In the News

ARMY NEWS SERVICE (NOV. 3, 2004)

SOLDIERS GLIMPSE FUTURE CAPABILITIES

Sgt. Lorie Jewell, USA

Soldiers of the future will head into battle with lighter loads, enhanced body protection, better chow, and more portable electrical power.

Technologies like nanotechnology and photovoltaics—evolving methods that are responsible for much of the improvements—were part of a recent forum on "Equipping the Soldier for the 21st Century" at the Association of the United States Army annual meeting.

Nanotechnology involves the manipulation of atoms and molecules to create materials or items at the nanometer scale, which is about 50,000 times smaller than the diameter of a strand of human hair. It's being used to develop lighter, stronger, and more flexible body armor, helmets, uniforms, eye protection, and food packaging, among other possibilities.

Using nanotechnology, scientists and engineers envision the soldier of the future in a battle uniform that can stop or slow bullets and other projectiles, repel water, monitor health, and automatically deliver medicines to treat injuries.

Such technology will improve a soldier's chance of surviving serious injuries from blasts and firefights, said Lt. Col. Charlie Dean, the Army's liaison at the Massachusetts Institute of Technology, where The Institute for Soldier Nanotechnologies opened earlier this year.

Photovoltaics, or PVs, use solar cells to convert light into electricity, with no noise, no moving parts, and without producing pollution, scientists said. PVs can be integrated into existing materials like fabric, shelters, and vehicles.

Lightweight and portable PV panels can be laid out on a table, or spread out on top of a shelter, to generate power that can be used for a variety of things, like recharging batteries. With a small PV panel that rolls up and fits in a pocket, soldiers can recharge two double-A batteries in about two hours. Larger PV panels can also provide emergency power to field hospitals.

The forum also included a demonstration of the new combat uniform, with Sgt. Maj. of the Army Kenneth Preston fielding questions about it. The uniform, designed with input from soldiers, has been field tested by Stryker Brigade soldiers in Iraq.

Wrinkle-free with a digitized camouflage pattern of greens and light browns, the uniform features angled breast pockets, a collar that folds up to prevent chaffing from body armor, Velcro and zippers instead of buttons, and pockets on the upper sleeves and toward the bottom of the legs. A pleat in the back shoulders makes the shirt more expandable for larger-chested soldiers.

Soldiers will also wear moisture-wicking T-shirts and undergarments, and lightweight jungle-style brown boots.

The uniform will help soldiers blend into a variety of environments and especially so in urban areas and at night, Preston said. It will be phased in much like the physical training uniform was, he added. Soldiers deploying next year for OIF 3 and OEF 6 will get the uniforms, which will replace the desert camouflage uniforms and both the summer and winter versions of the battle dress uniforms.

Basic training soldiers should start getting them issued in May 2006, with all soldiers in them by May of 2008. They'll cost a little more than battle dress uniforms, but clothing allowances will be adjusted to compensate, Preston said. Soldiers will also save money because the uniforms cannot be professionally laundered or dry-cleaned; they also won't pay for patches to be sewn on since Velcro will be used.

Preston said sleeves stay down in theater, and the Army is getting away from rolling sleeves up in general.

Sgt. Maj. of the Army Kenneth Preston describes features of the new combat uniform, demonstrated by Soldier of the Year Spc. Wilfredo Mendez, far left, and Staff Sgt. Andrew J. Bullock, Noncommissioned Officer of the Year. To the far right, Sgt. Rock, an interactive robotic soldier, also wears the new uniform.

U.S. Army photograph by Sgt. Lorie Jewell, USA

One concern expressed about the uniform was the noise Velcro makes when a soldier opens a pocket. Preston said the leg pockets have drawstrings that can be used instead.

Most soldiers were enthusiastic about the uniform and future technologies. Sgt. Samuel Cowell, a signal intelligence analyst from Korea, appreciated the chance to see the uniform up close.

"This dispels a lot of rumors about it," Cowell said. "People are saying there aren't any real improvements, that the Velcro won't work right. But with all the testing it's been through, and showing us, I think it's going to be fine."

AIR FORCE PRINT NEWS (NOV. 12, 2004)
AIR FORCE'S FUTURE 'INVENTED' AT RESEARCH LAB

Master Sgt. Scott Elliott, USAF

WASHINGTON—It still may be a little too soon for *Star Trek*'s "beam me up, Scotty" technology, but Air Force scientists and engineers are trying to narrow the gap between science fiction and science fact.

The Air Force Research Laboratory at Wright-Patterson Air Force Base, Ohio, recently published the results of a study on the feasibility of teleportation physics. The study looked at scientific and engineering literature worldwide to determine the practicality of advanced research into the disembodied transport of people or inanimate objects from point to point across space.

While the study indicates science and technology are not quite ready for teleportation, Col. Michael Heil, chief of AFRL's propulsion directorate, said the Air Force is not about to quit looking to the future.

"I think it's premature to discount the basic research into promising technologies," he said. "We keep our fingers on the pulse of science at all times, so it's a continual process by our scientists and engineers to stay up to date in following the technical literature and looking for breakthroughs in physics and other sciences."

Some technological breakthroughs spend many years making the transition from concept to reality. One example is the pulse-detonation engine, where the air and fuel mixture is detonated rather than allowed to simply burn.

"The concept, thermodynamically, has been around for many years, but no one had been able to make the concept work until we took it into the laboratory here," Heil said. "We have shown we can produce thrust from a pulse-detonation engine."

The colonel said a PDE has been installed on an aircraft and has successfully completed taxi testing. "That's an example of a technology that has payoffs in terms of efficiency of producing thrust, particularly in the supersonic regime," he said.

Another promising propulsion technology involves the manufacture of unique molecules.

"We actually have chemists who will theoretically design high-energy molecules on their computers, then go into the laboratory and synthesize those molecules," Heil said. "The [chemists] have invented new nitrogen ions. We're doing advanced research to see if these new compounds and materials have payoffs for rocket propulsion. Sometimes efficiencies are at least twice [that of] current rocket fuels and oxidizers."

Heil admitted that AFRL scientists and engineers occasionally have to deal with the "giggle factor" when looking into new concepts.

"Sometimes things start to look like science fiction, like *Star Trek*," he said. "We don't fund science fiction in AFRL, we only fund legitimate science that has potential payoff for the Air Force. However, it is our job to look far out into the future to pursue promising areas of science and look at high-payoff, high-risk technologies."

Heil said the Flash Gordon ray gun was one of those one-time giggle factor ideas. That science fiction has been turned into science fact in the form of laser technology, which currently has military, medical, and commercial application.

The colonel pointed to the very basis of the Air Force—the airplane—as justification for pursuing far-out technological concepts.

"We are a high-tech Service," he said. "We were born of technology when the airplane was invented. We always push the edge in terms of embracing technology and being on the cutting edge.

"We have brilliant people [at AFRL] who are inventing the future of the Air Force," he said.

