Commander’s Corner

Brigadier General Michael M. Brogan

Commander
U.S. Marine Corps
Systems Command

JLTV • USMC EFV • Counterinsurgency Ops
Battlefield Communications • TACOM
Advanced Infrared Sights For Ground Combat

Up-to-the-mission technology provides enhanced situational awareness for ground battle strategies. L-3 Cincinnati Electronics high performance imagers deliver greater detection capability and greater force protection in all combat conditions. Light weight/low power design meets difficult mission profiles.

For more information, contact us at 1.800.852.5105 or visit us online at www.L-3com.com/CE
Spearheading the Future
By Chad Samuels
Slated for initial implementation by 2012, DoD’s Joint Light Tactical Vehicle (JLTV) program is expected to offer next-generation mobility and protection for ground tactical and combat expeditionary operations.

Mission Possible
By Charles Jones
As CENTCOM’s focus shifts to Afghanistan, the importance of mechanized cavalry divisions in tactically difficult environments has brought this brigade combat asset to the forefront of joint counterinsurgency operations.

Sea Skimmer
By James L. Katzaman
In an effort to win support for seven prototypes slated for testing and preliminary implementation in 2010, the U.S. Marine Corps is upgrading its Expeditionary Fighting Vehicle (EFV) platform in support of global expeditionary operations.

Battlefield Communications—Protecting the Warrior
By Corey Noble
Commanders on today’s hi-tech battlefield are using a different type of weapon to disable their enemies—audible signals emitted at precise amplitude and frequency to attack autonomic receptors.

Transforming for Success
By Paul Moses and Randy Talbot
The U.S. Army Tank-automotive and Armaments Life Cycle Management Command (TACOM LCMC), Warren, MI is DoD’s premier command for the acquisition, fielding and sustaining of ground combat and tactical vehicles, and respective propulsion and protective systems and equipment.

Brigadier General
Michael M. Brogan
Commander
U.S. Marine Corps Systems Command

Editor’s Perspective
A&M Leaders
FutureTech
BRAC Spotlight
Ad Index/Calendar
Editor’s Perspective

A transformation is taking place across DoD. The Department is extending vehicle life cycles while adapting those critical platforms to meeting myriad environmental challenges facing a transitioning war effort. From up-armoring of HMMWV and other legacy tactical platforms to introducing next-generation protection and mobility-promoting product design, joint commanders throughout expanding theaters of conflict are working to bring more capability than ever to warfighters.

The Premier issue of Armor & Mobility offers readers a look at just how DoD is accomplishing this transformation with an in-depth interview from Brigadier General Michael M. Brogan, Commander, Marine Corps Systems Command. In this question and answer session, Brogan discusses his goals and challenges in continuing to improve the methods the Marine Corps uses to acquire and sustain critical equipment and systems that Marines depend on every day.

In a featured look at the Army’s Joint Light Tactical Vehicle (JLTV) program, A&M focuses attention on where the program is currently headed and the key hurdles prior to fielding. On an operations note, A&M offers readers an inside look at the Tennessee National Guard 278th Armored Cavalry Regiment, commanded by Col. Jeffrey Holmes, as it transitions to its new role as a heavy brigade combat team capable of addressing DoD’s need for professionals trained to conduct in-theater counterinsurgency operations. From a Marines’ point of view, Colonel Keith Moore, program manager for the Marine Corps’ Expeditionary Fighting Vehicle (EFV) initiative, offers insight into what makes EFV go and how this platform is enabling faster, smarter amphibious movements, from ship to shore. Rounding out the issue’s featured articles is a piece on battlefield communications which takes a look at how acoustic signaling is being used against enemy units and how DoD is protecting its own against this potentially harmful weapon.

These stories, including an in-depth profile of the U.S. Army’s Tank-automotive and Armaments Command Life Cycle Management Command’s work in support of key DoD acquisition and sustainment objectives can be found in the pages ahead. Please feel free to contact me with any questions or comments. Thanks for your readership!

Sincerely,
Chadwick “Chad” Samuels
Editor
Armor & Mobility
Tactical Defense Media
contact@tacticaldefensemedia.com
301-974-9792
Army Lt. Gen. Lloyd J. Austin III has been nominated for reappointment to the rank of lieutenant general and assignment as director, Joint Staff, Washington, D.C. Austin is currently serving as commanding general, XVIII Airborne Corps and Fort Bragg, Fort Bragg, N.C.


Col. Mark C. Dillon has been selected for the rank of brigadier general, commander, 60th Air Mobility Wing, Air Mobility Command, Travis Air Force Base, Calif., to commander, 86th Airlift Wing and Kaiserslautern Military Community Commander, U.S. States Air Forces in Europe, Ramstein Air Base, Germany.


From War Room to Boardroom

Major General, U.S. Army (Ret.), John G. Meyer, Jr., will succeed Dr. Regina E. Dugan as RedXDefense CEO. John G. Meyer, Jr. retired from the United States Army in 2001 as a Major General after 33 years of distinguished service, including assignments in Vietnam, Germany, and a variety of posts in the United States. He started his military career as a military police officer and held several high-level leadership and human resource positions.

After retirement from the Army, Meyer served as the Chief Executive Officer and President of the Allied Defense Group, Inc., a strategic international portfolio of defense and commercial security firms. Following the Allied Defense Group, he was the Chief Executive Officer of Heckler & Koch, an international manufacturer and distributor of small arms. He continues to serve on the Board of Directors of both Companies as well as most recently joining the board of Rohde & Schwarz Federal Systems, a subsidiary of a German electronic firm located in Munich, Germany.

Gil Meyer, a versatile senior executive, has a strong record in developing and implementing strategic programs, team building, managing large budgets, and optimizing fiscal efficiency. He brings 40 years of experience in the fields of defense, law enforcement, human resource management, business and business communication and leadership consulting. He is the author of Company Command: The Bottom Line, an authoritative leadership book.

Joseph “Keith” Kellogg, Lieutenant General, U.S. Army (Ret.) will continue to serve a vital role at RedXDefense as a member of the company’s blue chip Strategic Advisory Board.

For more information, visit: www.redxdefense.com.
The Department of Defense is developing a new Joint Light Tactical Vehicle (JLTV) capable of providing better protection and survivability than is offered by late model HMMWV platforms.

Prior to the emergence of the JLTV concept, the U.S. Army Tank-Automotive and Armaments Command (TACOM) Research, Development and Engineering Center was developing a concept called Future Tactical Truck System (FTTS) to streamline logistical movements to deployed troops. The FTTS initially consisted of two versions: FTTS-Maneuver Sustainment (FTTS-MSV), and FTTS-Utility (FTTS-UV). The FTTS-MSV was intended to replace the LMTV, MTV, HEMTT, and PLS trucks.

With R&D funding starting in FY04, the FTTS-UV would replace the HMMWV family of vehicles. Designed to meet or exceed the suspension and propulsion requirements touted by the Army’s Future Combat Systems (FCS) program, FTTS was expected to offer marked improvement to onboard diagnostics and prognostics solutions while enabling unmatched blast and ballistic protection, deployability, and network-centric situational awareness.

Trailing FCS in development by two years, FTTS achieved a high degree of commonality with FCS to such a point that DoD decided to expand upon FTTS with a family of five concept armored vehicles, ranging in mission from infantry combat, command, reconnaissance, and utility. Thus, JLTV was born. In October 2008, the Army...
announced the selection of three Technology Development (TD) contracts for the JLTV family of vehicles. The three companies awarded under the full and open competition process were:

- BAE Systems Land & Armament Systems – Ground Systems Division; Santa Clara, Ca.
- General Tactical Vehicles - A Joint Venture of General Dynamics Land Systems, Inc. and AM General, LLC; Sterling Heights, Mich.
- Lockheed Martin Systems Integration – Owego; Owego, N.Y.

The three contracts totaled approximately $166 million dollars in government costs, and are a combination of cost share and cost-plus-fixed-fee contracts. During the current 27-month TD phase, armor coupons, ballistic hulls, vehicles and trailers will undergo a series of performance and reliability tests to better understand the technical challenges, demonstrate mature technologies, and finalize the JLTV requirements.

Upon completion of the TD phase, the Army and Marine Corps anticipate conducting another full and open competition with award of two contracts for the Engineering, Manufacturing and Development (EMD) phase, with production anticipated to begin in Fiscal Year 2013.

A JOINT EFFORT

Aligned with a joint program office under the management of the U.S. Army's Project Manager for Joint Combat Support Systems (PM JCSS), JLTV is a joint service, multinational program for a family of light tactical vehicles and companion trailers. JLTV objectives include increased protection, performance, and expeditionary transportability (rotary wing airlift) over the current fleet; minimizing ownership costs by maximizing commonality; increasing fuel efficiency; and encouraging effective competition throughout the program development.

The JLTV family of vehicles includes ten configurations and companion trailers in three payload categories. Commonality of components, maintenance procedures, and training between all variants is expected to minimize total ownership costs. JLTV provides a design that supports mobility, reliability and maintainability within weight limits to ensure transportability to and from the battlefield using scalable armor solutions to meet requirements for added protection while maintaining load carrying capacity. Adjustable height suspension requirements are expected to increase survivability within the JLTV family of vehicles without impacting crucial transportability requirements.

“Modernizing the tactical vehicle fleet with JLTV is necessary to provide protected, sustained, and networked mobility for Army and Marine Corps personnel and equipment on the modern battlefield,” said an Army TACOM official. JLTV’s mobility requirements give commanders the flexibility to traverse diverse terrain across the global operational spectrum, as well as providing the option of rotary wing airlift. Having mobility and expeditionary capabilities balanced with force protection and performance requirements is key as it returns the operational flexibility to the commander on the ground, enabling choice of maneuver rather than being channeled into restricted & predictable operating areas.”

