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Fires

Fighting Fires:
Enabling Maneuver

A review of the topics that will be discussed and presented during the upcoming 2016 Fires Conference.

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FIGHTING FIRES: ENABLING MANEUVER

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Disclaimer

Purpose

Originally founded as the Field Artillery Journal, Fires serves as a forum for the discussions of all Fires professionals, Active, Reserves and National Guard; disseminates professional knowledge about progress, development and best use in campaigns; cultivates a common understanding of the power, limitations and application of joint Fires, both lethal and nonlethal; fosters joint Fires interdependency among the armed services; and promotes the understanding of and interoperability between the branches, all of which contribute to the good of the Army, joint and combined forces, and our nation.

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Brigadier General Christopher L. Spillman
Commandant of the U.S. Air Defense Artillery School

ADA Professional Military Education Transformation

As we approach the Army of 2025, the Air Defense Artillery branch must contend with a rapidly changing and increasingly diverse air threat and it must prepare for fielding of transformational air and missile defense capabilities.

To prepare for this change in the ADA force, we must assess our current education and training methods, determine future requirements and define training and education capability gaps in our initial entry training and professional military education. We are rebalancing our noncommissioned officer education system in order to better prepare NCOs to serve as the primary trainers of Soldiers and units. Our officer education system will transform to leverage the principles of talent management, transition from a task-based to an outcome-based education and provide greater depth in training and education for our warrant officers, in response to the functional alignment of those military occupational specialties (MOSs).

NCO Education System

We are rebalancing the curriculum of our Advanced and Senior Leadership courses (ALC and SLC), retaining the critical common core tasks, but returning to the practice of focusing on skill level 30 and 40 tasks for our career management field (CMF) 14 series noncommissioned officers.

Mastery of their MOS at the current skill level will be a key determinant in an NCO's eligibility to attend ALC and SLC. CMF14 must review and understand skill level 20 and 30 tasks, prior to arriving at ALC and SLC in order to meet the challenges of the new NCO Education System curriculum.

Officer Education System

The Office of the Chief of Air Defense Artillery and ADA officers assignment managers at the Human Resources Command will collaborate on accessions requirements and operational force manning requirements with the Human Resources Command. This will permit the ADA School to provide assignment-based education to lieutenants and captains who attend the Air Defense Basic Officer Leadership Course and the ADA Captains Career Course.

Lieutenants expecting to serve in the Army National Guard and active-duty Avenger or C-RAM units will concentrate their studies on these weapon systems, while the remainder will receive instruction on the Patriot Air and Missile Defense system. Each of these officers will be qualified at the Table IV level as tactical control officers upon graduation. Prior to attendance, each officer will undergo an assessment of their skills, knowledge and competencies, which will further aid the course cadre to tailor the officer's education to their unique professional requirements.

Air Defense Artillery warrant officers will receive greater depth in technical and tactical training and education related to Army Integrated Air and Missile Defense systems integration, air-battle management and training standardization and systems support functions. We have collaborated with the Army University, Fort Sill educational services officer and regionally accredited two and four-year colleges to create and offer cooperative degree programs.

Our warrant officers will earn college credits for successfully completing their military education courses, which they can apply towards completing undergraduate and graduate degrees and civilian certifications related to their specialties. In the end, this transformation in education and training will better enable our branch to develop a joint and combined arms capable air defense artillery warrant officer cohort of trusted professionals with technologically agile, adaptive and innovative leaders who maintain Army integrated air and missile defense capability overmatch and reduce logistical demands for Force 2025 and beyond.

As I transition to my next assignment, I can confidently say the ADA branch is on the right path to meet the challenges of the rapidly changing and increasingly diverse air threat. Our NCOs will be better prepared to serve as the primary trainers of our Soldiers and units, our company grade officers will receive assignment and outcome-based education, while our company grade and junior field grade warrant officers will receive unprecedented depth in functional education and training. It has been my distinct honor to serve as the Chief of Air Defense Artillery and Air Defense Artillery School Commandant, and to lead the branch's transformation in how we train Soldiers, leaders and units, as we prepare to meet the requirements of the Army of 2025 and beyond.

First to Fire!

Brigadier General William Turner
Commandant of the U.S. Field Artillery School

Join the Field Artillery for the 2016 Fires Conference

This year's Fires Conference is almost upon us. Like conferences of years past, this is a tremendous opportunity to gather and discuss various topics that are important to the Fires community. This year, the plan is to focus on the integration and delivery of Fires to enable Maneuver. I am confident this will generate discussions on how to conduct effective targeting, deliver Fires to defeat the enemy, preserve freedom of action and train our future leaders to best integrate Fires with Maneuver.

It is important that the Field Artillery stays in the hip pocket of Maneuver. In the past year, for the Field Artillery this has meant getting our Division Artillery (DIVARTY) force structure re-implemented. To summarize, the plan was to let our DIVARTYs shore up two recognized disadvantages; the need for division executed operational-level Fires and the need for trained and ready Fires formations to brigade combat teams (BCT).

I can tell you we have brought a lot of energy and vigor into developing standards across the FA branch, and we are improving daily. We are accomplishing this by instituting standardization letters and redbooks. There is power in consistency and standardization provides consistent training results.

It's one thing to generate standards, but it's quite another to enforce them. We are enforcing standards by providing mentorship, direct oversight and evaluation. This is nothing new, but we are refocusing our

efforts, reenergizing peer-to-peer mentoring and competiveness and continuing to provide challenges to our young officers and noncommissioned officers so they can better learn their profession.

These efforts do not stop with our DIVARTYs. Our FA brigades and battlefield coordination detachments (BCDs) are also playing a substantial role in improvements. Across the FA branch, maintenance and readiness have improved significantly. From Korea to Afghanistan, our FA brigades, DIVARTYs and BCDs are in the fight.

This is the bottom line: DIVARTYs are the Fires integrators for the division and BCT commanders. Through stringent training and certification programs they ensure standardization across the division in the employment of Fires assets. Their success is incumbent on building strong relationships across the division and with joint Fires resources to ensure the Fires teams deliver over-match to the division and BCT commanders.

FA brigades are providing integrated FA capabilities to the corps, joint task force and the joint force land component commanders. They are providing reinforcing capabilities to divisions by employing joint and Army Fires. FA brigades and DIVARTYs are focusing on the conduct of operational Fires, including the fusion of sensors and intelligence assets to support the targeting process. Close-support Fires are being planned, coordinated, integrated, synchronized and conducted by BCT FA battalions.

Our BCDs are serving as a bridge between the senior U.S. Army headquarters element and the senior Air Force headquarters in each respective U.S. combatant command or theater of operations. Our BCDs enable the coordination of Army-Air Force mission command, fire support, integrated air and missile defense, intelligence sharing, airspace management and airlift. Additional space, cyber and electronic warfare augmentation allow each BCD to further enable the designated Army force commander across the complete spectrum of warfare.

It is unquestionable, we have the most combat tested and experienced force today than at any time in our nation's history. Our FA leaders and Soldiers have performed and continue to perform magnificently in numerous combat missions.

Our training, education and combat experiences are a proven recipe for success, but I am sure there is more we can do to ensure Maneuver commanders have everything they need to not only exploit the initiative, but maintain it.

What more can we do as a part of the Fires force to ensure the future of Fires and our capabilities to support strategic land power? This discussion is bound to be lively and original, with a broad mix of leaders having a professional dialogue. Please join us.

Registration for the conference will open soon, but begin preparing now to either attend in person if you receive an invitation or log in through Defense Collaborative Services. We look forward to seeing and hearing from everyone this year.

King of Battle! Fires Strong!

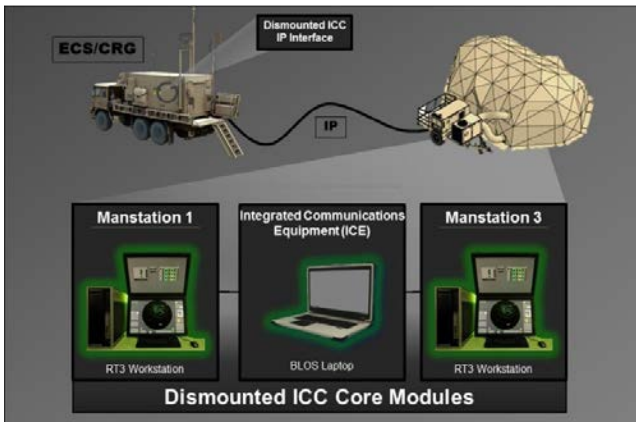
Dismounted Patriot Information Coordination Central

Provided by TCM AAMDC

The Dismounted Patriot Information Coordination Central (DPICC) is intended to provide a low-cost, urgent materiel release, Army Integrated Air and Missile Defense (AMD)-like deployment flexibility solution in the interim to the fielding of Integrated Air and Missile Defense Battle Command System. With DPICC, the AMD commander would be able to immediately reduce stress on the Patriot force by employing the DPICC in a consolidated tactical control, flexible task organization or streamlined multi-echelon control.

The DPICC is often referred to as the Information Coordination Central in a box, because of its portability. The planned major components of the DPICC are a Reconfigurable Table Top Trainer computer, map interface card and the portable beyond-line-of-sight computer that was originally programmed to field with Post-Deployment Build 8. Funding is currently being pursued to purchase five DPICC sets of equipment and to support further development, testing and fielding requirements.

