

# AIR DEFENSE ARTILLERY

A PUBLICATION OF THE AIR DEFENSE ARTILLERY ASSOCIATION • JULY- SEPTEMBER 2005

## ADA WEAPONS OF THE FUTURE

Coming Soon  
to a Theater  
Near You!

### C-RAM

Quest for the Ultimate Interceptor

### SLAMRAAM

Over-the-Horizon Engagement Capabilities

### JLENS

Taking the Mobile High Ground

### MEADS

Speeding New Capabilities  
to the Patriot Force

### THAAD

Expanding Missile  
Engagement Beyond  
the Atmosphere



### ALSO IN THIS ISSUE:

- Air Defense Weapons That Almost Were
- Roving Sands 2005
- V Corps Missiles Light Up Israeli Skies
- Blocking & Tackling: Instilling the Warrior Ethos
- It's Your Day ADA: New Feature Placing the Spotlight On ADA Soldiers



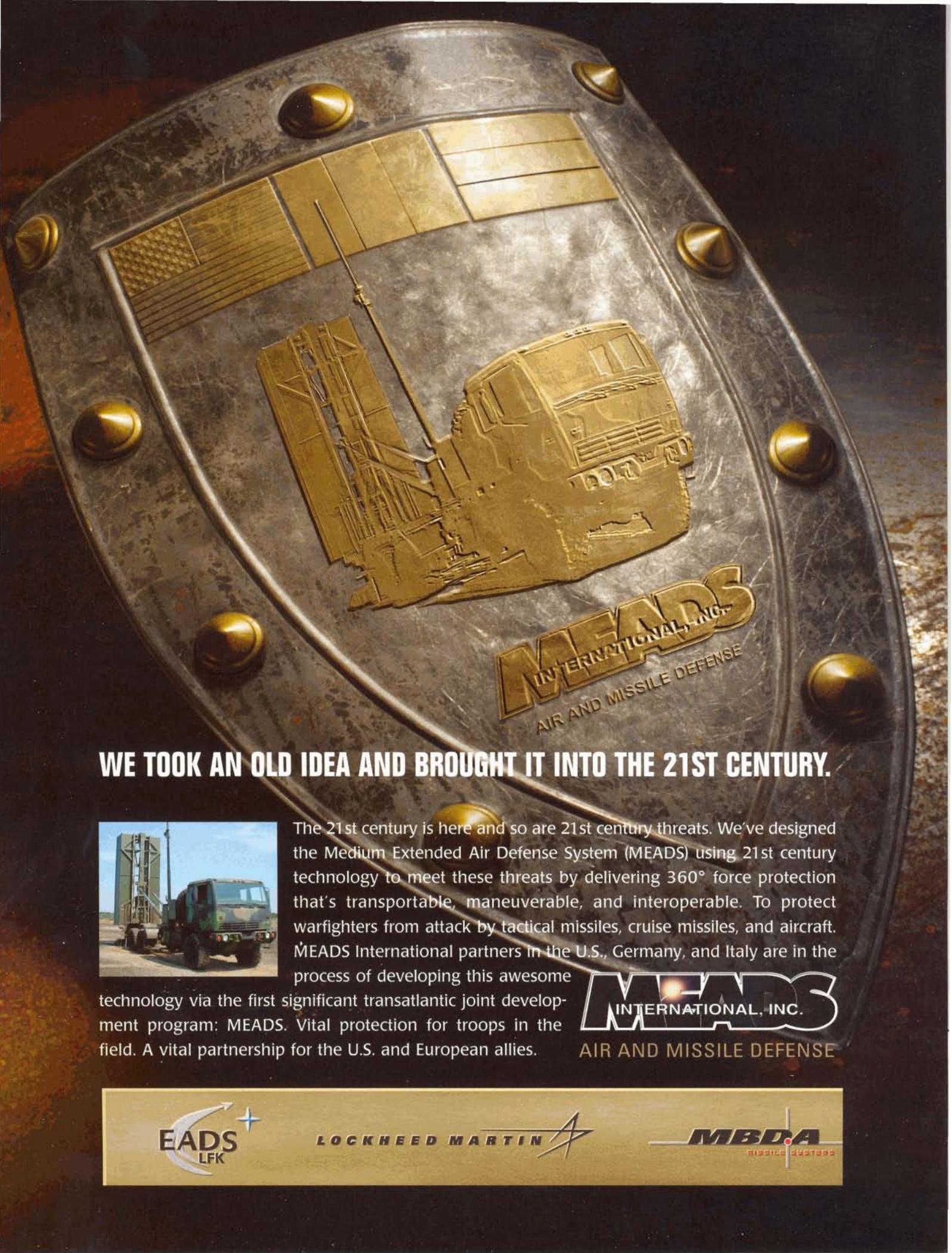
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AIR AND MISSILE DEFENSE





# ADA MAGAZINE

A PUBLICATION OF THE ADA ASSOCIATION

JULY - SEPTEMBER • 2005

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Articles appearing in *ADA Magazine* do not necessarily reflect the opinion of the officers or members of the U.S. Army Air Defense Artillery School, the Department of the Army, or the Air Defense Artillery Association.

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**On the Cover** The Surface-Launched Advanced Medium-Range Air-to-Air Missile system is one of several new weapon systems that will soon be added to Air Defense Artillery's arsenal.

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# INTERCEPT POINT

by MG Michael A. Vane

Accelerated by the Global War on Terrorism, the engine of Army Transformation is shifting into a higher gear. The progress our branch and the U.S. Army Air Defense Artillery School have made toward transformation while waging war against terrorism is astonishing, but the pace of change over the coming decade will be even more exhilarating.

The transformation of ADA into a modular force capable of engaging a more diverse threat set, including rockets, artillery and mortars, is well underway. The 1st Battalion, 44th Air Defense Artillery, previously supporting the 4th Infantry Division, recently completed its move from Fort Hood to Fort Bliss. Assigned to the 11th Air Defense Artillery Brigade, it is morphing into the Army's first composite air and missile defense battalion, employing Patriot missile systems along with Avenger fire units to provide the joint force a modular and robust capability package to counter aerial threats. The path to its success was blazed by the 2nd Battalion, 43rd Air Defense Artillery, the U.S. Army Training and Doctrine Command System Manager-Lower Tier and various other program managers.

Once regarded, despite its geographic immensity, as a military backwater by those who have never trained here, Fort Bliss has become one of the nation's premier power-projection platforms, and the installation seems certain to emerge from the upcoming round of base closures and realignments as a primary beneficiary. The imminent arrival of the 4th Brigade, 1st Cavalry Division, which is relocating from Fort Hood, is just the beginning of Fort Bliss expansion. This expansion will provide quality of life enhancements for Fort Bliss families and produce superior training opportunities for Fort Bliss units. This has all come about due to the hard work of superb leaders and Soldiers who joined forces with an extremely supportive community to develop and market the post's potential.

Meanwhile, Fort Bliss and ADA Soldiers continue to play crucial roles in the Global War on Terrorism. Since 9/11, Fort Bliss has mobilized, trained, deployed and demobilized more than 56,000 Soldiers in support of the war effort, placing second in the Army Chief of Staff's Deployment Excellence Competition for 2004. Many Soldiers who wear the crossed cannons and missile insignia have deployed or mobilized for Operation Iraqi Freedom, Enduring Freedom or Noble Eagle. More than 6,000 ADA Soldiers have served in Iraq or Afghanistan, with a good portion of them qualifying for the Army's new Combat Action Badge.

The Global War on Terrorism is not the sort of war that will likely end in victory parades. There may be no formal documents of surrender, but there will be turning points that future historians will point to as the beginning of the end, or at least, the end of the beginning. On 30 January 2005, Soldiers of the 4th Battalion, 5th Air Defense Artillery, tasked to defend Baghdad International Airport and surrounding neighborhoods against insurgent attacks, witnessed a turning point. As they passed checkpoints manned by Avenger and Bradley Linebacker crews, thousands of Iraqis returning from voting stations held aloft index fingers stained dark blue, indicating they had cast their ballot in their country's first free national elections in half a century. Voting overwhelmingly to reject a legacy of tyranny and oppression, they produced a mandate for democracy throughout the Islamic world. The elections were the "payoff" not just for ADA units that chanced to be deployed on election day, but for every ADA unit that deployed before or after them, and for every ADA Soldier engaged in the Global War on Terrorism.

When I read the casualty list of ADA Soldiers who gave their lives in the Global War on Terrorism, I envision a black wreath adorning a front door in Aliquippa, Pennsylvania; a funeral procession winding through the streets of Springfield, Massachusetts; a grave-side service in Wagon Mound, New Mexico. I also think of blue-stained index fingers held aloft by the people of Afghanistan and Iraq, their faces streaked with tears of joy, rather than sorrow. These images should remind us all that "Freedom Isn't Free," but is worth fighting for.

Leaving the U.S. Army Air Defense Artillery Center, Fort Bliss and El Paso is like walking away from a winning team in the middle of a championship season. What a high note! Liane and I have truly enjoyed being a part of this exceptional team. Team Bliss has a remarkable lineup of exceptional leaders, heroic Soldiers, hardworking federal civilian employees, dedicated civic leaders and visionary legislators who are going to keep right on winning. The same is true of Air Defense Artillery as a whole. We have championship-caliber players assigned to ADA units around the world, the Department of the Army staff, Army Test and Evaluation Command, Human Resources Command and program executive offices. We are wonderfully supported by air and missile defense contractors who arm the branch with weapon systems forged on the cutting edge of technology.

It is the leaders of this branch who have served Air Defense Artillery as the agents of change, a role they must continue to play as the branch advances deeper into the 21st century. Knowing Air Defense Artillery has no shortage of capable leaders makes our departure easier. We wish you all the best, and we leave with fond memories of our time with an incredible team of professionals. Thank you for your support across the board by being a leader, Soldier or supporter of us all. You have made a difference! Good luck and God speed to all of you!

First to Fire!

*Michael A. Vane*

Michael A. Vane  
MG, USA  
Commanding

*Major General Michael A. Vane became Chief of Air Defense Artillery, Commandant of the U.S. Army Air Defense Artillery School and Commanding General, United States Army Air Defense Artillery Center and Fort Bliss, Texas, in July 2003. He has been reassigned, effective 9 June 2005, as Director for Force Structure, Resources and Assessment, J-8, The Joint Staff, Washington, D.C.*



# INTERCEPT POINT

by BG Robert P. Lennox

I am honored to have been selected as Chief of Air Defense Artillery and Commandant of the U.S. Army Air Defense Artillery School. I am also excited about the challenges and opportunities ahead. First, let me publicly thank my predecessor, MG Michael A. Vane, for the tremendously positive impact he has had on Fort Bliss and our branch. His personal touch is evident everywhere. It is evident when you walk around Fort Bliss; it is evident when you see the path to the future for Air Defense Artillery. I know I can speak for everyone in our branch when I say thank you to him for his fantastic

accomplishments and personal sacrifices that have set us on the path to success.

Under MG Vane's guidance, the great team at Fort Bliss has developed a path to the future we call Air and Missile Defense Transformation. I am committed to that path. However, to be successful, we will need everyone's help. My first priority as branch chief is to its people. What has made a difference in our branch over the years has been energetic and creative people willing to press the envelope to accomplish the mission. When you look at how the Army plans to transform—netted warfare, sensor-to-shooter links and joint interoperability—you find that we in Air Defense Artillery have been excelling at this for some time. Our accomplishments are a direct result of the hard work and commitment of our Soldiers (active, National Guard, reserve and civilian). Therefore, it is critical that we continue to recruit and retain the right people.

Before I took command, MG Vane was kind enough to invite me to visit Fort Bliss so the selfless officers and NCOs who make our branch run could update me on ADA initiatives and developments. (Yes, their briefing slides showed the latest in warrior training for our Soldiers in advanced individual training and the Top Gun program along with our plans for leader development.) As I walked around and met everyone, I was struck by the high caliber and dedication of our team. What rang true for me was the quality and commitment of our leaders. (This is equally true for ADA leaders assigned to units away from Fort Bliss.) We now have some of the best commanders and sergeants major that I have ever seen in our branch. Our selfless folks at Headquarters, Department of the Army, in joint positions and at Human Resources Command are among the finest we have ever had in those positions. We have an enormously talented cadre of general officers serving in critical positions throughout the Army and joint positions. We have never been better postured for success.

Because there are not many of us in this branch, we have to communicate with each other and get the message out. Being successful is not only about getting the job done. It is also about building relationships.

We all work to set the climate and the environment. Is Air Defense Artillery a good place to work? Are there opportunities for all of us? Do we work to make others successful? Each of us has to operate individually at a high level, but the sum is greater than the parts. We will do the job, and will get it done together—as a team.

Sure, there are challenges ahead, and in future columns I will discuss them. However, I think our people are our number one asset and my number one priority. I am proud to serve you and our branch. I welcome the talents each of you brings to assist me in keeping Air Defense Artillery on the path to a healthy future. I need all the help the talented ADA team can bring to bear.

First to Fire!

*Robert P. Lennox*

Robert P. Lennox  
BG, USA  
Commanding

*Brigadier General Robert P. Lennox, formerly the Deputy Commanding General/Chief of Staff, United States Army Accessions Command, Fort Monroe, Virginia, became the Chief of Air Defense Artillery, the Commandant of the U.S. Army Air Defense Artillery School and the Commanding General, U. S. Army Air Defense Artillery Center and Fort Bliss, Texas, 9 June 2005.*



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# STRIPES

by CSM Stanley L. Davis

The Base Realignment and Closure (BRAC) recommendations released in May 2005 contain a proposal to move the Air Defense Artillery School from Fort Bliss to Fort Sill and collocate it with the Field Artillery School to create the U.S. Army Net Fires Center of Excellence. This proposal, along with the inactivation of divisional air defense battalions to create composite Avenger/Patriot battalions, has created a false impression that Air Defense Artillery's status as a combat arm is at risk. Nothing could be farther from the truth. The BRAC recommendations also contain a proposal to move the Armor School from Fort Knox to Fort Benning and collocate it with the Infantry School to create the U.S. Maneuver Center of Excellence. However, any suggestion that the branches themselves may merge is pure speculation. As things stand now, neither Armor nor Air Defense Artillery is "going away." If Congress approves the BRAC proposal, Air Defense Artillery and Armor will have new homes, but both would likely remain independent combat arms branches.

The billions of dollars budgeted to develop and field the new ADA weapon systems described in this issue of Air Defense Artillery magazine show that the Army is still counting on Air Defense Artillery Soldiers to counter the air and missile threat, now and in the future. These new weapon systems will increase our firepower, lethality and versatility, enabling us to take on new missions while more effectively accomplishing current missions. Staffing requirements for the new weapons systems coupled with the ongoing fielding of Air Defense Airspace Management (ADAM) cells will more than offset force reductions caused by the downsizing of the Avenger force and the departure of the Bradley Linebacker from the Army inventory.

The Counter-Rockets, Artillery and Mortars (C-RAM) system is fast-tracked for potential combat deployment. The C-RAM system will enable us, for the first time, to protect the force against mortar attacks. As more C-RAM systems are fielded, and as follow-on editions based on new technologies are developed, our C-RAM mission will grow more substantial. The first C-RAM intercepts will stand alongside the first Patriot tactical ballistic missile intercepts as milestones in Air Defense Artillery history.