GTV

In 2007, General Dynamics Land Systems (GDLS) and AM General LLC, in response to DoD requests for proposal for its newly-designated JLTV program, worked jointly to create an inter-company business entity called General Tactical Vehicles (GTV) for the sole purpose of developing a competitive JLTV product offering. In October 2008, GTV was awarded a $45 million, 27-month Technology Demonstration (TD) contract from the U.S. Army TACOM Life Cycle Management Command. GTV and subcontractors GDLS and AM General, along with GDLS sister company GDC4, embarked on a multi-phase program in which each company was to provide a minimum of seven product offerings for consideration by DoD. The primary categories of these product offerings include trailers, armored carriers, armor coupons for testing, as well as numerous system engineering support elements. “GTV offers an adaptable family of vehicles and trailers with commonality of components exceeding 95 percent, resulting
in speed to production and low life-cycle cost,” said Don Howe, GTV senior program director.

GTV is currently in the design and development portion of an initial test and demonstration contract phase, conducting preliminary design reviews, with critical design review scheduled for October 2009. With no foreseen delays, GTV is scheduled to deliver its prototype vehicles and trailers to DoD to begin a year of further testing in April 2010. In spring 2011, DoD is expected to issue a request for proposal to begin the engineering, manufacture and development (EMD) phase of its JLTV program.

**Cross Commonality**

As part of the family of vehicles being developed under contract, GTV offers a trio of platform designs based on particular mission requirements: reconnaissance, combat/tactical, and utility. GTV’s offer for the JLTV maximizes survivability and optimizes power and payload. The approach focuses on commonality of systems and components along with modular armor, resulting in an innovative and agile vehicle system that will provide enhanced crew protection, increased cargo capacity and transportability.

Primary to this approach is a lightweight hull configuration that provides a low-profile center of gravity for maintaining vehicle stability while offering a v-shape hull design to handle blast threats. Using an adjustable height suspension technology offered by AM General, the GTV platform can be raised or lowered on the fly to aid in mine blast protection without sacrificing transportability requirements.

“Through the use of push button technology, a vehicle operator can activate a semi-active suspension system which tells a series of sensors to alter platform ground clearance according to potential threat conditions,” said Howe. “If an operator wants to alter suspension altitude or attitude, a manual override control enables this, readjusting vehicle ride to the optimal position depending on a particular terrain or mission.”

When it comes to wheeled vehicle design, traditional thought has been to produce the basic platform configuration first and then add in the necessary subsystems such as computing, communications, and other electronics-oriented hardware. These systems, because they were generally added to the vehicle independently, would usually operate in the same manner and, in doing so, lack any integrated operability. These systems, labeled “stovepiped”, would often place great demands on operator attention and power networks within the platform.

In the 2004-2005 timeframe, the U.S. Army and U.S. Marine Corps leveraged the Future Tactical Truck System Advanced Technology Demonstration to help address this challenge, in order to eliminate these stovepiped systems, embed more capability into a platform which ultimately helped derive the requirements for JLTV. “We looked at what kind of C4IS architecture was required to give the vehicle ‘plug and play’ capability and yet anticipate requirements coming down the road for additional functionality so that every operator has access to the network and can operate successfully in the asymmetric battlespace” said Juan Hernandez, Computing Technologies Business Development Manager, General Dynamics C4 Systems. “The services decided that a single network architecture that would provide a point of unified power integration could create greater cross-application data sharing opportunities while simplifying the number of interfaces warfighters needed to operate inside the vehicle.”

To break this ‘stovepipe’ paradigm, GTV began developing an autonomic power ‘backbone’ within each vehicle. “In much the same way that car manufacturers use a single power grid in assembly plants, this centralized power source will enable greater plug-and-play integration between formerly standalone capabilities and enable greater scaleability of vehicle capabilities in meeting specific mission requirements,” said Hernandez. “If nothing else, this single networked approach will effectively eliminate the need for the retrofitting and rewiring often associated with the addition or replacement of equipment and provides every platform access to the network.”

**Modular Survivability**

Awarded a joint 27-month JLTV technical development contract by the Army and Marine Corps in October 2008, Lockheed Martin Systems Integration (LMSI), Owego, NY and BAE Systems, Global Tactical Systems (GTS) are also working to develop the next generation of light tactical vehicles. As lead prime on a multi-business contract, LMSI is offering a current family of 4 test vehicle platforms, each built specifically for a particular tactical mission.

“The focus of the JLTV program is to increase occupant survivability while maintaining vehicle mobility, transportability, and payload capacity,” said Kathryn Hasse, LMSI director, JLTV Systems. Offering a lightweight armor solution designed as a stand-alone application, LMSI’s “A” and “B” armor kitting utilizes the same wheel and axle configuration within all vehicle payload categories and trailers. With a greater than 90 percent commonality across all program variants, each platform incorporates an improved “v-hull” design with modular ballistic protection.

BAE Systems GTS is offering a JLTV prototype design which will provide improved survivability solutions (A-kit, B-kit, and other armor packages) along with automotive engineering support, test and evaluation support, manufacturing planning and engineering, and assembly facilities. “With JLTV, the challenge was how to provide greater protection and mobility under strict weight requirements,” said Regis Luther, vice president, Light Tactical Vehicles. “From a semi-empirical data approach, we took strain weights from our other proven vehicle platforms and, with a modified v-hull design, determined that blast energy could be vented away from each side of the passenger cab.”

Within the passenger compartment, GTS has implemented energy-absorbing (EA) seating technology borrowed from BAE Systems’ legacy helicopter business branch in Phoenix, Arizona. From a
Military Vehicles Portfolio for the remaining of 2009:

2ND ANNUAL HEAVY VEHICLES SUMMIT™
September 14-16, 2009 | Sheraton Premiere at Tysons Corner, Vienna, VA
www.HeavyVehiclesSummit.com

2ND ANNUAL MILITARY VEHICLE MAINTENANCE™
December 7-9, 2009 | Washington DC Metro Area
www.MilitaryVehicleMaintenance.com

8th Annual Light Armored Vehicles & Stryker™ Summit
November 17-20, 2009 | Washington DC Metro Area
www.LightArmoredVehiclesSummit.com

Register Early & Save!

www.idga.org
survivability perspective, the company has researched the effects of impact or blast energy's effects on the human body in both air and ground scenarios,” said Luther. “Much of what we have focused on is the potential dangers that blast or impact-related events can have on cab occupants following initial concussion,” said Luther. “The seats are designed to absorb energy throughout an event, minimizing the occurrence of contact injuries within the cab compartment caused by blast or impact-induced body movements.”

**Mobility and C4**

The LMSI/GTS team is also pursuing full spectrum mobility by incorporating a four-wheel independent suspension system with active damping, height adjustment and central tire inflation for excellent off-road mobility when compared to fixed-beam axle suspension systems in the current inventory. The integral add-on armor mounting provisions combined with the extra carrying capacity of our high performance suspension system provides built-in scalability to increase platform protection or payload in the future. “In full-out configuration, our JLTV vehicle family has about 4 inches of clearance allowing us to meet a requirement for 76-inch ride height,” said Hasse.

As part of the overall JLTV package, the LMSI/BAE Systems GTS team is working to integrate an advanced situational awareness/C4 technology to provide JLTV with capabilities for collecting and sharing tactical information and vehicle health information.

**Overseas Commitment**

The Army determined that the best approach to meet the need for international cooperation, support the OSD’s competitive prototyping policy, and reduce program risk, was to have foreign participants contribute to the technology demonstration phase and, by combining resources, increase the number of prototypes fabricated. This approach further reduces U.S. risk and satisfies test objectives and requirement validation for the TD phase.

Working in close coordination with the Deputy Assistant Secretary of the Army for Defense Exports and Cooperation (DASA DE&C), whose mission includes developing strategic international cooperative efforts, the JLTV program office was able to utilize existing memoranda of understanding (MOU) to develop a project agreement (PA) with Australia. The U.S.-Australian PA was signed on January 21, 2009. During the TD phase, the JLTV office will also exchange basic information with Israel, the United Kingdom and Canada by way of established working groups.

“International participation in the JLTV program during the TD phase reduces overall program risk through the testing and evaluation of additional prototype vehicles,” said a TACOM official. “As our military prepares for future coalition operations, similarity of tactical vehicle solutions across allies will enhance global interoperability and reduce the maintenance and logistical burden.”

**Outlook**

JLTV has undergone intense examination by acquisition decision makers and Congress. The program is one of the first to fully implement the Office of the Secretary of Defense’s September 2007 Competitive Prototyping policy which called for two or more competing teams producing prototypes through Milestone B, with the goal of reducing risk and synchronizing requirements. JLTV has been approved at Milestone A and is currently in the technology development phase.

“Based on the industry JLTV prototypes the government has seen to date, we are very confident that industry is on target to meet key program requirements which entail balancing protection, performance and payload while remaining transportable by air, land and sea,” said Army TACOM official. The JLTV program management office is collecting key program data during the technology development phase to fully inform the requirements as we move into the engineering & manufacturing development phase with projected production award in late 2012.”
Brigadier General Michael M. Brogan
Commander
U.S. Marine Corps Systems Command

Brigadier General Michael M. Brogan is a native of Orrville, OH. In May 1980, he graduated from the University of Notre Dame with a Bachelor of Science degree in Chemical Engineering and was commissioned a Second Lieutenant. Following graduation from the Basic School, he completed Assault Amphibian Officers’ Course as the Honor Graduate and was assigned as an Assault Amphibious Platoon Commander, Company D, 3rd Assault Amphibian Battalion (3rd AABn), 3rd Marines, 1st Marine Brigade, Marine Corps Air Station, Kaneohe Bay, HI.