In the News

17TH PUBLIC AFFAIRS DETACHMENT NEWS RELEASE (NOV. 8, 2004)

ARMY INITIATIVE PROVIDES LATEST EQUIPMENT TO DEPLOYED SOLDIERS

Sgt. Frank Magni, USA

FORWARD OPERATING BASE ORGUN-E, Afghanistan—As the battlefield of the 21st century evolves, so does the equipment that keeps soldiers in the fight. In response to the rapid deployments of the past few years, the U.S. Army leaders have created the Rapid Fielding Initiative, known as RFI, which aims to ensure that soldiers are issued the most technologically advanced equipment available to them.

The initiative team issues a variety of equipment, from boots and gloves to sunglasses and improved helmets. Most units receive a rapid fielding initiative issue before deploying. But in a time of no-notice or last-minute deployment orders, there are some soldiers who are missed. In this case, the RFI team will travel to the field to get equipment to soldiers, said Sgt. 1st Class James Mical, Army Test and Evaluation Command RFI consultant.

"With technology changing so fast, and soldiers rapidly deploying, it is necessary to have a flexible solution to get equipment to the soldiers," said Philip Whitlock, initiative team member.

The advantages of Rapid Fielding Initiative are numerous, Whitlock said. Because the team can travel throughout the world, they are able to bring equipment to soldiers whose units did not have the opportunity to receive the equipment at their home station.

"We go where the soldiers are," said Whitlock.

Once the members of the team visit the soldiers in Iraq, they send the measurements and sizes back to a warehouse in Kuwait. There, a duffel bag is filled with each soldier's gear based on his or her sizes. The bag is then sent back to the individual's unit for issue. This process can have the gear back to the soldier in about 15 days.

Emphasis on the soldier is one reason why the initiative is gaining in popularity within the Army, said Whitlock. Not only do members of the team pay close attention to customer service, but the equipment they issue keeps them popular, Whitlock said.

The items issued vary by the type of unit a soldier is in, but most get improved T-shirts, belts and socks, along with silk-weight long underwear, goggles, hydration systems, improved knee pads, fleece jackets, and bib overalls.

Some soldiers are even issued multi-function tools and other tools they use as part of their military occupational specialty. Combat soldiers are also issued modular lightweight load-carrying equipment, known as MOLLE gear.

On Forward Operating Base Orgun-E, in Afghanistan, the initiative team came to properly size soldiers for the Advanced Combat Helmet. The unit, 2nd Battalion, 27th Infantry Regiment, was issued a majority of their RFI items before deploying, but the advanced helmet was a supplemental item.

The ACH is an improvement over the traditional helmet because of its advanced design, said Luis Samuel, RFI team member. "It is designed to work better with interceptor body armor," he continued. "It is easier to shoot from the prone position with these new helmets."

The ACH is also one-and-a-half pounds lighter than the traditional Kevlar helmet and has a four-point chin strap system for a better fit. It also provides a better fit because each helmet has rotating pads that fit to different sized heads.

Each ACH comes with a night vision mount, helmet cover that is reversible with either desert or woodland pattern, movable pads, and the four-point chin strap

Sgt.Luis Samuel, right, a Rapid Fielding Initiative team member, fits an Advanced Combat Helmet to Spc. Richard Delgado on Forward Operating Base Orgun-E, Afghanistan. Delgado is assigned to Company C, 2nd Battalion, 27th Infantry Regiment.

U.S. Amy photograph by Sgt. Frank Magni, USA

retaining system. It can also be fitted with a communications system.

While the ACH is just now being issued to many soldiers in Operation Enduring Freedom, Spc. Edgar Salas of the battalion's Company C wore the ACH when he was with the 101st Airborne Division (Air Assault) during the early phases of Operation Iraqi Freedom.

Salas said he was very satisfied with the helmet during the months he used it in Iraq.

"It fits so well, and it is so much lighter that you sometimes forget you have it on," said Salas. "It really helps lessen neck and shoulder fatigue on long missions."

Spc. Dan Maulsby, another Company C soldier, said he likes RFI for a few different reasons.

"It feels good because it feels like the Army is going out of its way to get us the best equipment they can," said Maulsby.

The piece of equipment that has been most useful is the MOLLE vest, said Maulsby.

"These vests are comfortable and practical," he said. "It makes sense because each person can put the pockets in different positions. This is better, because with the different weapon systems, each person can put ammo where it is most efficient."

Both Maulsby and Salas said all the equipment they have received from RFI has been very useful and that they would likely have purchased some of the items themselves if they weren't issued them.

This is a common response heard by the Rapid Fielding Initiative team, and it has become one of the most rewarding aspects of their jobs.

"These are all items soldiers were buying anyway, We were just giving them something they can use," said Samuel. "This just cuts down on [unnecessary] cost to the individual soldier."

AIR FORCE PRINT NEWS (NOV. 2, 2004)

LEADERS UNVEIL UPDATED UTILITY UNIFORM COLORS, PATTERN

Tech. Sgt. David A. Jablonski, USAF

WASHINGTON—Responding to airmen's feedback, Air Force leaders unveiled an alternative utility uniform color scheme and pattern Nov. 2 as part of the ongoing wear-test that was announced in August 2003.

Secretary of the Air Force Dr. James G. Roche, Air Force Chief of Staff Gen. John P. Jumper, and Chief Master Sgt. of the Air Force Gerald R. Murray are now wearing the latest test version of the utility uniform during visits to airmen serving in Operation Iraqi Freedom.

The most striking change in this version is the switch from a deep blue, gray, and green color scheme to a more subdued mix of tan, blue, and two shades of green. And the tiger-stripe pattern is now pixilated.

This test version includes design changes incorporated in September based on feedback from airmen.

More than 700 people at 32 installations are wear-testing the first test uniform. These airmen participated in scientific surveys and focus groups. Their feedback was instrumental in making the most recent adjustments. The original plan called for only 300 testers, but uniform board officials decided to increase the number of testers

The Air Force utility uniform's revised colors are tan, blue, and two shades of green in a pixilated tiger-stripe pattern. Secretary of the Air Force Dr. James G. Roche, Air Force Chief of Staff Gen. John P. Jumper, and Chief Master Sgt. of the Air Force Gerald R. Murray are wearing the updated utility uniform during visits to airmen serving in Operation Iraqi Freedom.
U.S. Air Force photograph by Tech. Sgt. David A. Jablonski, USAF

to get more exposure and collect more test data. A select group will test the newest version.

Data showed that a Service-unique appearance was very important to airmen.

"Ninety-one percent of the airmen responded in favor of a distinctive Air Force utility uniform," Murray said. "Airmen take great pride in serving in America's Air Force. Having a distinct uniform that presents a professional appearance to the public and our sister Services, when we are at home station or deployed, is important"

A unique Air Force-designed uniform has another big advantage.

"Our new utility uniform incorporates a unique fit tailored for men and women, and a variety of realistic sizes beyond just small, medium, and large," the chief said.

"More than 20 percent of our airmen are women, and we continually received feedback on how the male uniforms they currently wear do not fit well. Fit and comfort are important for all airmen to project a professional military image."

Officials said they are reaping additional benefits from this particular uniform wear-test process.