Courtesy illustration depicting a Dismounted Patriot Information Coordination Central System. (TCM AAMDC)



Army Integrated Air and Missile Defense System uses Sentinel radar data for target intercept

Provided by TCM AAMDC

As part of the testing program for the Army Integrated Air and Missile Defense System (AIAMD), the Integrated Air and Missile Defense Battle Command System (IBCS) executed an effective launch-on-remote engagement Nov. 12, 2015. A cruise missile surrogate, launched at defended assets, was initially masked to the Patriot radar. The IBCS-enabled improved Sentinel radars acquired the target and reported it to the IBCS engagement operations center (EOC). The EOC then launched a Patriot Advanced Capability-3 missile off the composite track data and successfully engaged and destroyed the target.

This flight test was a significant milestone in the developmental test program for the AIAMD. This test, executed at White Sands Missile Range, N.M., demonstrated the system's ability to integrate multiple sensors to generate a firing solution that produced a successful intercept. This is a significant capability that was not previously available to the warfighter and is just one of the many capability enhancements that IBCS will deliver in the future.

From Shore to Sea

Ground-Based Support of the Sea Battle

By Capt. Colin Marcum

As far as foreign policy goes, the United States has a variety of situations with which it has to contend. The barbarous activities of the Islamic State, Russian support of Ukrainian separatists, the Ebola virus in West Africa and abroad, Israeli settlement expansion and the rise of Chinese regional influence have the government's attention drawn to the four corners of the earth. That being said, there is only so much time available for civilian officials to dedicate toward military studies, and as a result, there is a certain amount of trust placed in the Army to advise them on best courses of action.

While most of these strategic-level discussions are promulgated by the Joint Chiefs of Staff, combatant commanders and a plethora of special staffs and boards, that isn't to say their discussions of joint matters can't benefit from contributions by operational and tactical-level service members.

One such discussion is on the anti-access/area denial (A2/AD) threats affecting the freedom of maneuver of not only friendly military forces, but non-military organizations and their assets as well; Malaysian Airlines Flight 17 is proof of that. The president identified the safeguarding of the global commons as a key global challenge to which the U.S. would have to work in tandem with other nations in order to accomplish.

In the 2010 National Security Strategy, President Barrack Obama said, "The United States will continue to help safeguard access, promote security and ensure the sustainable use of resources in these domains. These efforts require strong multilateral cooperation, enhanced domain awareness and monitoring and the strengthening of international norms and standards. We must work together to ensure the constant flow of commerce, facilitate safe and secure air travel and prevent disruptions to critical communications. We must also safeguard the sea, air and space domains from those would deny access or use them for hostile purposes."

To the layman, A2/AD may appear to exclusively affect the Navy and Air Force, who by their ability to project power over significant range is immediately impacted by these systems, but due to the varied nature of these threats all services can be impacted either directly or indirectly. The destruction of a Department of Defense satellite by an enemy anti-satellite missile can be detrimental to command and control of ground-based forces, and an electrometric pulse weapon can disrupt, degrade and defeat unshielded systems. Beyond a single service's concerns, viewing the operational environment holistically, success or failure to operate in one domain can create second and third-order effects on others. An enemy anti-ship missile battery may be of no direct concern to the Army, but it is to the Navy and Marines whose ability to project power may be hindered, limiting the extent to which the Army can conduct its mission in a joint environment. In the hands of adversaries these A2/AD capabilities, therefore, pose a concern to the entire joint force.

In 2009, to contend with this threat the Navy and Air Force were directed by the secretary of defense to develop an approach to defeat it. The Air-Sea Battle Office was established as a result, and from it the Air-Sea Battle Concept was created and approved by the Department of Defense. The concept focuses on defeating A2/AD systems through the use of military platforms; primarily those of the Navy and Air Force, targeting critical infrastructure and command and control nodes. While the leaders of landpower forces don't necessarily refute the viability of Air-Sea Battle as a concept, there have been concerns voiced over the diplomatic and military second and third-order effects of its adoption. This article seeks to present those concerns to sister services, provide an alternative standing strategy that will achieve the United States' desired end-state more effectively and how landpower can support that strategy.

*Note: In January of 2015, the Department of Defense renamed the concept from Air-Sea Battle to the Joint Concept for Access and Maneuver in the Global Commons (JCAM-GC) in order to make

it more inclusive to the landpower forces; Army, Marines and Special Operations Command. That being said, on the surface there appears little to change from Air-Sea Battle to JCAM-GC as of yet. As a result, for the remainder of the article the concept will continued to be referred to as Air-Sea Battle.

Air-Sea Battle from a Landpower Perspective

Air-Sea Battle (ASB) provides the joint force the ability to project power by providing it a concept to defeat the enemy's A2/AD capabilities. If the United States seeks to pressure a major competitor or regional threat through the use of the military arm of national power, then ASB is needed as a credible opening move.

"ASB is a limited objective concept that describes what is necessary for the joint force to sufficiently shape A2/AD environments to enable concurrent or follow-on power projection operations," said Obama.

From the perspective of the ground-side of the joint force, the Army doesn't deny its viability, truth be told, should they need to project power into an A2/AD environment they will need ASB to set the conditions for future operations. The problem the ground component has with ASB is not the concept itself, but with those in the defense community and the capitol that dictate military policy.

The first criticism is in relation to those who seek to reduce the defense budget where possible in order to free up capital for other projects. ASB is a joint concept and for many policy makers that means reduced expenditures as the assets and capabilities of multiple services are coordinated, synchronized and complimented through action, reducing the overall costs required of the services compared to an environment devoid of that cooperation. It purports to defeat an enemy A2/AD capability through an effects-based approach to operations (EBAO) which is a means to an end; however, for some of those policy makers a successful ASB operation is an end in and of itself. If the United States can open up an enemy to unfettered attack then they can compel the adversary to fulfill their will, a very Clausewitzian perspective, but only if there is a significant follow-on force to induce them to do so.

ASB was designed to shape the conditions necessary for the joint force to project further and with more varied power into a previously restrictive and limited operational area. In order to make ASB a deterrent in its own right, there needs to be a credible follow-on force to exploit it. Naval blockades, amphibious landings, airborne operations and constant air attacks against critical military infrastructure; alongside other elements of national power, will be the compelling force that induces the enemy to the U.S.'s terms. Without these types of follow-on operations, an adversary simply must weather the initial attack until they are either compelled to submit to terms after constant duress or this country is compelled to cease operations due to ramifications of the continued effort.

The NATO Air and Missile Campaign against the forces President Slobodan Milosevic, Operation Allied Force, was the only military action required to be brought against the Federal Republic of Yugoslavia before Milosevic agreed to NATO terms. The operation seemed to herald a time in which the projection of strategic power alone could achieve our

national interests without great commitments and loss of life; the perception of a perfect or bloodless war. Though, the Supreme Allied Commander Europe Gen. Wesley Clark, commented on what he thought convinced Milosevic to cease.

"As I reflected on why Milosevic surrendered, I came to see a combination of factors at work: the impact of the air campaign, which, though measured, was steadily expanding and which Serbia was incapable of resisting; the threat of a ground invasions, which the Serbs could see building rapidly around Yugoslavia, with the strength of Task Force Hawk and the forces coming into KFOR."

He surmised that Milosevic could have persisted until public opinion turned against NATO, but when the possibility of a ground-based operation was becoming a genuine threat to his administration, he submitted. Thus, while Clark may have found the initial campaign necessary, it was not the cause of capitulation, only a factor in it. Through this perspective, the success in the Balkans was the simultaneous application of strategic airpower and the operational readiness of ground forces.

Again, the ASB Office understands this need for credible follow-on operations, but the handful of those in the defense community that do not understand the capacity of an adversary to persevere may look at historical examples in an attempt to promote strategic power projection as the de facto option for similar scenarios. They unintentionally misinterpreted the use of strategic air power as the cause of victory instead of a mere correlation; though it was vital. They are able to focus resources for supporting ASB while diminishing the joint forces' capacity to conduct other operations, and while this will strengthen the ability to disrupt, destroy and defeat an adversary's capabilities, the concept loses its deterrent value unless the U.S. can follow it up with other joint force operations that exploit its success.

The other criticism voiced about the defense community's preoccupation with ASB is that it appears to be less of a long-term deterrent to war and more of a gradual escalation towards hostilities. As stated within the unclassified ASB summary from May 2013: "While ASB is not a strategy; it is an important component of DoDs strategic mission to project power and sustain operations in the global commons during peacetime or crisis. Implementation of the ASB concept, coordinated through the ASB Office, is designed to develop the force over the long-term, and will continue to inform institutional, conceptual and programmatic changes for the services for years to come."

Due to the forward staging of counter-A2/AD capabilities, in order to execute an effective ASB operation, this will require continuous assessments about the operational environment to determine whether it can still successfully conduct that mission, or require additional assets or upgrades to that existing force in order to maintain that necessary edge. Every additional enemy A2/AD asset deployed within an enemy's territory may require changes to the existing force structure, and improvements in enemy capabilities may require further improvements in U.S. capabilities to oppose them. In order to maintain an effective deterrent; however, our forward deployments are purposely overt, and as a result, the enemy can develop a generalized idea of how the U.S. will counter their capabilities. This will naturally lead them to attempt to prevent this by possibly fielding greater numbers of A2/AD assets, as well as, developing

The first island chain perimeter, marked in red, refers to the first chain of major archipelagos on the East Asain mainland coast. (Rick Paape)

newer systems and/or upgrading existing ones. In the end, the United States and an adversary will be locked in an arms race between A2/AD and counter-A2/AD capabilities which can become a significant economic draw on the nation's budget.