After returning from deployment to the Western Pacific in support of Battalion Landing Team 1/3, he was reassigned in August 1982 as the Maintenance Management Officer and Assistant Logistics Officer, 1st Battalion, 3rd Marines and completed a second Western Pacific deployment.

In January 1984, Brigadier General Brogan reported to Marine Barracks, Naval Weapons Station, Yorktown, VA where he served consecutively as a Guard Platoon Commander, Operations Officer, Guard Officer, and Executive Officer. He transferred to Quantico, VA in July 1987 and attended the Advanced Communications Officer Course. Following graduation as an Honor Graduate in June 1988, he reported to 3rd AABn, 1st Marine Division and became the Assistant Logistics Officer. In March 1989, he assumed command of Company A, 3rd AABn. During Desert Shield and Desert Storm, the company supported 1st Battalion, 5th Marines and was a part of Task Force Ripper.

In June 1991, Brigadier General Brogan assumed duties as the Logistics Officer at the Amphibious Vehicle Test Branch (AVTB), Camp Pendleton, CA. While at AVTB, he completed work on a Master of Arts Degree in Business and graduated with Distinction from Webster University. He also attended the Program Management Course at the Defense Systems Management College, Fort Belvoir, VA. He returned to Quantico, VA in July 1994 as a student. A Distinguished Graduate of the Marine Corps Command and Staff College, he reported to the Office of the Direct Reporting Program Manager, Advanced Amphibious Assault (DRPM AAA) in June 1995, to serve as the Survivability Project Officer. In June 1998, he became the Program Manager for the Advanced Amphibious Assault Vehicle Survivability Program.

Brigadier General Brogan reported to 1st Marine Division, Camp Pendleton, CA in June 1999 and assumed command of 3rd AABn. In July 2001, he transferred to the National Defense University, Fort McNair, Washington, D.C. as a student in the Industrial College of the Armed Forces (ICAF). He graduated from ICAF in June 2002 with a Master of Science Degree in National Resource Strategy. He reported to the Marine Corps Systems Command, Quantico, VA and was assigned as the Product Group Director, Infantry Weapons Systems. In February 2004, he reported to the Office of DRPM AAA for duty as the Expeditionary Fighting Vehicle Program Manager.

Brigadier General Brogan’s personal decorations include: the Meritorious Service Medal with Gold Star, the Navy Commendation Medal with Gold Star, the Navy Achievement Medal and the Combat Action Ribbon.

BG Brogan was interviewed by A&M Editor Chad Samuels.

Q: Please talk about the role of Marine Corps Systems Command in supporting the warfighter.

A: We are an acquisition organization buying equipment for the Marine Corps, and we support a number of program executive officers (PEO) who buy gear.

For example, we support PEO Land Systems in eight major Marine Corps programs, PEO enterprise information’s systems, a logistic modernizations program and a joint PEO for chemical, biological and nuclear defense. But our primary role is equipping the Marine warfighter.

Q: Please tell readers about some of the key changes Marine Corps Systems Command is currently undergoing.

A: One of the principle changes for us is implementing the Deputy Secretary of Defense issue resource management decision 802 that requires the Department of Defense (DoD) to significantly reduce its support contractors and in-source those billets. The Marine Corps Systems Command’s share of that in FY 2010 is 200 billets. That’s nearly 20 percent of our work force; and we will have to find the facilities to house them. So bringing that number of people in will be a challenge for the organization.

But, there a lot of things being done behind the scenes, like our rapid development of improved personal protective equipment. Protecting our Marines who are forward deployed is perhaps the most important item. One vexing problem is how we reduce weight on our warfighters. They carry a significant amount of equipment, so anything that can be done to lighten that load would ease their burden.

Q: Please speak to some of the main Marine Corps Systems Command-lead programs/initiatives.

A: Throughout this conflict, we have had a huge increase in the number of optics and night vision systems that have been deployed to our forces. Now, every one of our rifles has a combat optic which improves the lethality and first round hits for our Marines. Additionally, we have put a large number of...
Q: What are some of the key changes your command has initiated in support of a smooth theater transition?

A: It has been a smooth transition from OIF (Operation Iraqi Freedom) to OEF (Operation Enduring Freedom). By working with Headquarters Marine Corps organizations, as well as other parts of the Marine Corps, we helped anticipate the needs of II Marine Expeditionary Force and began to plan for and move the equipment they need to conduct combat operations into Afghanistan ahead of their arrival. Additionally, we work closely with the commander of that organization to ensure that all his warfighting needs are met.

Q: As DoD introduces the latest in logistical and tactical technology into theater, how is Marine Corps Systems Command leading efforts to get this materiel to the warfighter?

A: The primary method that we use for rapid acquisition is called the Urgent Universal Needs Statement —Urgent UNS. We receive these often directly from the field that highlights the deficiency or a capability that they would like to have delivered; and then we go out and buy a materiel solution to resolve that capability gap and provide it to them.

Q: How is Marine Corps Systems Command working to foster greater cooperation on joint and coalition fronts in terms of enhanced systems interoperability and force integration?

A: We work very closely with our counter parts, principally with the United States Army, but also with other services. One example is the Joint Ordinance Commander’s Group where all of those involved in the development and acquisition of ammunition meet twice a year. There is face to face coordination done between the Army’s PEO Soldier and our folks who provide infantry weapons and protective equipment. We have attempted to harmonize our acquisition of gear for Soldiers and Marines so that we are all buying the same thing and allocating off of the contracts in accordance with the ratio of troops that are deployed.

We are involved in a number of joint forums and we participate in Army-Marine Corps boards where the senior leadership of the two services work together to look at requirements that can be solved together.

Q: What are some of the key challenges facing Marine Corps Systems Command as DoD prepares for an eventual force drawdown across the region?

A: As we begin to draw down in Iraq, resetting the force will be important, but in order to do that we have to retrograde the gear. That operation will be lead principally by the Marine Corps Logistics Command (LOGCOM). We will be involved in ensuring that any gear that has been destroyed or damaged beyond repair can be replaced through the supplemental budgeting process. So we will buy equipment and gear that will go through depot maintenance, working again with LOGCOM’s depot level maintenance program. But first we’ve got to retrograde that gear. So we continue to have liaison officers forward of those combat organizations to help identify the needs of the force or retrograde; then reset.

Q: Please feel free to speak to any other current/future Marine Corps challenges/objectives.

A: We come back to in-sourcing. It is going to be a significant effort for us as we reduce the number of support contractors and increase the number of civil servants in the Marine Corps. It is an opportunity for us to shape our workforce, to increase some of those skill sets and competencies where we have shortages or weaknesses, particularly systems engineering contracting officers, cost estimators, financial managers and program managers. Many of those positions are inherently government, so bringing those skill sets into the government workforce is exactly the right thing to do.

Q: Please feel free to add any comments.

A: We often talk about at Marine Corps Systems Command that our mission is to support a 19-year-old lance corporal whose company is forward deployed in Iraq and Afghanistan facing the nation’s enemies. He is not a concept, he is not an ideal, he is real and tangible, and today he is standing in harm’s way. It is our job to make sure he is properly equipped. We will continue to do our best.
Don’t miss Modern Day Marine 2009— the premier military equipment, systems, services and technology exposition – targeted directly to the U.S. Marine Corps!

Key Marine Commands will be on-hand to learn about cutting-edge products and services including: ground combat arms; equipment and systems for operational support units; and information technology systems and services designed for the USMC market.

The Latest Technology from exhibitors displaying bold new prototypes, computer simulations, software and equipment that will enable the Marine Corps to meet the challenges of the 21st century.

Come Together to Learn about the nation’s advances in elite defense products, equipment and services being designed and produced to meet the changing needs of tomorrow’s USMC!

To showcase your products and services, please contact: Charlie Baisley at 703.812.2741 or charles.baisley@nielsen.com.

For more information, visit marinemilitaryexpos.com
MISSION POSSIBLE

PREPARING FOR ITS NEXT DEPLOYMENT, THE TENNESSEE NATIONAL GUARD’S 278TH ARMORED CAVALRY REGIMENT TRAINS FOR COUNTERINSURGENCY OPERATIONS.

Col. Jeffrey H. Holmes has plenty to think about as he prepares for the next mission of the Tennessee National Guard’s 278th Armored Cavalry Regiment. Since returning from a year-long deployment in Iraq in 2005, Holmes, the regimental commander, has been working steadily to transform his battle-tested force from a heavily armed regimental-sized unit with 5,200 men and women into something smaller, or as he puts it, “modular.”

Now, he has 3,800 personnel, and a different array of armor, vehicles, and weaponry -- including unmanned drones.

“We’re still an ACR in name only,” he explains. “We’re now a heavy brigade combat team.” During its 2005 deployments, the 278th conducted 15,000 combat patrols along 150 miles of the Iran-Iraq border. It captured or killed 550 combatants and captured 328 weapons caches. Along the way, the Guard unit lost 10 soldiers killed in action and had 79 soldiers wounded.

After that tough duty, Holmes faces fresh challenges dictated by the decade-long transformation of the Army and National Guard. This paradigm shift comes as he also trains his soldiers in the use of counterinsurgency tactics that could be employed in either Iraq or Afghanistan.

