washington, D.C.—Their motto is: “If a soldier shoots it, drives it, flies it, wears it or eats it, we provide it.” The Army Materiel Command provides support across the spectrum of joint military operations. Operation Iraqi Freedom is no exception. In fact, AMC has provided extensive support to the ongoing efforts in Iraq to ensure that U.S. forces are equipped with what they need to accomplish their mission.

AMC’s complex support ranges from development of sophisticated weapon systems and cutting-edge research, to maintenance and distribution of spare parts and supplies. The chart below highlights examples of AMC’s more recent support to Operation Iraqi Freedom:

Equipped 101st Air Assault Division with thermal vision devices, which are lightweight, handheld units that support night vision activities.

Delivered imaging systems that enable video inspections of wells to search for hidden arms caches or tunnels.

Provided visual media presentation hardware, including video projection, flat panel display systems, DVD/VCR units, generators and canopies.

Provided connector/cable kits to relay Thermal Weapon Sight imagery to remote video monitors, enabling the operator to remain under cover.

Shipped 324 M1 tanks, 374 Bradley Fighting Vehicles, 31 Force Provider sets, 31 large area maintenance shelters and 312 solar shades.

Deployed nearly 400 military and civilian personnel to conduct field repair and maintenance activities.

Shipped 94,000 sets of Joint Service Lightweight Integrated Suits; 30,000 sets of chemical defense equipment (e.g., masks and detection paper); and 19 sets of air landing sets for helicopters.

Shipped 225 miles of inland distribution petroleum system pipe and pump stations; and 125,000 short tons of ammunition, including small armaments, crew served weapons and area munitions.

Provided cots, blankets and other equipment for camps that house up to 12,000 enemy prisoners of war.

[Back to Top](#)

[Back to top](#)

ARDEC Media Tour Showcases Weapons Supporting Iraqi Freedom

By Myra Hess

Picatinny Arsenal, N.J.—Just hours before President Bush readied the nation for war with Iraq, 16 media outlets visited the Armaments Research, Development and Engineering Center to see the high-tech weapon systems U.S. troops would use in the war against Iraq. The tour attracted two additional media tours, placing Picatinny at the center of media interest in deployed systems.



The Paladin, which entered service in 1993, features the Army's largest cannon at 155 millimeters, an on-board automated fire control system that provides ballistic computations, a vehicle location navigation system and nuclear-biological-chemical protection. The 32-ton Paladin can hit a target with a rocket-assisted projectile at a maximum range of nearly 20 miles. **Photo by Todd Mozes.**

The media tours included representatives from the New York Times, Wall Street Journal, Associated Press, The History Channel, Wired magazine, Univision, Fox 5-NY, WNBC, WCBS-TV and radio, WABC, News 12-NJ, AUSA Magazine, PM Soldier and several other local newspapers and broadcast media.

“Everything that you currently see is in the hands of our soldiers,” Armaments Commander Brig. Gen. Larry C. Newman told reporters at the start of the three-hour media tour. Newman explained that Picatinny is the military’s only research and development facility for ammunition and weapons.

On display were the Mortar Fire Control System, TALON Robot (a bomb disposal robot), M203 grenade launcher, M141 shoulder-launched multi-purpose assault weapon, Bradley



Fighting Vehicle, M240B medium machine gun, 81mm M252 mortar, portable vehicle arresting barrier, and other non-lethal weapons.

The TALON robot is used for bomb disposal. It is operated by radio frequency and equipped with four video cameras that enable troops to determine which areas enemy soldiers occupy. In addition, the TALON is waterproof up to 100 feet, allowing it to search for explosives off-land. The TALON also was used to locate victims and debris at the World Trade Center. **Photo by Todd Mozes.**

Reporters also toured ARDEC's Armament Technology Facility, viewed the Paladin M109A6 Self-Propelled Howitzer, and observed a demonstration of the TALON and a live-fire display at the Advanced Warheads Facility.