Air Force Clothing Office officials took detailed measurements of as many body types as possible and recorded them into a database for future uniform design studies. Since the last such measurement in the 1960s, officials discovered that the average airmen now has a more athletic build.

Not only are airmen more fit to fight; they are deployed more often and for longer periods than ever before. There is no time to fuss over finicky uniforms, officials said.

"The wash-and-wear uniform will be easier and cheaper to maintain," said Senior Master Sgt. Jacqueline Dean, uniform board superintendent. "The permanent-press treatment eliminates the need for ironing, and home washing can save an airman from $180 to $240 in laundry costs over the course of a year."

Dean oversees the wear test and leads the uniform board's campaign to display the uniform as much as possible in a variety of locations.

"The wear test allows airmen around the world to see the uniform in work places and to give feedback on its appearance, comfort, function, and maintenance," Dean said. "The chief of staff took that feedback into consideration when making the decision to move forward with expanding the test to include the new color and pattern."

Special operations and survival, evasion, resistance, and escape airmen will field-test the new utility uniform's pattern and colors to see how they perform in extreme conditions.

In January 2005, the uniform board will standardize the pattern, material, and specifications and deliver the results to the Defense Logistics Agency for production. Normal production to delivery time can take 18 to 24 months.

AMERICAN FORCES PRESS SERVICE (NOV. 9, 2004)

UNMANNED AIRCRAFT GAIN STARRING ROLE IN TERROR WAR

Donna Miles

WASHINGTON—Unmanned aerial vehicles are earning star status in the global war on terror, becoming the most requested capability among combatant commanders in Southwest Asia and increasing fourfold in that theater during the last year alone, according to the deputy director of the Pentagon's UAV planning task force.

Dyke Weatherington told the American Forces Press Service that UAVs are topping combatant commanders' wish lists. During the past year alone, the number of UAVs in Iraq has jumped from less than 100 to more than 400.

"We've seen a huge growth in the total number of UAVs in the theater, with most of that growth in the area of small UAVs," he said. "There's a lot of capability over there today, and frankly, the warfighter is asking for more."

What makes UAVs so valuable, Weatherington said, is their ability to provide eyes in the sky for extended periods of time, beaming real-time images to the ground.

"In the global war on terror, persistence is vitally important," he said. "It's important to deny the enemy sanctuary. And constant surveillance in his backyard, so to speak, prevents him the opportunity to mass assets and forces."

In the News

In the event the enemy does this, UAVs offer an additional capability beyond their traditional intelligence, surveillance, and reconnaissance role, Weatherington said. Now they're demonstrating a strike capability as well.

The Air Force's Predator UAV, which earned its stripes flying reconnaissance missions in Bosnia, showcased that capability in Southwest Asia. Predator is credited with taking out one of al Qaeda's top lieutenants in Afghanistan with a Hellfire missile, and has since been used widely for offensive operations in Iraq.

Although Predator wasn't initially designed as a strike platform, Weatherington said its ability to provide continual surveillance and respond quickly to on-the-ground threats makes it a valuable asset in the war on terror.

"A UAV with a strike capability can take action very early in that cycle [of enemy activity]," Weatherington said, "and in many cases, eliminate the threat entirely."

Even unarmed, Predator and other UAVs can identify targets so other strike platforms, such as AC-130 Spectre gunships, can engage them more quickly and effectively, Weatherington said.

But Predator isn't the only UAV proving its value in Southwest Asia. Weatherington said the variety of UAV systems in the military inventory ensures that UAV technology is adaptable to the widest range of missions.

In all, the military now has more than a dozen UAV systems in its inventory and is at work on several new ones, including the Joint Unmanned Combat Aerial System, which will incorporate direct-strike capabilities and a rotary-wing UAV.

On the more immediate horizon, there's the high-altitude, super-sophisticated Global Hawk being developed for the Air Force to conduct long-term surveillance. At the other end of the spectrum, the Marine Corps' hand-launched Dragon Eye system already in use in Iraq gives

U.S. Marines prepare a hand-launched Dragon Eye unmanned aerial vehicle along the outskirts of Fallujah, Iraq, in the first hours of Operation Al Fajr on Nov. 8, 2004. The Marines are assigned to 3rd Battalion, 5th Marine Regiment, 1st Marine Division.
U.S. Air Force photograph by Cpl. James J. Vooris, USMC

squad- or company-level leaders a snapshot of their operating area, then breaks down into pieces that fit in a backpack.

The Raven, another small, hand-held system in use by the Army, is the most common UAV in Iraq, Weatherington said, with about 250 systems providing real-time, up-to-date, over-the-horizon views over trouble spots. It packs into a transit case that fits into the back of a Humvee.

Another rising star is the Shadow tactical UAV, which is proving its value in Iraq during improvised-explosive-device sweeps and reconnaissance missions. Weatherington said six Shadow systems in Southwest Asia "are flying almost continuously."

Weatherington, whose office coordinates all military UAV initiatives and programs, said there's no single, one-size-fits-all formula for UAVs. Different systems are more readily adaptable to different missions, providing capabilities from the squad or company level to the division or corps level, to the theater level.

"It's the integration of all those capabilities that make them advantageous," he said. "The integration of those systems is what provides very persistent surveillance capabilities."

In Iraq, UAVs provide situational awareness for troops guarding garrisons and high-value targets, support mobile troops during scouting missions, and watch over convoy movements, among other missions, Weatherington said.

"They're a real advantage," he said. "If a convoy is going down the road and sees something up ahead that looks unusual, they can literally stop, put one of these things together and launch it, fly down the road and see what's down there—without endangering the convoy."

Weatherington said these small UAVs extend the capabilities of ground forces involved in protecting strategic locations. "You can have a detachment there for protection, but they can't always service the entire area," he said. "So with one of these small UAVs, you can extend their eyes and ears to a much larger area and have a very rapid response if they detect a potential threat."

Meanwhile, UAVs provide high-altitude surveillance with "robust capabilities" at the theater level. Weatherington said as many as five Predator systems—all operated from within the United States—continually monitor the skies over Iraq and Afghanistan, sometimes simultaneously.

Weatherington said UAVs can do what people can't—or ideally, shouldn't have to. They're able to operate at long ranges and don't tire or lose concentration as a human would over extended periods, particularly when operating in dangerous, high-stress environments.

They're less expensive to operate than manned platforms. For example, operating Predator costs "about a quarter of what it costs to operate an F-16—and it stays up 10 times as long," Weatherington said.

But perhaps most important, they can conduct highly risky missions without risking human lives. "It affords combatant commanders flexibility in using an asset to conduct a mission that they may not choose to risk a human, manned platform to do," Weatherington said.

In the long term, Weatherington said he expects to see UAVs and other unmanned systems replace more manned systems, particularly for high-risk or high-threat missions. "I think we'll continue to see that evolution," he said.

But despite their contributions, Weatherington was quick to point out that UAVs "aren't a panacea."

"They can't do everything for everybody, and we shouldn't try to make them do everything for everybody," he said.