“We actually have less [equipment and personnel] than we had as an ACR,” Holmes continues. As the Army has moved to what he called a “modularity approach,” the goal is to create a model for armored, cavalry and airborne units alike which would make it easier for them to rotate in and out of the theaters of combat -- seeking an optimum size for his new “plug and play” organization.

The Army’s transformation has helped streamline its “logistical tail,” Holmes says, thus applying some of the lessons of the 2003 lightning-quick invasion of Iraq. “The battle was so fluid and the advancement into Iraq was so fast,” sometimes leaving behind “the logistical piece needed to follow it,” Holmes observes.

Though the Regiment has not received its mobilization order directing it to a specific theater of operations, the rugged terrain of Afghanistan could pose unique challenges for transportation, communications and shelter, among other things.

“Previously, as an armored cavalry regiment formation, our mission was focused on security and reconnaissance.” This, he says, “focused our efforts on locating enemy forces to provide protection to larger [American] forces.” Such screening missions “prevented the enemy from observing or interfering with the movements of these forces.”

BRIGADE MODULARITY

“As we have transitioned to a brigade combat team formation, says Holmes, our possible missions have increased to not only the previous security-type missions, but all missions associated with full combat operations. These missions include urban combat, and a complete range of offensive and defensive missions. Whereas before, the regiment could perform some of these offensive and defensive missions, they would be performed in more of an economy-of-force role. That is, if I were a corps commander, I could task an ACR to conduct an offensive operation against a portion of the enemy to prevent that portion of the enemy from interfering with my main attack.

“Now, as a brigade combat team formation, the offensive and defensive missions are more likely, and the reconnaissance and security missions are less likely.”

Such flexibility comes with the new territory of counterinsurgency (COIN) operations. If the Regiment were to go to Afghanistan, its mission may be to own a given piece of terrain -- what the military calls “landowners” -- or the unit may provide security or other augmented roles for other forces. One thing is certain: knowledge is power.

“They’ll be dependent on getting intelligence -- and intelligence doesn’t come exclusively from satellites or electronic intercepts or finding computer hardware” in enemy positions, says Col. Daniel S. Roper, director of the U.S. Army and Marine Corps Counterinsurgency Center at Fort Leavenworth, Kansas. “It really comes down to understanding the attitudes and behavior of the local population.”

The Army’s “modularization” of its BCTs represents “the Army’s organizational expression of a full spectrum capability” in facing threats from the Middle East to Korea, according to Roper. “We don’t have the luxury of optimizing against one particular threat, or one particular challenge. Even if we have organized a unit to be operationally
prepared for one particular threat, the threat is going to adapt."

Thus, he says, the “formation versus formation conventional war” still must be considered -- as the relentless saber-rattling by North Korea has shown -- but with the ongoing missions in Iraq and Afghanistan, “formations must be adaptable and agile.”

He recognizes that such agility can be hard on field commanders such as Roper, who “think they know where they’re going, and when they’re going,” but sometimes get thrown curveballs. “So to come up with the right mix of capabilities that operational commanders may need -- the answer is not just in the formation, it’s in the combination of the formation that you send, and the doctrine and training that supports and the unit’s conduct of its mission.”

So, he says, “the materiel is very important, but not by itself decisive. The most important factor is the leadership and educational background of the people in that formation.”

COIN doctrine “is essentially a playbook, but when the opposing team does something different,” Army field commanders “have to adapt it ... The answer is not in the playbook, formation, or team, but it’s in how they think and how they adapt. It’s making sure the leaders -- from the corporal and sergeant through the captains interfacing with the population -- are able to use the tools they have.”

New communications gear, body and equipment armor and ammunition are important, but Roper insists, “We think the most important factor is leadership, which is a function of the training, education and development they have received.”

The goal is “to operate among the people. This is done not in isolation of the military but in conjunction with other elements of national and international” forces. “When we’re talking about COIN, it’s fundamentally a political issue... From Iraq to Afghanistan, security issues tend to be the most sensational, but simply addressing the symptoms -- the violence -- doesn’t get you to the cause of the violence.”

While counter-guerrilla operations typically are required, there are other issues to consider -- from weak governance to “tremendous crime, corruption and the influence of competing entities who don’t have much in common with the rest of the planet.”

So, Roper says, “The assumption you could make is regardless where they go -- they’re going to face a variety of challenges. Some of them are extremist organizations, depending on where they are, these may or may not be Taliban, who are competing for power and legitimacy.”

**Theater Transition**

As Army and National Guard units arrive for new missions, Roper says, “They’re going to have to integrate with other elements in their area.” Among them: U.S. State Department provincial reconstruction teams; the U.S. Agency for International Development; NATO, and the Afghan Army and police forces.

It’s hard enough to deal with the terrain in Afghanistan, which Roper notes is “very prohibitive to vehicle movement, compared to Iraq. If you want to go where the bad guys are, you might need to maneuver. There may be a tradeoff between mobility and physical protection. But then you get protection through the tactics, techniques and procedures you employ. You also get protection from intelligence, and you get intelligence from the population. It’s a complex, interactive, and potentially lethal environment.”

“It all comes back to the population. To defeat the IED buried in the road, most people would agree the best way to defeat it is not better armor, or better detection or bomb sniffing dogs, the best way to protect is to not have it placed there in first place,” by winning the trust of the local populace. “It’s based on confidence in the local governance,” Roper concludes. “If you lack that confidence you’ve created a vacuum someone can exploit.”

This delicate balance was underscored in late May when Admiral Mike Mullen, chairman of the Joint Chiefs of Staff, underscored the importance of avoiding civilian deaths when conducting drone and bomb strikes in Afghanistan and
Pakistan. “We cannot succeed in Afghanistan -- or anywhere else, but let’s talk specifically about Afghanistan -- by killing Afghan civilians,” Mullen said during a press conference.

He was referring to the May 4 incident in Farah province, an air strike that was blamed by Afghan leaders for the death of 140 civilians. A subsequent U.S. report said American forces killed an estimated 26 civilians.

Mullen said the military was trying to upgrade its targeting and “to be more deliberate and precise about this.” In late June, Gen. Stanley McChrystal, the new U.S. commander in Afghanistan, said he planned to order U.S. and NATO forces to break away from fights with militants hiding among villagers, the Associated Press reported. The U.N. says U.S., NATO and Afghan forces killed 829 civilians in the Afghan war last year.

The issue of collateral damage from unmanned drones is another concern for Col. Holmes. As a brigade combat team, the 278th has been issued 16 unmanned aerial vehicles. That comes with a reduction of other aircraft. (As an armored cavalry regiment, the 278th had 9 Apache ATK helicopters, 24 OH-58 D helicopters, and 9 UH-60 utility helicopters.)

**From Population Up**

Holmes has no doubt that the citizen-soldiers of the 278th are up to the challenges ahead. He’s seen their can-do, American attitudes help win the hearts and minds of Iraqis in the run-up to that nation’s 2005 elections. Those lessons can be applied in Afghanistan as well. He explains: “Soldiers across both theaters are required to make critical decisions affecting strategic level goals. Its not only important for our soldiers to train to shoot straight, it’s equally important to understand the population and understand their goals and what motivates them to act.”

He notes this is nothing new, but dates back at least to the 6th Century B.C. when Sun Tzu wrote *The Art of War*, which over the years has become a staple of American military training. “However,” Holmes notes, “implementing this understanding down to the lowest level across all formations is a new approach required in a counterinsurgency fight. Our soldiers, coming from the reserve component forces, have a unique ability to understand this.”

Coming from the civilian sector, he continues, “They live and work in an environment where a stove pipe chain of command doesn’t exist in all cases. They understand negotiations and dealing with entities outside of their direct influence. The additional skills of our soldiers which can be brought to bear in a COIN fight are amazing -- from criminal justice and law enforcement to engineering and public works.”

Holmes marveled to see this at work in Iraq, in something as seemingly simple as explaining to locals how a democratic system of government works. “During our last deployment we were tasked with securing the January 2005 elections. As the election approached, our soldiers were continually asked questions from the local populace about government. Our soldiers were able to explain the basics which allowed the populace to build some level of understanding in how they would benefit by the elections. Though it was easy to talk over their heads, as most had no experience in the process, we solicited help from our local Boy Scout organization back home.

“They sent over the Community in Nation merit badge pamphlet which allowed our soldiers to keep the mentorship at an understandable level. Things as simple as understanding and helping advise city leaders on ways to improve quality of life were a benefit.” This helped transfer responsibility in Iraq from American hands to Iraqis, all within a 12-month span. “We ensured that the Iraqis were treated with respect and avoided unnecessary damage and deaths, and when that was unavoidable, we ensured they were compensated. I think this had a lot to do with earning legitimacy in their minds and becoming partners in the fight.”

**Looking Ahead**

Today, as the debate over collateral damage from aerial attacks in Afghanistan continues, Holmes has more down-to-earth concerns. Among them: getting spare parts for his vehicles and radios, and making sure equipment is in good shape. “The contractor industry has been very proactive in offering new developments such as modifications to vehicles allowing better urban fighting capabilities as well as within the robotics area,” Holmes says. “My personal concern is the number of variants available and what could be a long-term problem of maintaining this equipment. Each piece of equipment requires a long-term budget in order to sustain it. This budget must come with the equipment or we’ll quickly get into a ‘disposable’-type outlook.”

Holmes adds, “We have a lot of smart contractors who are partners in this fight, but my soldiers have to understand the new systems and be able to fix them on the spot. That means a close association with the contracting side as well as additional training in maintaining those highly specialized pieces of equipment.”