The Army expects to field our first Surface-Launched Advanced Medium-Range Air-to-Air Missile (SLAMRAAM) battalion in fiscal year 2008 and the Joint Land-Attack Cruise Missile Elevated Netted Sensor (JLENS) batteries in fiscal year 2011. These systems will add a new "over-the-horizon" dimension to our ADA arsenal, enabling us to counter the growing cruise missiles and unmanned aerial vehicle threat.

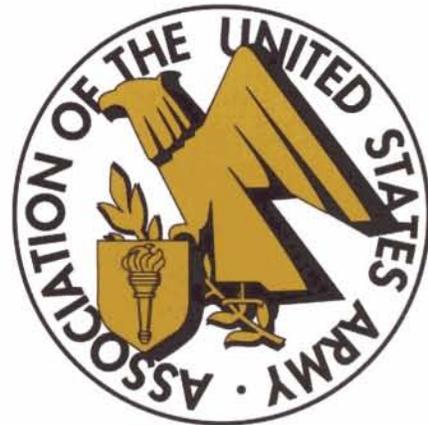
Meanwhile, our Patriot Soldiers will continue to perform their critical mission as the world's only deployable ballistic missile defense force. They will build on their Operation Iraqi Freedom success, incrementally fielding components of the Medium Extended Air Defense System (MEADS) and preparing for the eventual fielding of the Terminal High-Altitude Area Defense (THAAD) system.

Our Air Defense Artillery roles and missions will remain a critical part of Army transformation and the national defense strategy. The future looks bright for ADA Soldiers. For ADA Soldiers assigned to the school, a move to Fort Sill, assuming Congress approves the BRAC proposal, would mean little more than a change of scenery. For the branch as a whole, the relocation of the Air Defense Artillery School would create a greater diversity of assignment opportunities. If Congress approves the BRAC proposal, we will pack up our ADA lineages and traditions and restore the "First to Fire" legacy on Oklahoma's prairies.

*Stanley L. Davis*

Stanley L. Davis  
CSM, USA

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Voice for the Army  
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# C-RAM TASK FORCE

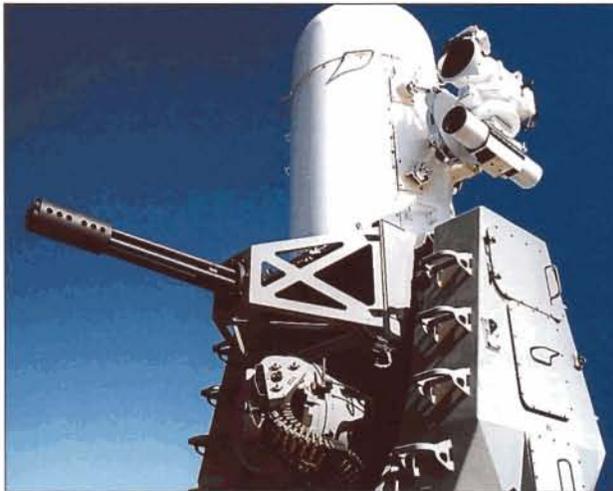
## Air Defense Artillery School Continues Quest for Ultimate Counter-Rockets, Artillery and Mortars Interceptor

by CPT Nicole Curtis

In the summer of 2004, Multinational Corps-Iraq submitted an operational needs statement to provide the currently deployed force with near- and mid-term protection against rocket, artillery and mortar attacks in a counter insurgency operational environment, with a focus on protecting forward operating bases and logistic supply areas. Theater commanders indicated they want an intercept capability that will identify, engage, intercept and neutralize incoming rockets and mortars at safe distances, minimizing collateral damage and posing no threat to friendly or neutral aircraft.

The envisioned counter-rockets, artillery and mortars (C-RAM) system will provide 360-degree coverage with a high probability of kill. The system will engage autonomously, but the operator—much like Patriot missile operators—will be responsible for allowing engagements to occur. When emplaced, the system will be integrated into base defense capabilities and be moveable, although no shoot on-the-move capability is required. An initial stock of repair parts to support maintenance for one year will accompany the system as well as contractor support for maintenance above operator level.

The U.S. Army Training and Doctrine Command (TRADOC) conducted a Quick Look C-RAM Analysis and concluded that "sense" and "warn" capabilities would reduce casualties by 13 percent. Adding an intercept capability to sense and warn would reduce casualties by 70 percent. Because of this study, TRADOC directed that the C-RAM system be a holistic solution. Intercept is only one of six pillars (intercept, sense, warn, deny, respond and protect) that make up the C-RAM mission. Many Army agencies, including the TRADOC Future Center, the Counterstrike Task Force, the Engineer Research and Development Center, the Rapid Equipping Force, and participating material developers have become



*The Land-Based Phalanx Weapon System will counter rocket, artillery and mortar attacks.*

integral parts of the C-RAM solution.

At Fort Bliss, the Air Defense Artillery School formed the C-RAM Intercept Task Force comprised of personnel from all its directorates. The task force identified a currently available system, the Land-Based Phalanx Weapon System (LPWS), as a near-term solution and is developing requirements for a spiral mid-term solution set. Additionally, the task force analyzed the near-term solution across the doctrine, organization, training, material, leadership, per-

sonnel and facilities spectrum to facilitate rapid fielding of an operational capability.

The Army recently tested the LPWS at Yuma Proving Grounds, Ariz. Should the Army decide to field the system, additional funding will be required to produce additional systems that will provide expanded coverage of critical forward operating bases and logistic supply areas within the theater of operations. The LPWS will not necessarily become the only C-RAM intercept system. The C-RAM Intercept Task Force has also been tasked to develop future spiral capabilities—an "ultimate" C-RAM intercept system that may evolve into a system of systems. Capabilities are not limited to only kinetic energy weapons. The C-RAM intercept system will eventually become the critical element of the Enhanced Area Air Defense System. It will provide our inner-tier capability and will consist of the best combination of kinetic or directed-energy systems capable of intercepting in-flight rockets, artillery and mortars.



*Captain Nicole Curtis is assigned to the Air and Missile Defense Battle Lab, Directorate of Combat Developments, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.*

# C-RAM

## Air Defense Artillery Takes On New Counter-Rockets, Artillery and Mortars Intercept Mission

by CPT Scott L. Mace

With hostile rocket and mortar attacks inflicting significant casualties in Iraq, the Army is moving forward with testing to support the counter-rockets, artillery and mortars (C-RAM) mission. The C-RAM mission represents a revolutionary approach to countering insurgent activities by intercepting rockets, artillery and mortar rounds in the air prior to impact; thereby, reducing or eliminating any damage they might cause. The Army is integrating sensors, systems and command and control capabilities to provide a C-RAM capability that units can easily incorporate into forward operating base and logistics supply area defenses. The C-RAM systems, once deployed, can save lives and reduce injuries from rocket, artillery and mortar attacks.

The weapon system selected as the near-term C-RAM interceptor is the Army's Land-Based Phalanx Weapon System, a reconfigured version of the U.S. Navy's Phalanx Close-In Weapon System. The Navy uses its sea-based system as a point-defense weapon to protect the fleet from low-flying cruise missiles and other air threats. The Phalanx was first tested for C-RAM missions in November 2004 and did so well that C-RAM production was moved forward. The first test of the Army-configured C-RAM system took place in April 2005 at Yuma Proving Grounds, Ariz.

The Army made slight reconfigurations to the Navy system to integrate it into the Army's ground defense mission and command and control structure. The 20mm, six-barrel Phalanx gun system and its search and track radars are trailer-mounted to allow movement to key military

sites. The Phalanx is familiar to some air defenders because it is similar to the Vulcan air defense gun system, which was the mainstay of divisional air defense battalions in the 1970s through the early 1990s.

The Forward Area Air Defense Command and Control (FAAD C<sup>2</sup>) system is one of the technologies used to integrate the C-RAM intercept system with other presently



*The Army recently tested the trailer-mounted Land-Based Phalanx Weapon System at Yuma Proving Grounds, Ariz.*

fielded Army and joint service systems. The FAAD C<sup>2</sup> software and hardware solution allows the C-RAM system to communicate freely with existing air defense sensors and other Army battle command systems. The C-RAM unit uses the Air and Missile Defense Work Station to pass information to other Army battle command systems. Together, these tools will allow soldiers working in engagement operations cells to easily integrate a C-RAM battery into the defense of a forward operating base.

The C-RAM Intercept Task Force leader, COL Paul McGuire, said, "The deployment of this weapon system and its integration into a holistic approach to defeat rocket, artillery and mortar threats will change the face of operations on the battlefield and will force the insurgents, currently operating in Iraq, to seriously consider their activities when attacking deployed forces. The enemy will be forced to change his tactics and potentially make mistakes that will allow coalition forces to react quickly and defeat his threats."

The first battery to perform the C-RAM mission is C Battery, 5th Battalion, 5th Air Defense Artillery, a separate Bradley Stinger Fighting Vehicle force that has been testing the C-RAM system and perfecting C-RAM battle

# ADA WEAPONS OF THE FUTURE

drills for several months. Charlie Battery Soldiers are now the tip of the spear in C-RAM development and fielding.

Charlie Battery will be augmented with Navy personnel who have many years of experience on the basic system to make up the first C-RAM intercept battery. Navy personnel are already an integral part of the battery's daily operation. Sailors quickly pass their expertise from years of maintaining and operating this system to Soldiers. The Soldiers received training from the Navy in several locations across the United States to facilitate the operational timeline. Soldiers have been firing the weapon system and intercepting mortars and rockets regularly. Their training culminated in a mission rehearsal exercise in Yuma. With help from the 3rd Battalion, 2nd Air Defense Artillery, during the evaluation, the mission rehearsal exercise was successfully completed, and Charlie Battery is considered trained for any C-RAM mission it might be assigned.

***To minimize collateral damage, the C-RAM interceptor will fire rounds that self-destruct...***

Collateral damage has always been a major concern whenever combat developers considered high-speed gun systems as a solution to the rocket, artillery and mortar threat. In urban terrain or heavily populated areas, outgoing rounds might prove as dangerous—if not more dangerous—than incoming rounds. To minimize collateral damage, the C-RAM interceptor will fire rounds that self-destruct (High-Explosive Incendiary Tracer Rounds-Self Destruct) when they miss their targets. These rounds have a very low dud rate, and studies show that residue from self-destructed rounds cause minimal damage.

Chief Petty Officer Jonny S. Schurch, the Navy's lead chief assigned to Charlie Battery, said the system would be even more effective except for safety measures imposed to prevent friendly casualties and collateral damage.

As ISG Stephen D. Kinzer observed, the Phalanx system will have to prove itself in new combat environments, where it has never been deployed. Time will tell how environmental factors may affect the intercept system once it arrives in a theater of operations.

Charlie Battery continues to operate on an aggressive schedule, racing an accelerated timeline, to bring the intercept capabilities online and prepare for a potential deployment. Every day that goes by before we deploy the system is another day service members have to survive rocket or mortar attacks without C-RAM protection. The sooner the C-RAM system is deployed, the sooner Soldiers, Sailors, airmen and Marines on forward operating bases will sleep safer and wake more rested for the next day's missions. The overall goal is to save lives and make the cost of firing mortars at U.S. Soldiers in Iraq too high



*Soldiers of C/5-5 ADA perform maintenance on the Land-Based Phalanx Weapon System.*

for the insurgency to pay. Soldiers of Charlie Battery have accepted the mission of saving Soldiers' lives and are prepared to execute their new mission.



*Captain Scott L. Mace commands C Battery, 5th Battalion, 5th Air Defense Artillery, the Army's first C-RAM battery. He was also the officer in charge of the Army's first Air Defense Airspace Management (ADAM) Cell. The author would like to thank COL Paul McGuire for his assistance on this article.*

## SCANNING

### Wasting Away in Mortaritaville

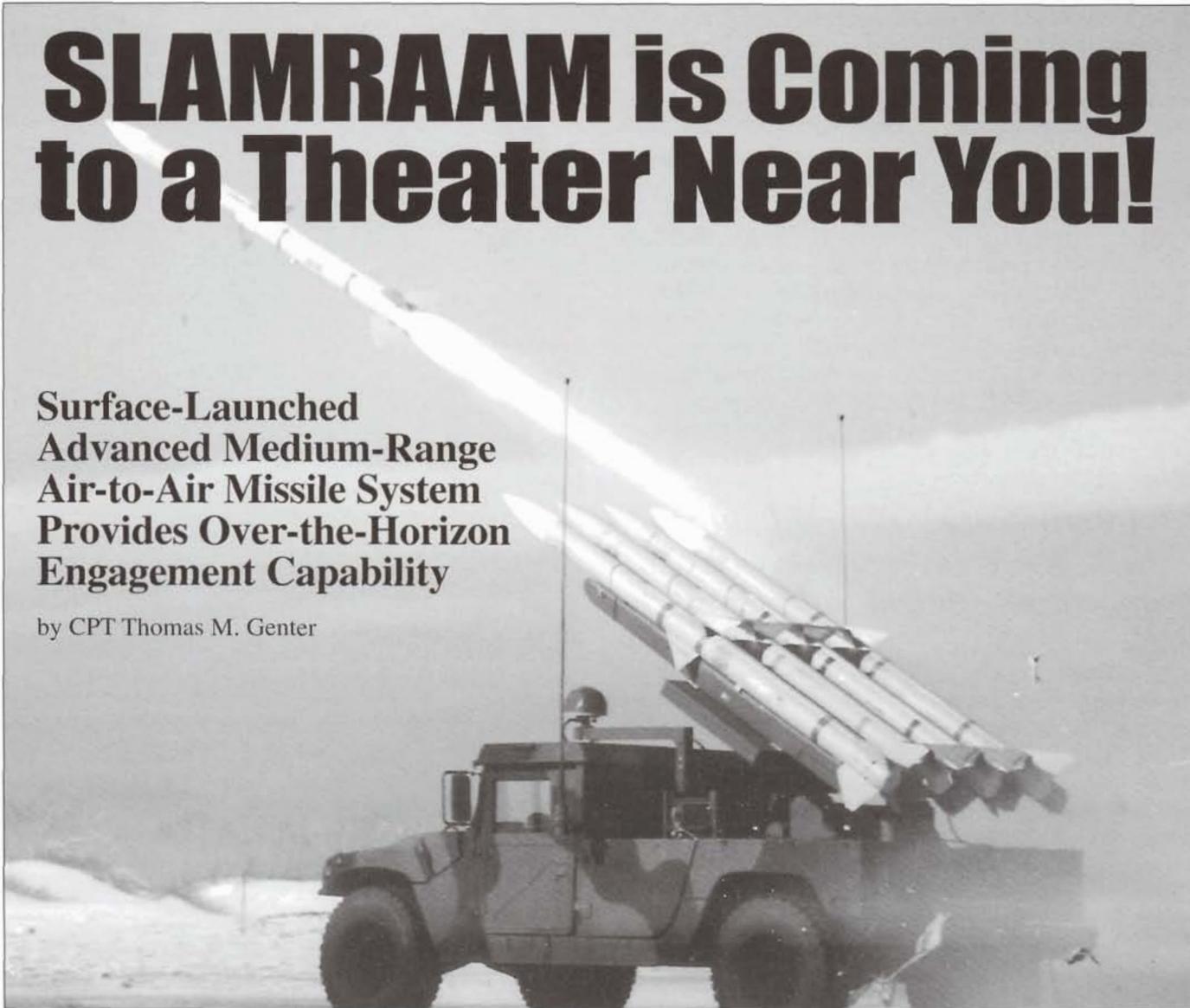
In Iraq, everyone called it [Camp Anaconda] Mortaritaville, you know, like Margaritaville. When we first arrived, we would have mortar attacks pretty much nightly. You become callused to it because it occurs so much. The statistics said we had more than one mortar attack per day. Some days there would be four or five a night and sometimes none.

