# ARMOR & Mobility

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## Commander's Corner

**MG Robert B. Brown**
Commanding General
U.S. Army Maneuver Center of Excellence
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# Armor & Mobility

March 2011

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By Lt. Gen. George Flynn

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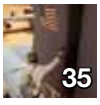


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# Insights

As DoD prepares for the redeployment of joint forces supporting U.S. Central Command, greater focus is on the equipment and mobility platforms being redeployed from Iraq. Much of this mission materiel once critical to operations there is in a continual cycle of reset and re-fielding from depot-level overhaul to re-issue at staging points such as Camp Armordillo, Baghdad, Iraq. Though no longer needed in one theater, these assets remain vital to the Afghanistan mission.

In the March issue of A&M, readers are immersed in the world of the warfighter, DoD's most valued weapon. From the evolution of armor design and deployment to brigade combat team (BCT) integrated ISR training, an emphasis on force coordination is the order of the day. In an exclusive interview with Major General Robert Brown, Commander, U.S. Army Maneuver Center of Excellence (MCoE), Ft. Benning, GA, Gen. Brown speaks to the new role that a combined armor and infantry center will have in shaping the future of the Army's mission. From a Marine Corps perspective, Lt. Gen. George Flynn (USMC-Ret.), offers his insights into the continued importance of tracked amphibious platforms.

From an Air Force viewpoint, A&M offers readers a perspective on engineering enhancements to F-15/16 engine propulsion capacity currently under testing. In this month's Emerging Forecast, a profiled look at the U.S. Air Force Materiel Command provides readers a close up of one of the world's top organizations for the development, test and evaluation of military air assets. The BRAC Spotlight column highlights Ft. Carson and the 2nd Brigade 2nd Infantry redeployment home while Unmanned & Beyond looks at the Army's TALON robotic vehicle program as a critical component for future MRAP operations.

As always, feel free to email me with any questions or concerns. Thanks for your readership!

**Kevin Hunter**
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## First Tanks - Evolution of Armor Sends U.S. Tanks to Afghanistan

In the first of a series, A&M offers readers a look at the evolution of armor in Afghanistan and the decision to send in the first U.S. tanks- Marine Corps' Delta Company, 1st Tank Battalion.

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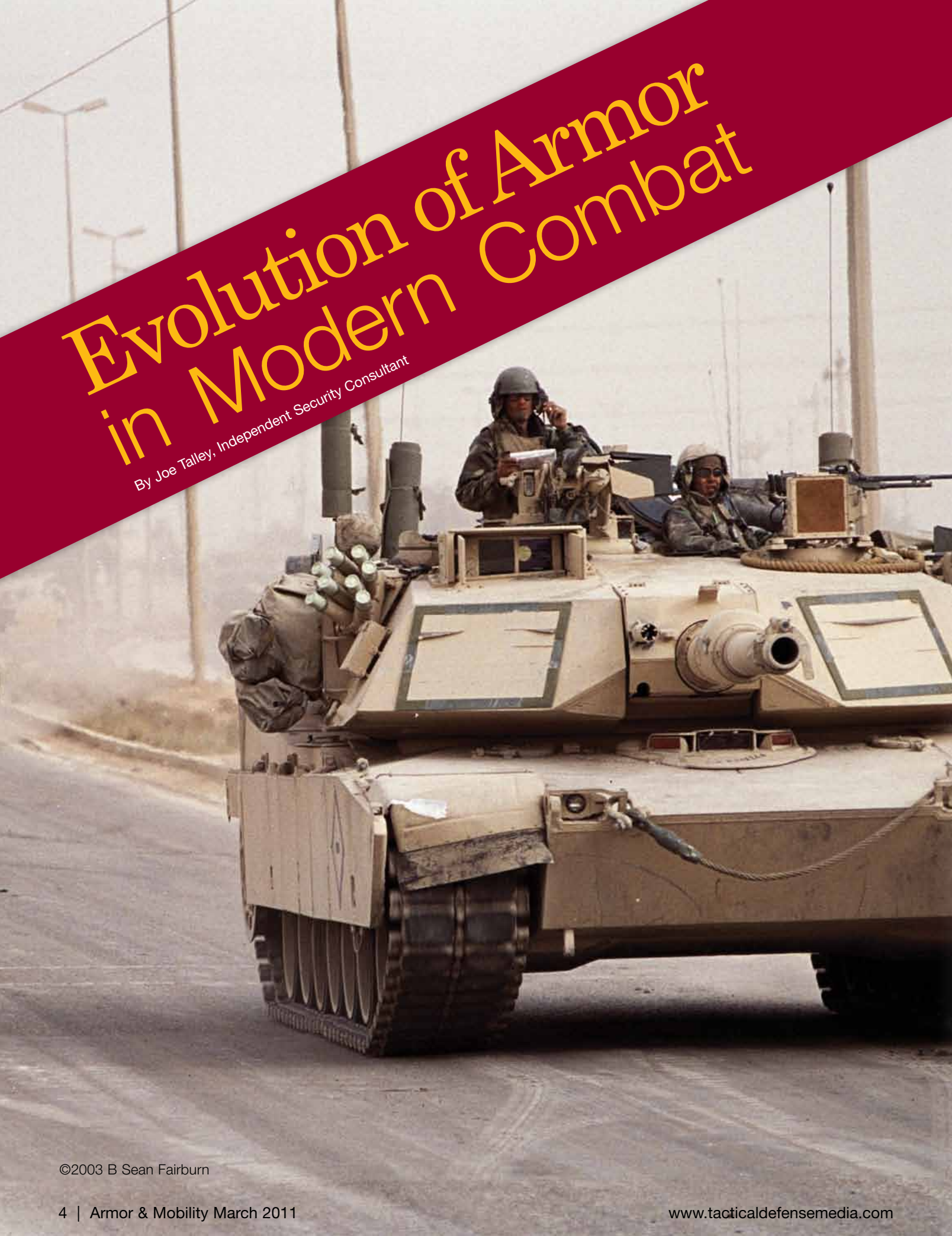
# Evolution of Armor in Modern Combat

By Joe Talley, Independent Security Consultant



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March 2003: Kirkuk, Iraq- Coalition forces are barred from entering Northern Iraq through Turkey. Special Forces must now negotiate with Kurdish rebel leaders to persuade them to join the assault on Kirkuk and to help secure Northern Iraq. There is an obstacle, though- the Kurds are wary of partnering with coalition forces, given previous failures on their part to support the Kurds since the end of the Gulf War some 10 years earlier. They need a guarantee that the coalition will fully commit to the fight at H-Hour. That guarantee comes in the form of a battalion of US Army M1A1 tanks deployed from Germany on C-17s to support the attack. Soon after, Kirkuk falls to Kurdish and coalition forces to open the Northern Front in the War in Iraq.

Far to the south, another group of tanks enters Iraq from the deserts of Kuwait. Marine forces, led by Delta Company, 1st Tank Battalion, US Marine Corps, would have it a little tougher, though- the Marines depart on a challenging journey north, including extensive fighting through formidable battles in Basrah, Numaniyah, Salman Pak, and eventually to the heart of Baghdad.

That push to Baghdad represents the beginning of a revolution in the design and deployment of US armor that continues to today- through the first-ever deployment of US tanks in Afghanistan, to the desert of Helmand Province. The decision behind recently introducing a US Marine Corps tank company to the Afghan War represents the result of an evolution in the approach to modern armored warfare as a culmination of advances in materials, technology, and combat experience since the first American armored forces crossed the border into Iraq in Spring 2003.

## *Training Ground for the Counterinsurgency Fight*

Even before the initial invasion, the military had repeatedly pushed for a transformation of forces to prepare itself for any number of contingencies and future battlefields. Within this context, it is important to understand the impact of the changes that have occurred in armored combat since 2003.

Back then, a young tank company commander by the name of Captain Greg Poland led his Marine tanks through a series of dangerous battles as they fought their way across Iraq against both Soviet tanks and Saddam Fedayeen fighters. All of this was but training for some of the most challenging fighting to come.

“I do not believe that the ‘success’ of Delta Company in 2003 during the March to Baghdad was necessarily unique”, says Greg. “We were simply a lucky group of Marines who were called upon to demonstrate our training and combat skills in actual combat.” He cautions though, “As a community, Tankers in the Marine Corps have learned hard lessons in Iraq since 2003, adapting to an emerging and evolving counterinsurgency” and having to evolve as warriors where “learning about your enemy and modifying your operations to defeat that enemy remains a constant over time.”

While the warrior has evolved, his combat experiences have reinforced the need for technological improvements to the core M1 Abrams platform. By 2005, the US military began adding a package of components to its tanks called the TUSK, or ‘Tank Urban Survival Kit’. Army tanks benefitted from extra belly armor and additional reactive side armor and skirts to protect the track wheels. While now-Lieutenant Colonel Poland says the Marine leadership chose not to add the protective skirts to their tanks, all M1A1s with the TUSK package would eventually receive key components such as the CWS or Commander’s Remote Weapon Station, which allows the tank commander to independently scan for and engage secondary targets while the gunner identifies and engages the primary ones, and other additions such as armored shields to the commander’s position. Now, the TC does not have to expose himself when remotely firing the additional .50 caliber machine gun provided as part of the system. Finally, an important component of the TUSK package is the reinforced, Counter-IED Driver’s Seat, to further protect the driver from IED blasts.

## *Taking Back Ramadi*

Then-Army Captain Tim Ferguson and his Warlord Company of 18 M1A1 tanks didn't have those add-ons yet, though, when they arrived in Ramadi, Iraq in 2006. His company, Charlie Co. 2-37 Armor served as the sole tank company assigned to secure and hold the eastern side of Ramadi at the height of the 1st Brigade, 1st Armored Division's campaign to take back that city from the enemy. For Tim, early experiences taught him to always keep the tank's front armor towards the enemy, but now it was a 360-degree enemy that one had to be constantly aware of. "Add in all the rest of a proper COIN campaign and the tank commander was a very busy guy." Tim's unit provides a comparative example to the current lone company deployment of tanks to Afghanistan.

"The tank system today has matured to meet that threat we faced in Ramadi. The bones of it are the same, but the Abrams is now a completely different animal, more tailored to the environment and threat it will be dealing with in the future", he said. When they deployed from Germany, they had yet to receive the TUSK packages and had only the standard M1A1 AIM (Abrams Integrated Management Overhaul Program) variants.

Back then, Tim's primary optic for the .50 caliber machine gun was the small daylight periscope – he didn't have the TUSK's thermal day and night system- which limited their ability to detect and engage targets with that weapon system. Even in 2007, when his company was replaced by C Co., 3-69 Armor from the 3rd Infantry Division, he believes that this follow-on unit had yet to receive the Thermal Viewers as well.

In reviewing the available pictures of the Marine M1A1s currently deployed to Afghanistan, Tim points out the Thermal Camera Viewer that can be seen on the front of each tank, as part of the CWS. This thermal site allows the commander to operate this system from inside the tank – giving him day and night, all-weather targeting and identification ability without exposing him to the constant sniper threat.

Thermal Viewer - Immediately to the front and left of the Commander U.S. Marines with 1st Marine Division, 1st Tank Battalion, Delta Company, navigates the terrain of Helmand province, Afghanistan in a M1A1 Abrams Tank (U.S. Marine Corps photo).

Tim remembers hearing about the TUSK program and how significant it was for the armor community. Again, looking at the pictures, even some of the more minor additions to the tank have revolutionized its capabilities.

"For years, Army units complained that they didn't have the infantryman's phone on the back of their tanks. In Ramadi, it would have been particularly useful to have them as we regularly responded to other units to include the Marine infantry battalion next door. It is much easier to grab a phone then worry about communication problems between units, trying to get on the same frequencies, etc."

"At the time, the guy on the ground would have to climb up onto the tank, or the commander would have to climb down, and in either case you are exposed to enemy fire. Then they would still have to yell over the sound of the engine to communicate face-to-face. With the infantryman's phone, the soldier would just grab the phone and talk directly to the crew- able to warn the tank about obstacles, identify a hidden enemy, ask for medical assistance if necessary, or more importantly, talk through the disposition of friendly forces in the area. Situational awareness is key and any tool that is simple and can add to that is a good thing."