Ken Juergens, program director of Oshkosh Defense, says he understands Holmes’ concerns. “Being an old Army guy, I used to have to figure out when a vehicle broke down.” But Oshkosh, which designs and makes tactical military trucks and armored wheel vehicles, has developed diagnostic tools to avoid breakdowns -- which in Afghanistan, can prove costly in human life as well as government treasure.

Such technology “allows soldiers to quickly troubleshoot the problem, cuts down on the number of repair parts to carry, keeps record of problems, and forecast what you need in future, and give you real time performance data,” according to the Juergens. By alerting truck crews to potential problems -- such as low on fuel, water, or a problem with a starter -- “that’s very critical” information, Juergens says.

“All those things work extremely well in a tough, austere environment like Afghanistan, where there are not a lot of roads, and where, if you need power, you have a vehicle that provides it.”
Selling to the Department of Defense or Federal Civilian Agencies?

Join the many FBC clients who build relationships with the government for business growth and success.

Strong relationships require time and patience. This is especially true in the Federal marketplace. FBC expedites the process with onsite expositions and conferences. Our events provide the best opportunity for networking with qualified buyers, end users, and program managers in a productive format.

- Focused Marketing = Qualified Buyers
- Three decades and 3000+ events
- 200+ event days held annually
- More than 80,000 federal personnel attend every year

Make the connection. 
Get business results.

Nicole McCracken at 240-841-2202 or nicole@fbcinc.com
Oshkosh Corporation to Supply M-ATV to Soldiers, Marines

The U.S. Department of Defense announced it has selected Oshkosh Corporation to supply MRAP All Terrain Vehicles (M-ATV) for its fighting forces. Oshkosh has received an initial delivery order from the U.S. Army Tank-automotive and Armaments Command Life Cycle Management Command for 2,244 M-ATVs valued at $1.05 billion, following months of government testing on multiple production-ready vehicles.

“We are proud that Oshkosh was chosen to provide its M-ATV offering to the U.S. Armed Forces. Our M-ATV design combines the crew protection warfighters have come to expect in MRAP vehicles with the extreme mobility and durability needed to negotiate Afghanistan’s mountainous off-road terrain,” said Robert G. Bohn, Oshkosh Corporation chairman and chief executive officer.

The Oshkosh Defense investments, planning and engineering activities, and production of M-ATVs in advance of this award will allow for accelerated delivery of the Oshkosh M-ATV, with initial vehicles available to TACOM LCMC in July.

In order to achieve the off-road mobility that soldiers and Marines need in Afghanistan, Oshkosh integrated its TAK-4® independent suspension system onto the vehicle. As further testament to the government’s confidence in this suspension system, the company recently received a supply order to equip more than 1,500 legacy MRAPs with the TAK-4 system and continues to work with the Army to evaluate using the system on additional legacy MRAP models. The TAK-4 suspension system is used on more than 10,000 Medium Tactical Vehicle Replacements (MTVR) supplied to the Marines and Seabees, as well as on the Marines’ Logistics Vehicle System Replacement (LVS-R) and the Army’s next-generation Palletized Load System (PLS).

Oshkosh Defense teamed with Plasan North America for the M-ATV armor system to provide an advanced armor solution. Plasan also developed the armor system used on more than 5,000 legacy MRAPs and thousands of Oshkosh Armored Cab MTVRs already in theater.

For more information, visit: www.oshkoshtdefense.com.

Force Protection to Provide MRAP Suspension Kits

The U.S. Marine Corps has awarded a follow-on second-phase contract to Force Protection to install suspension kits on mine resistant ambush protected vehicles.

U.S. company Force Protection announced it has been awarded a phase II installation contract that follows a previously unannounced phase I award from June. Under the phase I and II deals, Force Protection will provide 1,317 of its Cougar MRAPs with TAK-4 independent suspension kits.

Officials say the combined value of the Marine Corps Systems Command phase I and II contracts, expected to be completed prior to February 2010, is approximately $70.3 million.

“We are pleased to have received these awards to install this much needed, high-performance mobility upgrade package for approximately a third of our deployed fleet of Cougar MRAPs,” Michael Moody, Force Protection chief executive officer, said in a statement.

“This award demonstrates our ability to capture a range of opportunities to provide service, support, spares and training. We are excited to leverage our recent investment in our Kuwait-based logistics and service depot, which we believe has significantly increased our ability to serve our customer and the war-fighter with faster response and more comprehensive service.”

For more information, visit: www.forceprotection.net.

Agility DGS to Transport U.S. Army Personnel

The U.S. Army has exercised a one-year contract option with Agility Defense and Government Services to continue providing transportation services.

U.S. company Agility DGS announced it has received an extension on its Heavy Lift VI contract with the Army. Under the $91 million deal, Agility DGS will continue to provide military personnel with transportation services.

Agility DGS will also continue to provide the Army with heavy equipment transport services of supplies and equipment as part of a Defense Department effort to ensure the Army’s supply line requirements are met in the Iraq and Kuwait areas of operations.

“The Heavy Lift VI renewal again underscores Agility DGS’s reputation for efficient, effective and highly dependable performance on complex logistics assignments,” Dan Mongeon, Agility DGS president and chief executive officer, said in a statement.

For more information, visit: www.agilitylogistics.com.

Tactical Armor offers choices for law enforcement officers

MSA’s T2 Tango Tactical Armor combines reliable ballistic protection with flexibility, comfort, and practicality for today’s law enforcement applications. T2 Tango Tactical Armor integrates Paraclete Armor’s established Tango cut and styling with a new drop-down front flap for easy cummerbund access. New front-load plate pockets, anti-skid shoulder weapon stabilization, and choice of sizes and plates provide law enforcement officers with versatile and comfortable features. T2 Tango Tactical Armor meets the NIJ Standard – NIJ0101.06 Ballistic Resistance of Body Armor when paired with MSA Templar™ Ballistic Packages.

For information, visit: www.MSAnorthamerica.com.
Meritor WABCO Introduces SmartTrac™
Stability Control Systems

Meritor WABCO Vehicle Control Systems has introduced SmartTrac™, a suite of proven anti-lock braking, automatic traction control, and stability control systems for commercial vehicles. SmartTrac uses advanced electronic control units with enhanced capabilities, to help North American truck operators with more options to meet their operational needs.

"SmartTrac fits perfectly with our Pyramid of Safety concept," said Jon Morrison, president and general manager of Meritor WABCO. "It provides a broad base for controlling braking and stability control technologies now and in the future," he said.

The SmartTrac family of stability control systems is currently available immediately as a factory-installation option at several truck, tractor and trailer OEMs. The family encompasses anti-lock braking systems (ABS), automatic traction control (ATC), and stability control systems – designed for vehicle applications like commercial trucks and trailers, construction, fire and rescue, bus and coach, and military.

SmartTrac integrates the company’s active safety systems technologies:

- Electronic Stability Control (ESC) (released in 2005 by Meritor WABCO) combines Roll Stability Control (RSC) with the added capability of yaw or rotational control. ESC can reduce the risk of the vehicle instability while in a slippery curve or taking an evasive action; preventing jackknife and drift-out conditions through select braking of the tractor and application of the trailer brakes. If loss of stability is detected, tractor-trailer speed is reduced through engine control and application of the engine brake, tractor and trailer foundation brakes. Currently, Meritor WABCO has installed ESC in thousands of heavy-duty trucks and specialty vehicles.
- Roll Stability Control (RSC) provides the highest value of vehicle rollover stability with the fewest components, maintenance requirements and lowest cost. It continually monitors conditions that can lead to a rollover and can automatically de-throttle the engine and apply the engine brake, and drive and trailer axle foundation brakes to reduce tractor-trailer speed when lateral acceleration limits are about to be exceeded. Currently, the company has systems in 60,000 vehicles.
- RSSplus™ is an advanced two-modulator valve, trailer only, stability control system that integrates with the trailer’s anti-lock braking system. It continually calculates the trailer’s roll stability threshold based on load and measures actual lateral acceleration (side-to-side movements) and individual wheel speeds. When conditions indicate that a rollover may occur, the system automatically intervenes by reducing engine torque, and engaging the engine retarder, while automatically applying drive axle and trailer brakes to slow the vehicle and assist the driver in maintaining control. RSSplus is an ideal solution for retrofit applications for fast implementation of stability control protection.

- Monitoring and telematics: Communicating over the tractor’s data bus, status messages can be relayed to an on-board computer with telematics capabilities. Fleet managers at home can correlate stability control and braking events with precise time and location data.

Improved diagnostics and event recording: The SmartTrac family of ECUs can capture data about braking and stability control events and create a record of accurate, detailed information that fleet managers can use to identify trends and build more effective driver training programs

For more information, visit: www.arvinmeritor.com.

Body Armor Introduced

Safariland, a BAE Systems line of business, has announced that it is one of the first body armor manufacturers to satisfy the requirements of the National Institute of Justice’s (NIJ) new Voluntary Body Armor Compliance Testing Program under NIJ Standard-0101.06 (NIJ-06).

Safariland’s XT-700 Type II (#BA-20005-FC01) and XT-300 Type IIIA (#BA-3M005-BR01) models have been determined by the NIJ to comply with the new NIJ-06 standard. Both models are part of Safariland’s XT Series of concealable body armor, and are now available for immediate purchase. As of this date, these are the only Threat Level II and Threat Level IIIA vests that have been authorized by NIJ under the new NIJ-06 standard.

The NIJ introduced the Ballistic Resistance of Body Armor NIJ Standard-0101.06 to establish minimum performance requirements and test methods for the ballistic resistance of personal body armor in order to improve performance so that officers receive adequate protection against those threats likely faced over the next decade. According to the new NIJ-06 standard, body armor must now be able to defend against increased velocities of ammunition calibers to better reflect current street threats and law enforcement duty weapons. These new performance requirements are critical components to improving the life-protecting equipment being used by law enforcement.