—Greg Weiss, *Orange County Weekly*,  
3 June 2005.

# SLAMRAAM is Coming to a Theater Near You!

**Surface-Launched  
Advanced Medium-Range  
Air-to-Air Missile System  
Provides Over-the-Horizon  
Engagement Capability**

by CPT Thomas M. Genter



*The Surface-Launched Advanced Medium-Range Air-to-Air Missile system is crucial to the Army's strategy for addressing the growing threat posed by cruise missiles and unmanned aerial vehicles.*

The Surface-Launched Advanced Medium-Range Air-to-Air Missile (SLAMRAAM) system has been described as an Avenger on steroids, but Air Defense Artillery's new system packs more than just a powerful punch. The SLAMRAAM will extend the short-range air defense engagement envelope beyond visual identification range, allowing air and missile defense task forces to deal with emerging threats today's systems cannot touch. These unique capabilities, plus the realities of the contemporary operational environment, make SLAMRAAM a near-term capability imperative.

The SLAMRAAM system is crucial to the Army's strategy for addressing the growing threat posed by cruise missiles, unmanned aerial vehicles and unmanned combat aerial vehicles. The new system will enable air and

missile defense units to counter these threats while supporting counterattack, containment and contingency forces. The SLAMRAAM can destroy aerial targets masked by terrain or clutter, operating in periods of reduced visibility or employing standoff capabilities beyond the range and altitude of currently fielded Stinger-based weapon systems.

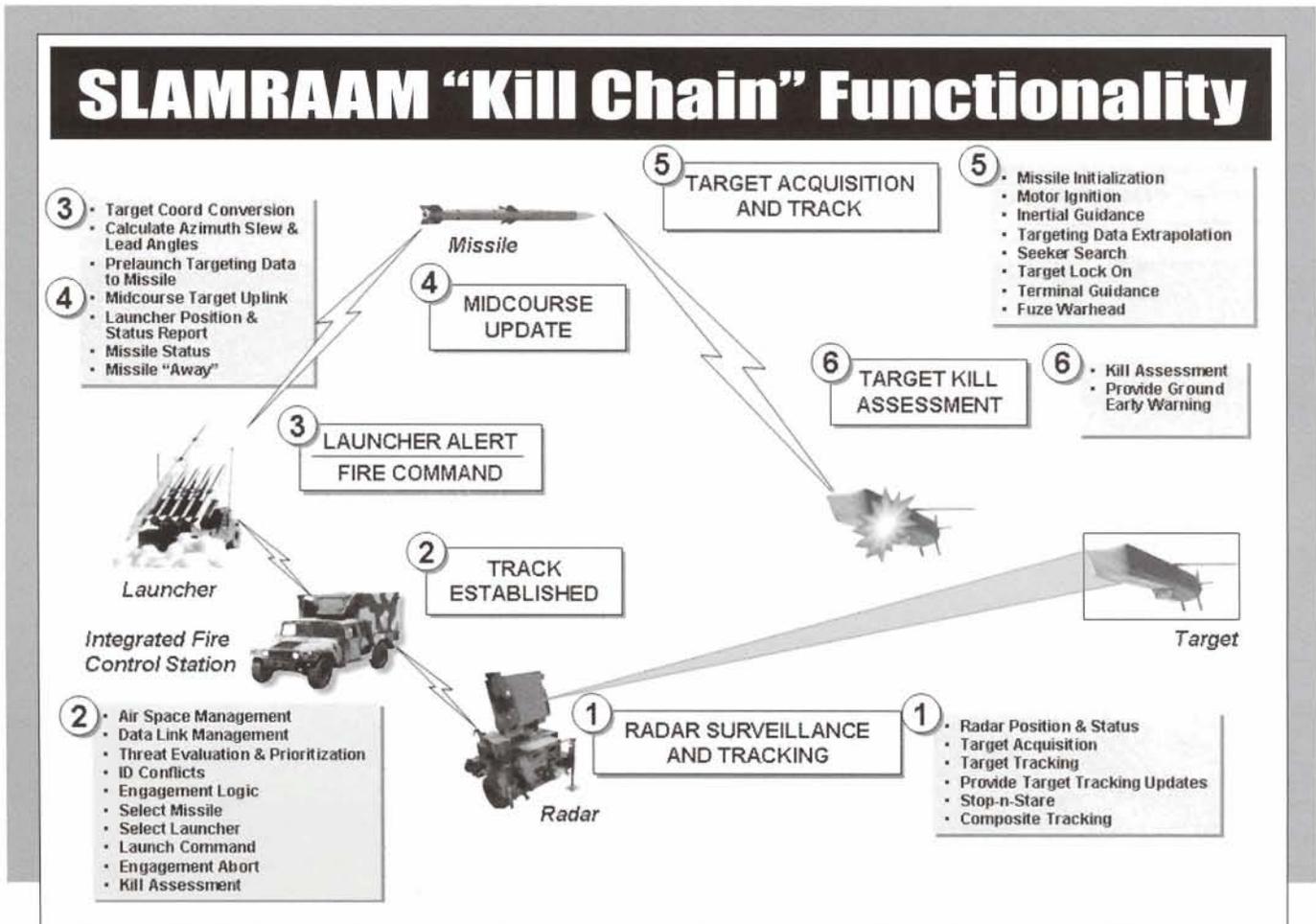
The SLAMRAAM is a product of the Air and Missile Defense Battle Lab demonstration and experimentation process. From 1996 through 1999, the Air and Missile Defense Battle Lab, in conjunction with the U.S. Marine Corps, Advanced Medium-Range Air-to-Air Missile Joint Special Project Office and the Army Aviation and Missile Command, conducted a series of live-fire experiments with SLAMRAAM prototypes. These live-fire experiments

# ADA WEAPONS OF THE FUTURE

demonstrated the feasibility and low-technological risk of integrating a SLAMRAAM capability into the existing short-range air defense architecture.

One experiment, Forward Pass No. 5, demonstrated how SLAMRAAM and the Joint Land-Attack Cruise Missile Elevated Netted Sensor (JLENS) will combine to counter the emerging cruise missile threat. Under the Forward Pass concept, a netted sensor on board an elevated aerostat platform guides a surface-launched interceptor missile to a target, such as a low-flying, maneuvering

communications and intelligence (BMC<sup>4</sup>I) subsystem. Using data from the Army integrated air and missile defense system of systems sensors, including the Sentinel ETRAC, JLENS and Patriot radar, the SLAMRAAM will provide beyond-visual-range engagement capabilities to air and missile defense task forces. The BMC<sup>4</sup>I must also provide target identification of friendly aircraft, a critical element since the system's beyond line-of-sight engagement capability cannot rely on visual identification means to distinguish friendly aircraft from enemy threats.



cruise missile, beyond the range of its own organic radar. During Forward Pass No. 5 on 4 April 2000, an elevated netted sensor guided a missile launched by a SLAMRAAM prototype to a successful intercept of a target simulating a low-flying cruise missile. This intercept, an ADA milestone, was the first live over-the-horizon engagement of a cruise missile target using an elevated sensor platform.

The fire unit consists of six ready-to-fire missiles mounted on a Humvee. The fire unit also includes a Sentinel Enhanced Target Range and Classification (ETRAC) Radar linked to an integrated fire control station, which is a battle management command, control, computers, com-

The 6th Air Defense Artillery Brigade will conduct a SLAMRAAM additional skill identifier course to train Patriot launching station operator/maintainers on SLAMRAAM vehicle and launcher procedures. The brigade will also train forward-area air defense tactical operation center operators and Patriot fire-control operator/maintainers on SLAMRAAM capabilities and limitations, including fire control procedures, beyond-visual range engagements and logistics support methods to support engagement operations and force operations. In fiscal 2009, some Avenger crew members will start training to make the transition to SLAMRAAM.

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By 2008, the Army expects to field the first SLAMRAAM battalion of 24 fire units. The Army will field SLAMRAAM fire units to composite Avenger/Patriot battalions and to the 5th Battalion, 5th Air Defense Artillery, 2nd Infantry Division, which will become a "pure" SLAMRAAM unit.

During Roving Sands 2005, the Common Command Post Joint Experimentation Test and Evaluation Advanced Concept Technology Demonstration employed reconfigurable tactical operations simulators representing a Patriot information coordination center and a SLAMRAAM integrated fire control system. Inside the common command post, operators sat at computer terminals, watching large video displays to monitor the skies over the exercise areas, looking for any sign of an incoming threat missile or aircraft. Patriot, Avenger and notional SLAMRAAM fire units awaited orders to engage. The experiment offered a glimpse of how Air Defense

Artillery's new composite air and missile defense battalions will focus the combat capabilities of diverse weapon systems to deal with a diverse threat.

Whether serving in a homeland air defense role, as part of a composite air and missile defense battalion or deployed as a pure SLAMRAAM battery or battalion, SLAMRAAM's extended range and non-line-of-sight over-the-horizon engagement capability makes it an essential part of air and missile defense strategy. The SLAMRAAM is coming to a theater near you.



*Captain Thomas M. Genter is assigned to the Air Defense Artillery Battle Lab, Directorate of Combat Developments, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.*

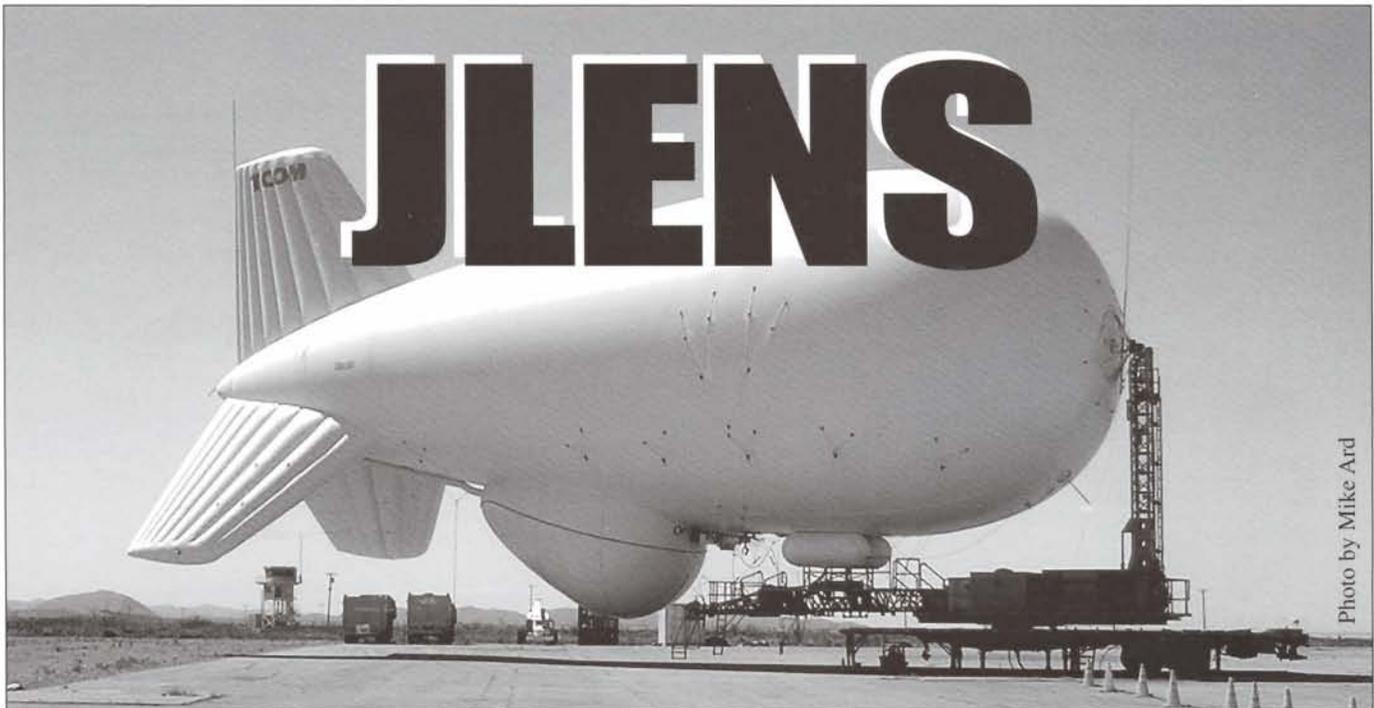


Photo by Mike Ard

## The Joint Land-Attack Cruise Missile Defense Elevated Netted Sensor is the "Mobile High Ground" Commanders Have Envisioned for Decades

by MAJ Thomas J. Atkins & Pete Olson

On 20 March 2003, the Marines of the 1st Marine Expeditionary Force (IMEF) headquarters were employed at Camp Commando, Kuwait, at readiness for the start of Operation Iraqi Freedom. A U.S. Air Force officer attached to IMEF sat at a computer terminal, ready to provide warnings of detected ballistic missile or cruise missile attacks to the Marine headquarters. If inbound missiles were detected, the Scud alert would be activated; subordinate units

would be notified; nuclear, biological and chemical protective masks would be donned; and Marines would enter underground bunkers.

Suddenly, Marines north and east of their headquarters observed a low-flying cruise missile pass nearby, heading toward Camp Commando. No alert sounded; the IMEF air defense terminals displayed no unusual activity. Headquarters Marines were caught completely by surprise as

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they heard the sound of the low-flying engine overhead, followed by the blast of the warhead. An Iraqi Seersucker anti-ship cruise missile converted for land attack had come dangerously close to striking the IMEF headquarters.

This successful penetration of allied airspace was not a lucky one-time event. On the morning of 28 March 2005, two cruise missiles were targeted at ships at the Kuwait City navy base. One headed for a radar reflector; the other struck close enough to a Kuwaiti shopping mall to shatter windows. A few days later, two more Seersucker cruise missiles were fired into Kuwait, one at the port of Umm Qasr and one at Safwan. None of these cruise missiles were targeted or detected in-flight. Fortunately, they did not cause any casualties, but they clearly demonstrated that cruise missiles are a viable means of long-range weapons delivery by which countries might threaten the United States and its regional partners.

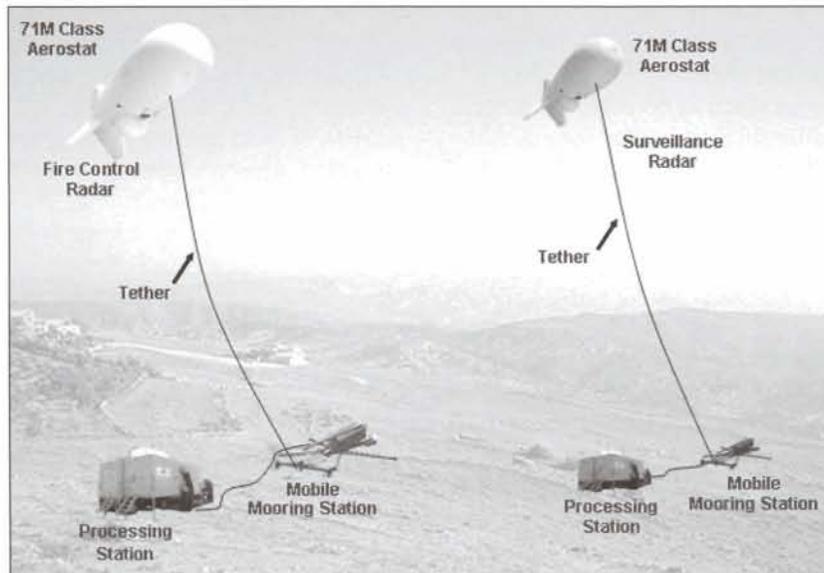
Experts consider defending against cruise missiles an extremely difficult task. Although many cruise missiles fly at relatively low speeds, they often are small and fly at very low altitudes, sometimes only a few dozen meters above ground. This makes it difficult for ground-based radars to detect and track them. We need an airborne radar system capable of detecting small aerial targets at long range and providing precise fire control data to air defense systems. The Joint Land-Attack Cruise Missile Defense Elevated Netted Sensor (JLENS) meets this requirement.