Small Box over the right track is the infantryman's phone (U.S. Army photo)

Some of the most critical components of the TUSK package could not come soon enough. "The deep-buried IED was a signature threat in Ramadi- it was a weapon of choice of the insurgents to try and limit our avenues of approach into areas of the city, and the additional armor would have most likely improved the tanks' survivability if they had had it then." Towards the end of the company's time in Ramadi, Tim lost one of his men, Specialist Douglas "DJ" Desjardins when a massive IED exploded directly underneath the driver's station in the tank where he had been sitting. While the IED did not compromise the hull of the tank, without the extra belly armor, the bottom of the tank received the full force of the blast and killed him instantly.

## *The Decision to Deploy*

By October 2010, General Petraeus approved a Marine Corps request to introduce US tanks to Afghanistan. In conjunction with the recent deployment of the 3rd Battalion, 8th Marines infantry battalion from the USS Kearsarge, Delta Company, 1st Tank Battalion Marines are currently executing

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Chuck Norris puts his arm around the tank's driver, Specialist Douglass "DJ" Desjardins in front of the Chuck Norrise Tank (U.S. Army photo)

their very first combat missions in Afghanistan since arriving in the Upper Gereshk Valley area of northern Helmand Province.

After six months of deadly fighting in the area of Sangin (known by many as Afghanistan's Falloujah, filled with enemy foreign fighters), Marine leaders developed a relationship with the local Alokozai Tribe, where the tribal members have agreed to expel foreign fighters and allow coalition patrols in exchange for an infusion of money and projects to the area. A unit held in reserve as part of a shipboard expeditionary force since September, 3/8 Marines was brought ashore to try to exploit this opportunity and secure one of the last trouble spots in the Sangin region. If successful, these Marines, with the support of Delta Company tanks, may have the opportunity to establish relationships with the first partner tribe in Afghanistan that could literally signify the beginning of the end to the war in that country, as it did for the War in Iraq.

The Gereshk Valley starts just north of the Kandahar Highway (Highway 1) and Lashkar Gah, about midway between Marjah and Sangin along the green valley of the Helmand River. Similar to other rural areas in Helmand, the river crosses through the Gereshk Valley in a relatively flat patchwork of simple villages and their surrounding fields of poppy and other crops. With fairly little rain throughout most of the year, the villagers are masters at pushing the limited water supply across the giant plots of crops through endless mazes of ditches and irrigation canals.


Map of Gereshk Valley (U.S. Army photo)

On February 18th, Major General Richard Mills, the top Marine Commander in Afghanistan, commented on Delta Company's recent combat actions, including firing main gun rounds and engaging IED emplacers at long range. He also highlighted that three of the tanks themselves encountered IEDs with minimal damage and no casualties.

While there has not been any publicly released information regarding their current mission set, it can be inferred that the tanks are actively engaged in combat. They have either effectively provided overwatch as part of 3/8 Marines infantry operations, or they are providing MSR security on major roads between key logistical or operational hubs and are employing their weapons systems out to great distances during the day (using their 10x GPS-LOS sights) or at night (using the CITV or ITS- the remote thermal viewer) to take out the IED teams.

The information regarding the IEDs and their limited impact is very important. It can further be inferred that the IEDs are typical to those often found in the rural areas of Helmand and are smaller and weaker (HMEs- fertilizer-derived Homemade Explosives) in comparison to daisy-chained artillery shell IEDs found in places like Falloujah and Ramadi. These Marines won't experience casualties from locally produced IEDs. With its enhanced belly armor, the M1A1 Abrams is able to withstand the effects of the IED strikes that would have been serious enough to cause some severe casualties to non-tank, vehicle crew members as seen previously in Afghanistan.

Using the War in Iraq as a reference, it is important to understand that while not all modern armor unit deployments may have made an overall positive impact during the course of war in terms of increasing security during their time on the battlefield, specific units like the 3rd Armored Cavalry Regiment and the 1st Brigade, 1st Armored Division did in fact change the course of the war and were critical to increasing security and ending the conflict. It is likely that the successful employment of armor in Iraq directly influenced the decision to send armor to Afghanistan.

## Coming Next Month

### *First Tanks - Evolution of Armor Sends U.S. Tanks to Afghanistan*

We follow the evolution of armor in Afghanistan and the decision to send in the first US tanks- the Marine Corps' Delta Company, 1st Tank Battalion. We also take a look at how the military's armor schools and training are evolving to meet future threats on an uncertain battlefield.

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# Modern Amphibious Capability:

## Tradition Meets Necessity

By Lt. Gen. George Flynn
U.S. Marine Corps Combat Development Command, Quantico, VA

"We ought not to look back, unless it is to derive useful lessons from past errors and for the purpose of profiting by dear bought experience."

– George Washington –

There is no guarantee we will learn from the bloody combat lessons of the last century. The current penchant by some for questioning the Marine Corps' need for an amphibious tracked vehicle suggests an ignorance of history and a lack of understanding of the future; it is unsupported by hard lessons learned, world trends, and a security environment characterized by a high degree of uncertainty. Our nation will most certainly require continued global access from the sea, and just as certainly there are forces at work that are actively and aggressively attempting to deny us that much needed access.

The Secretary of Defense clearly stated that his decision to cut the Expeditionary Fighting Vehicle program does not call into question the amphibious assault mission of the Marine Corps. Moreover, he stated the requirement of developing a more affordable and sustainable amphibious tractor to provide the Marines a ship-to-shore capability into the future.

### Maritime Need

As America's expeditionary force in readiness, the Marine Corps specializes in rapidly deploying anywhere in the world to develop access through partnership building activities, to create access in response to crises, and to provide the ability to force access to deter and/or defeat threats. The Corps will never be defined by a program, but rather by the capabilities we bring to the fight.

As a maritime nation, the tyranny of distance, geography, and topography remain constant challenges to our global influence. As demonstrated countless times, our ability to come from the sea and overcome the challenges of natural and manmade barriers allows us to protect and defend U.S. interests. Our continued ability to respond is dependent on our ability to operate in uncertain environments, create opportunities and ensure freedom of action regardless of access challenges.

The Marine Corps has learned that amphibious operations should avoid fixed defenses whenever possible. This option is not always available, however. In such cases, the amphibious tracked vehicle is essential to success. The tracked amphibious vehicle provides the ability to perform three critical tasks: ship-to-shore movement, breakout from

the beach and protected land mobility and firepower. As a result, the amphibious tracked vehicle has been a mainstay of amphibious capability. It has often proven the indispensible, enabling capability that Marines employ to both solve the sea/land mobility challenge and to gain advantage over our enemies.

## Proven Mainstay

Recent operational experience and history attest to the effectiveness of amphibious tracked vehicles in providing the capability and capacity demanded by numerous operating environments—permissive, uncertain, or hostile. Most recently, amphibious tracked vehicles assisted in overcoming the devastated infrastructure in Haiti. These same vehicles were used to rescue stranded citizens and deliver relief supplies following Katrina's devastation of the U.S. Gulf Coast in 2005. In the 1990s, these vehicles enabled relief efforts in Somalia during Operation RESTORE HOPE and subsequently provided the key capability necessary to safely withdraw U.N. forces in UNITED SHIELD. During the Korean War, these vehicles allowed us to project power from the sea at Inchon to reverse the looming defeat of U.S. forces trapped at Pusan. Given the proliferation of area denial weapons among both state and non-state actors, we believe that future operations—even those conducted for benign reasons—will be conducted under uncertain and highly dangerous conditions.

Amphibious tracked vehicles employed from ships at sea provide the means to assure littoral access that no other capability can provide. They are the only combat vehicles built to operate effectively in the littorals: a complex environment of salt and fresh water, muddy marshes and estuaries, and dry land; rural, suburban and urban landscapes; wildly varying terrain; high to low population densities; and temperature extremes. They can quickly and seamlessly transit from ship-to-shore as well as swim rivers and negotiate inland water obstacles, providing the ability to achieve tactical and operational surprise. They protect their occupants as they maneuver on sea and land to a position of advantage and can close with an enemy or rescue our friends. Their known presence off shore historically has been a powerful deterrent and effective capability across the range of military operations.

## Sustain and Develop

A modern amphibious tracked vehicle uses the sea as maneuver space, creates opportunities in the littorals, optimizes employment of amphibious forces, and enhances survivability in the face of area denial threats. An amphibious tracked vehicle is the proven means to overcome access challenges, natural or manmade, ranging from tsunami-ravaged infrastructure to an armed aggressor seeking to oppose our maneuver. Amphibious tracked vehicles empower a flexible, ship-borne force to wait off shore for the opportunity to shape the security environment or alter an outcome. This unique capability provides our Nation with a critical power projection asset.

There is no doubt that the sustainment and further development of our Nation's amphibious capability is important for continued access to strategically vital regions of the world. We see a clear mandate to be ready to shape, influence, deter, and if necessary defeat would be forces that seek to deny us access. Meeting this mandate will allow us to profit "by dear bought experience" rather than repeat the errors of the past.

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# Depots man STPE-I, Camp Armordillo

By Belinda Lee, Public Affairs Officer, Red River Army Depot

STPE-I, stored theater provided equipment-Iraq, is a key mission currently underway at Camp Armordillo, located in Baghdad, Iraq. The mission began in January 2010 and is spearheaded by Red River Army Depot with assistance from AMC sister depots Anniston and Tobyhanna Army Depots.

## Mission Readiness

STPE-I houses an equipment fleet stored in the Iraq Joint Area of Operation (IJOA) and ready to issue to a unit to allow for full spectrum operation (FSO), if required once the combat mission in Iraq ends. The mission of STPE-I is to ensure combat tracked vehicles are fully mission capable (FMC) plus safety and sustained at that level.

The vehicle fleet consists of Bradley Fighting Vehicles, M1 Abrams, M109 Paladins, M992 Field Artillery Ammunition Supply Vehicle (FASVS) and the work horse of the fleet, the M88 Recovery Vehicle. Once all vehicles have met FMC level, STPE-I transitions to a preventive maintenance checks and services (PMCS) mode which requires annual services on each vehicle to maintain an operational readiness rate of above 90 percent. STPE-I must maintain a ready state to issue all vehicles immediately for any conflict requiring the services of these vehicles.

The vehicles come from Fort Stewart, GA, through Kuwait and then trucked by secure convoy to the camp. The logistics of the operation is compounded by the security requirements of the deliveries and the required interaction with foreign nationals. Applying Lean principles has allowed the team to reduce fleet delivery processes from three hours to forty-five minutes per delivery.

"Applying Lean principles comes natural for us. It is an everyday way of life at RRAD and we just automatically used those same principles in establishing this operation. Incoming drivers comment that usually when they make such deliveries it takes a full day." "Our mission is to issue the fleet within 96 hours of a request. Applying efficient lean principles and Safety procedures has afforded us the capability to more than meet the 96 hour issue requirement," said John Moore, former STPE-I site manager.

## Small and Capable

The Camp Armordillo compound is a small area that requires personnel to be innovative in meeting the mission. Workers utilize their creative thinking in fabrication of needed parts to fulfill requirements. They build relationships with other services that prove valuable to both sides. Particularly valuable in completing missions are the joint endeavors with the Air Force.

"Not only do we maintain a ready fleet for the soldier, we also provide an inventory of parts that accompany the vehicles when deployed with the units. These field parts give the units added insurance that they can complete their missions with our fleet of vehicles," said Moore.

## Safety First

Other business practices that the RRAD staff incorporated into the mission were their safety procedures. As the home depot seeks VPP Star status, the workforce has become equipped with automatic safety initiatives that enhance their work environment and the quality of their products. While working with servicing contractors and other units, those safety initiatives 'rubbed-off' on personnel outside the compound.