Air-to-air combat, for example, is probably best left to the highly skilled pilots trained to operate in what Weatherington called "a highly dynamic environment." Similarly, tanker and airlift missions are probably most appropriate for manned aircraft, although Weatherington said the Services are eyeing the possibility of "optional manning" for these aircraft.

In the meantime, Weatherington said UAVs have become "an extremely valuable asset, in terms of their endurance, their intelligence, surveillance and reconnaissance capabilities, their flexibility, and their cost."

"They've proved their worth and continue to be a very effective tool for combatant commanders fighting the global war on terror," he said.

In the News

AIR MOBILITY COMMAND NEWS SERVICE (NOV. 15, 2004)

NEW AMC DELIVERY PROCESS SPEEDS SHIPMENTS TO TROOPS

Tech. Sgt. Mark Diamond, USAF

SCOTT AIR FORCE BASE, Ill.—A new Air Mobility Command program, dubbed "Pure Pallet," is simplifying and speeding up airlift shipments into the U.S. Central Command's area of responsibility.

The program involves building and shipping individual aircraft pallets with cargo for a single customer, AMC officials said.

Lt. Col. Steve AuBuchon, AMC's cargo management branch chief of the logistics air transportation division, said that a customer's cargo is normally loaded onto an aircraft pallet with cargo for other customers within the same region. Under this system, a single pallet could contain cargo for dozens of customers. The colonel said once these "mixed" pallets arrive at a forward-deployed aerial port, they must be broken down, sorted, re-palletized, and distributed to the individual customers.

Besides adding a considerable amount of time to the delivery process, AuBuchon said the airmen, soldiers, or Marines responsible for breaking down, sorting, rebuilding, and redistributing these mixed shipments are vulnerable to attack for longer periods of time.

"In CENTCOM right now, the aerial ports are very restricted on the amount of cargo processing facilities, equipment, people, and experience [because of] the threat of attack," he said. "If you're unloading and sorting cargo at Balad, you could easily have a mortar drop on top of you."

The program transfers this additional workload to what he called "the peaceful end of the process." When a pure pallet arrives at the deployed aerial port, it can be pulled from the aircraft and immediately handed off to the customer or placed on a truck or C-130 Hercules headed to more remote locations. "The process never stops," AuBuchon said.

The colonel said the program is based on the principle that the earlier in the logistics pipeline that individual shipments are unitized into a single package, the quicker and more efficiently the package is going to go through the system.

"Obviously, there are going to be some limitations, but our limitations are [fewer] than they have [at the deployed aerial port], so we've taken this upon ourselves," he said.

What the program means to the warfighter is a more rapid and simplified distribution of shipments into the theater of operations, said Maj. Michael Kossow, the branch's chief of strategic distribution.

"Our nation's military efforts in support of the global war on terrorism, particularly those of the Army and Marine Corps in the Central Command area of responsibility, have changed the old paradigm of logistics support to a new philosophy of time-definite delivery," he said. "The focus is on airlifting shipments to the warfighter at the right speed, at the right time, and most important, on the right pallet to a designated location."

Since March, the program has been incorporated in aerial port operations at Dover Air Force Base, Del., Charleston AFB, S.C., and Ramstein Air Base, Germany, for cargo shipments into the CENTCOM theater.

The process of building each pure pallet begins at the aerial port, where cargo is held in aisles or lanes, according to the customer's Department of Defense activity address code. AuBuchon said the codes can be compared to ZIP codes used by the U.S. Postal Service—each customer has his or her own code.

"One of the problems with building pure pallets is having enough cargo to fill an entire pallet," the colonel said. "When we were negotiating with the Army and Marine Corps, we told them it would kill us to ship a half-empty pallet. Airlift is a precious commodity, and we can't send a C-5 [Galaxy] over there with 36 half-empty pallets. We have better things to use that airlift for. Airlift is a precious national asset, and we have to make sure we use it as efficiently as we can."

He said Army and Marine Corps officials said they would be willing to wait a certain a number of days for the aerial port to accumulate cargo for specific codes. Additionally, AuBuchon said, certain codes can be combined to fill a single pallet.

Although the aerial ports are holding cargo for an additional three to five days, Kossow said the program has still reduced delivery times into Southwest Asia.

He said that because a single mixed pallet could include cargo for dozens of customers within the same region, aerial port workers and customers expend valuable time and resources breaking down, sorting, rebuilding, and distributing the shipments, resulting in delays of up to several weeks. The major said pure pallets, on average, are reaching their customers in fewer than nine days.

But AuBuchon said AMC officials cannot take all the credit.

Although pure pallets are new to the Air Force, the colonel said AMC's program was actually modeled after a similar system used by the Defense Logistics Agency.

"Our pure pallet operations are much smaller than the Defense Logistics Agency's, but no less effective," AuBuchon said. "Our program has been very successful. [Soldiers have] had some very high praise for the program, not only because the cargo is getting to them faster, but because of the quality job AMC is doing."

Kossow said the "quality" is a by-product of the hard work from AMC airmen.

"Our AMC aerial ports at Charleston, Dover, and Ramstein have made a very complex and unique task look easy," he said. "But the reality is these aerial port professionals have really stepped up to the task with hard work, creativity, and an insatiable drive to keep the warfighter equipped in the global war on terrorism."

AIR FORCE PRINT NEWS (NOV. 16, 2004)

NEW LIGHT-WEIGHT WEAPON JOINS BALAD ARSENAL

Master Sgt. David Reagan, USAF
332nd Air Expeditionary Wing Public Affairs

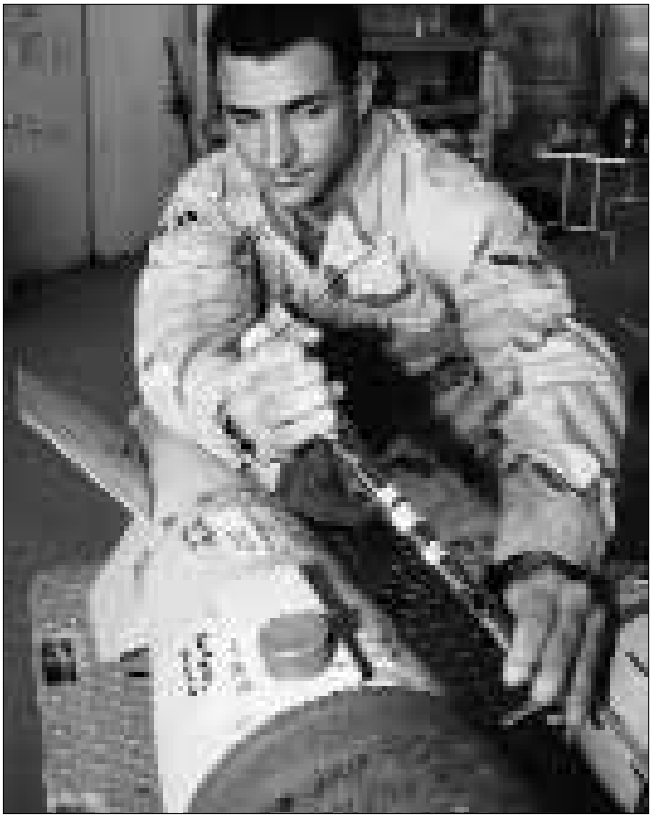
BALAD AIR BASE, Iraq—In an effort to keep pace with the ever-changing face of close-quarters combat, F-16 Fighting Falcon crews here plan to use a new, lightweight satellite-guided munition soon.