When the Department of Defense accepted ASB as a viable concept in the 2010 Quadrennial Defense Review, China was called out as a major A2/AD actor which would have the potential to limit or restrict U.S. ability to freely operate throughout the Pacific. The document calls for the development of a list of recommendations to counter A2/AD capabilities; one of which is the ASB concept. Naturally, some Chinese feel irked at what appears to be the United States' attempt to contain the rising strength and influence of their nation through the rebalance to the Pacif-

ic and the ASB concept. Even though this isn't the desired intent; the United States' being to maintain regional stability and protect allies, it creates the potential for rivalry which can create an environment where a small incident, which could have been managed diplomatically, escalates out of control.

Additionally, standing ready to execute ASB will inherently require the United States to shoulder the lion's share of the assets regionally. Taking China as an example, regional allies and partners are focused on fielding capabilities to prevent foreign power projections into their own sovereign territory, and not necessarily focused on defeating other nations' ability to do the same. Arguably, the United States is one of the few countries whose economic and military strength permit it to do so, and therefore, America would be going into a hornet's nest alone in an attempt to defeat it.

So from the landpower's perspective these are the five issues with the defense community's sole focus on the ASB concept:

- Emphasis on purely standoff capabilities
- De-emphasis on human engagements
- Limited landpower involvement
- Escalatory in nature
- Limited allied/partner cooperation

Again to reiterate, landpower doesn't have an issue with the ASB concept, only that policy makers directing the Department of Defense to establish it as U.S. standing strategy (predominantly in the Asia-Pacific region) are treating it as a panacea to dealing with rival regional powers. That being said, is there another concept or strategy that can support the desired end-state while simultaneously correcting the issues the ground component have identified at fault with a purely ASB-focused plan? And can the landpower, in turn, provide a capability to the Navy and Air Force that it couldn't do under ASB? The next section will hopefully convince the defense community of another course of action that will do just that.

War-at-Sea Strategy

In an article for the Naval War College Review, retired U.S. Navy Captains Jeffrey E. Kline and Wayne P. Hughes, Jr. discussed an intermediate strategy for the Pacific, and it is through this strategy the U.S. may be able to find a solution. In "Between Peace and the Air-Sea Battle" they suggested the standing strategy for military engaging the People's Republic of China should be that of War-at-Sea (WAS). Instead of countering A2/AD capabilities by way of the ASB concept, WAS flips that around through the deployment of U.S. A2/AD assets to counter their projection of power. It takes the fighting out of sovereign Chinese ground, sea and airspace, and instead focuses on contesting the freedom of operations within the East and South China Seas and the first island chain; an abstract boundary that extends from the Korean Peninsula through Japan towards the Philippines and Malaysia then upwards toward the coast of Vietnam.

Focusing on defending the first island chain from Chinese power projection, instead of projecting power into China, means the United States will be able to leverage the A2/AD capabilities of allies and partners who developed such capabilities in response to the same threat. This improves the nature of cooperation between the United States and partner nations as the elements of national power

combine to deal with a mutual concern. A shared policy in contending with the strength of China amongst the United States and friends in the region will naturally pose a greater deterrent than America going it alone.

By avoiding projecting power into China, WAS provides the United States a less escalatory strategy for two reasons. First, because it focuses on defending the first island chain, as opposed to defeating Chinese A2/AD assets, it can establish a "line in the sea" by which Chinese may not project across. This allows the Chinese government to grow its military capabilities within the chain while not militarily or diplomatically feeling the United States is preventing them from developing their own defense capabilities. Second, should hostilities ensue and the initial engagement is complete, WAS provides a strategic separation between China and U.S. partners that allows diplomatic forces an opening for negotiation. As stated by Kline and Hughes, "A war-at-sea strategy, however, affords time for passions to cool and opportunities for negotiation in which both sides can back away from escalation to a long-lasting, economically disastrous war involving full mobilization and commitment to some kind of decisive victory."

Additionally, WAS allows for greater shaping of the strategic environment through the use of various ways and means available to the joint force. Should it be necessary, the United States can impose economic sanctions against China while U.S. Navy and maritime partners, blockade important sea lanes to ensure they are enforced. It sets the conditions necessary to place the U.S. in a position of advantage against foe, and if still necessary, prepare to execute tenets of the ASB concept by degrading, defeating and destroying their A2/AD capabilities.

This strategy provides a greater degree of flexibility for the United States to employ its means to shape the region, and work with its partners to peacefully handle the rise in Chinese power and influence. That being said, how can landpower support the Navy's mission within the Pacific, and for that matter elsewhere, under a WAS strategy? The following section will provide what may be a capability to which land forces, predominantly the U.S. Army, can provide for sister services.

Supporting the Sea Battle from the Shore

Engaging targets at sea via shore-based weapon systems is nothing new for the Army. From the beginning of the 20th Century up until the Korean War, the United States Army Coast Artillery Corps was an active branch providing coastal and harbor defense for this country. With the advent of long-ranging firepower; through rockets and missiles, and far-ranging aircraft, the coast artillery's shore batteries were deemed obsolete, its batteries were all restructured as anti-aircraft artillery and the coast artillery ceased to exist as a branch. From that point forward, the Army and the Department of Defense had upmost confidence in the ability of the U.S. Navy and Coast Guard to defend the shores, and the Army's budget was shifted towards higher priority development.

While coastal artillery organizations deactivated, international partners, adversaries and third-party nations continued to develop and field more advanced

International Coastal Artillery Weapon Systems

RBS-15

Sweden

Range: 200 km
Speed: 0.9 Mach

BrahMos

India
Russia

Range: 300-500 km
Speed: ~2.8 Mach

Type 88 SSM

Japan

Range: 150 km
Speed: 0.94 Mach

YJ-62

China

Range: 280-400 km
Speed: >0.9 Mach

M40 Exocet

France

Range: 72 km
Speed: 0.92 Mach

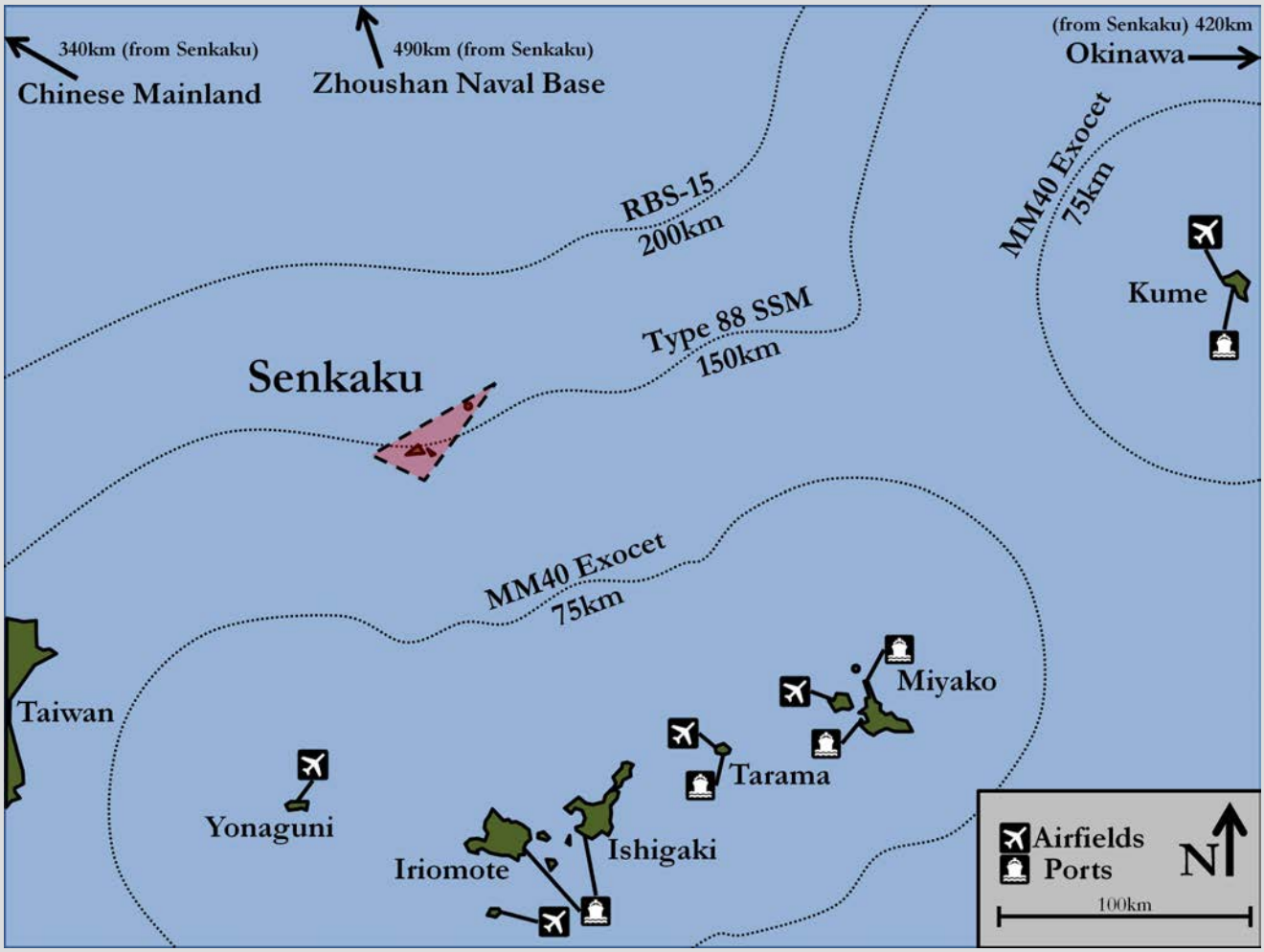
ground-based, anti-ship missile systems. When batteries of these systems are deployed, they have the capability to create mobile pockets of A2/AD extending from the shore to the sea. Some ground-based anti-ship missiles are variants of air-to-surface versions, such as the Japanese Type 88 Surface-to-Ship Missile, while the French developed the Exocet to launch from land, ship, rotary-wing and fixed-wing vehicles. The Swedes are still developing, fielding and exporting variants of the RBS-15 which not only engage naval vessels, but land targets as well. These missile systems represent a class of short and medium-range, subsonic, anti-ship missiles that are relatively cheap, and can deny movement through key straits and passages as well as hinder maritime and amphibious operations near protected coastlines. Conversely, the expensive, long-range, supersonic anti-ship missiles; such as the Chinese YJ-62 and the Russo-Indian BrahMos can interdict high value targets hundreds of kilometers from shore, and, in some cases, cross seas to target enemy ships docked in their home ports.