"The 402nd Battalion Safety Officer visited the compound and stated he was there to perform a safety audit. Our safety officer provided job safety analyses for each work area and a formalized safety standard-operating-procedure for the mission. He found no violations," said Moore. "For this type and size of operation, that is a remarkable accomplishment. We can attribute this to the instructions and training our personnel have received through the VPP Star journey at RRAD."

"Overall, the mission is very rewarding. As depots, we are able to go to the Soldier, use our skills and assist the Soldier in carrying out their mission. As Department of the Army Civilians, that is our ultimate goal," said Moore.

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## MG Robert B. Brown

**Commanding General**
**U.S. Army Maneuver Center of Excellence**
**Ft. Benning, GA**

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*MG Robert B. Brown is the Commanding General of the Maneuver Center of Excellence (MCoE) at Fort Benning, GA. He was commissioned an Infantry Second Lieutenant in 1981 upon graduation from the U.S. Military Academy at West Point. During his time at West Point, MG Brown was an accomplished student-athlete, playing basketball for Coach Mike Krzyzewski and serving as team captain during his senior season.*

*MG Brown brings a diverse background of Light, Mechanized, and Stryker assignments to Fort Benning, to include command at every level from company to brigade. As former commander of the Army's second Stryker Brigade Combat Team out of Ft. Lewis, WA, for three and a half years – to include a 12-month rotation to Mosul, Iraq – MG Brown later served as the Deputy Commanding General of the 25th Infantry Division, where he deployed a second time to northern Iraq. During his career, MG Brown has also supported Operation Uphold Democracy in Haiti and Operation Joint Forge in Bosnia-Herzegovina.*

**Q: Please talk about your role as Commanding General of the Maneuver Center of Excellence (include previous experience that has prepared you for this role).**

**A:** My main role at the Maneuver Center of Excellence is to maintain a strategic-level viewpoint to ensure we are preparing the Army for the current fight, as well as preparing the Army for the future – It is critical to get this right.

It is important I empower our two commandants – Armor and Infantry, to prepare for the current fight and to look to the future. We have had a lot of lessons learned and significant changes in our Army. Our enemy today is different as well. We may not see massed formations on a linear battlefield; it is more likely the enemy is a hybrid threat in a complex environment.

I want to ensure the leaders and soldiers at Fort Benning have what they need to get the job done, while guiding them as we focus on the future. This includes everything – from the right leader development and training, to the right organizational structure and equipment.

My goal is to empower and guide our center in strategic visioning as we fully support an Army at war now, and prepare for the future.

I've been able to learn a lot about team building during my career. And that's imperative as we meet the requirements of the job at hand – the task of completing the move of the Armor School to Fort Benning. We are taking two very distinct branches – Armor and Infantry – and bringing them together while maintaining their unique identity and lineage.

**Q: Please talk about MCoE's mission and role as part of the Army armor and infantry community, as well as the greater joint Department of Defense spectrum.**

The role of the Maneuver Center of Excellence is not to combine the Armor and Infantry branches. They are unique and distinct branches and they need to remain that way. They each bring a very critical background, a rich history and tradition, and a unique perspective to the current fight. However, they do need to train the way they are going to operate, train the way they are going to fight – together.

We have seen from the last nine years of fighting that these two forces have to collaborate and cooperate to successfully engage and destroy the enemy. These two branches have proven they can integrate effectively in battle, so it is only appropriate they integrate in training. We must train as we fight!

I mean think about it, as an Infantry officer, you don't want the first time you are tasked to plan a mission including tanks to be while deployed in combat – and, vice versa as an Armor officer. You have to know what each one is capable of – what are its strengths, what are its weaknesses, how can we communicate and share intelligence? The integration of mounted and dismounted units is a key to success for our Army's future.

An example of this integration is enabling the mounted and dismounted to share situational awareness and a common operating picture, while being linked to the same network. Our mounted platforms have kept pace with advancements in protection, communication, and networking capability with all of the many Army battle command systems such as Blue Force Tracker and FBCB2. However, despite all the advancements of our mounted platforms, we still lack the ability to network our dismounted force – the Tactical Small Unit – into a common operating picture with improved situational awareness.

We are spending more money per soldier, and they are well-trained and well-armed. They are better protected and their ability to engage with precision has risen exponentially. However, the network capability of our mounted systems has to be extended to these tactical small units. Our vehicle crews have to be able to cross-talk and more importantly, share situational awareness and a common operating picture with our dismounted soldiers.

The MCoE is putting a huge strategic-level emphasis on the soldier as a system. That is spending more at the tactical small unit level and focusing on the squad as a team. Our goal is to enable mounted and dismounted to be linked more effectively, and share better situational awareness and a common operating picture when they are on the ground and separated from the vehicle.

This communication connectivity is good for all of the forces. It does not matter if we are conducting stability operations, a disaster response, wide-area security, combined arms maneuver or full-spectrum operations; each and every member plays a role in the success of the operation and needs shared situational awareness, a common operating picture and an ability to link into the network.

The Maneuver Center can effectively take on this challenge. It requires both Armor and Infantry together. Alone, each could try to resolve the issue. However, it makes better sense for them to meet the requirement together. They can move us forward, so we'll get to the point where the dismounted element – squad, tactical small unit – has better situational awareness and is using the technological advantage we have available today for our mounted forces.

The Maneuver Center of Excellence directly impacts the entire Department of Defense spectrum as we work with all of the forces to collaborate, share best practices and lessons learned. All of the forces, and rightly so, have been consumed with the current fight and operations. The MCoE is developing opportunities for enhanced across-the-board dialogue, using forums and seminars, as well as websites, blogs and emerging technology. We want to provide avenues for these discussions and encourage everyone to play a role in helping to prepare all of our forces for the future. I am not necessarily talking about the service members who are currently involved in combat operations, those members are still busy. I am talking about those members who have returned home and have the opportunity to focus on the future effort.

**Q: From a joint and coalition global perspective, how is MCoE addressing the need for enhanced training, in keeping our soldiers ready to work with other national forces and a step ahead of their international counterparts?**

**A:** The key to training for future operations is what we call the blended training model. Rote repetition is still a major part of our training strategy – the technical, tactical and physical – everything from marksmanship, good physical training, and technical training.

In the past, that was good enough for us to be successful – now it is not. We still have to do the rote repetition, but we also have to do more. You have to get at incorporating the challenges of the operating environment we will face anywhere in the world.

It's an overwhelming and vast amount of information; it's a noncontiguous battlefield against an enemy who leverages technology, a complex operating environment, and an ability to work effectively with our Joint, Interagency, Intergovernmental and Multinational partners. Therefore, you have to use what we call live, virtual, constructive and gaming simulations to create those scenarios.

The technology exists and it is up to the Army to collaborate with our industry and allied partners to bring our tactical small units online with our mounted platforms. We must develop a

network that is accessible in training – using the live, virtual, constructive and gaming environment – and also can be plugged into a secure network while deployed.

We have to close the gap in our nation's technology and training. In this time of declining resources, live, virtual, constructive and gaming will allow us to train with Allied nations in realistic environments and is cost effective. That is one way to close the gap that may exist between our nations. Only by doing this, will we truly be able to train as we operate.

**Q: From an enterprising perspective, how is MCoE working to promote partnering with industry in delivering more effective and efficient know-how to the warfighter?**

**A:** At the Maneuver Center, we tie in closely with the battle labs and with industry. We host a large Industry Day event once a year, and several small ones throughout the year. We share with them what we are thinking, show them what we perceive to be the key concepts for the future and get their input. This dialogue gives them direction. Their innovations have saved many of my soldiers' lives and their support is terrific.
An example of our collaboration can be seen in more emphasis being put on the dismounted soldier and the squad as a team. We are letting industry know that we see that as a need, so now they can look for innovative ways to meet this need. Maybe it's a Smart Phone on a soldiers' wrist with a screen that won't break. Empowered by the knowledge of what we need, industry can start developing items to support these needs in the future.

I also think industry does a much better job of getting the soldiers' input early on as compared to 10-15 years ago. In the past, that dialogue began too late in the process, resulting in the delivery of equipment that wasn't quite user friendly for the warfighter – maybe it was too heavy or not durable. Now, we see our industry partners getting the soldiers' input very early on in the process and across the spectrum. It has a huge impact. We are seeing equipment tested in direct correlation with soldiers' input making it more likely we'll meet future requirements.

**Q: What are some of MCoE's biggest successes before/ since you assumed command?**

**A:** The Maneuver Center has had a lot of successes long before I got here. The success of the MCoE is its great soldiers and tremendous leaders. They are all constantly working and moving forward.

I think one of the most important things that has been done recently is getting the force to look more to the future. In making sure that as we have the Armor and Infantry here, united in training and development, they stay unique and separate, while also building on each other's strengths.

MCoE success also has a long-term impact. It will set us up for future success by ensuring our units have the right equipment, the right organizational structure, and can be effective in tomorrow's fight.

**Q: What are some of MCoE's biggest challenges from an at-war armor and infantry training perspective, as the nation continues to combat asymmetric and terrorist threats today and in the future?**

**A:** As a nation, we have many lessons learned to draw from due to the last nine years of fighting a ruthless and unrelenting enemy. And while we have these lessons learned, when you look at such a high-operating tempo, none of us has had the time to effectively capture all that is out there. Our challenge is to be able to slow down enough to capture those best practices and lessons learned, then use them to help shape the future force. This is critical.

The other challenge we face is getting everyone on board with the blended training model. There is a good segment of the force that believes simulations are just nice to do, and that a simulation is a good add-on to rote repetition, but not essential. I would say that the use of simulations now is absolutely essential in training the way we are going to operate in the future. We have to put soldiers and leaders through the complications of the operating environment today and in the future, before they face them for real.

I understand there are physical challenges with simulation centers and that some installations do not have the tools they need because they are costly in the near term. Everyone needs to realize that money will be saved in the long term; there will be a significant return on the investment. We also are faced with the disbelief that to truly train the way you are going to operate, you have to use the blended training model – something I believe to be a key to future success.

Feel free to discuss any continuing goals and objectives the MCoE is working.

Viewing the dismounted soldier as a system is critical to enabling the same technological advancements as with mounted counterparts. We have to get the dismounted linked with the mounted and provide them with the same situational awareness and common operating picture.

Also, just preparing the force for the future is absolutely critical, both in terms of technology, equipment, and leader development and training. We have to continue to lean forward. Change is always hard. But, to prepare for the future properly, it takes change. We have to really look at how we can work through the challenges – funding challenges, challenges of not enough time, and the challenges of a current high-operational tempo – so that we can truly shape the force for the future.

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# Joint, coalition partners prep IBCT for combat in Afghanistan

By Casey E. Bain and Marie La Touche, JFIIT, USJFCOM

Soldiers from the 170th Infantry Brigade Combat Team (IBCT), Baumholder, Germany, and joint and coalition partners from eight nations completed a unique exercise at the Joint Multinational Readiness Center (JMRC) that focused on enhancing joint and combined fires, as well as improving the integration of intelligence, surveillance, and reconnaissance (ISR) assets to better prepare the unit for the irregular warfare environment they will face in Afghanistan.

This capstone training event for the 170th IBCT included vital support from the U.S. Air Force Europe (USAFE) Warrior Preparation Center, known as the Bullseye Team, and U.S. Joint Forces Command's (USJFCOM) Joint Fires Integration and Interoperability Team (JFIIT) in Hohenfels, Germany.

"The work done by JFIIT, USJFCOM and USAFE provided us additional capabilities and allowed us to do things like (provide) continuous virtual unmanned aircraft systems and close air support (CAS), even if we didn't have those assets flying live here," said Army Col. John Spiszer, commander, JMRC. "That's a significant advantage for the units training here, and when you integrate the multinational forces into the mix, it's a real good situation and separates us from the other training centers."

More than 4,000 participants from all four U.S. military services and eight coalition partners including Albania, Belgium, the Czech Republic, France, Germany, Poland, Romania, and Slovenia participated in this three-week long exercise.