Safariland’s NIJ-06 body armor models include:

- XT-700 Type II – provides advanced ballistic protection in a lightweight, hybrid design.
- XT-300 Type IIIA – provides optimum ballistic performance in a robust design.

For more information, visit: www.baesystems.com.
If ever there was an idea ahead of its time, the Expeditionary Fighting Vehicle (EFV) might fit the description.

“Marines recognized the need for this vehicle since World War II, but it’s only in the last two decades that we’ve had the technology to support it,” said Colonel Keith Moore, EFV Program Manager. He and his team at Woodbridge, Va., are leading the acquisition program for the EFV, a program that falls under the purview of the Marine Corps’ Program Executive Office Land Systems.

According to EFV program officials, the vehicle will be the primary means of tactical mobility for the Marine rifle squad during the conduct of amphibious operations and sustained ground combat operations ashore. It will replace the Assault Amphibious Vehicle (AAV). Fielded in 1972, the AAV will be more than 40 years old when the EFV is fielded. Program experts said the EFV enables the Navy and Marine Corps team to project power from the sea base in a manner that will exploit intervening sea and land terrain, achieve surprise, avoid enemy strengths and generate never before realized operational tempo across warfighting functions.

**Bridging the Gap**

For many years, EFV was a concept waiting for a vehicle.
Meanwhile, gap fillers were called in to fill the need. At the time the Marine Corps fielded the AAV, it was already viewed as only an interim solution. The Corps needed a fighting vehicle that could self-deploy or be transported ashore rapidly from Navy amphibious assault ships off the coast.

However, the AAV’s slow water speed — the same 6 to 8 knots as the Corps’ World War II amphibious tractors — limited the buildup of combat power ashore from a sea base. Marine Corps leaders knew even before acquiring the AAV that the ideal vehicle would be a high-water-speed amphibian that also could be effective in combat operations on land. That idea remained a dream because the sophisticated technology required to achieve such a combination were immature or did not exist.

The turn of the century, Moore said, heralded technology breakthroughs everyone has waited for. As a new set of prototypes are prepared for delivery in 2010, the vehicle’s reliability growth program can proceed. Projections call for EFV fielding to start in 2015.

The Marine Corps is striving to achieve over-the-horizon deployment capability. That means the amphibious vehicles can deploy from ships more than 20 nautical miles from shore. Offering a much smaller profile for enemy artillery and traveling much faster than the AAV — more than 20 knots compared to only 6 or 7 — the EFV’s arrival on the beach would be almost stealthy by comparison.

“We’ll have a vehicle designed for the fight of the day,” Moore said. “EFV is customized for the folks who need high-speed transit toward the beach. It will also carry those who don’t have seats in other tactical vehicles.”

Moore noted that the EFV will seat 17 warfighters, not coincidentally the same number of people who comprise “a true assault echelon — a reinforced Marine rifle squad — the Marines’ smallest tactical unit. We are the heart of the conventional forces of the Marine Corps, the enabler for joint forcible entry. The EFV also gives us the flexibility to transition from high-intensity to low-intensity conflicts.”

The EFV is essential to the Marine Corps mission, according to General James Conway, Commandant of the Marine Corps. He said, “There are programs that
are absolutely and vitally important. One of those is our EFV. Navy ships are not going to go closer than 25 miles to another nation’s shore for reasons that have to do with the security of the ships and the safety of the Marines and Sailors aboard.

“The EFV is actually a sea skimmer,” he said. “It gets up on a plane at about 30 knots or so and gets us to where we need to go pretty quickly.”

**ADVENTIVE DESIGN**

Speed represents just one of the EFV’s technological advances. Its once insurmountable design challenges involved its engine, water jets and lightweight composite armor.

The vehicle’s powerful compact diesel engine is a turbo-charged version of that used on Germany’s Leopard 2, the United Kingdom’s Challenger, France’s Leclerc and Israel’s Merkava tanks. The basic 1,500-horsepower engine was boosted successfully to the 2,700 horsepower needed for the EFV’s high water speed by adding two turbochargers. This makes it the most powerful diesel engine in the world.

The vehicle’s water jets were largely the result of technology base work done at the Navy’s David Taylor Research Center at Carderock, Md., 10 to 15 years ago. The three-stage water jets are the most advanced in the world.

The EFV’s armor had to be as light as possible to allow the vehicle’s high water speed yet offer a high level of hull protection from enemy machine gun fire and artillery fragments. The answer was composite armor panels made of ceramics, S2 fiberglass and a Kevlar-like woven fabric in three separate layers. The combination weighs less than 20 pounds per square foot compared to typical rolled steel armor that weighs 56 pounds per square foot, yet provides twice the caliber protection of the current AAV.

With its many engineering feats the program has also suffered some major setbacks, which have delayed its fielding to the operational forces.

**FUTURE TESTING**

In 2006 during initial operational testing the current prototypes demonstrated less than expected reliability levels. Although some of the failures may have been attributed to the already overused vehicles, in 2007 the Program was restructured to provide additional development in order to improve vehicle reliability. These improvements will be demonstrated during Developmental and Operational Test in 2010 on seven new prototypes currently being manufactured.

“We’re preparing for where the next war’s going to be,” the EFV Program Manager said. “After years of research and preparation, we’re anxious to put the new prototypes through their paces.”

The Low Rate Initial Production decision is programmed for Fiscal Year 2012. The current acquisition objective is to produce 573 EFVs with initial operational capability starting in 2015 and full operational capability complete by 2025.
No matter what uniform you wear, the two things you need most are: **SPEED & ACCURACY!**


**ON-SITE BLOOD ANALYSIS IN MINUTES.**

- Thousands of units currently in use across government and civil units
- Rugged, portable construction for reliable operation—anywhere, anytime
- Easy-to-use, no special technical skills required
- Provides 90% of the most commonly used tests in medicine
- Wide range of panels available

Call Abaxis today at **800-822-2947** for more information or visit us online at www.abaxis.com/military
Battlefield Communications – Protecting the Warrior

By Corey Noble
President
Racal Acoustics, Inc.

Racal Acoustics’ new Raptor Circum-Aural Military Headset with active noise reduction and Talk Through technology offers greater data flow for higher accuracy targeting. (Photo by Racal Acoustics, Inc.)
Today, individual warrior communication requirements are eclipsed only by the need to protect the individual from harmful noise. In fact, the most frequent permanent injury to U.S. military personnel in war zones is permanent hearing loss. It is estimated that disability compensation will reach into the trillions of dollars due to the large number of individuals affected, multiplied by the increase in the human lifespan.

The problem with safety doesn’t stop with long-term permanent hearing loss alone. Audiologists now recognize that noise can disable an individual immediately if emitted in the proper frequency and amplitude.

In fact, acoustic weapons are already in use around the world and are proven very effective against unprotected individuals. Yet, despite the threat of acoustic weapons, it is far more likely for a war fighter to be acoustically disabled by the everyday noise inherent in the wartime environment or training regimes.

It is commonly viewed that individuals without hearing protection are safe at acoustic levels that remain below 85 dB (decibels). Unfortunately, there are very few military environments where we can count on these levels. For instance, working around a Joint Strike Fighter can expose one to 156 dB, an Abrams tank 110 dB, a typical HMMWV 90 to 100 dB or standing within 10 feet of a diesel generator can expose an individual to over 100 dB. Add to any of these environments the unexpected noises of battle, mortars – aircraft – gun fire – IEDs – loudspeakers, and the problem is fairly obvious.

A less frequent, but more severe problem common to soldiers is Temporary Threshold Shift (TTS). TTS refers to the immediate inability for an individual to hear, or even think, properly after a damaging burst of acoustic energy. At higher acoustic levels one can even experience Acoustic Trauma ranging from nausea to classic debilitating shock.

**COMMON “LINGO”**

As with most areas of science, the world of hearing protection and communication is riddled with acronyms and distinct definitions. Here are some very basic definitions to help you struggle through your next commo meeting...oh yeah..."commo" means communications or comms or sometimes the

**AUDIBLE AND SAFE**

There are many environments in the civilian world that have a similar need to bring communication and hearing protection together. Airline pilots, factory workers, heavy equipment operators and race car drivers are but a few who use sophisticated communication gear to communicate and protect. What makes military equipment requirements much more difficult to solve is the need to defend against much higher noise at more damaging frequencies, maintain situational awareness with the outside world, operate in extreme climatic conditions, operate despite high electronic/magnetic/nuclear interference, operate over very long mission times, fit under existing equipment including ballistic helmets, not interfere with existing sighting/viewing systems, and offer extremely low weight and comfort when part of the soldier’s personal gear.

Fortunately, modern material and electronic technology is helping meet some of today’s challenges. Let’s look at some of the exciting features that are now feasible in personal, soldier-borne communications gear:

**Passive Noise Reduction (PNR)** – Simply by adding material and sealing noise from the ear, we can block a wide range of noise from reaching the human hearing structures. Commonly, ear-cups or devices put into the ear canal are used to enhance PNR effectiveness. Breakthroughs in new materials have greatly enhanced the sound mitigating qualities and sealing ability of modern headsets, but one lingering problem has been the relative ineffectiveness of PNR techniques to stop damaging low frequency noise that is ever present in the military operational environment.