The JLENS is a critical enabler of the Joint Theater Air and Missile Defense (JTAMD) system of systems. It employs advanced sensors and networking technologies to provide wide-area surveillance and precision-tracking capabilities for long-duration missions with a specific focus on land-attack cruise missile defense. The dual aerostat system concept provides two individual radars, one for surveillance and one for fire control, each hosted on a separate 71-meter class aerostat. The surveillance radar is a key provider of aerial tracks to the single integrated air picture. It also provides surface moving target tracks to the common operational picture. The JLENS enables the precision tracking and illumination radar to support surface air defense assets in intercepting low-altitude airborne

targets at long ranges. The JLENS, with its long on-station time, complements fixed-wing sensor assets of the other services and serves as a key member of the joint theater air and missile defense architecture, which capitalizes on the synergy delivered by the integration of systems within a system.

## JLENS Surveillance and Fire Control Radar Coverage Comparison

The JLENS system consists of four main components: the aerostats, the radars, the mooring station and the processing station. The aerostats are unmanned, tethered, non-rigid aerodynamic structures filled with a helium/air mix. The aerostats are 77 yards long (three-fourths of a football field) and almost as wide as a football field. The aerostats must be large enough to lift the heavy radars that provide the system's extended range. The radars are optimized for separate, specific functions, but weigh several tons each. The surveillance radar searches very long distances to find small radar cross-section tracks before



JLENS aerostats will serve as the "mobile high ground" of air and missile defense.

*The fire control radar looks out at shorter distances, but ... provides highly accurate data to help identify and classify tracks. . .*

they can threaten friendly assets. The fire control radar looks out at shorter ranges than the surveillance radar, but provides highly accurate data to help identify and classify tracks while providing fire control quality data to a variety of interceptors. The two aerostats are connected to the ground via tethers through which power and data is transmitted. The tethers enable the aerostats to operate at altitudes of up to 15,000 feet and contain power lines, fiber-optic data lines and Kevlar-strengthened strands surrounded by an insulated protective sleeve. The tethers connect to mobile mooring stations that anchor the aerostats and control their deployment and retrieval. Mooring stations are connected to ground-mounted power plants and processing stations. The processing stations are the

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brains of the whole system. Each processing station contains an operator workstation, a flight-director control station, weather-monitoring equipment and a computer that controls radar functions and processes radar data.

## JLENS System Description

The JLENS is a critical enabler of future cruise missile defense integrated fire control, which consists of concepts known as Engage-on-Remote and Forward Pass. Under the Engage-on-Remote concept, an external sensor, such as JLENS, provides target location data to a weapon system that is masked to the target. The external sensor provides the data updates that enable the weapon system to launch a missile at the masked target. The Forward Pass is a similar concept, except that an external sensor provides information directly to the interceptor in flight and does not need to talk to the weapon system. These concepts will allow today's weapon systems to engage targets hidden behind terrain or over-the-horizon and beyond ground-based radar coverage. The JLENS maximizes the battle space of land-, sea- and air-based missile systems. It provides over-the-horizon, precision track quality data needed to support the defense of critical assets. From its unique position above the battlefield, JLENS detects and tracks targets normally invisible to terrain-masked ground-based sensors.

The JLENS enables air-directed surface-to-air missile and air-directed air-to-air engagement operations for air defense weapon systems such as the Surface-Launched Advanced Medium-Range Air-to-Air Missile, Patriot Advanced Capabilities-3, Aegis Standard Missile, Advanced Medium-Range Air-to-Air Missile and the Medium Extended Air Defense System. With JLENS hovering over the battlefield, these systems would be able to "reach out and touch" a threat that they normally never even see.

The JLENS makes a key contribution to aerial combat identification by providing very accurate continuous tracking of targets at long ranges to the designated combat identification authority. A track of hostile origin is a significant combat identification indicator, and acquiring it is often more easily accomplished by either an elevated or airborne sensor. Other indicators are flight profile and velocity; identification, friend or foe, response; and precise participant location and identification messages. The JLENS can obtain target measurement data that could be used to differentiate between manned and unmanned aerial vehicles. This long-range and highly accurate data make invaluable asset contributions to the future single integrated air picture, which will provide U.S. forces with information dominance on tomorrow's battlefields, as well as helping to ensure friendly force protection.

The JLENS, which can stay aloft up to 30 days, can support a variety of missions other than cruise missile defense. It can detect and track surface moving targets,

tactical ballistic missiles and large-caliber rockets. The system can also contribute to ascent-phase detection, tracking and determination of launch point estimates. The JLENS' elevated platform extends communication ranges, overcoming terrain restrictions associated with ground-based line-of-sight communications. The JLENS can also be used in critical homeland defense roles, supporting defenses against cruise missiles and other hostile aerial threats. These capabilities make JLENS one of the most versatile and desired systems on the battlefield.

The JLENS is the "mobile high ground" that commanders have envisioned for decades. The Army and Department of Defense conducted JLENS acquisition decision reviews in June 2005, and the system should be in Soldiers' hands in fiscal year 2011. The Army expects to deploy JLENS in battery-size units assigned to units of engagement, primarily combat brigades. The systems will be manned by ADA officers, ADA warrant officers currently serving as Patriot system tacticians/technicians and ADA Soldiers currently serving as tactical control center operators.

Elevated sensors such as JLENS provide surveillance and precision fire control that overcomes line-of-sight and terrain-masking problems that limit all ground-based sensors. JLENS fills a critical gap in cruise missile defense with extended operational time-on-station and long-range low-altitude detection capabilities.



*Major Thomas J. Atkins is Chief, Air Defense Branch, Requirements Division, Directorate of Combat Developments, U.S. Army Air Defense Artillery School, Fort Bliss, Texas. Pete Olson is assigned to the U.S. Army Training and Doctrine Command System Management Office-Lower Tier, Fort Bliss, Texas.*

## SCANNING

### Barrage Balloons

During World War II, the Army deployed barrage balloon battalions with anti-aircraft gun battalions to defend cities, factories and contested beachheads from low-flying air attacks. Cables dangling from the tethered balloons, which could soar up to 10,000 feet, forced enemy planes to higher altitudes or channeled them into zones protected by anti-aircraft guns. On 6 June 1944, Soldiers of the 320th Anti-aircraft Balloon Battalion brought their balloons ashore in the third wave at Omaha Beach. The all African-American unit set up their cable wrenches on the beach and launched their balloons to prevent the German Luftwaffe from strafing the invasion beaches during the early hours of the D-Day assault. —Skylighters

# ADA WEAPONS OF THE FUTURE



*The Medium Extended Air Defense System's mechanical wrench lifts a missile pack onto the launcher chassis.*

## It's Time to Start Thinking MEADS

### Incremental Fielding of the Medium Extended Air Defense System Will Speed New Capabilities to the Patriot Force

by J. E. Edwards

Writing for the April-June 2005 issue of *Air Defense Artillery* magazine, 32nd Army Air and Missile Defense Command experts noted that one of the major challenges facing the Patriot force during Operation Iraqi Freedom was supporting the maneuver force's rapid advance on a noncontiguous and hostile battlefield. "Patriot is mobile, but it was designed for operations on the linear battlefields of Europe's Cold War, not for today's contemporary operational environment," they observed. "V Corps' and the 1st Marine Expeditionary Force's rate of advance across Iraq's desert and unimproved roads challenged Patriot's outsized equipment and Heavy Expanded Mobility Tactical Trucks. It was through sheer skill, energy and tenacity that the Patriot batteries maintained pace with the maneuver forces and sustained air and missile defense coverage over critical assets on the march to Baghdad."

This article is dedicated to you, the Patriot Soldier whose shear skill, energy and tenacity shielded U.S. and friendly forces from potentially devastating Iraqi tactical ballistic missile attacks during Operation Iraq Freedom. Its purpose is to let you know that help is on the way and will arrive sooner rather than later.

In April 2005, Germany signed a memorandum of understanding, solidifying its continued commitment to the joint cooperative venture with the United States and Italy known as the Medium Extended Air Defense System (MEADS). The German parliamentary action erased any doubts about MEADS funding. The MEADS program is currently in the design and development phase and, over the next several years, will start incremental fielding to the Patriot force.

In 2003 the United States decided it was in our best interest to combine the Patriot and MEADS programs into the Combined Aggregate Program. This means that the U.S. Army will begin fielding MEADS capabilities to you as soon as the technology is ready, rather than waiting 15 years for a total Patriot replacement. The bottom line is that it's time to start thinking MEADS.

Changes in MEADS design will occur, but the basic requirements will remain. The MEADS project will incorporate lessons learned from Operation Desert Storm and Operation Iraqi Freedom plus numerous smaller-scale operations and exercises to produce a better system capable of defeating all foreseeable future threats. The objective MEADS will include a robust 360-degree area of coverage and will possess improved interoperability, situational awareness, maintenance, reliability and lethality. It will match and exceed what we are working with today.

As the system is incrementally fielded, you will begin to see changes to your command and control equipment. The battle management command, control, communications, computers, and intelligence (BMC<sup>4</sup>I) station will replace the Patriot battery command post and engagement control station. The BMC<sup>4</sup>I design is not yet final, but it will meet requirements for improved situational awareness, communications, interoperability and protection. It will also permit operators to perform force operations and engagement operations from within a single shelter. There will be two BMC<sup>4</sup>I vehicles per battery. In the event you need to support maneuver forces, the two BMC<sup>4</sup>I vehicles will enable you to provide bounding over-watch while exercising command and control of your air and

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missile defense system. This new capability will enhance the Army's ability to create and tailor air and missile defense task forces to specific missions.

The BMC<sup>4</sup>I is the first MEADS product you will see at our Patriot batteries. The next will be the lightweight launcher. The "Launcher Dawg" spends all day going from launcher to launcher, ensuring the generators are fueled, the radios are working, the fiber is laid out and the missiles are "hot." When missiles are expended, missile reload crews must perform as a team to unload expended missile canisters and load the next ones. Anyone who has been on a tagline—the safety line connected to the missile canister—probably has wondered if someone could make this "balancing act" easier (besides buying a forklift). The MEADS will make missile load and reload easy. A new five-ton vehicle from the Army's family of medium tactical vehicles (FMTV) that uses a mechanical wench to safely and quickly pull up a kitted pack of missiles onto the chassis from the rear of the vehicle will replace your launcher. The emplacement will be quicker and your communications will be more reliable. There will also be a two-to-one ratio of launchers to reloaders. This improved ratio will give you an organic capability to move missiles from the missile storage area without stressing your battery's onsite reload needs. Lastly, your launchers will elevate to a near vertical launcher position, facilitating a 360-degree coverage.

In the third increment, you will see the Patriot radar system replaced by two multifunction fire control radars and one sensor radar, all mounted onto the FMTV. Yes! There will be three radars per battery. Some maintenance personnel, faced with the prospect of maintaining three radars, are probably thinking about starting their retirement paperwork. Don't! A two-level maintenance system that will enhance response time and efficiency will be in place by the time the three new radars arrive. The MEADS maintenance system will feature embedded advanced prognostics and diagnostics. Imagine a system that foresees upcoming faults! It is like your family car telling you that the alternator will die in 15 days as opposed to finding out when you try to back out of the garage on the first morning of vacation. Advanced prognostics and improved reliability is of the utmost importance. We imagined it, and now we will get it.

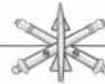
The three radars will permit you to mount a robust 360-degree defense against medium- and short-range tactical ballistic missiles, air breathing threats (unmanned aerial vehicles, hostile aircraft, jammers) and cruise missiles. The MEADS will be interoperable with other air and missile defense sensors, including Joint Land-Attack Cruise Missile Elevated Netted Sensors, broadening situational awareness against these threats. As the Army fields MEADS capabilities, you will continue to use combat-proven Patriot Advanced Capabilities-3 missiles. The missile segment enhancement phases of the MEADS program

will produce a new missile compatible with the MEADS system, enhancing your range and lethality on the battlefield.

As the primary mover for the MEADS battery, the FMTV adds greater tactical and strategic mobility. The decision to adopt the FMTV as the primary vehicle makes the MEADS major end items deployable by C-130. You won't have to rely solely on C-5As to get around anymore. Additionally, MEADS will also be transportable by helicopter lift. This means that if you need an immediate replacement for a MEADS major end item, such as a BMC<sup>4</sup>I vehicle or radar, in an area of operations, a CH-53 or CH-47 can get it there.

If you are a member of a Patriot emplacement crew, you have better things to worry about during the heat of battle than 45-minute crew drills. Therefore, MEADS developers are designing all major end items for quicker and safer emplacement procedures. Efficiency is of the utmost importance and is a primary goal.

The MEADS photos that accompany this article are conceptual. There will be changes in the design and development phase of acquisition. MEADS developers are mindful of lessons learned, and they have listened to your concerns and suggestions. With open eyes and open minds to our future threats and operational needs, we will work together to create a superior missile defense system. The MEADS is the future of Air Defense Artillery.



*J.E. Edwards received his commission upon graduation from the U.S. Military Academy and served more than five years in various roles as a Patriot officer. Today, he is a member of the MEADS Requirement Team, Directorate of Combat Developments, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.*

## SCANNING

### MEADS International Signs Design & Development Contract

On 1 June 2005, MEADS International announced it had formally signed a definitized contract to design and develop the tri-national Medium Extended Air Defense System (MEADS). The contract value is approximately \$2 billion plus Euro 1.4 billion for the program's design and development phase. The contract extends a contract previously awarded to MEADS International by the NATO MEADS Management Agency in September 2004. Award of the contract follows the German government's decision on 20 April 2005 to participate in the MEADS design and development phase, a step taken earlier by the governments of Italy and the United States. MEADS International is a joint venture of MBDA Italia, EADS/LFK in Germany and Lockheed Martin in the United States.