"The JMRC, USAFE, and USJFCOM team are great examples of how we can integrate our coalition partners into a first-class training environment that benefits the entire team," said Marine Corps Maj. Kevin Moody, JFIIT's JMRC lead. "This training will help the entire fires team shorten their learning curve and will improve the integration of coalition assets so the ground commander can more efficiently leverage all available capabilities in Afghanistan."

The exercise integrated a variety of joint enablers to replicate the resources that the BCT commander will have to support the International Security Assistance Force (ISAF) in Afghanistan.

"The stated mission of the Taliban is to defeat NATO and kick NATO out of Afghanistan," said Army Brig. Gen. Steven Salazar, commander, Joint Multinational Training Command, Grafenwoehr, Germany. "What we're doing is NATO training by preparing our units, as well as our coalition partners, for NATO operations in Afghanistan. No other combat training center (CTC) is doing that. Helping us accomplish that are our joint enablers, like JFIIT. I can't think of a single joint enabler that we have not been able to employ; they're all absolutely essential."

"Our primary mission is to assist the command in their efforts to achieve a joint environment for each rotational unit that comes here to train," said Ervin Cade, lead contractor, USJFCOM's Joint National Training Capability Support Element, Hohenfels, Germany. "The goal is to provide JMRC with joint enablers like JFIIT, Special Operations Forces elements, the Joint Improvised Explosive Device Defeat Organization (JIEDDO), and others to create an accurate and realistic training environment that will foster greater integration and understanding between joint and multinational partners before they deploy. Ultimately, it makes us a better combined team and will save lives in the process."

JFIIT helped integrate several joint intelligence, surveillance, and reconnaissance (JISR) assets to facilitate the joint fires targeting process for the training unit during the exercise.

"Without the support from JFIIT, we couldn't do our mission of integrating CAS training for USAFE into the Army's MRE at JMRC," said Air Force Lt. Col. Scotty Briscoe, commander, Detachment 2, Warrior Preparation Center in Hohenfels. "As the tactical level arm of USAFE, our goal is to support the Air Support Operations Squadrons (ASOS) that train here so they can better integrate and support the ground scheme of maneuver just as they will when they're deployed."

"These joint assets help round us out and provide crucial resources that we couldn't otherwise provide to the training audience," said Army Maj. Sherman Watson, plans chief, JMRC. "Our goal is to replicate the operational environment from in-theater so the rotational training unit learns how to leverage those capabilities before they actually deploy. The joint fires training and JISR integration is an important part of what we're providing to both U.S. and multinational units that come here to train."

Providing a realistic and challenging multinational training environment is just one of the unique advantages to training at JMRC, according to participants at the exercise.

"The training here has been spot on," said Army Chief Warrant Officer Philip White, Apache attack helicopter pilot from 3-159 Attack Reconnaissance Battalion, Ansbach, Germany. "The opportunity to train at a world-class facility with so many joint and coalition partners has been incredible. I think we're all learning a lot of valuable lessons from each other and that will make us a better team when we deploy."

I've been impressed with many of our multinational partners that are here training with us, especially the German joint fires observers (JFOs), said White. "They're as good as I've seen and I think we mesh our skills together quite well."

"Our ability to integrate JISR assets into our targeting process has been superb," said Army Capt. Jamen Miller, intelligence officer, 2-18 Infantry Battalion, 170th IBCT, Baumholder, Germany. "This is the first time that many of us have had the opportunity to work with many of these enablers that we'll see once we're deployed. This training will absolutely benefit the entire unit."



Soldiers from the 170th IBCT from Baumholder, Germany conduct a patrol with air-ground support from the Czech Republic and Germany as they trained for their upcoming deployment to Afghanistan. (Photo: Casey Bain, JFIIT, USJFCOM)

"The training at JMRC has been very useful," said Polish Special Forces Warrant Officer C. Charles, joint terminal attack controller (JTAC). "The familiarization training that we receive by working with many of our key partners is valuable and will be important to the speed in which we can successfully integrate together once we're in Afghanistan."

Enhancing air-ground integration and CAS skills of both U.S. and multinational participants were some of the benefits of the exercise.

"The training here is about combined fires not just joint fires," added Moody. "The unique nature of this training center is that it provides exceptional air-to-ground training for the entire joint and multinational team that accurately replicates what is occurring in theater."

"JMRC is the quintessential mission readiness training exercise that provides both U.S. and coalition units, JTACs, JFOs, and aircrews with the skills they need to effectively work together to achieve both lethal and nonlethal effects on the battlefield," said David Williams, JFIIT lead analyst in Germany. "This training will ultimately ensure the IBCT staff principles have a greater understanding and appreciation of joint and multinational enablers, and how to tactically employ them to their advantage."

According to senior leaders, the ability to forge important relationships with both joint and multinational partners is a strength that the command will build on to enhance training at JMRC for the foreseeable future.

"We work with virtually all the partner contributing nations in Europe and stretching into Central Asia, Georgia, and a lot of the Eastern European countries, like Romania, Poland, the Czech Republic, and Slovenia," Spiszer added. "We've got a great joint and multinational team that encompasses so many important enablers. Together, we create a more realistic training environment which translates into greater success downrange where it matters most."

For more info: www.jmrc.hqjmtc.army.mil

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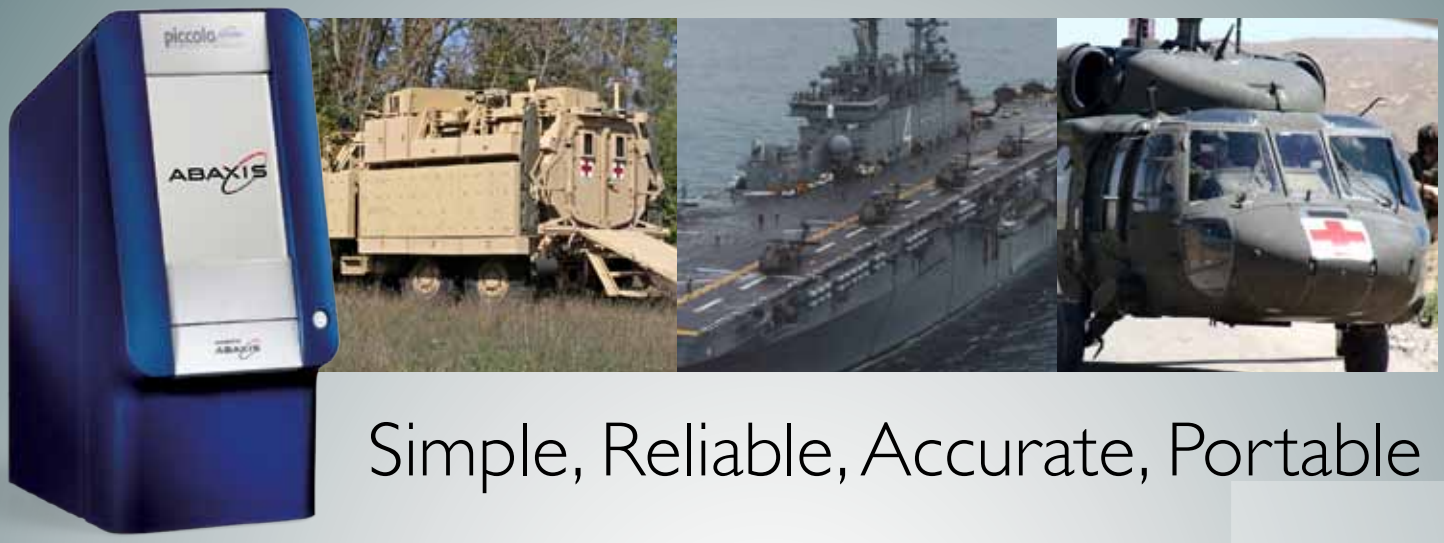


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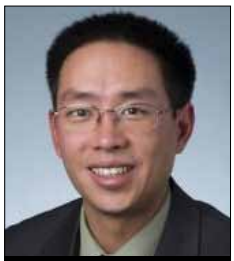
# HULC: Lightening the Load

**The U.S. Army, in conjunction with Lockheed Martin's Missiles and Fire Control business unit in Orlando, Florida, will be testing the latest in robotic exoskeleton technology to provide soldiers with relief from the bulk of back-mounted supplies critical to mission success.**

By James Ni, HULC Program Manager at Lockheed Martin Missiles and Fire Control

The latest generation of the Human Universal Load Carrier (HULC) soldier exoskeleton was introduced by Lockheed Martin this past fall and is touted to be a more robust, ruggedized system. The HULC offers warfighters a load carriage platform capable of carrying up to 200 lbs distributed between the front and back, operating for up to 20km on a single charge. The only battery powered, hydraulically-actuated system marketed toward the military, the HULC weighs 82 lbs standalone and can be augmented with multiple application specific attachments. A lift assist device attached to the HULC would enable a front lift capacity of 150 lbs, without the user feeling a pound of it.



James Ni
Lockheed Martin

"When wearing HULC, a user has the capability of carrying upwards of 200 lbs of dead weight without feeling the stress of that weight at all. The weight is transferred thru the machine," said Keith Maxwell, Lockheed Martin's HULC Business Development manager. "From a soldier's perspective, moving critical supplies, or even a wounded fellow soldier, can be the difference between a life saved and mission completed."

Fully loaded, a HULC user can actually move at walking or even running speeds of 0-7 mph without any stress from the load being transferred. While the system transfers weight to the ground, the soldier must still manage the inertia and depending on specific load weight, users will experience a difference in stopping distances from a dead run.

"The HULC exoskeleton was developed to address critical military concerns," said Maxwell. "These concerns include reducing load carriage injuries by transferring the weight of soldiers' loads from the user onto the exoskeleton and reducing soldier fatigue by decreasing the metabolic cost of carrying heavy loads for prolonged periods. Lockheed Martin has developed and matured a game-changing technology to address these concerns."

For more info: www.lockheedmartin.com/mfc

# AEDC provides the warfighter with critical assets

ARNOLD AIR FORCE BASE, TN. –Bagram Air Base, Afghanistan is approximately 7,300 miles from Arnold Engineering Development Center (AEDC) in Middle, Tennessee, but the work being done at AEDC directly impacts the warfighter in that remote region. In fact, ground testing on a range of weapons systems at AEDC provides the war-winning capabilities needed at innumerable locations globally.

## Prolonged Power

One example of this influence is AEDC's role in testing the F100-PW-229 engine powering the F-15 Eagle and F-16 Fighting Falcon fighter jet aircraft. The command goal in testing the engine was to ensure it would run 6,000 Total Accumulated Cycles (TAC) between depot overhauls, providing the warfighter with an enduring asset. TAC is a unit of measurement for major rotating engine components used to track service life.

The Towed Airborne Plume Simulator (TAPS), one of four, has been flight tested and validated following initial test runs at AEDC in 2007. (Photo by David Housch)

"This 6,000 TAC engine's depot maintenance interval is [now] 10 years versus seven years for 4,300 TAC engines with a 30 percent life cycle cost reduction and significant safety benefits," said Mike Dent, an Air Force test manager at AEDC.

The F100-PW-229 Engine Enhancement Package (EEP) engine tested at AEDC is the most current operational version available to power the Air Force fleet of F-15 and F-16 fighter jets and is currently being flown by U.S. allies.

"There is immeasurable value to the field from the increased availability of the engines to support the warfighter both in terms of less maintenance and longer life spans," said Lt. Col. James Peavy, director of the Turbine Engine Ground Test Complex. "This testing lets us develop a more robust engine and gives us a chance to look at the performance of improved parts for fielding later."

## Simulation Sensation

Also accomplished by engineers and support personnel at AEDC was ground testing of a missile plume simulator to test airborne sensors deployed by the U.S. military to locate, avoid and evade threats posed by hostile forces using shoulder-launched surface-to-air missiles.

The recent certification of an AEDC-built and tested Towed Airborne Plume Simulator (TAPS) has provided the Center for Countermeasures (CCM) with a vital component for developing sensors to counter the threat posed by man-portable air-defense systems (MANPADS), according to Dr. Robert Hiers, Aerospace Testing Alliance's technical fellow for instrumentation and diagnostics technology at AEDC.