(Insert Exocet, Type 88, RBS-15, YJ-62, and BrahMos pictures; possibly as an inset on the side)

Should the Army invest in such capabilities, it would be able to assist the Navy in protecting and blockading vital sea lanes from an adversarial fleet, while simultaneously providing the United States the ability to strike at that fleet prior to being engaged directly. Land-based anti-ship missile batteries are highly mobile and concealable, and can be bunkered at strategic maritime chokepoints only to emerge when needed. In a technical report from the RAND Corporation they remarked that, "an inexpensive truck-mounted missile launcher in an Indonesian jungle is considerably more difficult to locate and attack than an expensive naval warship patrolling the approaches to the Strait of Malacca – and yet both could contribute to blockade objectives." When ground-based assets can be stationed at those vital sea avenues, U.S. naval assets are free to maneuver throughout the region without necessarily losing control over them.

An additional benefit of having numerous inexpensive anti-ship batteries on hand comes from the ability to penetrate an enemy ship's defenses. A synchronized volley of missiles can saturate a target vessel, and overwhelm their short-range air defense (SHORAD) and close-in weapons systems. The launchers can exhaust their racks/pods-worth of missiles, and move out prior to being engaged themselves. Once out of danger, they can reload and possibly re-engage from new locations if necessary. Success can be further improved through coordination with land or carrier-based anti-ship aircraft in order to attack targets from multiple avenues. This would destroy, or at least attrit, the enemy fleet enough for them to either reluctantly withdraw or become engaged with U.S. fleet under less than ideal circumstances.

To effectively defeat an anti-ship missile battery they must be circumvented entirely; either through another sea lane or projected power through the air, or destroyed, neutralized or suppressed in a piecemeal fashion. For example, they could attempt to destroy them through the use of standoff weaponry; however, that may prove difficult due to their mobility and the natural cover and concealment of the terrain in which they operate. An adversary may attempt to execute an amphibious landing, heliborne insertion or airborne paradrop in order to close



In this illustration provided by Capt. Colin Marcum, anti-ship missile ranges located on the Senkaku Islands, Japan, are highlighted in red. (Capt. Colin Marcum)

with and destroy batteries with ground forces, but that would commit a considerable amount of resources and manpower to execute effectively. Moreover, risk of losing those forces while fighting friendly security elements may also prove too costly for them. Lastly, they could employ passive or active electronic warfare capabilities and assets to protect their ships and/or defeat radars' ability to track them.

To develop the doctrine, build up the organizations, design the training, field the materiel, grow the leadership, train the personnel, and build the facilities necessary to bring this new form of coastal artillery to the U.S. Army will indeed take considerable time and money. The Army however, has current capabilities to which it can support the joint force in the form of the successor to the coastal artillery; the air defense artillery. The ADA currently has deployed Patriot and Terminal High Altitude Area Defense (THAAD) batteries to critical areas of national interest; to include Turkey, Israel, Guam and Japan. While these forces are emplaced to defend friendly forces and critical infrastructure from aerial attacks they can also be utilized to support the fleet and the WAS strategy.

The Pacific deployment of these air defense assets; especially the THAAD, are primarily for the purpose of intercepting a North Korean inter-continental ballistic missile; should they ever become op-

This courtesy photo shows an island in the Senkaku Island group in the East China Sea. (Capt. Colin Marcum)

erational. Forward deploying THAADs, Patriots, Counter Rocket and Mortar (C-RAM), ground-based SHORAD and man-portable air defense systems (MANPADS) to friendly islands in the Pacific can provide umbrellas of protection for the combined fleet from attack from aircraft and anti-ship missiles. These ADA assets have the same benefits other ground elements have such as high mobility and easy concealment within this operational environment. Couple these forces with future anti-ship missile batteries and the joint force can have a powerful ground-based shield against possible Chinese force projection; a bubble of friendly A2/AD.

The Senkaku Islands (referred to as Diaoyu by the Chinese) has been at the head of a well-known ownership dispute between the People's Republic of China and Japan. America doesn't take a particular stance in the dispute for these islands, however, these islands are currently under administrative control of the city of Ishigaki and falls within Okinawa Prefecture, which makes it, as far as the United States is concerned, Japanese territory. As a result, according to the U.S.-Japan Treaty of Mutual Cooperation and Security, the United States is obligated to

come to Japan's defense should the Chinese attempt to take the islands through force or threat of force.

These small uninhabited islands hold little military value, and really only matter in the terms of fishing rights and possibly offshore oil. As a result, attempting to protect the islands by holding it with ground forces and patrolling its surrounding sea lanes with naval vessels may prove difficult and produce too much risk as they are projected a significant distance from the rest of the Ryukyu Islands. A more viable option (should it be necessary) would be to deny the use of the islands, their littorals and surrounding sea lanes to Chinese naval and air traffic. This can be done with the deployment of ground-based anti-ship and air defense batteries throughout the Ryukyu Islands; while simultaneously the combined U.S.-Japanese fleets can maneuver throughout the southwest under their protection ready to move into action. Additionally, the numerous airfields and ports in this region allow for expeditious deployment of ground forces and forward staging of aircraft and their support and maintenance apparatuses.

With the emplacement of friendly A2/AD capabilities to these islands they provide a hedge against Chinese attempts to control Senkaku Islands and project power beyond the first island chain. They can provide early warning of enemy movements and can offer protection for the

fleet against surface and air attack from the sea within that region. Overlapping cones of fire for anti-ship missile batteries from the various islands in coordination with land-based and carrier-based anti-ship aircraft can be synchronized to strike their ships from multiple avenues, simultaneously. The only naval threat that couldn't be engaged by land forces would be submarines, but by denying their own surface fleet and air forces, while protecting the U.S., the Navy can engage in anti-submarine warfare with superiority and diversity in assets. Furthermore, close proximity to these islands provide launching and resupply platforms for anti-submarine aircraft to provide coverage throughout the Ryukyu chain. Most importantly, however, the deployment of these capabilities will require the Chinese to employ such a significant air-sea force that the conduct of operations and potential loss of military hardware may require them to take the military option off the table; seeking instead a diplomatic solution to the Senkaku dispute.

Conclusion

The presence of ground-based anti-ship weaponry, and ground force assets in general, presents another threat an enemy fleet will have to anticipate. In respects to the Pacific and the increasing influence of China, should they choose to project power beyond the first island chain, they will have to be prepared to fight not only the combined fleets of the United States and its regional partners, but also the landpower A2/AD capabilities that are locally fielded. This creates a considerable deterrence towards hostilities while not directly projecting capabilities into the Chinese mainland; such as required in the ASB Concept. If necessary, WAS, with support by these ground-based assets, provides the ability to defeat their projection of power and still attempt to resolve the situation diplomatically before committing forces to execute ASB.

In order to make this work effectively, greater levels of joint training and coordination between the Army and Navy to a degree not seen since the Pacific Campaign of the Second World War is required. Anti-ship batteries would need liaisons to establish that link between them and the fleet to which they support and to coordinate and synchronize air assets for joint and combined strikes upon enemy vessels. Additionally, the U.S. may require Sailors, with intimate knowledge of enemy vessel design, to provide initial battle damage assessments for the Army and Navy in order to determine effectiveness of strike and necessity for re-attack.

As future technologies are fielded, greater involvement between the maritime and land components will be necessary. The ranges and capabilities of weapons systems, the flexibility of targeting and diversity of threats will mean U.S. services have to take into account actions and effects across multiple domains. The Army's area of interest cannot stop just at the littorals and the Navy's cannot stop just at the shore. They must look at the state of affairs out into the sea and deep inland, respectively, because it will be there that actions create a cascade of effects that come to directly impact joint operations. The services need to look into the others' domains to see what they can do to support one another in order to shape those conditions.

Capt. Colin Marcum is currently the brigade fire support officer for the 2nd Armored Brigade Combat Team ,1st Armored Division.

Chief Warrant Officer 4 Houston Burke, Army targeting officer, and Col. Thomas Williams, Fires Targeting Center director, led the first Army Targeting Working Group meeting Jan. 27 out of Searby Hall at Fort Sill, Okla.