The GBU-38 500-pound Joint Direct Attack Munition is designed to reduce collateral damage, limit unintended casualties, and take the fight up close and personal to enemy insurgents and anti-Iraqi forces alike.

Although they will not be the first in theater to drop the newest JDAM in the U.S. arsenal, munitions specialists, maintainers, and aircrews dedicated to keeping the bite of the 421st Expeditionary Fighter Squadron "Black Widows" lethal are saying, "Let's Roll."

As specialists and maintainers fine tune the basics to certify the GBU-38 on F-16s based here from Hill Air Force Base, Utah, elsewhere in the area the new JDAM has already proved to be a thorn in the side of those who choose to impede the Iraqi reconstruction effort.

Two F-16s from an undisclosed location completed the first successful combat drop of GBU-38s on Oct. 4, 2004, during a precision strike on a confirmed Abu Musab al-Zarqawi terrorist meeting. The two released JDAMs precisely struck the terrorist hideout causing only minimal collateral damage.



BALAD AIR BASE, Iraq—Airman 1st Class Michael Claypoole assembles a GBU-38 500-pound Joint Direct Attack Munition. The new munition is designed to reduce collateral damage, limit unintended casualties, and take the fight up close and personal to enemy insurgents and anti-Iraqi forces alike. Claypoole is a munitions systems journeyman with the 332nd Expeditionary Maintenance Squadron at Balad.
U.S. Air Force photograph by Master Sgt. David Reagan, USAF

"We're ready to go and just waiting on the final steps in the approval process," said Senior Master Sgt. Douglas Baker, 332nd Expeditionary Equipment Maintenance Squadron munitions flight chief. "After receipt of our JDAM tail fin kits in late October, my munitions crew produced sufficient quantities of the new JDAM to support our mission requirements in only 24 hours."

Additionally, Baker said the new weapon greatly enhances the capabilities of the Black Widows by giving them an additional choice of weapon that performs well in a confined, inner-city environment.

Normally with new equipment and cutting-edge technology, one can expect a certain degree of difficulty or steep learning curve to be associated with the product; however, during the initial build, munitions crewmembers found the newest version the easiest to assemble of all the JDAM line-up.

"We prefer building this JDAM over the others simply because it is much easier to work with the smaller weapon compared to the 2,000-pound JDAM we routinely call the monster," Baker said.

"The focus and level of teamwork we used in building the initial complement of GBU-38s was high. There is a profound likelihood these weapons will be expended on each mission here, so it was imperative for us to learn and follow the new procedures to the letter," said Tech. Sgt. Patrick Van Vranken, 332nd EMXS munitions flight production supervisor. "After all, it is all about bombs on target in this environment," he said. Van Vranken oversaw the initial assembly of the new JDAMs here.

"Anytime you experience a new weapons system, it is interesting and challenging all at the same time," Van Vranken said. "We have to do it right each and every time. Our Army, Navy, and Marine counterparts expect no less and need this support on the ground; they need this firepower."

AIR FORCE PRINT NEWS (NOV. 16, 2004)
SPACE ASSETS CRITICAL TO WINNING WAR ON TERRORISM

Capt. Johnny Rea, USAF
Air Force Space Command Public Affairs

NEW YORK—Space-based assets are proving critical to winning the war on terrorism, according to the commander of Air Force Space Command.

"You cannot go to war and win without space," Air Force Gen. Lance W. Lord said during a live appearance on "Fox and Friends" here Nov. 11, 2004.

The command comprises about 40,000 space professionals who provide combat forces and capabilities to North American Aerospace Defense Command and U.S. Strategic Command, supporting various operations worldwide.

Space allows precision attack on the battlefield, the general said, and has transformed the way American forces fight modern wars.

Precision-guided munitions using Global Positioning System satellites limit the exposure and vulnerability of forces while minimizing collateral damage and maximizing combat effectiveness, he said.

"We take the 'search' out of search and rescue," Lord said during his television appearance.

He said the command's airmen are currently supporting warfighters on the ground in Fallujah, Iraq.

"We provide the navigation and the timing so that [the warfighters] can know exactly where they are—and what the target coordinates are—and [are] able to hit those with precision using space-based capabilities."

The general reiterated the importance of space during a speech at a luncheon later the same day.

"Our nation depends upon our space capabilities for precision attack, speed, and unmatched maneuverability on today's battlefield," he said. "We are well on our way to becoming a full spectrum combat command in the future."

He said space superiority is a prerequisite for success, describing three elements necessary to achieve and sustain space superiority.

"Space situation awareness provides a robust understanding of what's going on in the medium of space," he said.

Defensive counterspace is not a program or a goal, but rather a mindset, he said. "We must work diligently to protect our advantage in space. Our nation depends on it."

Finally, the general said the United States must develop the ability to counter enemy systems through reversible effects.

"We have made some tremendous progress with our existing capabilities, and we can all be proud of the contributions made by our military space systems," Lord said. "We are making a difference—where it counts the most—on the battlefield."

ARMY NEWS SERVICE (NOV. 24, 2004)

ARMY MATERIEL COMMAND MERGES UNITS IN EUROPE

C.W. Fick Jr.

SECKENHEIM, Germany—In keeping in step with the Army's transformation, Combat Equipment Group–Europe and Army Materiel Command Forward–Europe merged Nov. 18, forming Army Materiel Command Field Support Brigade–Europe.

The new unit mirrors the mission of its parent, Army Field Support Command, and will deliver the full spectrum of logistics power projection and support to forces in the field.

"By combining two Army Materiel Command units with a proud history of warfighter support, the Army gains a leaner organization, focused on delivering expertise and equipment to soldiers and units throughout the European area of operations," said Col. Max Lobeto, commander of the newly formed brigade.

The focus of AMC FSB-E is to provide service to supported units.

"Adopting a brigade structure aligns us with the expeditionary Army units we support in Europe and beyond," said Lobeto. "Our mission is unchanged: AMC Field Support Brigade–Europe provides an essential and enduring link from America's arsenal to units and troops in the field."

More than 300 people form the core of the brigade, with several hundred more host-nation service providers and contractors adding capabilities ranging from mechanical repairs to logistics assistance.

"We have over 1,600 people on the ground throughout Europe and attached to U.S. Army Europe units for one purpose: delivering logistics readiness power forward," Lobeto said.

The new brigade also brings with it the capability to reach back to commands in the United States.

"Our team includes representatives from AMC's major subordinate commands, like Tank-automotive and Armaments Command, Aviation and Missile Command, and others, enabling us to deliver expertise and equipment directly from the source to the soldier," Lobeto said.