"The CCM now has an accurate missile simulator, an operationally-ready asset that can be towed 100 to 1,000 meters behind an aircraft to test missile-warning sensors on military aircraft and allow for either evasive or defensive action," Hiers said

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# Connecting Battlespace and Warfighter

The U.S. Army Program Executive Office for Simulation, Training and Instrumentation (PEO STRI) is on a perpetual mission: Preparing today's combat soldier for tomorrow's combat challenges.

Submitted by PEO STRI Public Affairs

The U.S. Army Program Executive Office for Simulation, Training and Instrumentation (PEO STRI) provides responsive simulation, training and testing solutions for the nation and its warfighters. PEO STRI offers lifecycle support for the U.S. Army's advanced training systems around the world.

PEO STRI executes programs valued at more than $3 billion with a workforce of nearly 1,200 military, civilian, and in-house contractor personnel and is responsible for sustaining 335,000 training systems at 480 sites worldwide, including 19 foreign countries. The organization's Acquisition Center manages more than 950 contracts valued at more than $10 billion. In addition, PEO STRI's Foreign Military Sales program supports countries around the world. Headquartered in Central Florida's Research Park, the organization also has geographically separated offices in Redstone Arsenal, AL, Ft. Bliss, TX, and Ft. Huachuca, AZ.

Every soldier deployed to a theater of operation has trained on a PEO STRI training device.

As the U.S. Army experiences a drawdown in Iraq and places an increased emphasis on operations in Afghanistan, PEO STRI proudly remains the nation's premier provider of training devices for the American soldier.

Currently, PEO STRI supports a wide range of training activities that prepare Soldiers for the full spectrum of operations in Afghanistan.

For instance, the organization—in partnership with its industry partners—enhanced the Common Driver Trainer program to include the MRAP All Terrain Vehicle (M-ATV). With guidance from Headquarters, Department of the Army, and the expertise from industry, PEO STRI was able to field M-ATV driver trainers very quickly. The M-ATV variant for the Common Driver Trainer allows Soldiers to drive these vehicles before they get to Afghanistan and under a number of hazardous driving conditions like narrow roadways and inclement weather.

The Army looks at the Common Driver Trainer program as a prime example of efficiency. This family of simulators has stepped up to the plate time and time again to meet the training requirements of our Army. Using common components, the simulator can be transformed to train Soldiers to drive everything from a Stryker to a tank to an MRAP.

Additionally, PEO STRI recently integrated the geo-specific terrain database for Afghanistan into the Common Driver Trainer program. Because of these efforts, U.S. soldiers can virtually "drive" on the streets of Afghanistan. Similarly, they added the Afghanistan database into the Close Combat Tactical Trainer, Call for Fire Trainer and Aviation Combined Arms Tactical Trainer, thereby allowing soldiers to virtually train in their actual assigned deployment locations.

PEO STRI is also helping soldiers right here on the home front. Most notably, in September 2010, the organization—in coordination with the special operations community—fielded the first Soldier Tracking System to Ft. Bragg, N.C., and made the grueling land navigation exercise safer for Green Beret candidates. The Multiple Integrated Laser Engagement System and Initial Homestation Instrumentation Training System were moved from Alaska—where they were simulating combat during force-on-force training exercises—to Ft. Bragg in order to track soldiers navigating the course.

PEO STRI understands that, in order to continually meet the high-demands of the Army, they must maintain a highly-talented and seasoned workforce. For this reason, in 2008, the Acquisition Academy was created. To date, the Academy has introduced 73 interns to the federal government, and along with them has come fresh ideas and eager attitudes. In fact, 97 percent of all the Acquisition Academy interns are still contributing members of the Department of Defense.

PEO STRI is proud to support the American soldier. Playing a pivotal role in giving soldiers the decisive edge in defending the nation, STRI works tirelessly to provide our warfighters with the most technologically advanced training devices so they can accomplish their missions and return home safely to their families.

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**DPEO**
Mr. Rob Reyenga

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Business Operations
Mr. Ken Wheeler

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**PM FFS**
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# PEO STRI Project Management Offices

**Project Manager for Combined Arms Tactical Trainers (PM CATT)**

PM CATT manages the development, acquisition, fielding and life-cycle support of the virtual synthetic environment and associated training aids, devices, simulators and simulations to support individual, institutional and collective training. PM CATT refers to a group of high-fidelity, interactive, manned simulators; command, control and communications workstations; exercise control stations; after-action review systems; and the virtual combined arms synthetic environment used to support virtual training up to the battalion and task force level. PM CATT's virtual synthetic environment includes large-scale virtual terrain representations with synthetic natural environment effects and accredited computer generated forces that replicate adjacent, supporting and opposing forces.

**Project Manager for Constructive Simulation (PM ConSim)**

PM ConSim acquires, fields and sustains constructive simulations and integrated simulation environments to support Army Battle Command and Intelligence collective training requirements. Constructive simulations and integrated multi-domain environments are the most effective and efficient means to train commanders and staffs from company to theater level. PM ConSim supports training transformation, Army Force Generation and the modular force providing tailored-made integrated environments for collective training objectives across the full spectrum of military operations.

**Project Manager for Field Operations (PM Field OPS)**

PM Field OPS provides worldwide operations, maintenance, sustainment and instructional support of training systems used by the U.S. Army, Air Force, Marines, Navy and multinational coalition forces. PM Field OPS uses three training services contracts to accomplish its mission of providing integrated live, virtual and constructive training worldwide. The three contracts are the Warfighter FOCUS contract, the Artillery, Chemical and Air Defense contract and the Flight School XXI training services contract.

**Project Manager for Instrumentation, Targets and Threat Simulators**

PM ITTS was established in 1990 at Aberdeen Proving Ground, Md., to provide centralized acquisition of the research, development, production and fielding of test assets and investments in support of full-spectrum, developmental and operational testing for the U.S. Army. PM ITTS is the life-cycle manager of major test instrumentation, aerial and ground targets, and threat simulators and systems, as well as the manager of the operation and maintenance of targets and threats for developmental and operational test and evaluation. Additionally, PM ITTS is the executor for programs and funding of Army-led Office of the Secretary of Defense Central Test and Evaluation Investment Program.

**Project Manager for Training Devices**

PM TRADE is the Army's solution provider for collective instrumented live training systems. PM TRADE's mission is to develop, acquire, field and sustain a family of interoperable live training solutions for use at homestation, Combat Training Centers and deployed sites to improve Warfighter readiness in peacetime and in war. Managing the acquisition of training systems to meet the user's requirements, the goal is to deliver the systems on schedule and within cost and to provide life-cycle management to ensure the best value products for the Army and joint service customers.

**PEO STRI Acquisition Center**

PEO STRI's Acquisition Center provides sound business advice and tailored contracting and acquisition solutions to acquire a variety of products and services managed by PEO STRI in support of the U.S. Army and the Nation's security. It serves as an Acquisition and Contracting Center of Excellence that focuses on customer satisfaction; promotes innovative and flexible business practices, calculated risk-taking, empowerment and partnering with industry; and emphasizes diversity in the workforce and professional development.

**Three Pillar Contracts**
**Simulation and Training Omnibus Contract (STOC II)**

Awarded in January 2009, STOC II provides the Warfighter with the next generation of simulation and training devices to meet the challenges of the joint operational environment. STOC II is not only a continuation but an evolution of its predecessor, STOC I. The omnibus contracting vehicle awarded a total of 142 contracts spread over two lots: Lot I, Full and Open Lot (consisting of small and large businesses), and Lot II, Small Business Set-Aside. These awards resulted in multiple-award, indefinite delivery/indefinite quantity contracts that will provide troops with simulation, training and instrumentation products and services beginning with concept development and continuing through life-cycle support.

**Warfighter Field Operations Customer Support Contract (Warfighter FOCUS)**

Warfighter FOCUS is a contract that fully integrates the live, virtual and constructive training services at Army installations worldwide. As the Army continues to field an increasing number of interoperable training systems, the Warfighter FOCUS contract provides a fully-integrated contractor workforce to operate and maintain them. Furthermore, the contract will allow PEO STRI to provide a more rapid response to Department of the Army requests.

**Systems Engineering and Technical Assistance Services (SETA) Contract**

An indefinite delivery/indefinite quantity contract for SETA services was awarded in August 2009 with a period of performance of five years. The SETA contract provides systems engineering and technical support services for PEO STRI and other federal agencies worldwide. The services include providing responsive, integrated and interoperable infrastructure for simulation, training, testing, and instrumentation solutions and acquisition services for the Warfighters and the Nation.

For more info: www.peostri.army.mil


# "Grow the Army" Grows On

**As part of the U.S. Army's "Grow the Army" Initiative, the 2nd Brigade Combat Team, 2nd Infantry Division, today known as 4th BCT, 4th Infantry, has relocated successfully to Ft. Carson, CO from the Republic of South Korea, leading the first of a series of unit redeployments aimed at consolidating force effectiveness.**

Submitted by LTC David H. Patterson Jr. OCPA - Media Relations Division Media Team Chief, Operations, Intelligence and Logistics

## *OIF Deployment*

In May 2004, the Department of Defense announced that the 2nd Brigade, 2nd Infantry Division (2-2) stationed in South Korea would be deploying to Iraq in August as part of Operation Iraqi Freedom. The 2nd Brigade acted as a deterrent against North Korean aggression against the Republic of South Korea (ROK) and was based at Camp Hovey for the past 50 years. The deployment to Iraq was for one year and affected roughly 3,600-3,700 soldiers. The 2nd Brigade, 2nd Infantry Division was the Army's only Light/Heavy Brigade with two Air Assault Battalions, the 1-503rd Infantry (Air Assault) and the 1-506th Infantry (Air Assault) and also had the 1-9th Infantry assigned to it.

On 23 September 2004, the Department of the Army announced the temporary relocation of 2-2 from South Korea to Ft. Carson, CO following its deployment to Iraq. Temporary stationing of 2-2 was operationally imperative to ensure the Army was postured to fully support its strategic global commitments. Additionally, 2-2 was scheduled to transform into a campaign-quality force with joint and expeditionary capabilities to meet the demands of combatant commanders sometime in 2005. Shortly after redeployment to Ft. Carson after completing its first deployment since arriving from South Korea, 2-2 began transformation to the U.S. Army's new modular force structure. Units previously held at division level were assigned and became organic to the unit, a key element of modular transformation. As a result, many of its units were reflagged.

## *Homefront Reflaggings*

With 2-2's redeployment stateside, some key reflaggings within the unit involved; 1st Battalion, 503rd Infantry, reflagged as the 1st Battalion; 9th Infantry, 1st Battalion, 9th Infantry reflagged as the 3rd Squadron, 61st Cavalry; and 1st Battalion, 506th Infantry reflagged as the 2nd Battalion, 12th Infantry. The 2nd Battalion, 17th Field Artillery and 2nd Forward Support Battalion (re-designated 2nd Brigade Support Battalion) were also made organic to the new Brigade Combat Team (BCT). As part of the transformation, 2-2's two Air Assault battalions were reassigned and reflagged as regular infantry battalions. In addition, 2-2 gained a cavalry squadron -- the 3rd Squadron, 61st Cavalry. The 2nd Forward Support Battalion was re-designated as the 2nd Brigade Support Battalion and became organic to the BCT, as did the 2nd Battalion, 17th Field Artillery.

In October 2006, the new 2-2 returned to Iraq in support of Operation Iraqi Freedom. After the deployment, the 2nd BCT returned to Ft. Carson and became part of a large reorganization of U.S. Army units. In April 2008, 2-2 was subsequently inactivated and its personnel and equipment were reflagged as the 4th Infantry BCT, 4th Infantry Division, the Army's first of six Infantry BCTs added as part of the Grow the Army Initiative.