# Terminal High-Altitude Area Defense

by CPT James P. Johnson

The Terminal High-Altitude Area Defense (THAAD) system is a ground-based terminal phase ballistic missile defense system element being developed to protect deployed military forces, allies and friends. THAAD has the capability to counter short-range and medium-range ballistic missiles inside and outside the atmosphere, significantly mitigating the effects of weapons of mass destruction. The system also has growth potential to defeat intermediate-range ballistic missiles

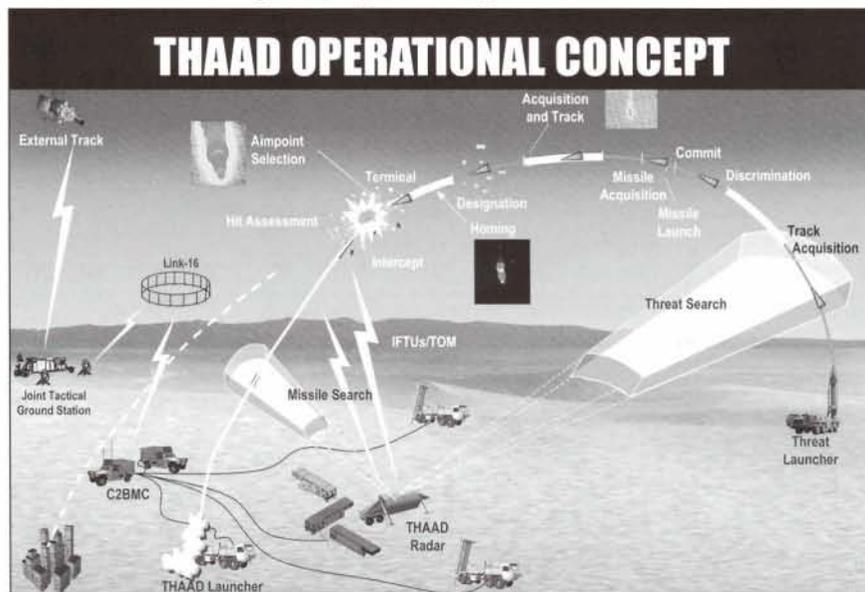
THAAD provides the combatant commander additional flexibility in defense planning to defeat ballistic missiles. For example, the combatant commander could allow Patriot to move forward while using THAAD to maintain coverage over assets. The THAAD will assist Patriot with defenses via Tactical Digital Information Link-J (TADIL-J)/Link 16 communications resulting in the exchange of track information. With this exchange of data, THAAD enables precise early warning to Patriot. This cueing information permits earlier detection of ballistic missiles, increasing Patriot's intercept altitude. The ability to share data maximizes interceptor efficiency in prioritizing targets and deconflicting shots, resulting in reduced vulnerability and minimized damage to defended areas. THAAD will expand defended area capability and ballistic missile defense coverage. Additionally, THAAD significantly improves passive defense by enabling selective warning, tailoring early warning to the specific threatened location on the battlefield rather than alerting an entire region of a ballistic missile launch. THAAD gives the combatant commander flexibility in attack operations by accurately determining ballistic missile launch points. These accurate target locations permit the combatant commander

to launch artillery, attack helicopter or fixed-wing strikes against mobile missile launchers, which are time-sensitive targets.

Although the THAAD system can operate as a stand-alone system, the THAAD battery will usually operate together with a Patriot battalion, forming an air and missile defense (AMD) task force. The THAAD command post includes hardware, software and communications equipment to enable THAAD to operate within the joint command and control architecture not only with the Patriot system but with the U.S. Navy's Aegis radar. For instance, the Aegis radar can detect a ballistic missile threat then alert THAAD. Once the

THAAD begins tracking the ballistic missile threat, it will launch the THAAD missile. Upon THAAD missile launch, the THAAD engagement will be processed by the THAAD command post (CP) to preclude engagement by Patriot. The THAAD CP will monitor all THAAD engagements and kill assessments. In the event of an unsuccessful THAAD engagement, the THAAD will alert Patriot. Once the Patriot system is alerted, it will engage if the target enters its battle space and if the target is threatening a defended asset. The AMD task force tactical operations center (TOC), in coordination with the ADA fire control officer (ADAFCO), will coordinate the upper-tier (THAAD) and lower-tier (Patriot) ballistic missile battles to ensure protection of assets assigned to the AMD task force.

The diagram above further illustrates the THAAD operational concept. THAAD can be cued by external sensors or the THAAD radar detects the target. When THAAD receives a cue, the radar searches to establish a track for



# ADA WEAPONS OF THE FUTURE

the ballistic missile. As the target approaches the THAAD battle space, the THAAD system formulates an intercept plan to include cueing Patriot. After THAAD takes a shot the system will conduct a hit assessment and reengage the ballistic missile based on this assessment data. Should the THAAD engagement fail, then Patriot will engage the target entering its battle space.

The primary components of the THAAD system are the command and control battle management and com-

upon the M1120 Heavy Expanded Mobility Tactical Truck. The THAAD launcher has a fire-to-fire reload time of 30 minutes. Modifications were made to accommodate the THAAD missile round pallet, a launch stabilization system, and THAAD unique electrical requirements. The first THAAD fire units include three launchers per fire unit.

The THAAD radar is an X-band, solid state, phased array radar capable of tracking multiple threats and interceptors during engagements. The THAAD radar provides

surveillance, acquisition, track, discrimination, missile communications and hit assessment data collection for the C<sup>2</sup>BMC. The THAAD radar communicates with the missile in flight and provides in-flight target updates, enabling the missile to hit the lethal object for the highest probability of kill. The above illustration describes the components of the THAAD radar, which consists of the electronic equipment unit, antenna equipment unit, cooling equipment unit and the prime power unit.

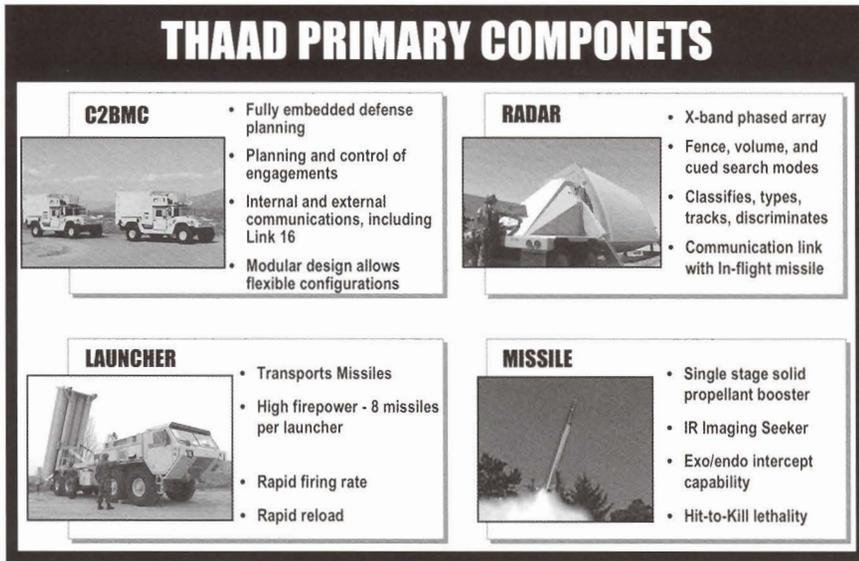
The THAAD missile is a "certified round" consisting of a strong, lightweight missile canister and a missile. The missile is composed of a single-stage booster and a kill vehicle with infrared homing. The canister serves as a non-reusable housing and launch tube providing envi-

ronmental and limited ballistic protection for the missile. The kill vehicle provides for high-aim point accuracy intercepts and destroys the target through kinetic energy, hit-to-kill intercepts upon impact.

The secretary of defense restructured all missile defense programs and cancelled all missile defense operational requirements documents in January 2002. As a result, THAAD now follows the Missile Defense Agency (MDA) capability-based acquisition strategy that emphasizes testing, spiral development and evolutionary acquisition through the use of two-year capability blocks.

Block 2004 (calendar years 2004 and 2005) represents the design and development of a significant, fundamental capability against short- and medium-range ballistic missiles. It also incorporates the demonstration of exo- and high endo-atmospheric capability against unitary and separating ballistic missile targets. The Block 2004 element consists of basic test hardware that incorporated a basic radar discrimination and missile infrared discrimination capability and interactive defense planning and basic interoperability.

Block 2006 (calendar years 2006 and 2007) represents an incremental enhancement to the Block 2004 capability and continues THAAD's evolutionary acquisition/developmental strategy. This block expands the capabilities of the system to provide improved exo- and endo-atmospheric capability against increasingly complex targets.



munications (C<sup>2</sup>BMC), radar, launcher and the missile. The above illustration provides a general description of each element.

The THAAD C<sup>2</sup>BMC acts as a battle manager for the THAAD battery. The role of the THAAD C<sup>2</sup>BMC is to conduct THAAD force and engagement operations. The THAAD C<sup>2</sup>BMC integrates the launcher and the radar and provides the planning, control, coordination, execution and communications necessary to fulfill the THAAD mission in a coherent and fully integrated fashion. The C<sup>2</sup>BMC's functions involve activities associated with defense planning and the actual conduct of the missile defense battle engagement operations. The THAAD tactical station group (TSG) is composed of the tactical operations station launch control station (LCS) and the station support group (SSG). These elements make up the THAAD tactical ground station (TSG). The first THAAD fire units include two TSGs. The dual TSG configuration allows one TSG to perform engagement operations while the other TSG performs force operations functions. With a dual configuration, one TSG can assume dual engagement/force operation roles, continuing to function in the event of equipment failure or required maintenance.

The launcher is a mobile tactical element of the fire unit with eight missiles per launcher. Used to transport, aim and launch missiles, the launcher consists of the transporter and the missile round pallet. The transporter is based

# ADA WEAPONS OF THE FUTURE



ADA Soldiers have been extensively involved in every phase of Terminal High-Altitude Area Defense system development and testing.

The Block 2006 THAAD element will have automated defense planning, embedded training, and enhanced radar discrimination capabilities.

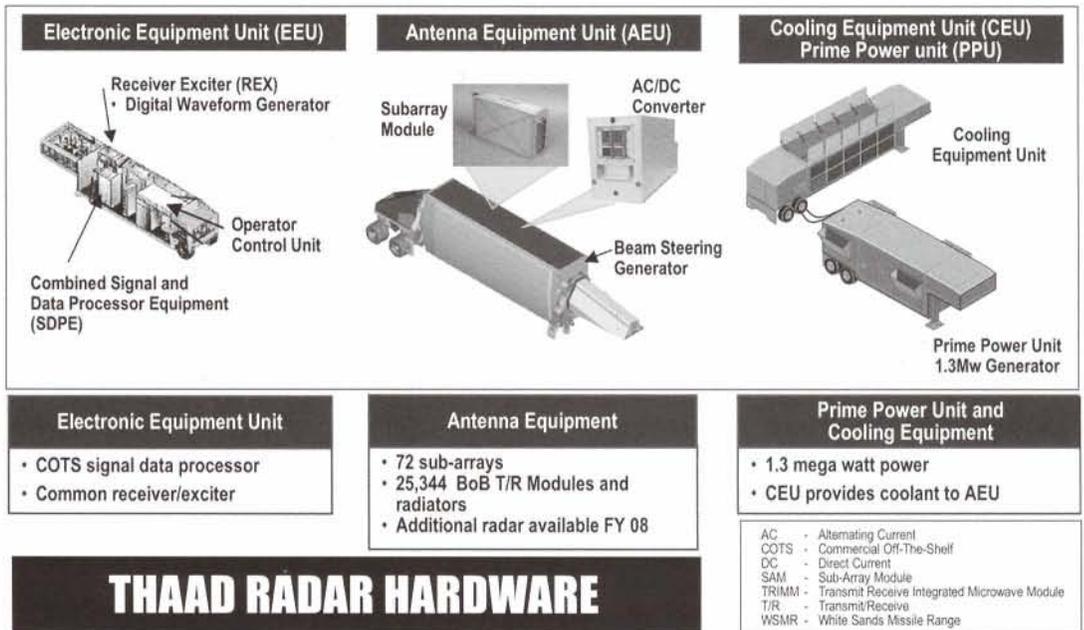
Block 2008 (calendar years 2008 and 2009) will build on the core, near-term missile defense capability provided by THAAD Block 2006. The Block 2008 element will have enhanced intermediate-range ballistic missile defense planning and reporting, and launch-on-remote. This block will demonstrate THAAD capabilities in endo- and exo-atmospheric battle space against the full spectrum of adversarial capabilities.

Soldiers have been extensively involved with the development and testing of the THAAD system. As a result of Soldier involvement and input, numerous improvements have been made to the THAAD system. Soldiers have a vital role in software development and improvements and in changing the THAAD hardware to make the system better and more Soldier friendly.

Flight testing will begin in calendar year 2005. The first five flight tests will be conducted at White Sands Missile Range, N.M., with follow on flight tests conducted at the Pacific Missile Range Facility, Hawaii. As flight testing progresses, flight test Soldiers will assume greater responsibility for testing and operation of the THAAD system.

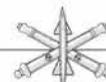
The MDA will deliver the first THAAD unit in FY09 and the second fire unit in FY11. The configurations for the first two fire units will consist of one radar, one battle

manager, three launchers with missile round pallets, and 24 missiles. The MDA and the Army will execute delivery of the first two fire units, using a teaming approach that supports incremental fielding of capability enhance-



ments. The MDA will retain programmatic authority and responsibility for incrementally developing and fielding advanced THAAD capabilities while the Army will man and operate the THAAD system.

THAAD development is progressing well with flight testing beginning in the near future. When fielded, THAAD will offer combatant commanders flexibility in defense planning while increasing air and missile defense capabilities on the battlefield. It is a critical element of the Ballistic Missile Defense System and will bring significant capability to the AMD task force.



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# AIR DEFENSE WEAPONS THAT ALMOST WERE

Poor Design Killed Some Promising ADA Systems, But Others Fell Prey to Political Infighting or Were Sacrificed to Satisfy a Media Feeding Frenzy

by John Hamilton

Karl Von Clausewitz, in *On War*, asserts that defense is the stronger form of battle. Air Defense Artillery, by its name, connotes defense rather than offense. Looking at the history of the branch, however, it becomes clear that air defense is not passive. Rather, the approach has been to take the offensive against the air threat: find it, fix it, destroy it or throw it off its mission.

The development of air defense weapons has been more evolutionary than revolutionary. As the air threat evolved on the battlefield, so did the weapons that ground forces used to attack and defeat the threat. Due to the increasing complexity and sophistication of aircraft and missiles, the need for precision acquisition and targeting increased. With the demise of the draft Army, we could not afford (and indeed may never have been able to afford) diverting sufficient manpower and equipment necessary to throw up a "wall of steel" to knock down an attacking airplane. We needed complex, precision weapon systems to confront the airplane and later the missile.

Weapons development and acquisition in the United States has always been a contentious issue. Competition for weapons program funding is severe. Many other programs, such as other weapons systems, social programs, health care and education all compete for money. This makes weapons procurement part of the political process, a battle waged beneath the Capitol rotunda and in the hallways of the Pentagon. Another strong influence is the news media, especially after World War II. Sometimes, it seems as though journalists go out of their way to be skeptical of

weapons development, as though they were on a crusade against the whole process.

History provides lessons learned for commanders. More significantly, it arms commanders with the right

questions to ask in the process of formulating plans, conducting operations and buying weapons systems. As we continue to develop future air and missile defense systems described in this issue of Air Defense Artillery and consolidate the Army's air and missile defense capabilities, it may be instructive to examine three forward area defense systems we tried to field in the

second half of the 20th Century: Mauler, Roland and the Sergeant York Gun.