Pre-positioned equipment and repair capabilities also feature prominently in the new command. Field support battalions (formerly called combat equipment battalions) located in The Netherlands, Italy, Luxembourg, and the United Kingdom bring 20 years of experience in delivering combat-ready equipment to the battlefield.

"Many of the tanks and trucks the 3rd Infantry Division drove to victory in Operation Iraqi Freedom were deliv-

Brig. Gen. Jerome Johnson, Army Field Support Command commander, Gen. Benjamin S. Griffin, Army Materiel Command commander, and Col. Max Lobeto, AMC Field Support Brigade–Europe, salute during a Nov. 18 ceremony at Seckenheim, Germany, in which CEG-E and AMC Forward–Europe were merged to form AMC Field Support Brigade–Europe. U.S. Army photograph by C.W. Fick Jr.

ered by CEG-E, which has become the field services arm of the new brigade," the commander said.

Though the name has changed and the staff are consolidated, the pace of operations has not missed a beat all across the brigade.

"Now that the 1st Armored Division is back in Germany, our workforce is heavily engaged in rapidly repairing and returning equipment in what is called a 'reset' mission," Lobeto said. He said this enables the soldiers to concentrate on training and getting back to full operational readiness.

"We're part of an Army at war, and we are adapting to the mission," Lobeto said. "By merging capabilities into one headquarters, we're providing combatant commanders with one-stop logistics services."

ARMY NEWS SERVICE (NOV. 30, 2004)

ARMY SCIENCE CONFERENCE SPEAKER FORECASTS REPLACEMENT OF COMPUTERS BY 2010

ORLANDO, Fla.—By 2010, computers will be replaced by electronics so tiny they can be embedded in clothing or eyeglasses and broadcast on the human retina, a noted inventor predicted at the Army Science Conference.

Dr. Ray Kurzweil, creator of the first synthesizer, inventor of the first commercially marketed large-vocabulary speech recognition machine, and winner of the $500,000 Lemelson-MIT Prize for invention and innovation, also foresaw the introduction of realistic 3-D holographic projection and machines that instantly translate the spoken word from one language to another.

His presentation on Nov. 29, 2004, capped off the first day of the 24th biennial conference sponsored by the United States Army to explore how transformational science is changing our world and the soldier fighting force. Senior Army leaders, industry experts, and noted academics joined together here to build collaborative relationships and develop the technologies and capabilities that will be the hallmark of the future force.

Technological advance has incredible potential to improve the warfighting effort, Kurzweil said. New virtual technologies will reduce—and in many ways, are already reducing—the time it takes to develop new combat systems, he said.

Miniaturization, or the process of condensing more powerful technologies into smaller packages, will help the Army create more and better unmanned machines that remove soldiers from dangerous combat situations. Some fighting will be done by remote control, Kurzweil said.

Today we have smart bombs, but tomorrow we may have smart bullets, he added.

Human knowledge of information technology, computer technology, and health science is doubling annually, Kurzweil said. In nearly every area, we are experiencing exponential growth in knowledge.

This knowledge does not only have military applications; its possibilities across the spectrum of human existence are astounding, he noted.

Kurzweil offered the example of genetics. It took 15 years to sequence the HIV virus, the cause of AIDS, but it took only 31 days to sequence the SARS virus. This knowledge allows scientists to explore gene suppression, a possible key to unlocking a cure for dozens of diseases, he said.

"There are new drugs… kind of like smart weapons, that zero in on specific targets with no side effects," Kurzweil said.

Another example is the development of instantaneous language translation devices, which Kurzweil predicted will be common on cellular telephones by the end of the decade.

"Within a few years, we will be able to talk to anyone, regardless of language," he said.

Because of the importance of technology, the threat to the military and economic dominance of the United States lies in the decline in Americans' pursuing careers in fields such as engineering and natural science.

Kurzweil noted that more and more students in China and other Asian nations are pursuing advanced education in science-related fields. In America, these trends are reversed.

Kurzweil admitted while technology will solve many problems we face today, a utopia is not on the horizon. He concedes this development will unlock new problems we do not fully understand today.

Commissioned by Claude M. Bolton Jr., assistant secretary of the Army for acquisition, logistics and technology, the Army Science Conference has a focus that is twofold: to discuss the current state of technology and how it is being used to support the global war on terror; and to forecast how emerging technologies will be harnessed in the future.

ARMY NEWS SERVICE (DEC. 3, 2004)

ARMED ROBOTS SOON MARCHING TO BATTLE?

Sgt. Lorie Jewell, USA

ORLANDO, Fla.—Soldiers may have armed robots as battle buddies by early 2005, according to industry and military officials attending the biennial Army Science Conference.

The Special Weapons Observation Reconnaissance Detection System, or SWORDS, will be joining Stryker Brigade soldiers in Iraq when it finishes final testing, said Staff Sgt. Santiago Tordillos, a bomb disposal test and evaluation NCOIC with the EOD Technology Directorate of the Army's Armament Research, Development and Engineering Center at Picatinny Arsenal, N.J.

"We're hoping to have them there by early 2005," Tordillos said. "The soldiers I've talked to want them yesterday."

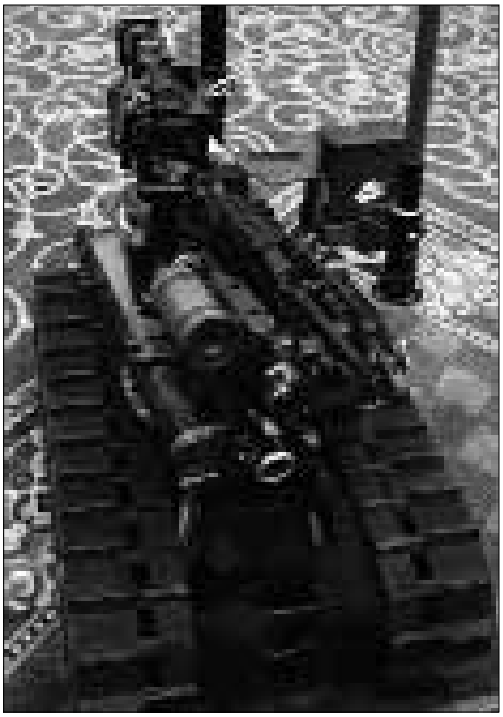
The system consists of a weapons platform mounted on a Talon robot, a product of the engineering and technology development firm Foster-Miller. The Talon began helping with military operations in Bosnia in 2000, deployed to Afghanistan in early 2002, and has been in Iraq since the war started, assisting with improvised explosive device detection and removal. Talon robots have been used in about 20,000 missions in Iraq and Afghanistan, according to Foster-Miller reports.

"It's not a new invention; it's just bringing together existing systems," said Tordillos, who has been involved with the project since its inception about a year and a half ago.

Different weapons can be interchanged on the system—the M16, the 240, 249, or 50-caliber machine guns, or the M202 -A1 with a 6mm rocket launcher. Soldiers operate the SWORDS by remote control, from up to 1,000 meters away. In testing, it's hit bullseyes from as far as 2,000 meters away, Tordillos said. The only margin of error has been in sighting. "It can engage while on the move, but it's not as accurate," Tordillos said.