**Q: Please provide some brief background regarding the BRAC recommendation to move 2nd Brigade/2nd Infantry to Ft. Carson, Colorado.**

**A:** 2-2 ID was identified under BRAC 2005 but not recommended by the BRAC Commission. A detailed analysis was conducted using the BRAC process and Military Value Analysis to determine locations for stationing six Growth Infantry BCTs. The unit relocated from South Korea to Ft. Carson, CO under Global Defense Posture Realignment and Grow the Army to achieve Army end strength of 74.2K by FY13.

**Q: Please briefly explain the primary objectives for the relocation at the brigade/infantry level as well as Army-wide.**

**A:** Relocation of 2-2 ID was operationally imperative to ensure the Army was postured to fully support its strategic commitments. Additionally, the 2-2 ID transformed to a campaign-quality force with joint and expeditionary capabilities that met the demands of combatant commanders. Ft. Carson was selected based on existing facility capacities, available training space, and current locations of similar units.

**Q: Please provide a timetable for the planned phases of the move.**

**A:** In early 2005, the 2nd Brigade, 2nd Infantry Division began transformation to the U.S. Army's new modular force structure. Then unit deployed in support of Operation Iraqi Freedom. By August 2005, soldiers of the 2nd BCT, 2nd Infantry Division redeployed to Ft. Carson after completing the Brigade's first deployment since the Korean War. In 2006, after redeploying to Ft. Carson, the unit began transformation to the U.S. Army's new modular force structure-BCT. On 8 April 2008, the 2nd BCT, 2nd Infantry Division was inactivated and its personnel reflagged as the 4th BCT, 4th Infantry Division.

**Q: Please explain the re-integration of 2nd Brigade/2nd Infantry.**

**A:** The inactivation of the 2-2ID and reflagged to become the 4th BCT, 4th Infantry Division was part of the Grow the Army (GTA) Plan. The 2-2ID, now 4-4 ID was the first of six brigade combat teams programmed under GTA.

**Q: Please speak to any future objectives of 2nd Brigade/2nd Infantry.**

**A:** The 2nd Brigade 2nd Infantry, now re-designated as the 4th Infantry Brigade Combat Team 4th Infantry Division, stands ready to bring the full spectrum of combat power to meet our nation's call once again.

For more info: www.first.army.mil

## Headgear Integrated Comms

3M, supplier of technology for commercial and defense application, has introduced an integrated communications solution for use with the Ops-Core™ FAST™ (Future Assault Shell Technology) Helmet. The new helmet attachment for new 3M™Peltor™ ComTac™ Headset has been designed to interface with the Ops-Core ARC Kit (Accessory Rail Connector), offering FAST Helmet wearers combined protection and comms capability.

Using a 3M mounting mechanism with two stainless steel cables connecting the ear cups of the ComTac headset to the side rails of the FAST Helmet, the integrated solution addresses the challenge of donning and doffing the helmet while reducing the need to modify the internal helmet padding for a proper fit. The spring tension on the ear cups allows for an "open" and "closed" position. The "open" position allows for easy donning/doffing the helmet while the "closed" position is designed to positive seal against the head. The "open" position also provides ventilation in high heat environments but can permit the user to monitor radio communications via the speakers in the ear cups. Each ear cup can also be rotated 90 degrees to the rear and stored on the back of the helmet.

**For more info: www.peltormilitary.com or frank.gavin@mmm.com**

## COTS Servers being Redesigned for Military Applications

Military operations are being inundated with data from an expanding network of sources, including sensor data from Unmanned Aircraft Systems (UAS), satellites, and remote monitoring stations. A new white paper released by Z Microsystems, a provider of mission-ready computing systems, provides an in-depth analysis of how ruggedized servers are being redesigned by Commercial-Off-the-Shelf (COTS) suppliers to meet these demands.

The white paper, entitled "Redesigning COTS Servers for Military Applications," examines the ways in which rugged computer platforms can incorporate COTS motherboards and extend the capabilities of commercial components. The paper includes details on how systems can be designed to withstand shock, vibration, and temperature extremes while providing the versatility and flexibility needed in the field. Specific adaptations include hot-swappable component parts and disk drives, redundant power supplies, and rack-mount servers in place of laptops.

"Whether on a Navy ship, an aircraft, or a UAS ground station in the middle of a desert, these operations rely on data center computing power," said Jack Wade, CEO of Z Microsystems. "COTS manufacturers can use a variety of techniques at each stage of the design, manufacturing, and testing processes to meet U.S. Military Standards and ensure the system will be rugged enough for a particular application."

**For more info: www.zmicro.com**

## RF-EO Protection for Aircraft

Elisra, a company specializing in EW, intelligence and communications solutions, has introduced an active and passive self-protection suite for helicopters and transport aircraft. The suite constitutes a new stage in the evolution of self-protection and survival systems for airborne platforms. Offering a complete and comprehensive RF-Laser-EO protection shell, it combines RWR, LWR, IR-PAWS, RF Jammer, laser DIRCM and Chaff/Flare dispensing functions, providing quick reaction time and effective responses to all types of threats.

With seamless interoperability of components, the system searches and detects threats, provides warning and jamming against airborne and ground-based EO, RF and laser threats presented by all types of air defense systems, including missiles, MANPADS, ground-based fire, RPGs and others. The system also offers a host of additional capabilities including pinpoint geolocation of threats.

**For more info: natasha.pheiffer@baesystems.com**

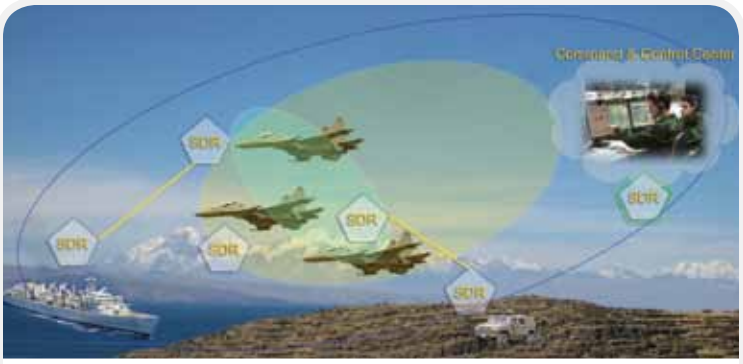
## *Combat-Rugged Computing*

LogIn Crete AB has launched its new series of combat-rugged notebook computers – Rocky RT986 and Rocky RK986. The newly launched combat-rugged computers offer higher performance to run heavier, more demanding software.

With a memory capacity of 8 GB and capacity of 1695 MB that can be dedicated to an Intel GMA 4500 MHD graphics memory, limits experienced by previous variations in running advanced applications and map software have been overcome. Both Rocky RT986 and Rocky RK986 have Intel® Core™ 2 Duo Processors running at 2.26 GHz, cooled effectively via the chassis enabling quiet and reliable operation.

Rocky RT986 and Rocky RK986 have also been upgraded to IP55 and now comply with the latest MIL-STD-810G and MIL-STD-461F.

**For more info: oskar.forssell@login.se**




## *Software-Defined Airborne Radio*

Elbit Systems Ltd. ("Elbit Systems") has announced the launch of its latest software-defined radio, the airborne Tadiran SDR-7200AR. Specifically designed for airborne platforms, this innovative radio system has automatic routing and relay capabilities to offer extended range, while offering video, voice and data simultaneously at an exceptionally high data rate.

Embedded in the radio system are fundamental avionics applications for enhanced situational awareness, including video and safety enhancement features. These applications enable on-the-move commands and real-time intelligence updates that are automatically updated on a built-in C4I system.

The Tadiran SDR-7200AR offers versatility in enabling direct support of air-to-air, air-to-sea and air-to-ground communications. The product is fully compliant with the Software Communications Architecture SCA version 2.2.2.

**For more info: www.elbitsystems.com**

## *RG31 MRAP READINESS AND SUSTAINMENT*

Through its teaming agreement with General Dynamics Land Systems Canada (GDLS-C), BAE Systems, Land Systems South Africa recently won a contract worth more than $130 million for survivability and mobility upgrades to its RG31 Mine Resistant Ambush Protected (MRAP) vehicles.

The upgrade kits will further enhance the survivability and mobility of battle-proven RG31 vehicles. As part of the modernization work in South Africa, a powerpack providing higher performance and new suspension components and transfer cases, designed and manufactured by BAE Systems, will be incorporated into the upgrade kits.

"We appreciate our ongoing relationship with GDLS-C as well as the confidence that the U.S. military has in the RG31 vehicle. Readiness and Sustainment is an important part of our business and through these programmes we continue to protect the lives of U.S. soldiers," said Johan Steyn, Managing Director BAE Systems, Land Systems South Africa.

In total, over 1,600 RG31 vehicles have been delivered through GDLS-C under the MRAP program. An additional 566 RG31s have been delivered to U.S. forces under separate contracts.

**For more info: www.generaldynamics.com**

# Mission: Enemy Misfire

**DoD's Joint Improvised Explosive Device Defeat Organization (JIEDDO) is developing the next generation of Rhino passive counter-passive infrared (PIR) sensor technology designed to trigger IED detonations before U.S. and coalition forces advance into harm's way.**

By Anthony Richiazzi, PAO Tobyhanna Army Depot

Even with the shift in the U.S. war effort to Afghanistan, IEDs remain the principal killer of American troops in combat. In Afghanistan — where the number of IED incidents doubled in 2009 and caused 75 percent of casualties in some areas — the U.S. Joint Improvised Explosive Device Defeat Organization (JIEDDO) faces a new generation of more ingenious, and bigger, bombs. Even excluding those in Iraq and Afghanistan, there were nearly 3,300 IED incidents around the world in 2009. "The IED as a tactical weapon is a condition of our workplace in the armed forces," says Michael Oates, JIEDDO Director. "We believe it will be a persistent threat."

Soldiers prepare to deploy RHINO during route clearance operations in theater. (U.S. Army photo)

The introduction in 2006 of a new type of IED called the explosively formed penetrator, or EFP, to the fight in Iraq and today in Afghanistan brought a new challenge to a newly-formed JIEDDO in protecting U.S. and coalition warfighters. Made from a short length of steel or PVC pipe packed with explosives, EFPs are a sealed projectile capped with a concave copper disk. When the explosives detonate, the blast energy inverts the copper plate into a ragged slug traveling more than a mile per second and capable of punching through tank armor 300 feet away. Using passive infrared (PIR) sensors that detect motion by responding to changes in temperature — like that created by the engine of a passing truck, EFPs don't use radio frequencies as triggers and, therefore, are invulnerable to electronic jamming.

By May 2006, the effectiveness and frequency of EFP attacks had proved so devastating that JIEDDO introduced the first of two variations on its Rhino PIR and counter-PIR explosive advance-trigger system. Funding an expedient solution developed in the field, JIEDDO created Rhino with the intent to defeat PIR-triggered IEDs utilizing a boom-mounted glow plug that causes PIR-initiated IEDs to detonate prior to their intended targets entering the kill zone. The Rhino glow plug — an electric heating element for warming diesel engines before ignition — is housed in a steel box on the end of a 10-foot boom. Heat emitted from the glow plug triggers EFP-triggering PIR sensors, causing the weapon to discharge in advance of target acquisition.

In response to Rhino, insurgents adjusted the firing angle of their EFPs so that the slug struck 10 feet behind the decoy. JIEDDO countered with a Rhino II variant, fitted on an adjustable-length boom that presents the glow plug to the EFP's PIR trigger earlier than its Rhino counterpart, ensuring premature firing. Along with electronic jammers, Rhino II became standard on U.S. vehicles in Iraq.

By late 2008, JIEDDO had funded and fielded more than 16,000 second-generation Rhino II systems, also providing upgrade kits that included heat monitoring systems with safety and performance improvements. JIEDDO continues to fund an effort to develop and deliver Rhino systems (Rhino III) that will meet the unique terrain requirements of the Afghanistan theater of operations.