Working group focuses on Army targeting readiness

By Marie Berberea

Seventy-one stakeholder organizations across the globe gathered in person and virtually Jan. 27 for the first Army Targeting Working Group (ATWG). Guests shuffled into seats and dialed in to the conference call with the goal of bridging the gap between what the Army has versus what it needs and synchronizing the Army's targeting activity with joint efforts.

Col. Thomas Williams, director of the Fires Targeting Center (FTC) and Chief Warrant Officer 4 Houston Burke, senior targeting officer at the FTC, led the meeting out of Searby Hall at Fort Sill, Okla.

The ATWG is made up of Soldiers from the Army National Guard, Army Service Component Commands, Department of the Army, Forces Command, Intelligence and Security Command, Training and Doctrine Command, Army Reserves and more. Their many voices shared insight into what it takes to support Army

Chief of Staff Gen. Mark Milley's vision of readiness.

"There is no other number one priority," said Williams, quoting Milley.

The first meeting on Army targeting is a milestone for the FTC. Formerly the Joint and Combined Integrated Directorate, or "JACI," the FTC was established March 2, 2015, with the mission of addressing Army targeting doctrine, policy and program oversight within the joint community.

This transformation happened after an operational targeting study in 2014, which compared the Army's abilities against joint requirements as well the methods other services implemented to address similar issues. The study focused on target development, targeting responsibilities, joint certification and integrating capabilities across all warfighting functions.

Recommendations from the study were for the Army to establish a targeting center, designate proponency over targeting matters and conduct leadership education focused on targeting.

Major General John Rossi, the Fires Center of Excellence (FCoE) commanding general, was designated as the Army force modernization proponent for targeting in September of last year as a result of the study.

"When General Rossi speaks to the Chief of Staff of the Army or [Department of the Army] level staff, he now speaks on behalf of the Army when it comes to targeting. He's not just speaking as a TRADOC entity commander," said Burke.

"The Army didn't have a fully vested seat at joint targeting forums where these policy decisions were made, but now that the Army has a proponent for targeting we can start making inroads to those joint organizations and joint decision makers," said Williams.

Defining The Problem

To begin to find a way to address targeting gaps in the Army, questions such as, "What is the scope of Army targeting? How do we educate and train Soldiers in joint targeting tasks?" and "Who in the Army requires joint certification?" were raised during the meeting.

"We get a lot of great recommendations coming to us at FCoE, and we're seeing many issues that need to be addressed. I know those in the operational force would love to have everything fixed tomorrow. We intend to get to where we need to be in an efficient manner by establishing a common view of what the priorities are," said Burke.

The issue of manpower in a time of Army restructuring was also a topic of discussion.

The representatives from the component commands were concerned with how to address their targeting requirements while facing personnel reductions.

"We're going to get after it with what we have and that's going to cause us to innovate" said Col. Brent Parker, U.S. Army Pacific Chief of Fires.

Another goal for the ATWG is to inform those involved in making decisions.

"This targeting issue touches all warfighting functions. It certainly touches the intelligence warfighting function because they do the heavy lifting with respect to target development," said Williams. "We need to make sure the Army educates and trains people so they are prepared and ready to execute targeting process-

A small contingent gathered in Searby Hall Jan. 27 for the first Army Targeting Working Group meeting, while the rest of the 71 stakeholders dialed in or joined digitally for the discussion.

es and functions at the operational and higher levels."

He said currently the method for training Soldiers in Army operational units to meet joint targeting standards is having them attend Air Force and joint schools.

"We can do better than that. This forum and its anticipated results [are] a big step forward," said Williams.

He said they need to ensure joint targeting is responsive to the largest consumer of joint Fires: the Army.

"Over the past several years, I'd say basically since the early 90s, and certainly after 9-11, the joint targeting environment has been dominated by the Air Force and the Navy, shaped by their experiences in the Central Command [area of responsibility]. They've had the largest say in writing joint standards and the [Chairman, Joint Chiefs of Staff Instructions] that drive these processes, but in some cases these [joint standards] may not work best for the Army, again the largest consumer of joint Fires."

The ATWG discussed how hurdles will be addressed by subgroups. There will also be a charter established so the different organizations can vote on important matters giving the FTC and the ATWG a consolidated voice at the quarterly Military Targeting Committee meetings.

The next ATWG is scheduled for April.

Marie Berberea is currently the editor for the Fires Bulletin.

A High Mobility Artillery Rocket System (HIMARS) is loaded into a C-17 Globemaster III at Biggs Army Airfield at Fort Bliss, Texas. (Airman 1st Class Emily A. Kenney/U.S. Air Force)

The HIMARS Liaison

How to improve deep Fires integration through personnel

By Capt. Brennan S. Deveraux

The High Mobility Artillery Rocket System (HIMARS) has the potential to be the deadliest weapon in the artillery community. How this asset can influence a battlefield is more tied to planning and understanding of capabilities than to the qualification of launcher crews or vehicle maintenance. The liaison officer (LNO) is the critical link who translates the potential of the system into tangible battlefield effects. According to Department of the Army, Army Training Publication (ATP) 3-09.60 "Techniques for Multiple Launch Rocket System (MLRS) and High Mobility Artillery Rocket System Operations," the problem is that HIMARS "battalion(s)

lack organic fire support coordination personnel," requiring the LNO to take on the role of a fire support officer when advising a higher headquarters. The ATP on HIMARS, ATP 3-09.60, acknowledges that the current "liaison sections organic to Fires brigade MLRS/HIMARS battalions are not designed to satisfy this function." It goes even further, addressing major coordination issues that an LNO must be prepared to address including; shifting support relationships, communications and net planning and ammunition resupply considerations. It is my recommendation that the Army increase the rank requirement of a LNO in a rocket artillery battalion from lieutenant to captain.

The foundation for this article is based on personal experiences of HIMARS LNOs for National Training Center (NTC) rotations 15-08.5 and 15-10, participation in the 2015 HIMARS Stakeholders Conference and interviews with four of the five active Army HIMARS battalion commanders. These experiences have made it clear that there must be a change in the structure of the LNO teams in HIMARS battalions. This article will discuss three topics that will support the rank increase to captain: first is defining the LNO and their responsibilities; second is analyzing field artillery targeting through NTC experiences; and finally a look at current LNO manning in HIMARS battalions.

The Liaison Officer

The LNO is a task-organized position for a lieutenant that is generally used for a planner in the operations office, who is often in transition: fresh from the Officer Basic Course or preparing to transition out of the unit. For most units, this provides a transitional position that allows flexibility in officer placement, but in a rocket artillery unit this can be detrimental. Rockets are a corps-level asset that was established to provide general support Fires: a centralized control that supports the entire force with Fires. This relationship with a higher echelon requires detailed integration and is reliant on the LNO position. The LNO can help to create habitual associations. According to the now outdated Army Field Manual (FM) 101-5-1 Operational Terms and Graphics, "the close and continuous relationship established between support elements and the combat units they support … to ensure a mutual understanding of operating procedures and techniques and to increase overall responsiveness." Maintaining these close relationships is imperative for successful integration of rocket assets in the future.

These experiences have made it clear that there must be a change in the structure of the LNO teams in HIMARS battalions.

According to the HIMARS battalion commanders interviewed during the HIMARS Stakeholders Conference, a rocket LNO serving in a division or corps headquarters has a comparable level of responsibility to that of a task force fire support officer who serves in a brigade combat team (BCT), a role filled by a captain. These roles are important in the development of a field artillery officer and

in their effectiveness to support detailed fire support integration across the battlefield. A rocket LNO is a detailed planner, a subject matter expert (SME), an advisor to field-grade officers and a fire support advocate who understands the entire battlefield. These are qualifications of an officer who is getting ready to take command, not learning their craft for the first time.

Field Artillery Targeting

Artillery targeting takes into account the synchronization of assets in both space and time. It is an iterative process that cannot begin after the maneuver plan is finalized, but needs to be integrated throughout the planning process. All of the HIMARS battalion commanders interviewed agreed that the LNO is more than just a SME who is able to brief the effectiveness of their asset; they are a representative of the unit and must be involved in the planning process, capable of integration into the staff and limited decision-making. This is the largest problem with having a lieutenant as an LNO.

It is at the second level of officer professional level education, branch specific Captain's Career Course or the Expeditionary Warfare School, that officers first learn in detail the military decision-making process (MDMP). This means that the lieutenant LNO inherently lacks the formal training to conduct MDMP and cannot fully integrate into the planning process. Limited integration during the planning process often results in HIMARS primarily conducting reactive Fires, but early integration can lead to preplanned targets and early de-confliction of airspace. This proactive approach to targeting can also facilitate more effective reactive Fires by

Soldiers from 1st Battalion, 14th Field Artillery, 214th Fires Brigade, check their radio before their M142 High Mobility Artillery Rocket Systems (HIMARS) are loaded onto a U.S. Air Force C-17 Globemaster III cargo aircraft, March 6, 2015. (Airman 1st Class Nathan Clark/U.S. Air Force)

creating a responsive and effective counterfire capability.