[Back to Top](#)

Edgewood Center Receives Patent for New Virus Detection System

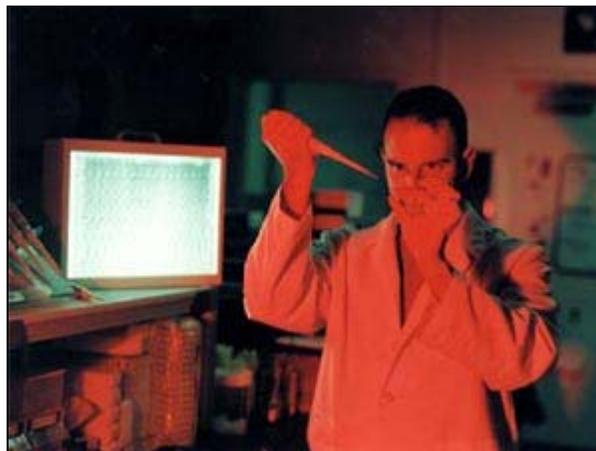
Edgewood Chemical Biological Center

"No other technology exists that can screen for unknown viruses. The process by which the (system) sorts and counts viruses allows us to narrow down the possible identity of any unknown viral sample."

Dr. Charles Wick, leader of ECBC's chemical and biological point detection team

[Back to top](#)

Aberdeen Proving Ground, Md.—It's not a scenario too far removed from the nightly news: a mysterious virus moves across the world, turning up in cities and towns with seemingly no connection. Slowly, a pattern emerges, linking those remote cases to a common thread—a convention, maybe a hotel in Asia. Scientists and health professionals are at a loss to identify the virus, which doesn't respond to the usual treatments. How do you begin to identify it? Ideally, a fast acting, efficient, portable and easy-to-use detection device could be deployed to these locations to confirm the presence of the virus and outline its characteristics.



ECBC's patented Integrated Virus Detection System is a fast-acting, efficient, portable and easy-to-use detection device that could be deployed to confirm the presence of a virus and outline its characteristics.

The Integrated Virus Detection System does all those things. A patented and licensed technology from the Edgewood Chemical Biological Center, the detection system represents a breakthrough technology at the early stages of its life cycle.

Dr. Charles Wick, leader of ECBC's chemical and biological point

detection team fostered the technology from concept to development, picking up the Department of the Army Research and Development Award for Technical Excellence and a Federal Laboratory Consortium Technology Transfer Award in 2002.

The challenge in virus detection—especially in military applications—is that viruses are smaller than bacteria, measuring anywhere between 10 and 300 nanometers each. Given that a nanometer is one billionth of a meter, these particles are quite small and difficult to detect. The system developed by Wick and his team takes a unique approach to this challenge.

Without any reliance on chemistry, the system detects viruses by counting viral particles in a given sample and sorting them by size.

“The system can tell a virus from pollen or dust because viruses have their own window in the physical world,” said Wick.

“No other technology exists that can screen for unknown viruses,” said Wick. “The process by which the (system) sorts and counts viruses allows us to narrow down the possible identity of any unknown viral sample.”

The system has been patented and licensed to Virus Detection Systems, a Maryland company, for commercialization and production. Virus Detection Systems holds an exclusive license for production and is capable of delivering 100 systems per month.

The system’s future leads where most technologies do: smaller, lighter and faster. Technology advancements in miniaturization will enable a smaller footprint as well as an increased integration into other systems, such as wide-area air samplers. “We’d like to see it become remote-automated, more sensitive and more mass producible,” said Wick.

[Back to Top](#)

“To have one style of footwear for 450,000 people and get more than an 80 percent approval rating makes us feel like we’re moving in the right direction.”

Michael Holthe, lead project engineer for footwear programs

Combat Boot Testing Keeps Soldiers in Step

Soldier Systems Center

Natick, Mass.—After thrashing through 100,000 cycles in a puddle of water, checking for a leaky boot is as simple as removing the piece of absorbent paper tucked inside.

“We beat up boots here. We beat the heck out of them,” said Michael Holthe, lead project engineer for footwear programs at the Soldier Systems Center. “They have to be durable, but also help the person do their job.”

[Back to top](#)

The Footwear Performance Laboratory, the only facility of its kind in the Department of Defense, provides a central location for testing, research and development for all military footwear, Holthe said.