**Active Noise Reduction (ANR)** – ANR is a great technology which picks up where PNR is weak. ANR is very effective at cancelling low frequency noise, which is also the most likely type of noise to cause hearing loss. ANR technologies use electronic circuits to first sense noise as it approaches the ear then it replicates the exact noise in a wave aimed at the incoming offensive noise. The result is partial or total cancellation of the offensive noise.

As a Soldier utilizes a Frontier Intra-Aural, custom-molded military headset with TalkThrough technology while targeting an objective. (Photo by Racal Acoustics, Inc.)
While ANR comes in many forms – analogue, digital, feed forward, feedback, DSP enhanced, modular, baffled – they all share a common goal of electronically cancelling noise.

Talk-Through (TT) or Hear-Through Circuitry – This is another electronic technology which typically places microphones on the outside of the hearing protection structure that can then feed critical situational awareness into the user’s internal speakers. By limiting the amount of sound that is transmitted to the user, one can hear the outside world, but at safe levels.

The earliest technologies for talk-through used mechanical devices or “clipping circuits”. Clipping cuts off all sound when it reaches a certain level and can lead to missed critical information to the user. For instance, if someone yelled “don’t shoot” but the “don’t” portion was clipped out, you would think you were told to shoot! In a military environment this could cost lives.

A better Talk-Through technology is “clamping or compression” circuits which effectively limit the sound, but allow all the information to flow into the user at safe levels. With compression circuits the order to “don’t shoot” would be heard in its entirety, but at a comfortable amplitude.

Talk-Through answers that long running complaint that war-fighters have voiced about hearing protection “Give me back my ears”. Essentially, this is an example of technology letting us have our cake and eat it too!

Enhanced Hearing – If you’ve ever cupped your hand around your ear to hear better, you understand enhanced hearing. The problem with this technique is that you are even more exposed to damaging noise should it occur while you are “enhanced”. By introducing enhanced hearing into a Talk-Through equipped headset, we can give the user “better than human” hearing, but with the full protection afforded by Talk-Through circuitry.

**PRODUCT VARIATION**

There are several military headsets in the market today that offer enhanced hearing in their Talk-Through designs.

Digital Signal Processing (DSP) – Sound is by its nature analogue. A microphones’ job is to convert sound to an electronic signal, while an acoustic speaker’s job is to convert that signal back to analogue. While the signal exists in its electronic form it can further be converted to a digital format (A to D). While in this binary or digital state a software program, typically called an algorithm, can process the information so it is positively enhanced before it is converted back to analogue (D to A) and heard as sound again. If in a digital state, sound can be enhanced, filtered, clean-up, clarified, modified, limited, measured, and much more in a very efficient way.

While DSP is incredibly promising, the need to carry a powered processor at all times can be at odds with other military requirements. Today, it is far more likely to find this technology in vehicles or Tactical Operation Centers (TOC) where the weight of the added hardware and batteries are not human borne.

Enhanced Microphones – The most common personnel microphones in the military are mechanical “noise cancelling” microphones. Without them a person transmitting over a radio would be hard to hear if operating in a loud environment – which the battlefield often is.

Without the use of electronics, noise canceling microphones utilize a front and back port (opening) which can cancel “far field” noise, or that which is not coming from the user. This is done by using a simple acoustic principle that takes advantage of the shape of the incoming acoustic wave. The further away the origin of the sound, the flatter the acoustic wave will become. Because the acoustic wave is flat, it tends to enter the front and back ports at equal times thereby cancelling itself. It works very much like ANR discussed earlier, but purely through mechanical design.

Other advancements in microphones hold promise in using microphone arrays, solid state (chip borne) microphones, and digitally enhanced microphones. As learned earlier, noise canceling microphones seek to enhance signal over noise.

3-D Audio Enhancement – This technology can bring better comprehension to the listener by placing sound within distinct quadrants as perceived by the listener. For instance, if a detection system in a vehicle emitted an incoming missile signal tone, with 3-D audio it could be “heard” coming from the direction of the threat. Although this technology has been fielded, it requires a high level of processing and sensors to realign and adjust for the constant movement of the individual or vehicle it is mounted in.

3-D audio can also enhance by means of “separation”. Generally, in a stereo (2 channel) headset, if you were monitoring 5 radios (each speaker (left and right) would need to carry multiple incoming signals. Life could get very interesting trying to understand who, what, and where the 5 messages were originating from. 3-D audio could “arrange” the sound so signal 1 always came from left ear; signal 2 always came from your forehead area, signal 3 from your chin and so on. Suddenly what seemed overwhelming is much more manageable.

Gunshot Detection/Translation Systems – Although these are distinct technologies in their own right, they are perfect additions to a headset communication suite. They key to these feature add-ons is the pre-established existence of a digital system which can then share processing and sensor duties.

Gunshot detection systems are especially advantageous as noise mitigating headsets because if a user is not in Talk-Through mode, the headset is working to keep them from hearing the enemies gunshot report. This is a good case of where...
Hear the Command... the First Time!

Wired/Wireless Voice Intercommunication System

- Adaptive Noise Cancellation
  - Clear Comms in High Noise Environment
- Dismounted Wireless Extension to NetCom-V™
  - Maintain Situational Awareness
- No Tangling Headset Cables for Gunners
  - Hands-on Weapons/Eyes Out
- Smallest Size, Lowest Weight and Power
  - More Space for Ammo and Water
- Encrypted Variant Options
  - Keep Communications Secure

For Further Information contact George Pavlicin
Ph: 631-755-7427 • E-Mail: pavlicin@telephonics.com
“noise” is suddenly “signal”. In fact, many warfighters refuse to wear hearing protection stating “dead men don’t hear!” We hope to never make our war-fighters need to make this difficult choice into the future.

Wireless – Wireless is the biggest buzzword in the communications world today. Everyone talks about it, but few really understand the complexities of adding a wireless feature into a military environment.

I like to joke that wireless was used at least as far back as pre-Colonial times, after all smoke signals are wireless! The Titanic had wireless too, but it couldn’t compensate for nature’s fury and man’s vanity. In fact, wireless devices abound in the military in the form of many excellent radios.

Among existing radios, we have vehicle borne, man-pack, portable tactical, personal role, and short range frequency hopping. Why then do those of us in the warrior comms business constantly hear about the need for wireless? Typically there are two “wishes” when wireless is spoken, a) untethering from a vehicle and b) untethering the head-borne part of the headset away from the Push-To-Talk (PTT) device. Both are simple developments in commercial environments, but very difficult in military equipment due to the security risks inherent in transmitting without security encryption schemas.

My personal belief is that wireless features should be inherent in the radio, allowing the rest of the body worn communication gear to be as battle hardened as possible. This insures proper security when utilizing the higher level encrypted radios and focuses the security/power/weight decisions around the choice of radio or Intercom System (ICS).

There are several excellent Short Range Frequency Hopping wireless choices now available, mostly developed around aviation applications. Sadly, they are also expensive and add weight and bulk to an already weight burdened warrior. Look for technology to eventually overcome today’s limitations in this area.

Almost every war fighter is within reach of some form of radio or ICS, almost every tactical vehicle is equipped with an ICS attached to multiple radios. Why the change? Force Multiplication! This is the doctrine designed to make a better equipped and trained force more effective than a much larger ill equipped one.

When we view any nation’s Future Force Warrior program, they have one thing in common, comms on every warrior – every warrior a sensor. Naturally, the communications input and output will be critical to the effectiveness of any future force multiplier when designed around the individual warfighter.
The Armor Center and School, Fort Knox, Ky., is moving to Fort Benning, Ga., to consolidate with the Infantry Center and School into a Maneuver Center of Excellence for ground-forces training and doctrine development. Consolidation joins both infantry and armor one-station unit training, allowing the Army to reduce the number of basic combat training locations from five to four (Forts Jackson, Sill and Leonard Wood would be the other three besides Fort Benning).

Q: Why are the Infantry and Armor important to the defense of the United States?

A: The U.S. Army Infantry Center and the U.S. Army Armor Center are essential components of the U.S. Army Training and Doctrine Command’s mission to train Soldiers. The Infantry and Armor Centers train Soldiers who are flexible, adaptive, agile, confident and competent—and they instill the Soldiers Creed and Army Values in all Soldiers. Infantry and Armor training incorporates lessons learned from combat in Iraq and Afghanistan so we can best prepare Soldiers for deployment immediately upon graduation where they will join their units and fight in the Contemporary Operating Environment.

Q: When must this move occur?

A: The integration of Infantry and Armor Schools will prepare both branches to meet the challenges of the future. Federal law requires this move take place by 15 September 2011. Although both branches will combine to form the Maneuver Center of Excellence they will retain their individual proponency.

Q: What type of planning is being done?

A: Planning is a team process between Fort Benning, Fort Knox, TRADOC, Corps of Engineers, Installation Management Command and Department of the Army necessary to ensure we meet the needs of Soldiers, their Family Members, Department of the Army Civilians, contractors and that we identify impacts on the local communities. Throughout the process, we remain committed to training the best Soldiers in the world…making a strong Army stronger!

Q: What kind of growth will occur at Fort Benning as a result of the Armor School move?

A: Under current projections, the Fort Benning daily supported population is expected to grow by approximately 30,000 military personnel, Department of the Army Civilian employees, contractors, dependents, and military students by 2011.

Q: With this expected increase in personnel, will there be any new construction to support the growth?

A: To support this increase in training and personnel, planners are anticipating $3.5 billion in new construction including training barracks, dining facilities, fitness centers, chapels, weapon ranges, classrooms, and maintenance facilities.

Q: What is the Army doing about protecting the environment through this process?