The system runs off AC power, lithium batteries, or Singars rechargeable batteries. The control box weighs about 30 pounds, with two joysticks that control the robot platform and the weapon, and a daylight viewable screen. SWORDS recently was named one of the most amazing inventions of 2004 by *Time* magazine.

There are four SWORDS in existence. Eighteen have been requested for service in Iraq, Tordillos said. So far, each system has cost about $230,000 to produce, said Bob Quinn, lead integrator for the project. When they go into production, Quinn estimates the cost per unit will drop to the range of $150,000 to $180,000.



With a weapons platform mounted to a Talon robot, the SWORDS system allows soldiers to fire small arms weapons by remote control from as far as 1,000 meters away. The system, demonstrated at the biennial Army Science Conference, may soon join soldiers in Iraq.
U.S. Army photograph by Sgt. Lorie Jewell, USA

Quinn credits soldiers with getting the project started. "It's a classic boot-strap effort," said Quinn.

Tordillos fielded a variety of questions while showing off the system in the exhibit hall. Soldiers wanted to know what military occupational speciality they have to sign up for in order to work with the system. There is no specific MOS for it, he said.

Other questions were more thought-provoking. Does he envision a day when armed robots will outnumber humans on the battlefield? Tordillos firmly said no. "You'll never eliminate the soldier on the ground," he said. "There'll be a mix, but there will always be soldiers out there."

In the News

ARMY NEWS SERVICE (DEC. 7, 2004)

EMERGING TECHNOLOGIES FORM FUTURISTIC UNIFORM

Sgt. Lorie Jewell, USA

ORLANDO, Fla.—Dressed in black from head to toe and wearing a helmet that allows barely a glimpse of his face, Staff Sgt. Raul Lopez looked like something out of a science fiction thriller.

Lopez, an infantry soldier stationed at the Natick Soldier Center in Massachusetts, spent four days in what could be the Army uniform of the future at the 24th Army Science Conference, explaining the technology behind it.

The black fabric of the form-fitting suit would be made through the wonder of nanotechnology, which involves manipulating atoms and molecules to create things at the nanometer scale. That's about 50,000 times smaller than the diameter of a strand of hair. Soldiers wearing the suit would have the ability to blend into any environment, like a chameleon.

The helmet is the main hub of the uniform, where "all of the action happens," Lopez said. A tiny video camera in front provides 360-degree situational awareness. A series of sensors inside give the soldier three-dimensional audiological hearing and the ability to amplify specific sounds, while lowering the volume of others.

Complete voice translation is also provided for what the soldier hears and what he or she says. Night vision sensors, minimized to the size of pencil erasers, are also in the helmet. Maps and other situational awareness information are projected on the inside of the visor, while everything the soldier sees and hears is sent in real time up to higher headquarters. "It's all voice activated," Lopez said. "I can tell it to show me where my buddies are, and it projects it on the visor."

Virtual reality technology would also play a part in helping the soldier navigate an environment by projecting maps on the ground surrounding him or her.

Sensors detect threat, provide treatment

Thermal sensors weaved into the fabric of the uniform control its temperature, based on the soldier's environment. An on-board respirator, tethered to the soldier's back, provides a continuous supply of fresh air—eliminating the need for a protective mask. Should the soldier breath in some kind of harmful agent with the visor up or the helmet off, the uniform sensor will immedi-

Army Staff Sgt. Raul Lopez models a conceptual version of an Army soldier's uniform in the year 2025.
U.S. Army photograph by Sgt. Lorie Jewell, USA

ately detect it, release tiny embedded capsules to counter it, and inject treatment into the soldier's body.

From the waist down, a skeletal system allows the soldier to carry two or three times his or her body weight, feeling only the weight of the body through the technology of an XO muscle, which augments a soldier's strength.

Wearing the futuristic suit doesn't make Lopez feel like a science fiction superhero or invincible. "It's just conceptual right now," he said, smiling.

Liquid armor protection

The uniform might be made out of fabric treated with another technology featured in the conference's exhibit hall, shear thickening fluid. Unofficially referred to by some as "liquid body armor," STF is made of equal parts polyethylene glycol—an inert, non-toxic thickening agent used in a variety of common products, like some ice creams—and miniscule glass particles, said Eric Wetzel, who heads the STF project team in the Weapons and Materials Research Directorate of the U.S. Army Research Laboratory.

In a small glass vial, the light blue liquid is easily stirred with a small plastic stick—as long as the stick is moving in slow, easy motion. When sudden, rapid or forceful motion is applied, the liquid instantly hardens, preventing any movement.

"When the movement is slow, the glass particles can flow around each other," Wetzel explained. "But when the movement is fast, the particles bump into each other, preventing any flow of movement."

STF has been applied to regular Kevlar material, Wetzel said. The fabric's texture doesn't change; it looks and feels the same as if it hadn't been treated. Using a test swatch of four layers of untreated Kevlar—the normal thickness of body armor—Wetzel is able to stab an ice pick through the fabric. But when stabbing a treated section of fabric with all the force he can muster, the ice pick dents the fabric but can't penetrate through.

Research is being done into whether STF can be of use to the Army, Wetzel said. If it is, soldiers may start getting gear treated with it in about two years, he added.

PROGRAM EXECUTIVE OFFICE FOR ENTERPRISE INFORMATION SYSTEMS NEWS RELEASE (DEC. 10, 2004)

ARMY AND INDUSTRY WORKING OVERTIME TO SUPPLY IMPROVED TACTICAL HEADSETS FOR TROOPS IN IRAQ

Stephen Larsen

The Army is scrambling to acquire sufficient quantities of improved tactical headsets (ITHs), which are designed to protect soldiers' hearing and to allow them to communicate in the high-noise environment of the M1114 up-armored HMMWVs (High-Mobility Multipurpose Wheeled Vehicles) and other light tactical vehicles being used by the Army in Iraq. The ITHs are manufactured by Bose Corporation under a subcontract with Northrop Grumman Corporation. The hurdle is that the improved tactical headset is a completely new, revolutionary design that is being rushed into production to satisfy the Army's needs in Iraq.

"The Army had not planned on needing the new headsets until sometime in late 2005," said Maj. Ron Claiborne, the Army's assistant product manager, vehicular intercommunication systems, with the Project Manager, Defense Communications and Army Transmission Systems. "But we have soldiers in Iraq who need these headsets now, so Bose is working with us to produce ITHs on an accelerated production and delivery schedule."

Speaking in December 2004, Claiborne said there were "around 2,000" ITHs fielded—all in Iraq—and that Bose was able to produce between 125 to 400 a week. "Our goal is to get production and fielding up to between 500 to 700 ITHs per week by the end of January," he said. "Then after we satisfy all requirements for M1114 HMMWV headsets in Iraq, we hope to be able to field them to the rest of the Army beginning in July 2005."