During recent rotations at NTC, 15-08.5 and 15-10, the potential flexibility and lethality of rockets were put to the test. Successful integration of a captain as LNO during rotation 15-08.5 allowed the HIMARS battery to destroy 170 enemy vehicles during force on force, compared to only 22 vehicles destroyed by the M777 cannon battalion. The opposite was observed during rotation 15-10. Although the failure of integration of HIMARS during this rotation can be attributed to a lot of factors, one stands out above the rest, a second lieutenant LNO briefing HIMARS capabilities to a BCT. In comparison, rotation 15-10 shot almost exactly half the rockets and destroyed 82 less vehicles during the force-on-force portion. The most troubling of all, however, was during rotation 15-10 only 24 percent of enemy artillery acquisitions were counterfired on, compared to 60 percent during rotation 15-08.5. According to the NTC Fire Support after action review, the overall effectiveness of rockets during an NTC rotation is directly related to the integration of LNOs into the planning process. Captains have the experience and knowledge to not only brief their asset, but to influence the targeting process.

Liaison Officer Manning

The U.S. Marine Corps currently has an LNO team comprised of a major and captain task organized within their HIMARS battalion, their titles are Fires Plans and Assistant Fires Plans Officers. The Army HIMARS battalion commanders interviewed all agreed that the Army needs to increase the task organization of the LNO to captain, and the units are addressing this problem through alternative means. The 18th Field Artillery Brigade has created a LNO academy that ensures all lieutenants are trained to the same standard, but also relies on the battery commander in a limited LNO role to shape key decisions of BCTs involving unit placement and integration. The 1st Battalion, 94th Field Artillery Regiment slots a lieutenant as the intelligence officer, freeing a staff captain to be slotted as an LNO, and others often send their assistant operations officer to temporarily fill the position during training center rotations and deployments.

Artillery will continue to support maneuver operations around the globe, according to Janice E. McKenney, author of "The Organizational History of Field Artillery 1775–2003." And if the ground Soldier remains a critical element of warfare, so the services of the field artillery—the King of Battle—will remain critical as well. In an ever-changing battlefield, the Field Artillery branch will need to continue to be diverse and prepared to support any conflict with scalable Fires. The lives of many Soldiers will remain reliant on proper planning and de-confliction of Fires at all echelons. Commanders will continue to make decisions in combat that put Soldiers at risk, they deserve advisors who are professionals of their craft to help mitigate this, and they deserve a captain. The successful integration of rocket artillery into future conflicts requires the Army to increase the rank requirement of a liaison officer in a HIMARS battalion from lieutenant to captain.

Capt. Brennan Deveraux is currently stationed at Joint Base Lewis-McChord (JBLM), Wash., as a member of the 17th Field Artillery Brigade and serves as a planner and Liaison Officer (LNO) for the 1st Battalion, 94th Field Artillery Regiment (HIMARS).

In this illustration provided by the Capabilities, Development and Integration Directorate, a Fires battlefield of the future could employ high-energy lasers and high-power microwave systems in a counter unmanned aerial system role reducing enemy threats in a more cost-effective manner. (Capabilities, Development and Integration Directorate)

Fort Sill High-Tech Range Assessment Approved

By Shane Sandstrom

In the next edition of the Fires Bulletin, keep an eye out for coverage of the 2016 Maneuver and Fires Integration Experiment. This experiment will explore the challenges associated with the ability to detect, identify and defeat threat unmanned aircraft systems (UAS) at the tactical unit level. The Fires Battle Lab will execute this annual event in April 2016 at Fort Sill, Okla. with a focus on counter-UAS, air ground integration and precision Fires. Key takeaways and lessons learned will be highlighted at the 2016 Fires Conference May 2-4 2016.

The Fires Center of Excellence (FCoE) and Fort Sill, Okla., satisfied a milestone by approving the Electric Fires Range environmental assessment.

The assessment concluded with a finding of no significant impact to the environment on post or surrounding areas following demonstrations of electric Fires systems (e.g. laser, microwave and railguns technologies). This will pave the way for future demonstrations of these technologies at Fort Sill.

The FCoE has been identified as the proponent for electric Fires and is responsible for the developing doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy strategies for Fires and its Soldiers.

These revolutionary systems have been labelled as potential game changers for modern and future battlefields. This realization has been discussed through-

out the Army and the rest of the Department of Defense (DoD) posing questions and directing the use of emerging technologies and identifying possible capability gaps these systems may reduce on the battlefield.

To solidify the Army's interest regarding these technologies, during a recent visit, Brad Carson, former under secretary of the Army, said the FCoE is the perfect place for the Army to find more effective ways to fight the enemy.

"I definitely see it as a mission for Fort Sill," he said. "The problem with air and missile defense today is each missile costs millions of dollars trying to take down targets that are just a few hundred dollars, or a few thousand dollars. So, we have to change that imbalance in cost. Directed energy weapons, electric weapons and electric Fires is a way to address that imbalance. It's reusable, inexpensive and can put the balance of cost back in the Army."

With the Electric Fires Range on Fort Sill, developers can observe and examine these potential game-changing technologies in a live-fire event besides just evaluating the technologies through modeling and simulation.

The benefit of demonstrating these systems to capability developers is to showcase their tailorable and scalable effects, increased speed of engagement (i.e., speed of light), greater magazine depth and reducing the logistical footprint while minimizing collateral damage.

The Fort Sill range will not be considered a testing facility, but a site for demonstrations, one of only a handful of ranges approved across the DoD for use of these futuristic weapons. This range will provide a cost-effective and less restrictive schedule alternative when demonstrating electric Fires, which is essential for many budget constrained research and development programs.

The range will be available to the DoD, industry, academia and science and technology communities. Demonstrating emerging technologies at Fort Sill will require a thorough technology review and approval process, which will be managed by the science and technology office in the Capabilities, Development and Integration Directorate (CDID).

Along with the environmental assessment approval, the science and technology office has also begun the process for modernizing the firing location identified for these technology demonstrations. The proposed renovations include a command and control building and a concrete firing pad.

The FCoE and Fort Sill are surging ahead regarding the integration of these revolutionary concepts that could potentially provide and maintain a battlefield advantage to Fires Soldiers.

To ensure the Army maintains a ready and modern force, new capabilities such as electric Fires are under development and involve a collaborative effort between science and technology, industry, government, intelligence and academic communities. Investing in these emergent revolutionary technologies counters current threats and ensures a decisive advantage to the Army of 2025 and beyond.

Shane Sandstrom currently works for the Fort Sill Capabilities, Development and Integration Directorate on Fort Sill, Okla.

CMIC Development

The Ability to Perform Synchronized C-UAS and Counterfire Missions

2nd Lt. Catherine Grizzle

The Army Warfighter Assessment (AWA) 16.1 is a field exercise managed and operated by 2nd Brigade Combat Team, 1st Armored Division, in Fort Bliss, Texas. It consists of various missions, exercises and real-life combat scenarios that incorporate U.S. military branches, allied nations and states to demonstrate their expertise in Fort Bliss' training areas. The exercise is also an opportunity for Soldiers to test and provide feedback on the upcoming facilitation of vehicles, weapons and equipment.

The 4th Battalion, 27th Field Artillery, part of the Network Integration Evaluation exercises for five years, had the privilege of sending a fire support team (FIST) and fire support officer (FSO) to test and inform the Fires Center of Excellence and Brigade Modernization Command of exercising a counter-unmanned aircraft system (C-UAS) mobile integrated capability (CMIC).

The Future of Conflict

The low-cost, high-yield nature of unmanned aircraft systems (UAS) has made their development an area of emphasis for potential adversaries, resulting in an

emerging threat to the U.S. and coalition partners. Various sources have suggested there are more than 800 current and developing UAS programs worldwide. The rapid expansion of UAS proliferation feeds into the strategies of potential adversaries, which seek to avoid Army strengths, disrupt access and freedom of maneuver and action, as well as emulate friendly technical and tactical capabilities.

The primary UAS threats to the Army land operations are classified as low, slow and small (LSS). These LSS threats present a gap in current detection, identification and defeat mechanisms in C-UAS capabilities for forces below brigade level. This creates a considerable restriction on tactical operations for maneuver forces. The solution is CMIC.

Defining CMIC

CMIC is a combined arms solution that repurposes existing programs of record to provide a ground-based, lethal or non-lethal, C-UAS capability against select threat UAS. CMIC is also capable of providing counterfire.

AWA 16.1 featured a combat observation battlefield recon asset which is a repurposed military all-terrain vehicle with C-UAS and counterfire capability with the Maneuver Aviation Fires Integrated Application, a next generation graphical user interfac and a Venom laser rangefinder system.

Other programs of record include a Q-50 radar with LSTAR radar software improved to address air surveillance for LSS UAS, a Lethal Miniature Aerial Munitions System (LMAMS) for a kinetic asset, an Air Defense Airspace Management Cell repurposed to detect and iden-

In this photo provided by 2nd Lt. Catherine Grizzle, during the Army Warfighter Assessment 16.1 a group of Soldiers known as the Cobra Group poses for a photograph. (Courtesy photo)

tify ground and aerial targets, as well as Instant Eye (IE), a friendly UAS asset used to detect movement and action on the ground.

CMIC assists various Army Warfighting Challenges (AWFCs), including, but not limited to, developing situational understanding; conducting air-ground reconnaissance; integrating and delivering Fires and exercising mission command.

Executing CMIC

AWA 16.1 tasked the FIST to demonstrate, inform and answer requirements which address fire support options at the company-level exercising a CMIC and fulfilling integration delivery of Fires as part of the AWFCs. The team was located in New Mexico at MacGregor Range and White Sands Missile Range for the demonstrations. They received a common tactical air picture, detected enemy and friendly UAS and located the ground control stations (GCS) that were operating the LSS threat UASs.