For more info: www.jieddo.dod.mil

# Tactical ATVs:

## Mobile, Unmanned, Mission-Versatile

By Kevin Hunter, A&M Editor





PFM Manufacturing, Inc. of Townsend, Montana manufactures the Land Tamer 6x6 class of commercial grade, low-impact, amphibious, remote access All-Terrain Vehicles (ATVs) that provide mobility capabilities for military tactical operations. Selected as the platform of choice for the Squad Mission Support System (SMSS) under development and in conjunction with Lockheed Martin, this autonomous platform is expected to be workhorse for a squad of soldiers and is expected to see real action in Afghanistan by the end of 2011. On the light ATV side, Phoenix International has introduced the Prowler Light Tactical All-Terrain Vehicle (LTATV) configuration versatility in a commercial-off-the-shelf (COTS) platform capable of light tactical military missions in ISR, mobile communications, assault, or search and rescue.

### *Multi-medium Capable*

Since 1998, PFM has been manufacturing the Land Tamer® to fill the need for a vehicle that will stand up to the commercial applications. This vehicle was designed from the ground up for heavy duty use. The Land Tamer is in use year around from the Arctic Circle to the Equator in all types of commercial applications in all types of terrain. A robust commercial grade amphibious vehicle, Land Tamer can be used as an ATV, boat, snow coach, and tractor.

The Land Tamer RS (Reduced Size) 8x8 is a smaller version of the larger standard sized units, and can fit inside the V-22 Osprey with minor modifications. All Land Tamer vehicles feature our hydraulic/gear drive system requiring minimal maintenance.

Land Tamer's Water Propulsion Unit is powered from the vehicles built in hydraulic drive system. The 9" hydraulically driven propeller can be raised, lowered and steered from the driver's seat. Speeds of 5-10 mph on water can be attained depending on cargo load. Quick installation and removal of the Propulsion System can be achieved in 1 minute or less and the vehicle can be used as a boat.

### *Staying on Track*

As part of the Land Tamer® Track System, Land Tamer utilizes a custom rubber track feature. Implementing a 22" wide track that fits over the existing tires, operators can achieve quick installation by just driving onto the track and inserting the connecting pin.
"The main benefit of tracks is that they allow the vehicle to lower the vehicle ground pressure from the already low 3 psi, down to less than 1 psi," said Patrick Miller, PFM Manufacturing. "This allows the vehicle to travel over deep snow that otherwise would require a snowmobile to travel."

The Land Tamer® unique drive system allows the installation of tracks over the tires for year-around use in any terrain type. This is a unique capability and strength of the Land Tamer®'s go-anywhere, anytime, easy mission configurability.

For winter travel, Land Tamer® can be configured with the fully enclosed, heated cab option. This can also be used as an ambulance to evacuate casualties, or accommodate a crew of 10 in seats or sleep 6 people in bunks. The current cab is covered with unbreakable Lexan plastic glass but can be configured with a lightweight armor if or when extra protection is required.

# Maximize your response no matter how rugged the terrain.

Turn your ATVs into rapid response vehicles with **Intelagard's SwiftCAF ATV** system. Use the **Intelagard SwiftRunner** to turn your UTV into a dynamic response vehicle for maximum maneuverability and unparalleled capabilities.

Powerful and effective, Intelagard equipment will quickly become your most versatile weapon of choice. Intelagard's advanced CAF systems are self-contained, easy to use, and work equally well for fire suppression, hazmat remediation, and decontamination ops. These multi-asset systems were designed to switch between applications quickly and with few adjustments.

**Contact Intelagard today at 303.309.6309 or visit us at www.intelagard.com**

INTELAGARD®

## Unmanned Option

With a flip of as switch, Land Tamer offers operators an optional Light Tactical (LT) Remote Control System which allows the vehicle to be driven remotely as an unmanned platform. This benefit allows the vehicle to do dangerous jobs without endangering a driver.

"The benefit of the optional 3-Point Hitch System is that Land Tamer® can be used as a remotely-operated tractor and a complete mobile power source," said Miller. "The Category 1, 3 Point Hitch accepts any off-the-shelf farm and construction implements such as an earth moving blade, back hoe, mobile power generator or other equipment enabling a combat engineer capability in a light tactical platform. If desired, a remotely-controlled mine sweeping device could be attached."

## Versatile Utility

Phoenix International commercially introduced the industry's first"quad"ATV with rack and pinion steering (no handlebars), automotive controls and a roll cage (now popularly called a Roll Over Protection System, or ROPS) in June 2002. An adaptation of this unique concept was made by a single recreational ATV manufacturer late in 2004 followed by others in 2006.

The Prowler Light All-Terrain Vehicle (LTATV) was purposely designed as a commercially-available vehicle to provide reliable performance and endurance in the most demanding, inhospitable and harsh terrain encountered, and in any environment. The Prowler's configuration versatility in a commercial-off-the-shelf (COTS) platform makes the platform a capable light tactical solution for military missions in ISR, mobile communications, assault, or search and rescue, as well as its similar domestic security patrol and emergency response vehicle (ERV) wildfire and rescue applications.

## Tactical Test Ready

In military tactical applications, the Prowler is easily deployed, capable and nimble in hostile environments and is multi-mission configurable. Unlike any generic ATV-derived vehicle, the vehicle is built to provide maximum operator protection, enhance driver control, improve crew safety and reduce operator fatigue.

The Prowler's rugged design and construction incorporates roll cage and chrome alloy steel tubing components that won't bend, crimp, dent or break versus typical ATV plastic panels and common steel stampings welded together. In 4WD, Prowler's wheels have power delivered simultaneously to each wheel all the time, unlike modified recreational vehicles which only revert to 4-wheel drive if a rear wheel slips or spins. The Prowler keeps its engine engaged with the drive train at all times, with constant engine braking under all driving conditions. This means that the wheels turn slower as the engine revs lower, improving driver control and lengthening the life of its brakes.

As well as transportable within most cargo Helos and fixed wing aircraft, Prowlers can be backed into the MV/CV-22 Tilt-Rotor OSPREY aircraft - ready to drive straight out, fully crewed and mission equipped immediately upon ramp down - without any vehicle modification, disassembly, change or adjustment.

## Mobility and Durability

Designed to operate with tires under the most demanding off-road and rugged terrain conditions, Prowler's extreme duty double reinforced rim wheels do not dent, bend, twist or break. Prowler's heavy duty undercarriage skid plate system can support the entire vehicle on a single point of contact. This means that if "high centered", the vehicle needs only to be rocked with all wheel drive locked to pull off of a "hang up" point. All Prowler surfaces are industrial powder coated, not painted, for durability and long life.

The Prowler platform design makes all routine service and maintenance points easily accessible for service without special tools, equipment or disassembly. Major engine and drive train parts and service is available from dealers worldwide. Effective operational capacity and acceptable mishap risk assessment within the constraints of potential mission requirements throughout the life cycle of Prowler platforms was and remains a critical factor in their design and evolution.

contact@tacticaldefensemedia.com

# Unmanned Accompaniment

**The U.S. Army is fielding and the latest in small unmanned ground vehicle (SUGV) technology to provide the warfighter with critical mission support.**

Submitted by PEO GCS Public Affairs

The Program Executive Office Ground Combat Systems (PEO GCS) Robotic Systems Joint Project Office (RS JPO) is responsible for managing the development, acquisition, testing, systems integration, product improvement, and fielding of robotic systems for the joint warfighter. Systems include the M-160 Mechanical Anti-Personnel Mine Clearing System (MAPMCS), TALON Family of Systems (IIIB and IV), PackBot, FasTac, MARCBot, and the Small Unmanned Ground Vehicle (SUGV-310) otherwise known as the Mini-EOD. General improvements to robotic systems include increased agility, mobility, SWaP-C (Space, weight, Power and Cooling) and transportability.

## Small Utility, Big Capability

The TALON is considered the workhorse of the 'small' robot family weighing in at 115 - 140 pounds. The unmanned ground vehicle (UGV) is a robotically controlled system that provides the warfighter with the ability to visually identify both stand-alone and vehicle-borne improvised explosive devices (IEDs) from a safe range. The TALON is also capable of supporting explosive ordnance disposal (EOD) and provides additional engineer support that may not involve IEDs. The TALON is equipped with an extension arm, cameras, microphone loudspeaker, and a manipulator arm with a gripper. The infrared and white-light illuminated cameras provide the operator the ability to conduct operations in day or night conditions.

TALON is used in conjunction with Mine Resistant Ambush-Protected (MRAP) vehicles and other ground assets to support route clearance missions. The TALON robot is used to visually inspect and interrogate suspect terrain anomalies, debris or other impediments. PEO GCS does not manage the MRAP systems. They are managed by Program Executive Office Combat Systems & Combat Support Systems (PEO CS & CSS).

TALON RDS is managed by PM Assured Mobility Systems under PEO CS & CSS. The RDS enables transportation, deployment and operation of the TALON from within the host vehicle. It serves to alleviate the need for Soldiers to dismount to deploy and operate the TALON.

## Light Might for the War Fight

The XM1216 SUGV is a lightweight (32 lb), man-portable, unmanned ground vehicle capable of conducting operations in urban terrain environments like tunnels, sewers, and caves. In order to minimize exposure of the warfighter to potential hazards, the SUGV provides an unmanned capability for manpower-intensive or high-risk missions such as IED and Chemical/Toxic Materials reconnaissance, as well as urban intelligence, surveillance, and reconnaissance (ISR). Initial fielding of the SUGV is slated for April 2011.

For more info: www.peogcs.army.mil



# GLOBAL REACH, GLOBAL POWER, AND GLOBAL VIGILANCE

**The U.S. Air Force Materiel Command (AFMC) is DoD's primary organization for the development, fielding, and integrated life cycle management of materiel critical to joint combat forces at home and worldwide.**

Submitted by AFMC Public Affairs

The U.S. Air Force Materiel Command's mission is to deliver war-winning expeditionary capabilities to the warfighter. It does this by developing, fielding and sustaining the material that allows the U.S. Air Force to remain the most capable, flexible, and dominant military force in the world -- providing technology and systems that enable "Global Reach, Global Power, and Global Vigilance."

The command provides and sustains everything from fifth-generation fighters like the F-22 and the F-35 to the new Airman Battle Uniform, supporting combat forces around the world.

AFMC's priorities include continuing to strengthen the command's role in supporting the nuclear enterprise; implementing effective and efficient Integrated Life Cycle Management to support the warfighter; recruiting, training and retaining a high-performing workforce; nurturing and protecting our people and families; and being good stewards of government resources.

## *Capabilities*

AFMC's greatest asset is its people. The command employs a highly professional and skilled command work force of more than 83,000 military and civilian employees. They are organized into four broad mission areas: research and development, acquisition management, test and evaluation, and sustainment.

In encompassing cradle-to-grave life-cycle management of warfighting systems, AFMC impacts the full spectrum of Air Force capabilities. In short, AFMC is responsible for equipping the Air Force so it can aim high and fly, fight and win today.

## *Major Air Force Materiel Command Organizations*

AFMC is headquartered at Wright-Patterson Air Force Base, OH. This is an appropriate home as the Wright Brothers perfected powered flight less than 2 miles from the Headquarters building — thus serving as a constant reminder of the innovative spirit the command strives to embody.

In addition to its Headquarters, AFMC is made up of the following centers and organizations around the country:

## *AFRL*

AFMC's Air Force Research Laboratory (AFRL), responsible for science and technology, includes the Air Force Office of Scientific Research as well as nine technology directorates – Air Vehicles, Space Vehicles, Munitions, Sensors, Propulsion, Information, Human Effectiveness, Materials and Manufacturing Technology, and Directed Energy.

Overarching science and technology priorities -- addressed by the laboratory -- include supporting the current fight while advancing breakthrough science and technology (S&T), developing balanced S&T investment strategy and portfolio, retaining critical competencies required to address the full range of Air Force S&T needs and ensuring that the S&T program is integrated into the Air Force requirements and programming process. They also include increasing emphasis on S&T that will reduce cyber vulnerabilities

while emphasizing mission assurance; improving sustainment, affordability and availability of legacy systems; reducing energy dependence; enabling long-range strike; delivering autonomous systems envisioned in the Air Force's New Horizons plans; and enhancing decision-making with improved situational awareness.