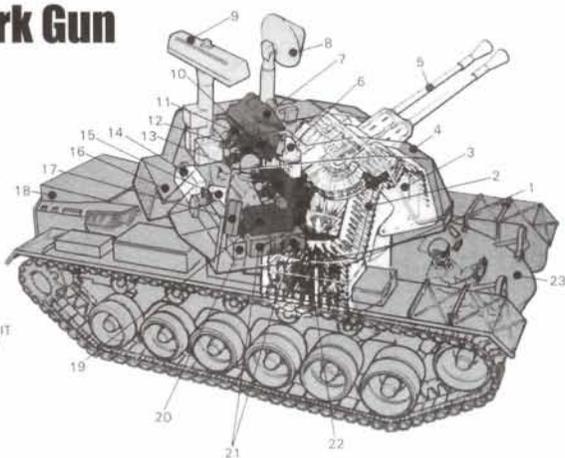
## Mauler

The XMIM-46 Mauler emerged in 1957 when it became apparent that the anti-aircraft guns in use were inadequate to defeat the air threat. The Army conceived Mauler as a compact, self-contained missile system mounted on a M113-type tracked vehicle. The vehicle housed the Mauler's acquisition and fire-control radar, power source, missile launcher and the system operator in a pod that could be detached from the prime mover and emplaced on the ground, moved by aircraft or mounted on a truck. The vehicle crew consisted of a driver, a system operator and a relief man. The missiles were carried in a launch rack on top of the vehicle in three tiers of three missiles stacked atop each other. It looked like a mini-Patriot system. The missile contained a solid fuel rocket motor, a semi-active homing sensor designed to home in on the illumination

## Sergeant York Gun

Major Subsystems

- 1 LOWER MAGAZINE
- 2 AMMUNITION
- 3 UPPER MAGAZINE
- 4 ARMORED TURRET
- 5 40mm TWIN GUNS
- 6 SQUAD LEADER'S PERISCOPE
- 7 STABILIZED SIGHT WITH LASER RANGEFINDER
- 8 TRACK RADAR
- 9 SEARCH RADAR
- 10 SQUAD LEADER'S TELESCOPE
- 11 GUNNER'S TELESCOPE
- 12 GUNNER'S CONSOLE
- 13 SQUAD LEADER'S CONSOLE
- 14 FIRE CONTROL COMPUTER
- 15 RADAR PROCESSOR
- 16 ENVIRONMENTAL CONTROL UNIT
- 17 LOW VOLTAGE POWER SUPPLY
- 18 PRIMARY POWER UNIT
- 19 SYSTEM CONTROLLER
- 20 NBC FILTER
- 21 RADIO
- 22 DISPLAY ELECTRONICS
- 23 TANK CHASSIS



The cancellation of the Sergeant York Gun program left a gaping hole in forward area air defense that was filled by Avenger and Bradley Linebacker air defense systems.

# ADA WEAPONS OF THE FUTURE

from the radar, and a 10-pound blast-fragmentation warhead. The maximum velocity of the rocket was Mach 3.2 with a maximum effective range of 10,000 meters.

The Mauler operator had to fit in a very tight space, almost like a second skin, with a weapons console in front of him. This allowed the operator to view the air tactical situation, acquire targets, test the system's readiness and control the system's operation. The primary contractor selected to build the prototype was the Convair Division of General Dynamics Corporation, supported by Raytheon and other contractors.

The development of this system pushed the envelope of technology at the time. The toughest problem was building a radar system that would fit the space provided without sacrificing performance. In testing the system, the Army encountered some insurmountable problems. The missile canisters failed during missile launch and damaged adjacent canisters. The new rocket motor failed. The missile had aerodynamic problems with excessive drag and wing flutter. The missile seeker lost lock immediately after launch. And, as if these problems were not enough, they surfaced in a time of fiscal austerity when weapons development program budgets were especially tight. The Mauler also suffered from insufficient funding, inadequate guidance from higher headquarters and a gradual loss of confidence in both the contractors and the weapons system. Ultimately, Defense Secretary Robert S. McNamara terminated the Mauler on 19 July 1965. In its place, the Army adopted the Chaparral system, based on the U.S. Air Force's Sidewinder missile. The total Mauler program had cost more than \$200 million dollars.

## Roland

The Roland system was a self-contained missile system designed for forward area defense. The French company Aerospatiale and German company Messerschmitt-Bolkow-Blohm jointly developed the system. The French and Germans, who wanted a low-altitude missile system to confront Soviet warplanes, collaborated on a design that would be light and mobile enough to keep pace with armored and mechanized forces. The system could be mounted on a French AMX-30 chassis, a German Marder chassis, on the bed of a truck or in a fixed shelter. The U.S. Army examined the system as a low-altitude air defense system that would complement the Hawk and Nike-Hercules systems. In its June 1973 issue, *Air Defense Trends*—the forerunner of today's *Air Defense Artillery* magazine—covered the system in detail.

The Roland I was an optical system supported by an external radar while the Roland II employed a self-contained tracking radar. The system mounted two launchers on either side of the radar, with the missiles in their own canisters inside the vehicle. The Roland carried 10 missiles, and crews could reload the missiles in a matter of seconds from within the vehicle. Designed to intercept

helicopters and fixed-wing aircraft flying up to Mach 1.2, Roland had a maximum range of 6,000 meters, an effective range of 5,500 meters and a probability of a successful engagement ratio that ranged from 80 to 95 percent.

So, why didn't the Army adopt the system? The Army engaged a Boeing Company and Hughes Aircraft team to manufacture the system to U.S. specifications. The Army looked at mounting the system aboard the M109 chassis, the experimental Mechanized Infantry Combat Vehicle, the M551 Sheridan or possibly the Marine LVTP-7. The Army planned to spend \$3.32 billion for 180 fire units, enough to equip four-Roland battalions, but the Carter administration severely reduced the program funds in the 1982 budget, precluding the purchase of the system. However, there were funds available to field the system in the 1983 and 1984 budgets, so the Army fielded one battalion to the New Mexico Army National Guard's 5th Battalion, 200th Air Defense Artillery, which became a "full-time" Guard unit stationed at McGregor Range, N.M. The 5-200 ADA participated in several exercises in which it was the only system capable of detecting and engaging low-level, special-operations helicopters at night. At the National Training Center, Fort Irwin, Calif., it augmented the opposing force, virtually shutting down low-level close air support for friendly forces. Unfortunately, the Guard unit was not sustainable, and the Defense Department shut down the Roland program in 1988.

Significantly, the Argentine forces employed the Roland effectively against British aircraft in the Falklands War. British aviators learned quickly that the best way to avoid Roland was to stay out of its envelope. Canada fielded Roland systems to its air defense regiments, and a fellow named Saddam Hussein employed the Roland effectively against coalition forces in Operation Desert Storm.

## Sergeant York Gun

Advocates promoted the Sergeant York Gun, which was to have replaced the Vulcan gun system, as a quantum leap ahead for Air Defense Artillery. Sergeant York Gun developers envisioned a sophisticated 40mm gun system mounted on a tracked chassis that would be able to keep up with maneuvering forces mounted on M1 Abrams tanks and M2/M3 Bradley Fighting Vehicles. Developers hoped to cut at least five years from the development process by building and testing the prototype simultaneously with gearing up production. The prime contractor, Ford Aerospace, would develop the system and work the inevitable bugs out of the gun as it was fielded. Significantly, Ford Aerospace agreed to repair deficiencies at no cost to the government. The Sergeant York's radar was based on a proven design employed on the U.S. Air Force's F16 fighter-bomber. The gun was a twin 40mm Bofors design, under armor and mounted on the M48A5 tank chassis. The Army chose the M48A5 because the M1 Abrams tank

# ADA WEAPONS OF THE FUTURE

was under development, and its chassis could not be adopted for Sergeant York. The M48A5 was a product-improved version of the older M48; it was plentiful in depot storage, and it could be used to bound forward and maintain contact with tanks and fighting vehicles that left older air defense systems in their dust.

The Sergeant York fell under intense scrutiny from the beginning. The debate centered on the effectiveness of a gun versus a missile system. The Sergeant York would also be relatively expensive, since the Army expected to buy only 276 systems. The gun was to cost \$2.4 to \$3 million each, while the Abrams tank was to cost \$2 million per vehicle for 7,000 tanks.

A storm of controversy that surrounded the Sergeant York Gun arose during a period of intense media scrutiny of defense spending. News stories alleging—misleadingly—that the military was paying \$500 apiece for toilet seats and \$700 apiece for coffee makers made headlines. The most damaging blow to the Sergeant York was an article published in *Atlantic Monthly* in October 1982. It was well written, carefully researched, illustrated with cute cartoons and wrong on several substantive issues. Nevertheless, the news media picked up the story and different permutations appeared in the *Washington Post*, *New York Times*, *Chicago Tribune* and other newspapers. The Army categorically refuted the articles, but with little effect. A television broadcast on ABC's *20/20* edited combined footage of Sergeant York tests, Army spokespersons and system critics in a clever way to make the Sergeant York look like a failure.

The final decision to terminate the Sergeant York came from Secretary of Defense Casper Weinberger in 1985. He based his decision on many factors, including the cost of the system, the mixed results of operational testing and the media circus. The Sergeant York Gun was sacrificed

to sate the media's feeding frenzy.

The cancellation of the Sergeant York Gun program left a gaping hole in forward area air defense. The Air Defense Artillery School's Directorate of Combat Developments plugged the gap by creating the Forward Area Air Defense System of Systems Concept, which produced the Avenger, Bradley Linebacker and Forward Area Air Defense Command, Control, Communications and Intelligence systems.

## Lessons Learned

So what? How do these three historical tales instruct us? The Army is undergoing a radical transformation while under fire in two major theaters of operations—Iraq and Afghanistan. Weapons design and procurement is part of the transformation process. Air Defense Artillery leaders must understand how the process works so they can successfully wage the battles they must win in the political arena to equip the branch with the weapons it needs to win on the battlefield.

Air and missile defense weapons are, by nature, complex and, therefore, expensive, but this is no excuse. Our sister services encounter the same barriers, but somehow aircraft carriers, submarines, sophisticated bombers and high-tech fighter aircraft still get built. History shows that Army leaders need to do a better job in articulating where our weapons programs are taking us by engaging the legislature, the media and the public early in the procurement process. We should learn history's lesson well.



*John Hamilton is the Air Defense Artillery Historian, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.*

## SCANNING

### 'Aim High' Battalion Inactivates

With a history that spans more than 200 years, the 1st Battalion, 62nd Air Defense Artillery, the oldest unit in the 25th Infantry Division, will be inactivated 15 Sept. 2005. The inactivation is part of Army Air and Missile Defense Transformation, which is inactivating maneuver air defense battalions to create composite Avenger/Patriot battalions.

"Some of the Soldiers will be relocating to the newly formed 94th Army Air Missile Defense Command, Fort Shafter, Hawaii, while others will [remain] at Schofield Barracks and be reassigned to division headquarters, units of action or the Stryker Brigade," said LTC Stephen Christian, 1-62 ADA commander.

In 2004, 1-62 ADA deployed to Iraq and Afghanistan in support of Operations Iraqi and Enduring Freedom. As combat multipliers throughout both regions, the battalion added another success story to its long history.

"This unit has a long and prestigious history," said SGT Frederick Robinson, squad leader, Headquarters and Headquarters Battery, 1-62 ADA. "It makes me extremely proud to know that I have had the opportunity to be a part of that history by adding another chapter."

—SPC Cheryl Ransford 17th Public Affairs Detachment

# ROVING SANDS 2005

## Patriot Relief-In-Place Operations

by MAJ Brian Adams & MAJ Matt Tedesco

Exercise Roving Sands 2005 proved to be an excellent training opportunity for all participating units. The event, which took place in March 2005 at Fort Bliss, Texas, was tied to Exercise Joint Red Flag, a much larger exercise conducted simultaneously with Roving Sands 2005 at Nellis Air Force Base, Nev. Roving Sands 2005 encompassed the full spectrum of live, virtual and constructive training. For



*During Exercise Roving Sands 2005, 1-44 ADA and 5-52 ADA fire units sequentially defended the same task force from air and missile attacks.*

the live portion, Headquarters, 11th Air Defense Artillery Brigade, and two of the brigade's three battalions conducted operations in the Fort Bliss training area. Within the exercise scenario, our battalions—the 1st Battalion (Avenger/Patriot), 44th Air Defense Artillery, and 5th Battalion (Patriot), 52nd Air Defense Artillery—sequentially defended the same designated combined joint task force (CJTF) commander's critical assets from air and missile attack. For the first time, our battalions seamlessly executed a relief-in-place operation that was coordinated between our formations and controlled by our brigade headquarters.

Critical and unique to the success of our operation was controlling fires by establishing a master information and coordination central (MICC) to subordinate information and coordination central (SICC) relationship. We planned to conduct the operation in four phases: preparation, battle position assumption by 5-52 ADA, MICC/SICC establishment and transfer of authority, and combat operations and transition to future operations.

### Preparation

The preparation phase was essential to the success of the relief-in-place. The battalion commanders (LTC Elliot Bales of 1-44 ADA and LTC Joseph Simonelli of 5-52 ADA) thoroughly discussed the upcoming operation with designated leaders from each battalion and issued guidance on its execution. Next, we conducted a rock drill,

using an in-depth synchronization matrix, with all battery commanders and first sergeants rehearsing the actions on the objective. Tactical directors from both battalions joined in to "rock drill" the operation's critical events. This face-to-face coordination would prove invaluable in deconflicting mission critical tasks. Once the rehearsal was completed, we moved into the execution phase.

### Battle Position Assumption

We planned the operation to ensure that we would provide continuous protection of the CJTF commander's critical assets. As the Army's first composite air and missile defense battalion, 1-44 ADA's combat power consisted of four Patriot Advanced Capabilities-3 (PAC-3) batteries and one Avenger battery. The 5-52 ADA would replace 1-44 ADA with four PAC-3 batteries. The exercise began with 1-44 ADA emplaced. To ensure seamless transition of command and control, 5-52 ADA's jump tactical operations center (TOC) deployed on 25 March 2005 and established operations within the 1-44 ADA TOC. This provided direct coordination between both battalions at crucial times during the arrival and establishment of 5-52 ADA fire units. It also mitigated the initial problem of establishing connectivity between the battalion's information and coordination centrals (ICCs). Both battalions validated doctrine by modifying TAB 69 to allow the control of four additional fire units.<sup>1</sup> The MICC was able to control all eight PAC-3 fire units during the final phase of the relief in place.<sup>2</sup>

Headquarters and Headquarters Battery, 5-52 ADA, deployed to their positions in the morning, established UHF communications, achieved minimal engagement capability and assumed directed alert state. In the afternoon, C/5-52 deployed and was emplacing when the MICC/SICC relationship was established at 1840 hours.

<sup>1</sup> FM 3-01.87, 2-127, *Patriot Tactics, Techniques, and Procedures*. TAB 69 accommodates a maximum number of nine extra-battalion units for ICC. The link address entry tells the software the link address (Army tactical data link [ATDL] or tactical digital information link [TADIL]) of the defined unit (unless a Patriot MICC, SICC, or lateral ICC has been defined by the identification code and unit type entries).

<sup>2</sup> MICC is capable of controlling up to 12 fire units.



The transfer of authority between 1-44 ADA and 5-52 ADA occurred in the middle of an enemy attack with 5-52 ADA Patriot fire units successfully engaging and destroying a simulated air-breathing threat. (Photo at right by SPC Mark Miranda.)



## Transfer of Authority

As is the case with all missions, plans were not always executed as intended. To establish MICC/SICC between units, 5-52 ADA's ICC planned to establish a UHF shot into a communication relay group (CRG) collocated with 1-44 ADA. This CRG attempted to establish a link to the D/1-44 engagement control station (ECS), which was hardwired into 1-44 ADA's ICC. However, the plan to link the two battalion ICCs through an ECS failed. The 1-44 ADA ICC dropped a redundant shot they had established, and established a corner reflector shot with the CRG. Once this was completed, the MICC/SICC relation was immediately established.