Holthe and Valerie Banville, a lab technician and project engineer, work primarily with the Army and Marine Corps, provide engineering support to the Defense Supply Center-Philadelphia, and have supported the Navy and Air Force. Other jobs include testing footwear for law enforcement officers and firefighters under contract with the National Protection Center at the Soldier Systems Center.

Currently, Holthe and Banville are assessing performance specifications for the Army's new Infantry Combat Boot. When not evaluating new product models, they are working to enhance performance, safety, comfort and durability, or researching and developing new boots.

“(Boots) can affect oxygen consumption, fatigue and marksmanship in addition (to causing) lower leg injuries. We need to make footwear function in many environments but also protect the soldier and help him do the job more efficiently,” Holthe said.

Their research is sometimes collaborative, involving the Natick-based U.S. Navy Clothing and Textile Research Facility, U.S. Army Research Institute of Environmental Medicine and Natick Soldier Center's Textile Testing Facility. Holthe also explained that the Army is partnering with industry in determining ways to improve efficiency, capability and safety.

“To have one style of footwear for 450,000 people and get more than an 80 percent approval rating makes us feel like we're moving in the right direction,” Holthe said.

[Back to Top](#)

The Aviation Applied Technology Directorate provides a unique capability to conceive, create, test and install expedited material fixes to “pop-up” problems in the fleet.

[Back to top](#)

Spotlight on Aviation

By Col. William Gavora and Bruce Tenney

Ft. Eustis, Va.—With numerous worldwide Army deployments and the ongoing war with Iraq, designing and fielding critical aviation technologies quickly is a high priority for the Army Aviation Applied Technology Directorate, located at Ft. Eustis, Va.

Recently, the directorate successfully designed, tested and integrated a new radio for helicopters inside Afghanistan in less than six months. The new system allows better non-line-of-sight communication between airborne assets, ground units and Tactical Operations Centers currently operating in theater. The effort concluded when the directorate deployed

one military technician and five Army civilians to install and test the necessary modifications to the aircraft, train the troops, and troubleshoot and fix non-operational systems located overseas.

In addition, the directorate designed, tested and integrated new situational awareness kits in 197 aircraft that are supporting current operations in Afghanistan and Iraq. Called the Blue Force Tracking Situational Awareness System, it provides situational awareness communication between airborne assets, ground units and Tactical Operations Centers. The directorate, which acted as the prime integrator, also applied the system to two demonstration aircraft that are now deployed in Iraq.

The directorate also is fully engaged in the research and development of future unmanned aviation systems to create a full spectrum of unmanned capabilities that, when combined with manned systems, yield tremendous benefit in an affordable, reliable and sustainable way.

For example, the directorate is partnering with the Aviation and Missile Research Development and Engineering Center and the Defense Advanced Research Projects Agency to develop the A160 Hummingbird unmanned aviation system for Army use. The team will fully expand the flight envelope of the A160 while simultaneously integrating common data links, developing open systems architecture and evolving to a common unmanned control system.

[Back to Top](#)

TARDEC's goal is to design an advanced two-man crew station that incorporates the fight, carrier, reconnaissance, and command and control functions of unmanned systems.

[Back to top](#)

TARDEC Demos Vehicle Electronics Technologies

By Rae Higgins

Warren, Mich.—The Tank-Automotive Research, Development & Engineering Center's Vetronics Technology Integration Program recently showcased its advanced technology demonstrations during VIP Day at Fort Bliss, Texas.



Vetronics, or vehicle electronics, is the

Stakeholders from across the Army met at Fort Bliss, Texas, to learn

discipline of total ground vehicle electrical/electronics system integration. TARDEC's Vetronics Technology Area conducts research in intelligent systems, robotic mobility, simulation and other technologies, all while leveraging advanced automotive technology.

TARDEC Executive Director for Research Dr. Grace M. Bochenek explained that demonstrations are a vital part of the Army's science and technology program. Such demonstrations, she said, enable the Army to make informed decisions about technology requirements prior to full development.

At McGregor Range, attendees witnessed several demos, such as a dismounted robotic follower demonstration in which an experimental unmanned vehicle autonomously followed a soldier; and a robotic follower chase, where guests piled into HMMWVs to "chase" and observe an autonomous Stryker while it traversed rugged desert terrain.