Examples of AFRL's ongoing and successful work include achievements with alternative fuels for Air Force fleets, development of laser technology for use on large aircraft, and development of a phased array antenna designed to maximize the use of commercial off-the-shelf components to communicate with satellites from the surface of the earth.

### *Product Centers*

AFMC has three product centers, each of which is responsible for transitioning technologies into systems ready to be deployed to meet users' needs. The centers are charged with developing and managing the acquisition of militarily effective and sustainable weapon systems:

**AAC:** Air Armament Center (AAC), located at Eglin AFB, Fla., serves as the focal point for all Air Force armament. The center is responsible for development, acquisition, testing, and deployment of all air-delivered weapons. It plans, direct and conduct test and evaluation of U.S. and allied air airmament, navigation and guidance systems, as well as command and control systems. They also support the largest base mobility commitment in the Air Force.

**ASC:** Aeronautical Systems Center (ASC) is located at Wright-Patterson AFB, OH. The center designs, develops and delivers dominant, war-winning airpower capabilities for the Air Force. Its portfolio of capabilities includes fighter/attack, long-range strike, reconnaissance, mobility, agile combat support, special operations forces, training, unmanned aircraft systems, human systems integration, and installation support

**ESC:** Electronic Systems Center (ESC), located at Hanscom AFB, Mass., is the world leader in net-centric command and control; communications; intelligence, surveillance and reconnaissance; and combat support systems. These integrated systems help the Air Force maintain all its daily operations across the globe and provide the situational awareness enabling battlespace dominance for U.S. and allied commanders.

Examples of work done by the product centers include development and acquisition of the MQ-9 Reaper unmanned aerial vehicle (UAV). Aeronautical Systems Center manages development of the Reaper, and has been accelerating its acquisition to meet increasing requirements. The 42nd Attack Squadron at Creech AFB, Nev., recently received the first MQ-9 Reaper nearly a year ahead of schedule, exceeding Air Combat Command requirements. Together with the MQ-1 Predator, the Reaper quickly became a workhorse for our warfighters.

In another example, AFMC established the Aeronautical System Center's Large Aircraft Infrared Countermeasures program in response to the man-portable anti-aircraft missiles threat to intra-theater airlift. Many C-130s and C-17s aircraft are now LAIRCM-equipped.

The Space Fence program is another example of the work done by AFMC's product centers. Managed by the Electronic Systems Center, the Space Fence will deliver a system of geographically dispersed ground-based sensors to track space debris and provide timely assessment of space events. The total anticipated value of the program is more than $3.5 billion.

AFMC also developed the Joint Air-to-Surface Standoff Missile (JASSM), the nation's only stealthy, conventional, precision, launch-and-leave, standoff missile capable of being launched from fighter and bomber aircraft. Developed at the Air Armament Center, JASSM is 2,000-pound class weapon with a highly lethal combination penetrator/blast fragmentation warhead. It cruises autonomously in adverse weather, day or night, using a state-of-the-art infrared seeker in addition to the anti-jam GPS to find a specific aimpoint on the target.

### *Test and Evaluation Centers*

AFMC ensures its systems will meet the demands of the military environment through extensive test and evaluation provided by its test centers. The command operates two dedicated test centers and a separate test wing where it pushes aircraft, spacecraft, and air armament to the limit.

These unique facilities research, evaluate, and test developing air and space capabilities in both controlled and real-world environments:

**AFFTC:** Air Force Flight Test Center (AFFTC), located at Edwards AFB, CA, is the world's premier flight test facility, dating back to the days of Chuck Yeager in the Bell X-1. They've tested and evaluated manned and unmanned systems such as the F-22A, the X-45 Unmanned Combat Aerial Vehicle, Global Hawk, Airborne Laser, and the F-35. AFFTC is also the home of the United States Air Force Test Pilot School. Although renowned for open air flight testing of manned aircraft, AFFTC also is paving the future in testing of electronic warfare systems, UAVs, net-centric warfare, directed energy, and hypersonics.

**AEDC:** Arnold Engineering Development Center (AEDC) at Arnold AFB, TN., operates pre-flight test facilities capable of simulating flight conditions from sea level to the edge of space and speeds from zero through Mach 14. AEDC has nearly 60 propulsion and aerodynamic wind tunnels (including one that's the largest in the world), rocket and turbine engine test cells, and space environmental chambers. Nearly every U.S. military aircraft, both military and commercial aircraft engines and many satellites systems have been tested at AEDC since it opened in 1951.

**46 TW:** The 46th Test Wing at Eglin AFB, FL., is the primary test facility for all Air Force armament. It operates unique climatic labs capable of testing airframes covering the full spectrum of weather conditions from hot, dry deserts, to icy, sub-zero tundra – and virtually every combination in between. The wing is also responsible for testing systems against cyber attack.

Other examples of work done by the Test and Evaluation Centers include test and evaluation of the Airborne Laser (ABL). In 2007, AFMC executed the AFFTC's ABL test program and successfully demonstrated effective firing of the ABL from an airborne-platform as well as its ability to track airborne targets –achieving two major program milestones stepping closer to one of tomorrow's critical directed energy capabilities.

The Towed Airborne Plume missile simulator (TAPS) is the product of Arnold Engineering Development Center, where it was

both built and tested. TAPS was created to test early warning sensors on military aircraft, thus helping to protect low-flying military aircraft operating in hostile air space.

### Sustainment Centers

As AFMC develops and tests new weapons systems, its people continue monitoring and shepherding those systems to make sure they are maintained and sustained throughout their service lives. The sustainment mission is even more demanding today as the Air Force's aircraft fleet is the oldest in history, with an average age of 25 years, and many well over 40 years old.

To carry out this mission, AFMC manages several sustainment centers -- highly industrialized complexes focused on providing comprehensive depot-level maintenance and repair of all current and future USAF air and space systems. These complexes include three air logistics centers (ALCs), the Air Force Nuclear Weapons Center and Air Force Global Logistics Support Center.

ALCs include the 309th Aerospace Maintenance and Regeneration Group at Davis-Monthan AFB, AZ, which reports to the air logistics center in Oklahoma and serves as the DoD's single repository for stored aircraft. ALCs also provide support at numerous field locations both in country and overseas:

**OC-ALC:** Oklahoma City Air Logistics Center (OC-ALC) at Tinker AFB, OK., manages logistics support mainly for large aircraft, such as the B-1, B-2, B-52, KC-10, C/KC-135, E-3 and E-4B aircraft. In addition, the ALC manages a number of contract logistics support aircraft, including the VC-25A, or Air Force One. It is also the Air Force Center of Excellence for sustainment of all engines.

**OO-ALC:** Ogden Air Logistics Center (OO-ALC) at Hill AFB, UT, provides worldwide support for aircraft such as the F-16, F-22, T-37, T-38, C-130 and A-10, as well as ICBMs. The center also manages and repairs a wide range of components such as landing gear, rocket motors, avionics and other related aerospace items. It has also taken over storage for all Department of Defense retired aircraft through the 309th Aircraft Maintenance and Regeneration Group at Davis-Monthan AFB, AZ.

**WR-ALC:** Warner Robins Air Logistics Center (WR-ALC) at Robins AFB, GA, provides depot maintenance support for large transport aircraft such as the C-5, C-17 and C-130; supports the U-2 and F-15; and helicopters and electronic warfare systems.

AFMC's ALCs have won numerous awards for excellence in industrial operations management and are leading the way in ensuring aircraft are available and mission ready for the warfighter.

**AFNWC:** Air Force Nuclear Weapons Center (AFNWC), at Kirtland Air Force Base, NM, serves as the command's Center of Expertise for nuclear weapon systems. The center is critical to ensuring the safety, security, and reliability of nuclear weapons to support the National Command Structure. It performs this role through acquisition, modernization, and sustainment of nuclear system programs for both DoD and the Department of Energy.

The AFNWC serves as a single manager for lifecycle support, stockpile support and nuclear engineering. It was established in 2008 and reached initial operational capability in January 2011. Creation of the AFNWC consolidated alignment of people, training, and resources.

**AFGLSC:** Air Force Global Logistics Support Center (AFGLSC), located at Scott Air Force Base, IL, is the single Air Force Supply Chain Management owner and provides enterprise planning and execution, global command and control, and supply chain enabling functions.

The center is comprised of more than 4,800 people at six operating locations: Langley, Hill, Robins, Scott, Tinker, and Wright-Patterson Air Force bases. This includes networking logistics experts who link wholesale and retail logistics, as well as integrate and oversee all logistic processes, technology and resources to deliver end-to-end warfighter support with increased velocity and reduced cost.

## *Specialized Units*

**AFSAC:** Air Force Security Assistance Center (AFSAC) is located at Wright-Patterson Air Force Base, OH. The center is the Air Force's security assistance agent for administering $92.7 billion in foreign military sales to more than 96 countries, operating more than 6,000 aircraft and other weapon systems. Along with this, AFSAC is responsible for sustaining aerospace capability for friendly foreign forces in support of U.S. national security objectives. Within the center, about 420 military, civilian and contractor personnel and foreign liaison officers are helping to build partner Air Force capabilities, contributing to strong relationships and interoperability.

**NMUSAF:** The National Museum of the U.S. Air Force (NMUSAF) is located in Dayton, Ohio, next to Wright-Patterson Air Force Base. The museum is the service's national institution for preserving and presenting the Air Force story. Each year more than 1 million visitors come to the museum to learn about the mission, history and evolving capabilities of America's Air Force.

The museum is the world's largest and oldest military aviation museum featuring more than 400 aerospace vehicles amid more than 17 acres of indoor exhibit space. Thousands of personal artifacts, photographs and documents further highlight the people and events that comprise the Air Force storyline, from the beginnings of military flight to today's current operations.

Along with more than 480 volunteers, the museum has a professional staff of nearly 100 that include education, research, exhibits, restoration, collection management, special events, plans and programs, and public affairs divisions.

For more info: www.afmc.af.mil



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**Gen. Duncan McNabb**

Commander

U.S. Transportation Command

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**Tactical Radio C2**
The U.S. Army is employing the latest in handheld digital radio technology in support of enhanced command and control across a brigade combat team-led force structure.

**Ground Soldier Ensemble**
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U.S. Special Operations Command
The U.S. Special Operations Command (USSOCOM) is DoD's top organization in the joint special operations forces (SOF) community, synchronizes the planning of global counterterrorism operations in defense of U.S. interests worldwide.

### Bonus Distribution

SpecOps Warfighters West
Joint Warfighers Conf & Expo
Military Armor Protection
Joint CBRNE
Special Ops Industry Conf
Command & Control
Sustainment Symposium
ArmorCon Expo

## Calendar of Events

**March 28-29**
**Soldier Technology**
Ft. Hood, TX
www.idga.com

**April 6-7**
**Reconnaissance Summit**
Ft. Benning, GA
www.fbcinc.com

**April 19-20**
**Tactical Vehicles Summit**
Alexandria, VA
www.idga.com

**April 27-28**
**Marine South**
Camp Lejeune, NC
www.marinemilitaryexpos.com

**May 3-4**
**Joint Service Power Expo**
Myrtle Beach, SC
www.ndia.org

**May 3-5**
**Global EOD Conference**
Ft. Walton Beach, FL
www.ndia.org

**May 9-12**
**2011 Environment, Energy & Sustainability Expo**
New Orleans, LA
www.ndia.org

**May 17-19**
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www.vmrelectronics.com

Enhanced situational awareness is not new. But until now, getting the full picture meant bolting on a tangle of equipment, or sticking one's neck out. Literally. With ITT's Visual Situation Awareness System (VSAS), warfighters benefit from a 360º display of hostile surroundings while integrating a full spectrum of complementary technologies, such as sniper detection, Google Maps™, communications, night vision, and more. Now warfighters can see more and risk less, thanks to VSAS. More at **itt.com/vsas.**

# They're already sticking their necks out for us. No point in them sticking their heads out too.

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RCCS

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