We discovered that a battery's ECS should not be located between the ICC to CRG to ICC shot. After five hours of troubleshooting problems, a decision was made to establish a direct link via the CRG between ICCs. The 1-44 ADA ICC removed the hard wire with D/1-44 ADA's ECS and dropped a UHF shot to C/1-44 ADA.

Units employ MICC/SICC operations to deconflict command and control between two Patriot battalions and sustain continuous air and missile defense protection throughout the duration of a relief-in-place. The battalion serving as the MICC controls the subordinate battalion's ICC. The key features of a MICC include display enhancements, increased external and internal interfaces, track management, automatic fire distribution, battalion engagement assignment, identification (ID), and identification, friend or foe, coordination. The MICC ID processes help ensure a common ID throughout the data net. The advantages include automatic ID sharing between battalions, with ICC operators resolving any conflicts resulting from a track's ID governed by the MICC.

During transfer of authority, 5-52 ADA's ICC assumed the role as MICC until the 11th ADA Brigade commander directed 1-44 ADA to its follow-on mission. Transfer of authority criteria included 100-percent communications between the brigade TOC, the brigade ADA fire control officer and both subordinate battalions. Additionally, all

fire units were required to be at the directed alert state. Once all criteria were satisfied, the transfer of authority would be accomplished.

## Transition to Future Operations

The 11th ADA Brigade commander declared the transfer of authority effective at 1940 hours with three out of four 5-52 ADA launchers operational. Upon 5-52 ADA's mission assumption, 1-44 ADA fire units dropped their alert status and march ordered for its follow on mission. Due to the cruise missile threat, the 1-44 ADA Avenger battery was the last unit to drop coverage. The battery began redeploying at 0700 on 26 March 2005. Following the exercise scenario, 1-44 ADA maneuvered north to defend additional CJTF commander's critical assets.

## Conclusion

Roving Sands 2005 provided a unique opportunity to validate relief-in-place operations and exercise MICC/SICC doctrine. It was very similar to missions Patriot units executed during Operation Desert Storm and during Patriot Southwest Asia rotations. During at least the first five years of Patriot rotations, there was a MICC in Dhahran and a SICC in Riyadh. Roving Sands 2005 helped air and missile defense units train to address key kill-chain and airspace control procedures based on lessons learned from Operation Iraqi Freedom.

Within an hour of establishment of MICC/SICC operations between battalions, the transfer of authority occurred in the middle of an enemy attack with 5-52 ADA successfully engaging and destroying an air-breathing target. Teamwork on the battlefield between units proved the concept and made the operation a success.



Major Bryan Adams and Matt Tedesco are the executive officers of 1-44 ADA and 5-52 ADA, respectively.

# V-Corps Patriot Missiles Light Up Israeli Skies in Joint, Combined Exercise Juniper Cobra

by SGT Kristopher Joseph  
V Corps Public Affairs Office



A Patriot missile launched by 5-7 ADA streaks into the Israeli sky during Exercise Juniper Cobra 2005. (Photo by SGT Kristopher Joseph.)

## ISRAEL—You Launch, You Die!

In his memoir, *American Soldier*, GEN Tommy Franks says that Iraqi missile crews learned that lesson early in Operation Iraqi Freedom. On the first day of the war, Patriot missile batteries shot down an enemy Ababil-100 missile headed for the 101st Airborne Division's tactical assembly area. A week later, a Patriot fire unit intercepted and destroyed an Al Samoud missile aimed at the Coalition Forces Land Component Command headquarters. At the same time, Patriot systems computed the probable location of the Al Samoud launch site, and within minutes U.S. Air Force fighters located and destroyed the missile launcher.

But V Corps air defenders know it takes long hours of coordination, planning, deploying and training to make dramatic saves like those happen. Clear proof of that became evident on 12 April 2005 in a thundering climax during the live-fire that served as the climatic event of Juniper Cobra 2005. The fire, smoke and tungsten steel of Patriot missiles pierced the Israeli sky that day, capping the biennial exercise that tests the interoperability of U.S. European Command and Israeli Defense Force (IDF) air and missile defense systems. The exercise also strengthens the ties of security cooperation between Israel and the United States.

The U.S. Army Europe Commander, GEN B.B. Bell, issued a command training guidance that set the U.S. Army's goals for Juniper Cobra 2005. He instructed V Corps air defenders to concentrate on deploying theater missile defense assets into a joint operations area; reconnoitering and occupying real-world battle positions; conducting a Patriot live-fire exercise; and activating a V

Corps-led theater missile defense joint task force linked into a joint-coalition command and control system.

About half of the approximately 1,000 U.S. service members who took part in this third Juniper Cobra exercise came from the headquarters of V Corps' 69th Air Defense Artillery Brigade in Giebelstadt, Germany, and its two Patriot battalions, the 5th Battalion, 7th Air Defense Air Defense Artillery, and the 6th Battalion, 52nd Air Defense Artillery. The corps air defenders were part of a group of American forces deployed by sea and air as a joint task force that included Army National Guard Soldiers and members from both the U.S. Air Force and Navy. These task force members blended their expertise with that of their IDF counterparts for a two-month-long exercise that took nearly two years to plan.

"The premise of this year's Juniper Cobra was to build on the successes and lessons learned in previous exercises and try to raise the bar for this one," explained the joint task force commander, MG Harry Burchstead, who also commands the South Carolina National Guard's 263rd Army Air and Missile Defense Command. Burchstead brought many of his Guard air defenders along to participate in the exercise, making it the first time the 263rd conducted training in a hazardous duty area.

Juniper Cobra 2005 primarily consisted of three specialized phases. The first phase consisted of a 36-hour joint U.S. and Israeli field training exercise in the Tel Aviv area. The exercise focused on marking a launch site, deploying and emplacing missile launchers and establishing communications with the engagement control stations.

The second phase was a computer-assisted command post exercise in which task force members had to react to

simulated ballistic missile attacks. The scenarios challenged U.S. and Israeli air defenders to mesh their missile defense doctrines and make combined split-second decisions.

The final phase was the live-fire exercise. It allowed the joint-combined team to put their hard work and preparation to the ultimate test: engaging and destroying ballistic practice drones.

"Juniper Cobra is like a military laboratory where we can experiment, test and confirm our air defenses with our U.S. counterparts," said BG Ilan Bitton, the Israeli Air Force air defense commander. "Through our shared knowledge and experience, we are more than ever prepared and capable of providing the maximum security for our citizens."

While officials of both nations agree that each has sufficient theater ballistic missile defenses, they also agreed that the shared values, and interests and enormous effort that go into each Juniper Cobra iteration is justified. Indeed, Israel views its theater missile defense capabilities with such importance that it is essentially the only arena of military operations in which the normally self-sufficient Israeli forces conduct extensive training and operations with other nations.

Much of Juniper Cobra's focus is on consolidating the powers of the U.S. Patriot missile, the powerhouse interceptor that quickly became a household word following its first appearances in Operation Desert Storm, and the Israeli Arrow missile. Air defenders from both nations are not shy about singing the praises of the potent one-two punch of the systems working in concert.

"We have a balance," said Burchstead. "The Arrow is designed to destroy missile threats in the upper atmosphere, while the Patriot primarily engages targets in the lower atmosphere, giving us a two-tiered missile defense system."

That successful two-tier defense has been the nucleus of past Juniper Cobra exercises, but this year's exercise marked a step up in missile defense innovation. Before the exercise, U.S. and Israeli missile operators worked in simulators that replicated various forms of debris they might encounter in an air defense battle. For the first time, air and missile defense operators trained to deconflict air debris on their radars and engage any incoming missiles that bypassed initial defenses because of that debris.

Colonel Kirk Lawrence, the 69th ADA Brigade commander and joint task force chief of staff, said penetrating debris to destroy "leakers," enemy missiles that make it past the first tier of defense, is a "potentially ground breaking technique."

Sailors aboard the USS Carney supported the task force with the destroyer's Aegis combat system and SPY-ID radar (an advanced multi-functional phased-array radar), capable of searching, tracking and guiding missiles simultaneously. With the ability to track more than 100 targets at once, the Navy system allowed the Patriot and Arrow operators to see a single, integrated air picture.

Navy officials said that providing support for Juniper

Cobra was an opportunity for the Navy to increase its expertise on many levels as well.

"The Navy's participation was designed to enhance interoperability and develop military-to-military cooperation among the participating countries," said LTJG David Lockett, the Sixth Fleet's deputy public affairs officer. "Very few military operations will be conducted by one service in today's effects based operations. Coordinating with multiple nations and

multiple services is the best way to train to achieve desired effects in a dynamic, real-world environment."

"Working with the U.S. Army for Juniper Cobra 2005 was a valuable experience to me as a SPY radar technician," added Carney crew member Petty Officer 3rd Class Raymond Kinchen. "It stressed not only our functional capabilities, but our hands-on technical experience as well."

The Aegis combat system's new Coalition Network (CNET), a secure computer interface, provided an extra dose of octane to this year's Juniper Cobra by allowing U.S. and Israeli forces to communicate and collaborate seamlessly at all levels. Developed especially for Juniper Cobra 2005, the CNET works much like Internet instant messaging, allowing U.S. and Israeli counterparts to post reports, missile counts, fragmentary orders and any other secure operational information in real time.

While the exercise drills were not much different than what the 69th Air Defense Artillery Brigade would do at home in Germany, Lawrence said, the uniqueness of Juniper Cobra lies in the real-world relevance of the training.

"We are here to help and contribute to [Israel's] defenses," said Lawrence. "We are not protecting some static, impersonal asset. It's a living, breathing city of over a million people. The number-one priority was keeping everything as real as possible for the Soldiers. The Soldiers have become very aware of the unique situation that Israel is in, and they have seen first-hand how seriously the IDF [Israeli Defense Force] is taking this exercise."

Joint chemical training exemplified how much effort went into making Juniper Cobra 2005 as realistic as possible. Combined U.S. and Israeli forces reacted to mock



5-7 ADA's SPC Kellien Johnson (left) and PFC Phillip Thiessen stand guard with Israeli PVTs Dima Flyshman and Max Vizcko.



At left, 5-7 ADA Soldiers prepare to convoy from an Israeli port. (Israeli Defense Force photo). At right, SSG Jesus Herrera of E/5-7 ADA discusses live-fire preparation with SSG Joseph Ben David of the Israeli Defense Force. (Photo by SGT Kristopher Joseph.)

missile alarms by donning chemical protective gear and hustling into bunkers in and around the various IDF compounds. During the field training exercise, launcher crews from 5-7 ADA, backed by the 375th Biological Detection Unit and the Israeli Home Front Command, performed a step-by-step joint decontamination exercise involving a simultaneous personnel and vehicle clean-up in the aftermath of a mock chemical attack.

"After the training and rehearsals, I thought the decon was going to be good, but it turned out to be great," said MAJ Khalil Karadshi, the joint task force chemical officer. Karadshi said a year and a half of planning, training exercise instructors and coordination between the corps and Israeli forces made the decontamination portion of the exercise overwhelmingly successful.

Lawrence said the overall success of Juniper Cobra and the longtime defense cooperation between the two nations was a result of the personal and individual bonds forged during Juniper Cobra 2005 and previous Juniper Cobra exercises.

"The primary factor for our continued success is the relationship of trust that we have established with our Israeli counterparts," said Lawrence. "It makes a huge difference when we are in their culture, meeting each other's family members and going through the streets and seeing the faces of the people we are protecting."

"They are all eager to learn and no different from us in the way they take care of business," said SPC Daniel Smith, a Patriot missile launcher crew member in A Battery, 5-7 ADA, adding that, "I have made a lot of friends and future pen pals working with the Israeli Army."

The success of Juniper Cobra 2005 also depended heavily on support service members from both sides who work behind the scenes to make the exercise happen, said 69th ADA Brigade CSM Bruce Likens.

"They are the ones who kept all of this running," Likens said. "Without the mechanics, medics, signal operators, mail and supply handlers doing their jobs, we could not accomplish our mission."

"It takes a complete team effort for this to work," said Lawrence. "We as planners can pat ourselves on the back

as much as we want, but the plan is only good until the moment of execution."

"We are often on a higher ground of respect in the ADA world, because without us doing our jobs those launchers aren't going to get anything done," agreed SPC Timothy C. Abrams.

After spending two years planning and two months executing Juniper Cobra 2005, task force members looked forward to the live-fire events like kids clamoring for the grand finale of a Fourth of July fireworks show. And they weren't disappointed. The U.S. and IDF crews fired 15 missiles; all 15 hit their targets.

"The live-fire was not only the height of the exercise, it was [the] height of my career," exclaimed SPC Mark Howard of E Battery, 5-7 ADA. It was the first real Patriot launch he had witnessed.

As the U.S. military continues to build coalitions, strengthen international ties and completes its transition from a forward-deployed force to a more expeditionary force, task force officials say the Juniper Cobra exercises provide a road map to success.

"The future of our security lies in mutual cooperation, jointness and interoperability," Luckett said. "Our definition of partnerships is expanding to include nations, navies [other service branches] and other organizations of expertise not traditionally considered. Opportunities such as this exercise are the cornerstones to building productive theater security cooperation efforts."

"It's marvelous the way everyone came together," said Burchstead. "I was thoroughly impressed with the professionalism and enthusiasm of all the services involved."

"Throughout our time together, these Soldiers have done nothing but live up to the outstanding reputation that the U.S. has come to enjoy," said Bitton.

"In Juniper Cobra you get it all in one package," Lawrence concluded. "We are joint, expeditionary and combined. Together we had the vision, we plotted the milestones and when it came time to execute, I am proud to say it was a success."



# Blocking and Tackling

by BG Charles A. Anderson

I always enjoy reading any of the countless articles addressing the Warrior Ethos. Every piece reinforces those four powerful sentences, causing me to consider ways we can make everyday training throughout the Army reflect the Warrior Ethos. The Warrior Ethos combined with lessons learned and observations from the Global War on Terrorism will continue to shape the culture of our Army.

Leaders shape the culture of their units. We can strengthen units by instilling the Warrior Ethos and injecting Global War on Terrorism observations into training. Trainers may easily apply lessons learned in Iraq and Afghanistan with minor modifications suited to their home station. I propose my list of four essentials that capture the Warrior Ethos and a few lessons and observations from Operation Iraqi Freedom and Operation Enduring Freedom. I am not suggesting we abandon common task training; nuclear, biological and chemical training; Warrior Tasks or Warrior Drills; I merely seek to highlight basics important to shaping a transforming force where time is the most challenging resource.

In football, blocking and tackling wins games. Winning games wins championships. Consider the "blocking and tackling" of warfighting that wins engagements. Engagements win battles that win wars. The blocking and tackling of engagement is shooting weapons, preventative maintenance checks and services (PMCS), physical readiness and taking care of one's comrade. These fundamentals, if mastered by units, enhance soldier discipline, confidence and competence. Undoubtedly, competent Soldiers who possess a high degree of discipline and confidence, and are committed to mission accomplishment will perform miracles on the battlefield.

**Shooting.** A Soldier honestly living the "fight tonight" mentality should be confident in carrying, maintaining and shooting his or her assigned weapons. From the 9mm pistol to the Avenger-mounted 50-caliber MP3 machine gun, accurate fire at enemy targets wins engagements. Firing weapons only twice a year will not develop adequate confidence or competence. I offer several suggestions to enhance training.

Carry blank rounds in the field to develop muzzle control and exercise the rules of engagement. Soldiers should carry weapons in accordance with a published weapons control status that defines whether the magazine is in the

weapon, a round is chambered, and if the weapon is on safe or semi/burst. This applied control builds discipline and attacks the problem of a negligent discharge.