TARDEC's goal is to design an advanced two-man crew station that incorporates the fight, carrier, reconnaissance, and command and control functions of unmanned systems. Key requirements include speech recognition, three-dimensional audio, indirect vision driving, autopilot, robotic follower path generation and position navigation.

[Back to Top](#)

The Energetics Rheology Lab houses a variety of instruments and equipment for the characterization of energetic materials.

[Back to top](#)

ARDEC Opens World-Class Energetics Rheology Lab

By Peter Bonnett

Picatinny Arsenal, N.J.—Studying energetics and their use in munitions has become increasingly easy with the Armament Research, Development and Engineering Center's new Energetics Rheology Laboratory.

Rheology is the study of the flow and deformation behavior of liquid and solid materials to their molecular structure and morphology. It also explores the engineering processing parameters of temperature and flow rate.

The state-of-the-art lab was commissioned in fall 2002 and is being used to better understand, simulate, design and optimize energetics manufacturing processes and their use in munitions. Three full-time ARDEC engineers are dedicated to this facility to conduct various experiments and analyses of energetic and non-energetic materials.

The lab houses a variety of instruments and equipment for the characterization of energetic and nonenergetic materials. All instruments are remotely controlled from a centralized control room via closed-circuit surveillance cameras and computerized monitoring systems.

ARDEC has entered into a Cooperative Research and Development Agreement with the Polymer Processing Institute to support the lab's operation. The institute provides consultation services from more than 14 full-time, doctorate-level scientists and engineers, and has set up a highly specialized team to provide technical services to the energetics community. The partnership provides the customer with experience, expertise and response to their rheological needs.

[Back to Top](#)

"The (detector) makes it feasible to assess the effect of a given chemical on any number of different cell types simultaneously and greatly reduces the variables of both time and expense."

Roy Thompson, ECBC's principal investigator for the project

[Back to top](#)

Edgewood Center, Vanderbilt Develop Chem Bio Detector

Edgewood Chemical Biological Center

Aberdeen Proving Ground, Md.—Edgewood Chemical Biological Center's Molecular Engineering Team partnered with Vanderbilt University to develop a system that can detect chemical and biological activity at reduced time and expense.

The new system, to be called the Massively Parallel, Multiphasic Chemical Biological Activity Detector, will monitor different types of cells (e.g., skin, nerve, cardiac, kidney, etc.) and their unique responses to a given agent or class of agents. Previous research at ECBC has shown, for example, that VX nerve agent decreases neural cell metabolism and increases liver cell metabolism.

Roy Thompson, ECBC's principal investigator on the project, stresses that it will be some time before the detector becomes available off-the-shelf. There are significant technical hurdles to overcome in maintaining the viability of live cells outside the laboratory in more harsh environments and with fewer doctorate-level scientists attending to the details. More near term applications, however, exist within the pharmaceutical industry for general toxicology testing.

"The (detector) makes it feasible to assess the effect of a given chemical on any number of different cell types simultaneously and greatly reduces the variables of both time and expense," explained Thompson.

[Back to Top](#)

[Back to top](#)

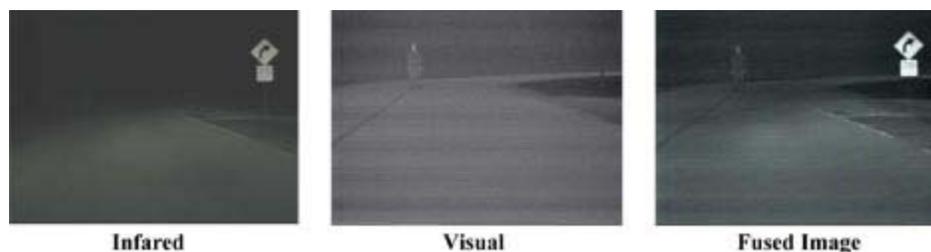
Command News Briefs: Identifying & Defeating Terrorist Activities

Homeland Defense Vehicles Get Enhanced Vision

The Tank Automotive Research, Development and Engineering Center's Visual Perception Lab, in cooperation with the Ford Motor Company Research Laboratory, is developing panoramic vision technology for the diverse needs of federal, state and local homeland defense agencies.