They also tested the capabilities of non-kinetic and kinetic assets (IE and LMAMS). They sent communications, both voice and digitally, to the proper new equipment trainers and were able to see video feed of the IE in order to make a positive identification on the GCS. They executed more than 15 missions and established three standing operating procedures in the limited days they were assigned to test and demonstrate the CMIC.

Lessons Learned

Using all existing programs of record redefined to aid in the C-UAS and counterfire fight, they proved CMIC can detect, identify and defeat LSS UAS all below the brigade level. They were notionally successful in achieving counterfire effects on the GCS. All the programs of record provided were beneficial and integral to the end state of the mission. With this being said, the programs of record need to provide more of a handshake method with each other in order to ease the operators in the counterfire and C-UAS fight. Once this is complete, CMIC can prepare to successfully field to fire supporters at a company level.

The Future of C-UAS

CMIC's future will depend on funding and interest from the Fires and Maneuver communities – able to be sent downrange in 2018. The intent for the CMIC will be the ability to push the system to the company level, featuring decentralized control at the tactical edge, a full "green suiter" based operation. The preparation for the C-UAS fight is ongoing; they will not be forgotten with the proficiency of CMIC, and will soon lead the C-UAS fight. CMIC will be featured in AWA 16.2 in the spring of 2016.

Second Lt. Catherine Grizzle is a fire support officer in 4th Battalion, 27th Field Artillery, 1st Armored Division Artillery, at Fort Bliss, Texas.

Air Force Senior Airman Grant Haefke, a joint terminal attack controller (JTAC) qualified tactical air control party Airman assigned to the 817th Expeditionary Air Support Operations Squadron, talks to an F-16 Fighting Falcon aircraft pilot during a mission at an Afghan National Army combat outpost in Afghanistan, June 23, 2015. Haefke was supporting Soldiers with the 3rd Battalion, 187th Infantry Regiment, 101st Airborne Division (Air Assault), during a NATO Resolute Support Train Advise Assist Command-Air mission. (Tech. Sgt. Joseph Swafford/U.S. Air Force)

Conducting Formal Collateral Damage Estimation in Afghanistan

By Maj. Rufino B Flores, Jr. and Chief Warrant Officer 2 Barry D. Galinger, II
Dedicated to the memory of Air Force Capt. Matthew R. Rowland (Dec. 24, 1987 to Aug. 26, 2015)

The transition from Operation Enduring Freedom to the Resolute Support (RS) mission created many voids in fire support and kinetic targeting in the combined joint operations area (CJOA) in Afghanistan. Many practices that were

once implied and second nature to fire supporters were now questioned and critiqued by others not involved in the fire support or kinetic targeting process. The focuses of the questions were based almost entirely on whether or not an objective was even a lawful military target or a force protection threat. This displayed a limited understanding of what fire supporters must go through to conduct formal collateral damage estimates on a target that could have both an operational and a strategic-level implication.

When the RS mission officially assumed the responsibility of the CJOA on Jan. 1, 2015, there was a question as to whether or not fire support personnel were a necessity in the CJOA under RS authorities. As a result, target mensuration only, weaponeering and the graphic production of collateral damage estimates took an operational pause while strategic-level discussion and terms of reference were debated with words such as "only in extremis" and "in self-defense only." Since the end of the International Security Assistance Force mission (ISAF), NATO has fully integrated into the RS mission. The few fire supporters who were in Afghanistan witnessed multiple changes in authorities, tactical guidance, rules of engagement and national caveats. What did not change is that the insurgency was not yet defeated.

The threats in Afghanistan continued to evolve. After the announcement of the death of Mullah Omar in July 2015, the Taliban went on a major offensive. In August, the Taliban once again proved itself to be both a bold and devious enemy capable of maneuvering into major cities. The call was once again sent out to all fire supporters to have a process for selecting and prioritizing targets, then to match those particular targets against the appropriate munitions capable of meeting the ground force commander's guidance and intent. In addition to the standard, cowardly techniques carried out by terrorists during the peak of the 2015 fighting season, targets emerged in the form of anti-aircraft weapon systems, armored tanks and vehicles, command and control nodes in hardened facilities and insurgent training camps. Once targets were detected and positively identified as a force protection threat and individuals assessed as directly participating in hostilities against RS forces, fire supporters had no other choice but to instantly assume their lethal responsibilities. As a result, fire supporters assigned to different organizations bonded together to map out support roles to conduct formal collateral damage estimates and analysis.

RS Headquarters (HQ) and the Special Operations Joint Task Force-Afghanistan (SOJTF-A) are learning organizations. The Joint Effects Coordination Cell (JECC) on the Combined Joint Operations Cell (CJOC) floor at HQ RS rapidly refined processes and procedures to adapt to the problem-set of lacking fire support teams and cells at the different headquarters conducting combat operations in Afghanistan. SOJTF-A took an unconventional approach and formed a joint and interagency kinetic targeting cell with the capability of coordinating indirect Fires in support of SOJTF-A. This compressed the decision cycle to engage time-sensitive fleeting targets that were dynamic in nature.

SOJTF-A's Joint and Interagency kinetic targeting cell consisted of one Army field artillery fire support and effects coordinator who was qualified and certified through United States Central Command (CENTCOM) as a collateral damage analyst; one Air Force joint terminal attack

controller (JTAC) and two National Geospatial Intelligence Agency targeting imagery analysts. The primary purpose of this joint and interagency kinetic targeting cell was to integrate the no-strike and collateral damage methodology into the kinetic strike process in accordance with the rules of engagement and target engagement authority granted to SOJTF-A. Bridging the gap between HQ RS' JECC and the SOJTF-A joint and interagency kinetic targeting cell offers many lessons learned to future fire supporters, who may have the opportunity to serve in Afghanistan. The lessons learned from both the JECC and the SOJTF-A emphasize the basic principles of fire support that highlights the balance of art and science in the no-strike and collateral damage methodology.

The first lesson was to revisit the fact that even under the RS mission, CENTCOM is the Title 10 Authority of all United States Forces operating in Afghanistan. The CENTCOM supplement to Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3160.1A states, "Therefore, the CENTCOM joint targeting element (JTE) is the primary coordinating office for collateral damage estimation in the CJOA." This was identified as a challenge for fire supporters and targeting officers who worked on the CJOC floor at HQ RS, since they were working within close proximity to coalition personnel who were not utilizing Secret Internet Protocol Router workstations. The CENTCOM JTE on the other hand was capable of assisting the SOJTF-A with any target that required exceptional target analysis and review. This often came in the form of conducting quality assurance or quality control of collateral damage estimation graphics produced by SOJTF-A. The CENTCOM JTE offered the reach back capability necessary for the SOJTF-A to conduct the formal targeting cycle by having a professional staff on duty 24 hours a day, seven days a week.

The second lesson dealt with the certification and qualification to become a collateral damage analyst. The CENTCOM supplement to the CJCSI 3160.1A states, "A collateral damage analyst must have successfully completed both the Basic Collateral Damage Estimation (BCDE) and Advanced Collateral Damage Estimation Course (ACDE)." Along with the responsibility of being the primary coordinating office for collateral damage estimation, the CENTCOM JTE is the agency that can both certify and qualify a collateral damage analyst for the CENTCOM area of responsibility (AOR). The CENTCOM supplement to CJCSI 3160.1A continues, "Certification is achieved by passing a BCDE course at a schoolhouse accredited by the Joint Targeting School. For the United States Army Field Artillery, the Fires Center of Excellence at Fort Sill, Okla. is accredited to certify fire supporters on the BCDE course… However to serve as a collateral damage analyst in the Central Command AOR, qualification must be achieved by passing the ACDE Course offered through the Regional Joint Intelligence Training and Education Facility (RJITEF) at Headquarters, USCENTCOM, MacDill, Air Force Base, Fla. or via mobile training team from HQ USCENTCOM."

Since the basic CDE certification has become common for fire supporters in the Army, finding a fire support officer (FSO) that has both the basic and advanced CDE certification and qualification has become a challenge. There is a myth that only field artillery warrant officers (MOS 131A) are qualified and certified collateral damage analysts. In reality, a qualified and cer-

tified collateral damage analyst can be a fire support team member (13F), field artillery warrant officer (131A), and/or a field artillery officer (13A), or be sourced from a different branch of service (i.e. Navy, Marine Corps or Air Force). The challenge for the Field Artillery branch will be to identify individuals who will be serving in the CENTCOM AOR and already have the BCDE Certification, then immediately send them to the RJITEF at MacDill AFB in order to serve in a lethal Fires capacity as a collateral damage analyst with the ACDE qualification from CENTCOM.

The third lesson involves the Digital Precision Strike Suite Collateral Damage Estimation (CDE) tool, affectionately known as the DCiDE program. "The DCiDE program is currently the only automated CDE tool authorized for CDE graphic production in the USCENTCOM AOR. All assigned, attached and supporting organizations conducting collateral damage estimation in the U.S. CENTCOM AOR are required to use the DCiDE program for all CDE analysis. If there is a problem or an issue with their CDE workstation, CDE analysts are required to notify the CENTCOM JTE immediately," as stated in the CENTCOM supplement to CJCSI 3160.01A. The DCiDE program holds the same or greater value to a collateral damage analyst as an Advanced Field Artillery Tactical Data System or AFATDS has to a tactical field artillery battalion.