The M240B machine gun, M2 50-caliber machine gun, and M249 Squad Automatic Weapon are popular in Iraq and Afghanistan. How many officers and noncommissioned officers carry only the 9mm pistol in combat zones? Not many. Most carry the M4 carbine in addition to the 9mm and a few carry shotguns. Don't limit Soldiers to one weapon. The Engagement Skills Trainer also helps preserve training ammunition stocks.

Learn to shoot from a moving vehicle and while walking, running, turning around and crawling. Close-quarters marksmanship and convoy live-fire exercises incorporate these tasks. The additional planning and safety measures live-fire training requires are well worth the efforts; live-fire training escalates Soldier confidence. Classroom instruction, dry-fire and rehearsals with blank rounds contribute enormously

to crucial skill development.

Conduct drills and exercises in full gear with integrated body armor and small-arms protection inserts (SAPI) plates. Practice muzzle control at every opportunity, shoot and maintain all individual and crew served weapons to shoot on the move, whether in a vehicle or on foot. The better Soldiers shoot, the more engagements we will win!

**Equipment PMCS.** Like shooting weapons, PMCS is a component of blocking and tackling. Equipment must operate as designed, anything less is unacceptable. Just as in the days of the horse cavalry, well-maintained equipment facilitates the ability to move, fight and survive. Disabled vehicles abandoned during Operation Iraqi Freedom were either stolen or stripped. A combination of well-developed assembly area operations programs, PMCS certifications teams and holistic unit service programs develop confident and competent drivers and vehicle commanders.

Weapons PMCS is especially important. Carry weapons technical manuals and cleaning kits to the range and to the field. Clean magazines as well as weapons. In Afghanistan and Iraq, dirty rounds and magazines caused weapons malfunctions. Soldiers soon learned to empty

## Warrior Ethos

I will always place the mission first.

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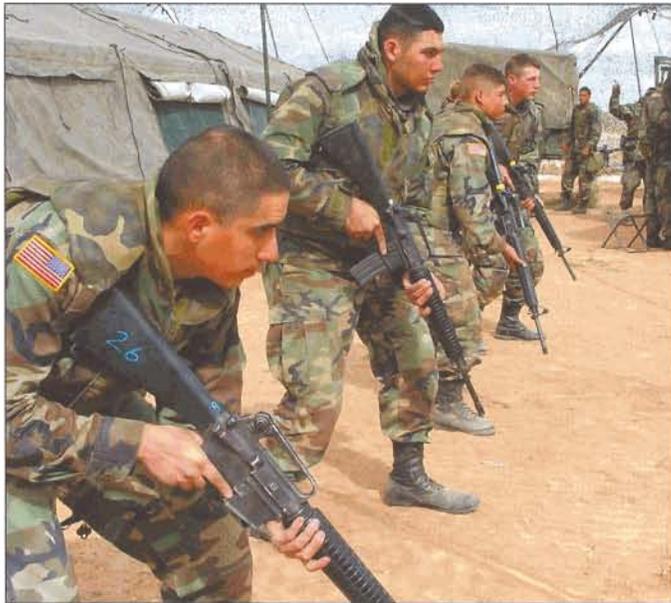
I will never accept defeat.

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I will never quit.

•

I will never leave a fallen comrade.



5-52 ADA Soldiers practice individual weapons skills during Exercise Roving Sands 2005. (Photo by SPC Mark Miranda.)

magazines, allowing the springs to elongate so they could clean both the rounds and the magazines. These habits breed discipline and reduce start-up cost in the event of hostilities.

**Physical Readiness.** Physical readiness programs should balance three components, strength, mobility and endurance. Develop a warrior physical readiness program that precisely replicates the types of physical exertions required in combat. Concentrate on the body's core muscle groups that generate running, crawling, lifting and squatting. Programs are incomplete without military movement drills such as carrying your buddy, short sprints and lateral movement. With the addition of Army Combatives, road marches, rope climbing, log physical training and obstacle courses, the warfighting physical readiness program prepares Soldiers for the long haul.

A campaign-quality unit must survive and operate over long periods in all types of weather and terrain. Programs should accommodate different fitness levels, new soldiers and the injured. Achieving high scores on the Army Physical Fitness Test is important, but high scores are ancillary to a unit's ability to sustain the endurance, strength and mobility required to conduct the activities and tasks of war.

***"I will never leave a fallen comrade."***

**Taking Care of One's Comrades.** The last sentence of the Warrior Ethos is "I will never leave a fallen comrade." This tenet reinforces the buddy system and applies whether Soldiers are in a garrison environment or in a combat zone. The Warrior Ethos requires all Soldiers to strive to be combat lifesavers. Knowing how to apply a tourniquet or pressure to stop bleeding and how to open the airway might buy time to get a wounded comrade to a medical station. Combat lifesaver training is incredibly

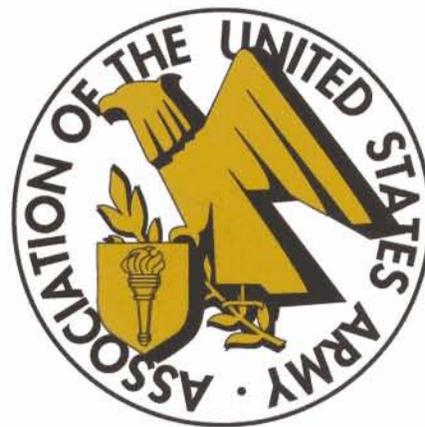
valuable and has saved lives in Afghanistan and Iraq. Expertise in this fundamental makes a Soldier a desirable battle buddy, a teammate who brings added capabilities to the organization.

Our historical experiences show the direct correlation between realistic training and success on the battlefield. We sent superbly trained units into combat during Operation Iraqi Freedom and Enduring Freedom, and they produced quick and decisive victories, but after-action reviews revealed—as they always do—room for improvement. The contemporary operational environment has demonstrated a need to instill the Warrior Ethos throughout the force, not just in "spearhead" organizations. It is every officer's and noncommissioned officer's duty to link every phase of training to the Warrior Ethos. Warrior Ethos-focused training that emphasizes warfare's blocking and tackling assignments—shooting, PMCS, physical readiness and taking care of one's comrades—builds disciplined, confident and competent Soldiers who can adapt to any mission. Collectively, discipline, confident and competent Soldiers build tactically competent units that will excel on the battlefield.



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# IT'S YOUR DAY ADA...

“It’s Your Day ADA ...” are pages set aside for you, the ADA Soldier. Let us know what makes you get up and pull your boots on everyday, share your world with air defenders throughout the branch. Recognize your unit and Soldiers, share a smile, say thanks or just toot your own horn ... we are family afterall!

Send your submissions (short article, photos and/or artwork) along with your full name, rank, unit assignment, email address and phone number to [adamag@bliss.army.mil](mailto:adamag@bliss.army.mil), then check out the next edition of ADA Magazine. The editorial staff will determine use of submissions as space is available.

## ADA Officer’s Humanitarian Efforts Blossom Into Operation Dreamseed Incorporated

Captain Todd A. Schmidt, commander of A Battery, 1st Battalion, 62nd Air Defense Artillery, 25th Infantry Division, Schofield Barracks, Hawaii, saw the deplorable condition of Afghan schools and wanted to make a difference. He came up with an idea to help Afghan schoolchildren that grew into a nationally recognized non-profit organization called Operation Dreamseed Incorporated.



**CPT Todd A. Schmidt, Commander, A/1-62 ADA, Schofield Barracks, Hawaii negotiates with Afghan tribal leaders.**

A simple email message to his mother, Wendy Schmidt, a teacher at Maple Grove Elementary in Greenwood, Ind., planted the seed. Believe it or not,” he wrote, “even with three feet of snow in this remote, mountainous village of Nele Zaragak in the Ghor Province, many of the children are without shoes.”

Schmidt asked his mother to urge her students to donate clothing and school supplies for Afghan students caught in the crossfire of war. Virtually the entire student body responded. Soon care packages began arriving from other generous state-side supporters, along with messages asking the troops what more they could do to help.

**Dreamseed Soldiers from A/1-62 ADA deliver school supplies to children in Kandahar, Afghanistan.**



Schmidt and Soldiers from A/1-62 ADA cultivated the seed and nurtured its growth by sending back pleas, not for themselves, but for the children of this war-torn region.

Thus, Operation Dreamseed pushed through the dirt and sprouted its first leaves. Assistance poured in from the most unlikely sources—a large New York City law firm, a Chicago philanthropist, a Houston middle school, a Beverly Hill investment consulting firm and many others.

In December 2004, Dreamseed sponsored its first large-scale event, the “I Choose Freedom” speech contest in Kandahar. The contest drew 2,500 Afghan students and thousands of parents. One student spoke of a poem she had written comparing freedom and democracy to emerging from a cocoon. Each child received a backpack stuffed with school supplies contributed by compassionate Americans throughout the United States. As Dreamseed bloomed, it took on an expanded mission that continues to evolve, providing basic school supplies, renovating schools and classrooms and establishing an exchange program between Afghan teachers and institutions in the United States. Soldiers of the 82nd Airborne Division, which replaced the 25th Infantry Division in April, are continuing Operation Dreamseed.

“If you have a generation of kids that realize the importance of education, to me, that’s an investment in the future. We Americans need to foster those seeds of hope. This is a marathon, not a sprint,” Schmidt said.



**Operation Crayon Soldiers from B/1-62 ADA assemble school supplies for children in the Kirkuk, Iraq area.**

In a similar effort in Iraq, Soldiers from B Battery, 1st Battalion, 62nd Air Defense Artillery, 2nd Brigade Combat Team, 25th Infantry Division, delivered hundreds of individually packaged school supplies to schoolchildren in Kirkuk, Iraq, and surrounding towns as part of Operation Crayon. Operation Dreamseed and Operation Crayon are just two of the many humanitarian missions carried out by ADA units deployed to Afghanistan and Iraq.

## Chicago Cubs Welcome ADA Guard Members Home from Iraq

Recently returned from a year in Iraq, members of F Battery, 202nd Air Defense Artillery, Illinois Army National Guard, proudly carried the American colors onto Wrigley Field prior to the Chicago Cubs home opener against the Milwaukee Brewers. Sergeant Mark Stach, F/202 ADA, was one of three Soldiers selected to throw a pitch from the mound.

Listening to Cub’s games on Armed Forces Radio while stationed at Camp Victory North in Iraq had provided F/202nd Soldiers brief respites from nerve-racking missions. “Eight hours, that’s all it took for our unit to face the reality of war,

and it only got worse from that day on," recalled MAJ Mike Kessel, the battery commander. "We did a lot of fighting."

Initially met by a shower of bullets from Iraqi insurgents, the unit spent much of its deployment patrolling a two-mile stretch of road leading from Baghdad International Airport to the Green Zone, the heavily guarded area of closed-off streets in central Baghdad where U.S. occupation authorities live and work. The U.S. State Department designated Baghdad's Airport Road the most dangerous two miles in Iraq, and patrolling "Ambush Alley" was one of Operation Iraqi Freedom's most dreaded assignment. Remarkably, all the battery's soldiers returned home alive, and one came back from the brink of death. Sergeant Dusty Hill, was severely wounded when a suicide bomber detonated his vehicle near Hill's Humvee. Hill is still recuperating at Brooke Army Medical Center in San Antonio, Texas. In June 2005, an Illinois television station broadcast a one-hour special titled "Dusty's Miracle: A Soldier's Story" about his struggle to overcome traumatic injuries. Kessel spoke highly of his men, calling them "heroes." About a fourth of them received Purple Hearts. Kessel noted that the battery's wounded soldiers were more afraid of being taken out of the battle and sent home than they were of completing their mission in Iraq.

These Soldiers really know how to play ball!



Soldiers from F/202 ADA display Cubs loyalty. (Kneeling l-r) SPC Chase Price, SGT Dan Brokaw, SGT John Kreps, SGT Mike Finney, and SGT Mark Stach (standing l-r) SGT Josh Newman, SGT Michael Maddolozzo, SPC Seth Malcolm, SPC Nathan Kull, SPC Paul Calhoun, SPC William McDaniels, SPC Tim Bowman, SGT Tyler Anderson, SGT Ryan Peterson, SGT Tommy Brock, and SPC Todd Kavran.



SSG Quinnus Caldwell of C/2-44 ADA, Fort Campbell, Ky., knows full well the Warrior Ethos, "I will never leave a fallen comrade." Seen here with CPT Christopher D. Brough and 1SG James Brazill, Caldwell proudly wears his Soldier's Medal.

## Blackhawk Down, Air Defender to the Rescue

Staff Sergeant Quinnus Caldwell of C Battery, 2nd Battalion, 44th Air Defense Artillery, 101st Airborne Division (Air Assault), earned the Soldier's Medal by rescuing the crew of a downed UH-60 Black Hawk Helicopter in Iraq. While on his way back from picking up long over-due mail for his platoon, Quinnus spotted a Black Hawk helicopter on the horizon. A few moments later, Caldwell heard a loud explosion. Turning in his seat, he saw a fireball on the ground below where the helicopter had been. He immediately turned his Humvee around and sped across the desert to render aide.

First on the scene and without regard for his personal safety, Caldwell began dragging Soldiers from the downed helicopter, returning to the burning remnants of the Black Hawk on no less than six separate occasions, ensuring that no soldier was left behind. Although most crewmembers sustained only minor injuries, he took great care not to aggravate the severe injuries of the pilot and co-pilot while ensuring their safety. Caldwell called upon greater inner strength to extricate the crew chief, who was trapped under debris from the burning wreckage.

In true heroic fashion, SSG Caldwell said, "I did what any other Soldier would have done for another; it was instinct what I did and the most gratifying moment of my career [so far], but I just did my job, and that is what I take the most pride in."



The Soldier's Medal acknowledges service members who distinguish themselves by an act of heroism, involving personal hazard or danger and the voluntary risk of life under conditions not involving actual conflict with an enemy.



*I could hear Marines shouting "incoming"... then I heard the Patriot missiles launch, five seconds later the explosions followed by a roar of jubilation.*

—SFC Geoffrey W. Oliver, HHB/108th ADA Brigade

*We were finally doing what every radar team had dreamed of, providing a digital air picture through the FAAD equipment, MODE 4 validation, a shared early warning picture with elements of the Patriot units and mastering the "leap frog" affect.*

—SSG John S. Brown Jr., A/1-3 ADA

*What I found to be most difficult was the fact that my Soldiers were left in the hands of others ... my only choice was to trust other NCOs to take care of my Soldiers.* —SSG Luis E. Cruz, A/3-4 ADA

*We headed into Iraq feeling the whole spectrum of human emotions, we did not know what to expect ... when you have 20 Apache helicopters escorting you in country, you feel pretty safe.*

—SSG Bob J. Gonzalez, D/2-44 ADA

*I am proud to have served in Afghanistan. I am sure my kids and grandkids will be proud that their father was the first Chaviera family member to serve in a war for the United States of America.* —SSG Daniel J. Chaviera, I-62 ADA



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Visit our website ([firststofire.com](http://firststofire.com)) and use our secure Online Membership Form to join the ADA Association.

**For More Information on the ADA Association:**

Call 915-568-2711, email us at [fanninge@bliss.army.mil](mailto:fanninge@bliss.army.mil), or write to the ADA Association at P.O. Box 6101, Fort Bliss, TX 79906



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