A vehicle equipped with panoramic vision contains several imaging sensors with overlapping fields-of-view. These sensors can be sensitive to visible, infrared or millimeter wave radiation. With panoramic vision technology, sensors with the same fields-of-view are merged together by sensor fusion to provide more information than a single sensor can provide. By merging the different field's in real time, it is possible to pan and zoom anywhere, based on the driver's interest.

The photos below illustrate the increased detection capability of sensor fusion. Features of an image ordinarily not detectable in the visible part of the spectrum are easily seen when combining the visible with infrared sensor images. The image on the left is low light visible at night using headlights, the center image is infrared, and the right is the fused image. The fused image shows the direction of the road, the sign and the pedestrian in the road.



The above photos illustrate the increased detection capabilities of sensor fusion.

The lab is also developing advanced image processing that will be useful for scanning crowds at airports, sports events or other locations for concealed weapons. Several law enforcement groups have also expressed interest in this technology and are in line to receive test vehicles.

Developer: Tank-Automotive Research, Development and Engineering Center

[Back to Top](#)

End-of-Service Life Indicators Developed for Mask Filters

Timing is critical when it comes to changing the cartridges on an air-purifying respirator. The development of end-of-service life indicators ensures that air-purifying cartridges are disposed of before the soldier or domestic responder is exposed to harmful contaminants.



Service Life Indicator
Visibly changes color showing the Real Time life of the carbon inside.

Through the efforts of a Department of Defense Small Business Innovative

The service life indicator visibly changes color, showing the real time life of the carbon inside.

Research grant and its partnership with North Safety Products, K&M Environmental has developed the indicators for use inside respirator cartridges. These cartridges, manufactured by North Safety Products, are approved by the National Institute of Occupational Safety and Health. K&M Environmental currently is developing sensors for the detection of warfare agents and hopes to incorporate these indicators into North Safety's cartridges and canisters. These indicators are not on current cartridges and are a new technology.

Developer: Army Research Laboratory

[Back to Top](#)

New Sensor Wipe Can Detect Nerve Agent

Color changes are now being used to detect the presence of nerve agent thanks to a new sensor wipe developed by a commercial contractor. The sensor is a sponge-like material that is wiped over a surface of interest. If agent is present, the sensor will change from its yellow start color to



red.

This technology is made possible through incorporating active enzymes into sponge-like materials. Since 1990, Alan Russell, a University of Pittsburgh professor, has studied the

incorporation of enzymes into such materials. The fruits of his long research are now paying off with the new chemical agent sensor system.

The new agent detection sensor is wiped across a surface of interest. The sensor changes to red if it detects nerve agent. Green indicates a clean surface, and yellow—as neutral—indicates an unused wipe.



Agentase, LLC, will develop the sensors. The Army Research Laboratory, the Defense Advanced Research Projects Agency and the Defense Threat Reduction Agency supported the research effort.

Department of Defense research laboratories are evaluating the new system to determine the best format for field use. It has also been fielded to some DoD agencies for further testing.

Developer: Army Research Laboratory

[Back to Top](#)

ARL Studies Eye and Face Identification Technology

As the Department of Defense maintains increased security at its facilities, it is looking for better and more accurate ways to identify both employees and visitors. A promising technology for controlling access to facilities is biometrics—the use of unique human characteristics to identify individuals.

The Army Research Laboratory conducted a yearlong study of iris (eye) recognition and face recognition technology. About 250 lab employees volunteered for the Office of the Secretary of Defense-sponsored study.