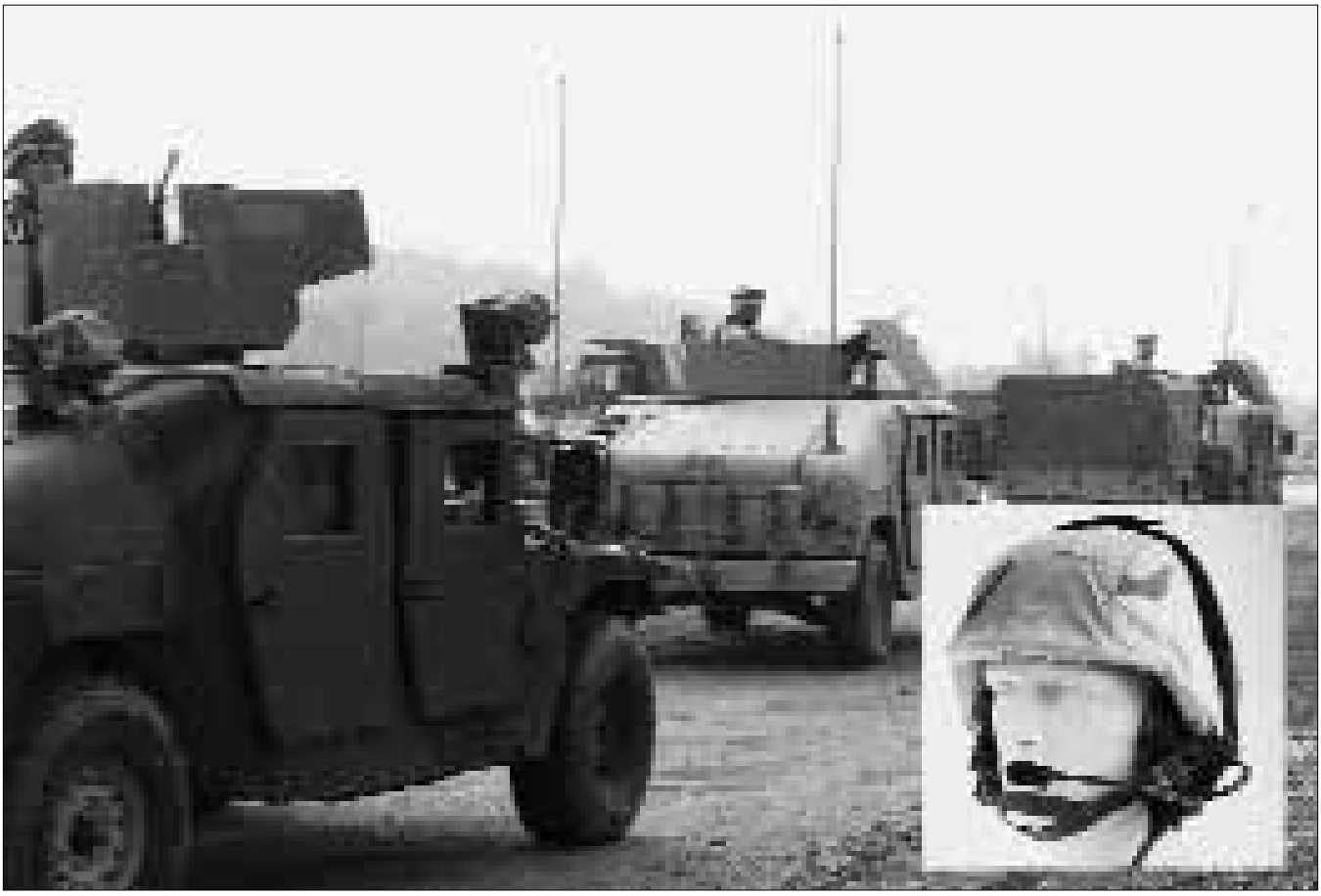
Designed to fit under the standard U.S. Army personnel armor system ground troops helmet and the newer advanced combat helmet, the ITH provides hearing protection through both active and passive noise reduction technologies and enables soldiers to communicate in the high-noise environment (up to 95-plus decibels) that is typical of the M1114 up-armored HMMWV. Soldiers can wear the ITH for extremely long periods without discomfort because of the reduced clamping force on their ears and its light weight (only about 16 ounces). Bose also has a special patent on ear cushion material, which further increases comfort.

Claiborne said that the ITH will be replacing nearly 15,000 emergency-issue interim headsets and older models currently in use. "The emergency issue interim headset doesn't provide any hearing protection from the noise in the M1114 HMMWV," he explained. "The Army's goal is to replace every interim headset with the new ITH so that the soldiers have adequate safety and protective equipment, and reduced hearing loss medical claims."

Also, he said, the new ITH can be put on or quickly removed without requiring a soldier to remove his or her helmet. "This is an absolute requirement for soldiers who might have to quickly dismount from a HMMWV for combat or security operations," said Claiborne.

Claiborne said that he has feedback from Maj. Matt Paige, the project leader for the M1114 Up-Armored HMMWV, who was on temporary duty in Iraq. "Paige said that every soldier he spoke to had only positive things to say [about the ITH]," said Claiborne. "One M1114 crew told him they were wearing the ITH when a tank was operating nearby, and not only was the M1114 driver able to keep in constant contact with the gunner through the headset, but the headset canceled out almost all of the background noise from the tank. Before getting the improved tactical headset, the driver or vehicle commander wouldn't have been able to communicate with the gunner in a safe manner because of the tank turbine engine noise levels."

The effectiveness of the ITH's active noise reduction technology was supported by a study completed in early December 2004 in the engineering psychology department of the U.S. Military Academy, West Point, N.Y. by cadets Edward "Flip" Klein and Jon Wertz, under the leadership of research coordinator Maj. Dan Smith. They studied



The improved tactical headset (inset) protects soldiers' hearing and allows them to communicate in the high-noise environment of the M1114 up-armored HMMWVs (High-Mobility Multipurpose Wheeled Vehicles) and other light tactical vehicles being used by the Army in Iraq.
Photograph by Stephen Larsen/inset courtesy of Bose Corporation

the effect of noise cancellation on sound localization, comparing use of the interim headset with the improved tactical headset.

"The study supported our hypotheses, which were based on signal detection and sound localization theory," said Wertz, "that the improved tactical headset allows soldiers to better localize the direction of exterior sounds, although there is a degree of typical front-rear confusion."

"In practical terms, this means a soldier wearing the new ITH headset has a better chance of identifying the direction of incoming sniper fire than a soldier wearing the older interim headset," said Claiborne.

For information about availability or technical characteristics of the improved tactical headset or vehicle intercom system, contact Maj. Ron Claiborne at (732) 532-5415 or ronald.claiborne@us.army.mil.

Stephen Larsen is the Public Affairs Officer for the PEO EIS at Fort Monmouth, N.J.

West Point Cadets Jon Wertz (left, wearing Improved Tactical Headset, ITH) and Edward "Flip" Klein studied the effect of noise cancellation on sound localization, comparing use of the Interim Headset with the ITH at the U.S. Military Academy, West Point, N.Y.
Photograph by Stephen Larsen