A: Before construction started, the Army conducted an environmental impact study with public participation to assess potential issues involving air, water quality, wildlife habitat, noise and traffic, wetlands, and socio-economic concerns.
The U.S. Army TACOM Life Cycle Management Command is a key player in DoD’s new sustainment-focused approach to mobility and firepower.


Evolution of TACOM LCMC

The background of the U.S. Army TACOM Life Cycle Management Command (TACOM) Life Cycle Management Command (LCMC) is steeped in the World War II industrial mobilization of the United States. Even before the start of World War II, Army and business visionaries came...
together and built the Detroit Arsenal Tank Plant, soon becoming synonymous with the nation's nickname 'the Arsenal of Democracy'. Seventy years later, the Detroit Arsenal, home of the TACOM LCMC, is still at the forefront of providing our modern day warfighters with the equipment they need to fight yet another global conflict. From the very beginning, through today, the mission of the TACOM LCMC has remained constant. The efforts of our command—through mission changes and multiple reorganizations — never lost sight of our primary focus: our soldiers.

The command was originally comprised of three separate entities: a production facility in the Detroit Arsenal Tank Plant; an installation at the Detroit Arsenal; and a command structure in the Office, Chief of Ordnance-Detroit (OCO-D). By the end of World War II, these three organizations and their missions combined logistics, fleet management, research and development, ground combat vehicle production, and acquisition under one command structure at the Detroit Arsenal. Mission changes, consolidation, and decisions from the Base Realignment and Closure acts expanded our responsibilities to include additional commodities such as armaments, tactical wheeled vehicles, soldier equipment, and Army watercraft. We also added depots and arsenals to the command and significantly increased our industrial base.

Today, as a life cycle management command, our objective is to get products to the warfighter faster, make our good products even better, minimize life cycle costs, and enhance the effectiveness and integration of our acquisition, logistics, and technology communities throughout the life cycle of our equipment. The program executive offices (PEOs) and program managers (PMs) are integral to achieving our objective. They are ultimately responsible for the equipment from concept development through modification and sustainment to final disposition. Although they are members of the LCMC community, they retain their direct reporting lines to the Army Acquisition Executive (AAE). In a similar manner, our research, development and engineering centers (RDECs) provide enhanced technological influence on our future acquisitions while retaining their strategic and organizational link to the Research, Development, and Engineering Command. Our Integrated Logistics Support Center provides logistics expertise, products, and services to both the PEOs/PMs and the RDECs throughout the life cycle.

**TACOM LCMC’s Primary Mission**

The mission of the TACOM LCMC is to develop, acquire, field, and sustain weapon systems for America’s warfighters. If a soldier eats it, wears it, drives it, or shoots it, the TACOM LCMC develops, provides, and sustains it. The TACOM LCMC also provides products, services, and support to the other military services, our nation’s allies, and foreign military sales customers. Around the world, 150 countries use our equipment.
The TACOM LCMC manages more than 60% of the Army’s most critical systems, almost 70% of the equipment in a brigade combat team, and approximately 3,000 major and 37,000 secondary items. We provide technology for over 90% of the Army’s lethality. We also manage technical and logistical data for more than 500,000 parts. We provide support to warfighters at over 100 locations worldwide. Our annual command payroll is approximately $1.8B. We have equipped over 1 million soldiers and continue to do so. We executed $30B in contracts during FY 08. The TACOM LCMC plays a vital role in the Army’s efforts to sustain, prepare, reset, and transform its operations.

**Current TACOM LCMC Initiatives**

Providing ongoing support to overseas contingency operations remains the top TACOM LCMC priority. At the same time, we’re working to rebalance Army, Army National Guard, and Army Reserve units. Our ongoing responsible drawdown and reset efforts require thoughtful planning, extensive coordination, and timely execution. TACOM LCMC teammates know that communication, collaboration, and coordination with all of the key players involved in the process must be at the center of our drawdown and reset operations. This unity of effort is driving improvements in how we execute Army Force Generation (ARFORGEN) - the process through which we build and generate combat power.

The first step is to adapt the reset model we use for institutional support of the ARFORGEN process. This institutional adaptation - called continuous reset - has been identified by the Secretary of the Army and the Army Chief of Staff as vitally important to our ability to effectively sustain our Army. It differs from intermittent actions or reset applied as a transitory solution. Continuous reset prepares forces for future deployments. It rebuilds readiness through the coordination of all the tasks required to re-integrate soldiers and families as well as all the actions needed to organize, man, equip, and train a unit. We must not only return units to pre-deployment levels of equipment readiness, we must also equip them to the standards required by the modular Army or posture them to return to combat. Continuous reset applies a fleet strategy approach to planning and execution. Adoption of this enterprise approach, in lieu of individual reset actions performed by local brigade combat team commanders, will reduce costs and enable the Army to meet unit schedules more efficiently.

**CENTCOM Support**

In addition, the TACOM LCMC’s role is changing with regard to support of operational shifts within CENTCOM. The need for fact-based decision making in the coordination and execution of our responsible drawdown and reset operations has never been greater. The amount of equipment involved, its projected disposition, the number of Soldier units affected, and the redistribution of materiel within theater and outside of the area of operations requires a very high level of communication and collaboration in order to achieve the Army’s goals for this effort.

We need significant real-time data and extensive synchronization among all of the organizations involved. It’s a collective endeavor, and the TACOM LCMC is an active participant and partner.

**Contracting Enterprise Efforts**

The Army Contracting Command (ACC) was established in the fall of 2008 to increase the effectiveness of the Army’s contracting efforts. The cumulative effect of fighting two overseas contingency operations simultaneously has pulled the Army out of balance and significantly increased its reliance on contract support from private sector partners. The TACOM Contracting Center (TCC), part of the ACC, is our TACOM LCMC partner that helps us address our increased contracting requirements. The scale of this support is large and requires careful planning, administration, and oversight.

Located at multiple geographic sites throughout the United States, the TCC is responsible for acquisition support and contracting to ensure warfighting readiness by purchasing ground combat, tactical vehicles, small arms, chemical/biological systems, targetry, support services, associated consumable parts, and...
the Future Combat Systems program. It is a customer-focused organization with goals related to customer satisfaction, contracting excellence, workforce revitalization and development, improving the work environment, implementing improved business processes, and developing leadership competencies. The TCC provides comprehensive contracting, business advisory, production support, and depot level maintenance services in the acquisition, fielding, and sustainment of TACOM LCMC systems and support requirements.

Senior leaders and subject matter experts within the TACOM LCMC community have long maintained a clear focus on the importance of accuracy, transparency, reasonable and prudent decision making, and integrity in the contracting process. Training, regular reinforcement of principles, consultation with legal counsel, and multiple review procedures are a way of life in the TACOM LCMC. The TCC ensures that the best products and services reach our soldiers when they need it, while ensuring fair opportunity for industry, including small businesses, and obtaining the best value for our Army.

**Recent Program Successes**

There are many good news stories within the TACOM LCMC - MRAP fielding, add-on armor upgrades for tactical wheeled vehicles, and our equipping soldier initiative, among others - but the true measure of success is the day-to-day willingness of each TACOM LCMC teammate to communicate, coordinate, and collaborate with other individuals inside and outside our organization in order to get the work done. Through our application of Lean Six Sigma tools and techniques, we’ve achieved measurable performance that is now equal to or better than our industry partners in some key areas. From FY06 through FY08, the TACOM LCMC’s Anniston Army Depot achieved multiple efficiency improvements in its industrial operations resulting in $81 million in cost reductions. What does this mean for the Soldier? It means better equipment delivered faster at a lower cost.

In FY08, the Army Materiel Command - our higher headquarters - reset 33 brigade sets of equipment. The projection for FY09 is the same. When you lean and improve processes and generate cost savings, it’s a gift that keeps on giving.

**Future Challenges**

There is no evidence that the current era of persistent conflict is ebbing. We will need a full range of capabilities and resources in order to effectively prepare to meet a wide spectrum of potential challenges and conflicts. Some of our capabilities bring more to the fight in a conventional warfare scenario. Other capabilities have unquestioned value in counterinsurgency operations. No single system or approach can provide the flexibility and effectiveness we will need in future years.

Perhaps the biggest challenge in the near term may be our ability to address the Army’s need to prepare for multiple contingency operations while rebalancing the force in a reasonable and prudent manner. This means we’ll have to look to the past, the present, and the future... without binding our people, processes, and products too closely to the way we’ve done things before, the way we’re handling things today, or to the way we think things will operate in the future.

The past is over...the present is constantly changing...and our view of the future is always a guess. This is why it’s so important that we make enterprise thinking the new norm. As an enterprise, we’re all stakeholders and we’re all accountable to give the best possible products, services, and support to warfighters while we work to rebalance the Army.
The advertisers index is provided as a service to our readers. Tactical Defense Media cannot be held responsible for discrepancies due to last-minute changes or alterations.
Go ahead, challenge us.
Give Agility an impossible task and we’ll make it happen, regardless of the obstacles. That means there’s nothing that will prevent us from delivering what you need, where and when you need it, in some of the most challenging environments in the world.

“Hostile environment. Unforgiving terrain. Questionable infrastructure”
When the operational order is given, you must have the ability to view and process vital information. At L-3 Ruggedized Command & Control Solutions (RCCS), we provide proven displays and computer solutions to military markets worldwide. We offer a broad array of hardware products to systems integrators, sheltered, tracked and wheeled vehicles, airborne platforms, as well as the dismounted soldier. Offering a family of proven rugged tactical displays and computers, RCCS has you covered. L-3 RCCS is building the future while supporting the needs of today’s warfighter. For more information, visit L-3com.com/rccs.