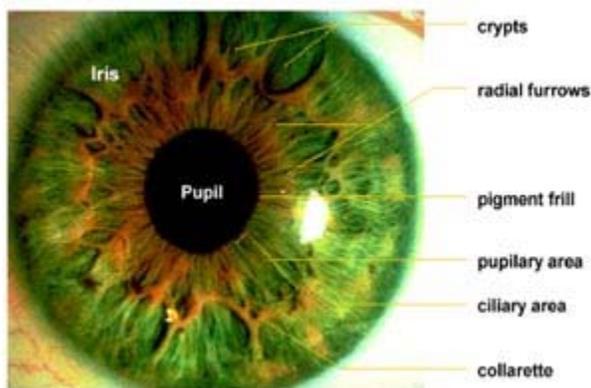
Iris recognition is non-invasive and uses high-resolution video images of



A research volunteer's face is scanned to test the system's accuracy in face recognition technology.

the iris (the colored part of the eye) to identify users. The system captured and identified over 180,000 iris image samples. It correctly identified 94 percent of these samples, falsely labeled 6 percent as unauthorized and incorrectly identified only two samples. Its high accuracy, low incorrect identification rate and non-invasive operation combine to make iris recognition an excellent access-control mechanism.

Face recognition uses images of an individual's face to identify users. In the study, the system provided the "top 10" best matches to each face sample collected. The face recognition system captured and identified over 40,000 face images. The system correctly identified 51 percent of these images as the top match, and identified 81



The recent Army Research Laboratory study found iris or eye recognition technology is highly accurate.

percent of the images within its "top 10." Although not as accurate as iris recognition, face recognition has an advantage over other biometrics because face images of a variety of users, including unwilling participants such as criminals or terrorists, can be included in the system. The resulting "watch list" capability could not only detect unwanted visitors, but would also be a deterrent to those who might make such attempts.

The study concluded that a distributed biometrics-based access control system is feasible and could provide significantly enhanced visitor control and screening at DoD facilities.

Developer: Army Research Laboratory

[Back to Top](#)

Robots Will Improve Vehicle Inspections

Hollywood portrays car bombs as big sticks of dynamite with huge ticking alarm clocks taped under vehicles. In real life, sophisticated bombs are hard to detect without close visual inspection.



A new robot that resembles an oversize

The Omni robot features a small camera that enables inspectors to see every angle of an undercarriage while at a safe distance.

bathroom scale on roller blade wheels can easily scurry under parked vehicles, making vehicle inspections safer and more thorough. Called the Omni-Directional Inspection System, the robot has a small camera that enables inspectors to see every angle of an undercarriage from the safety of a remote station. A series of tests demonstrated that the robot provides the best improvement to the traditional "mirror-on-a-stick" inspection method.

In addition to hand-held mirrors on sticks, conventional means of parking lot and garage surveillance include mounted video cameras, visual inspection and use of trained dogs. However, authorities want a safer alternative to sending humans or canines into a situation where a motion-sensitive bomb could detonate. While static surveillance cameras have been used for years, they lack the resolution and mobility needed for effective searches.

Vehicle security concern heightened when it was learned that associates of the Sept. 11, 2001, terrorists obtained licenses to transport hazardous materials. Recent news reports indicate that border inspection delays at the Windsor, Ontario and Detroit, Mich., crossings are costing automobile plants millions when parts fail to show up in time and assembly lines stand idle. The robots are a tool to improve time consuming and dangerous manual under-vehicle inspections.

The robot has been demonstrated and well received at several recent military forums. Additional units are being produced in limited numbers and will be available for user testing in the near future. New robots will have the capability to integrate infrared and non-visual sensors, including radiological detectors and chemical analyzers.

Developer: Tank Automotive Research, Development and Engineering Center

[Back to Top](#)

Plasma Decontamination Effectively Neutralizes Chemical and Biological Agents

Quick and effective decontamination of chemical and biological agents is more important than ever. Recent research has found that decontamination systems using new plasma technologies can inactivate anthrax spores in two to three minutes. Additional testing at the Edgewood Chemical Biological Center also shows promising results in deactivating actual chemical agents.

Developed by Atmospheric Glow Technologies and supported by the Army Research Laboratory, the plasma decontamination system is more effective

and convenient than existing methods used to neutralize chemical and biological warfare agents.

Plasma is the key to the detection system's technology because it allows an efficient, practical and cost-effective approach to decontamination that was previously impossible.

Developer: Army Research Laboratory

[Back to Top](#)

Maj. Gen. John C. Doesburg—RDECOM Transition Director
Miguel Morales—Chief, Public Affairs Office/G-5

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