What makes the DCiDE program attractive to experienced fire supporters is it will swiftly walk a collateral damage analyst through the CDE methodology. It is unique, because it can be interlinked with the Modernized Integrated Database (MIDB) in order to display the no strike list. The CENTCOM supplement to CJCSI 3160.01A also discusses the MIDB, "This is essential information to communicate to ground force commanders and

Artillerymen from 3rd Battalion, 320th Field Artillery Regiment, 3rd Brigade Combat Team, 101st Airborne Division (Air Assault), conduct M777A2 howitzer training with precision-guided munitions, March 19, 2015, at Operational Base Fenty in Afghanistan. (Capt. Charlie Emmons/U.S. Army)

target engagement authorities since the no strike list is managed and maintained in MIDB." The DCiDE program is also capable of producing products that can be uploaded into other programs such as Google Earth and Ringtail/Replay by being able to save the analysis conducted by the collateral damage analyst into a Keyhole Markup Language (KML) file. This can assist decision makers by importing the KML file onto the common operating picture (COP) to gain better situational understanding of the current situation prior to making an informed decision on a kinetic strike.

The five levels of CDE are: Level 1: Targeting validation/initial analysis overview; Level 2: General/target size anal-

ysis overview; Level 3: Weaponeering analysis overview; Level 4: Refined analysis overview; Level 5: Casualty analysis overview.

Conducting formal collateral damage estimates and analysis is the most difficult task to conduct during the kinetic strike process. However, experienced field artillery fire supporters have a few advantages. An experienced field artillery fire supporter understands the five requirements for accurate predictive Fires and lives by the 10 commandments for fire support. What this offers the ground force commander is a collateral damage analyst who can make the connection between the five requirements of accurate predictive Fires and the collateral damage methodology. Meeting the first two requirements for accurate predictive Fires (accurate target location and size and accurate firing unit location) will assist in meeting the first two steps in the collateral damage methodology (initial target analysis and general/target size analysis). SOJTF-A was able to capitalize on the expertise offered by the NGA targeting imagery analysts to assist the FSO on the classification of targets and their functionality. Mastering the third requirement of accurate predictive Fires (accurate weapons and ammunition data) will assist in the weaponeering analysis during a formal CDE analysis. Since air delivered munitions and surface-to-surface precision guided munitions are essential in the deep Fires fight and the self-defense of special operations forces conducting expeditionary train, advise and assist in remote locations, JTACs and targeting officers are more valuable in the CJOA than ever before. Therefore, the habitual partnership between the JTAC, the targeting officer and the FSO are essential when conducting a formal CDE analysis. Steps four and five of a formal CDE analysis which accounts for a refined, structural analysis and a casualty estimation analysis, consist largely of computational procedures that require concurrence to make the formal CDE call valid. Concurrence from another certified and qualified CENTCOM collateral damage analyst is just as important in the formal CDE analysis as a secondary check is when computing technical firing data during the fire mission process.

The 10 commandments of fire support are a set of principles that field artillery fire supporters are taught at the tactical level of war. It deals with planning, reporting, battle tracking, target list

The ten commandments of fire support

1. Thou shalt always know where thou art.
2. Thou shalt always know where thine Infantry elements are.
3. Thou shalt always report thy position at every halt.
4. Thou shalt always have commo.
5. Thou shalt continuously update thy Fire Support Plan. Adding targets when stopped and deleting old targets.
6. Thou shalt use the Mortars first.
7. Thou shalt complete and distribute a Fire Support Matrix to Mortars, Commanders, Scouts, TOWS, ALO, SALT, etc., for each mission.
8. Thou shalt always designate a Priority of Fire.
9. Thou shalt always use Mortars, SALT, etc., in the planning process.
10. Thou shalt plan for CAS, SMOKE, and Illumination for each mission.

management and constant communication between enablers and decision makers. The collateral damage methodology incorporates similar principles when informing ground force commanders and target engagement authorities in order to make quick, decisive and sound decisions. The CENTCOM supplement to CJCSI 3160.01A states, "The collateral damage methodology stresses the standardization, coordination and dissemination of collateral damage estimates and not to impede Fires when engaging dynamic targets." Constant communication is the key to successful coordination. When conducting formal CDE analysis for kinetic strikes in a dynamic environment, the formal collateral damage assessment is only as accurate as the information that is being received from a qualified and certified observer or JTAC. Experienced fire support personnel understand that in this environment the JTAC may be fixed in a close proximity fight with the enemy. The JTAC will often times be the one multi-tasking by not only firing his primary weapon, but also transmitting the necessary requirements to accurately engage the enemy with indirect Fires and air delivered munitions. This will require an experienced crew next to the target engagement authority to remain calm as they monitor, assess and navigate through the process of the collateral damage methodology.

Precision Fires mitigates collateral damage and raises morale that assists the Afghan National Defense and security forces in gaining the initiative to secure their country. Organizations may have to quickly relearn what the requirements are for conducting formal collateral damage estimation if the necessary processes and procedures are not in place next to the target engagement authority. However, qualified collateral damage analysts who have experience in fire support can assist in leading the process for the ground force commander and target engagement authority so collateral damage estimates do not impede Fires when engaging a dynamic or fleeting target.

In summary, the first step for the Field Artillery branch to stay relevant in this fight will be to identify experienced fire support personnel who already have formal CDE training and who are graduates of an accredited Basic Collateral Damage Estimation Course recognized by the Joint Targeting School. These fire supporters should be groomed for service at the joint and multinational level with additional training at the U.S. CENTCOM Advanced Collateral Damage Estimation Course at the Regional Joint Intelligence and Education Facility at MacDill Air Force Base in Tampa, Fla. Once they are certified and qualified, they should be deployed to the CENTCOM AOR. When deployed, the successful accomplishment of facilitating the kinetic strike process can be conducted by having fire supporters as certified and qualified collateral damage analysts taking their rightful place next to the target engagement authority. This will allow coalition advisors to enable host nation defense and security forces to break the momentum of an insurgency.

Chief Warrant Officer 2 Barry D. Galinger is currently on deployment to Kabul, Afghanistan, working with the CJ3 Targeting Operations Cell, as well as serving as liaison to the Combined Air and Space Operations Center Targets Cell.

Maj. Rufino B. Flores, Jr. is currently assigned as the fire support officer for Special Operations Joint Task Force – Afghanistan (SOJTF-A), and is deployed in support of Resolute Support Mission and Operation Freedom Sentinel.

10 years of C-RAM History

By Maj. Daniel G. Corbett

In this photo courtesy of Yuma Proving Ground, a Land-based Phalanx Weapon System (LPWS) performs a test at the Yuma Proving Ground , Yuma, Ariz. (Yuma Proving Ground)

The Army's newly designed Land-based Phalanx Weapon System (LPWS) met its first target March 15, 2006, providing yet another level of defense against enemy attacks. During the early morning hours of that historic day 10 year ago, the Soldiers, Sailors and Airmen located on Balad Army Air Field, Iraq, aka Logistical Support Area Anaconda, heard the newly installed sense and warn system's loudspeakers signifying an insurgent indirect fire had once again been launched against coalition forces.

While the sense and warn system provided coalition forces an early warning of the attack, the fact the indirect fire projectile would land within the compound still loomed. However, on that day Soldiers from C Battery, 5th Battalion, 5th Air Defense Artillery Regiment, who had only a few months prior been assisting with the operational testing of

the new system, reacted to an enemy insurgent 57 mm rocket using the Army's newly designed LPWS.

Shortly after the alert, coalition forces on the base heard the now familiar "BRRRRRRRRRP" associated with an LPWS engagement. The unit's LPWS detected, tracked and engaged the incoming round using rapidly fired 20 mm self-destructing rounds firing at a rate of over 75 rounds per second. Retired Maj. Scott Mace, the first counter-rocket, artillery and mortar (C-RAM) battery commander, recalled the unique mission train-up his battery, consisting of 155 Soldiers, seven Sailors and interim support contractors, underwent along with their initial setup in Iraq. The mission-set held a special meaning for then Capt. Mace as his father had sustained significant injuries by a mortar round while serving in Vietnam.

The C-RAM mission began in 2004 in response to an urgent need for protection from increased indirect Fires on coalition forces in Iraq. In an effort to quickly address this threat the LPWS, also referred to as "C-RAM Intercept," was created.

"We [had] been under tremendous pressure to make this happen for quite some time now. What started as a chimpanzee on our shoulder quickly grew into a gorilla and lately had become King

In this photo courtesy from the U.S. Army Acquisition Support Center, a Land-based Phalanx Weapon System (LPWS) protects ground forces and critical assests from an indirect fire attack. (U.S. Army Acquisition Support Center)

Kong on our backs," said Lt. Col. Donald Fryc, 2nd Battalion, 44th Air Defense Artillery commander. The LPWS had at that moment changed the dynamic for coalition forces.

The LPWS utilized and incorporated readily available technology combined and assimilated for a new purpose using the Navy's existing Phalanx Close-in Weapon System (CIWS), which had provided indirect fire protection to the U.S. Navy's fleet of ships since the 1980s. The system designers took the Navy's CIWS, mounted it onto a large flatbed trailer, and used systems associated with the Air Defense and Airspace Management Cell to create the new weapon system. Several other modifications were required, but what is truly amazing is the LPWS went from concept to tactical engagement in less than two years.

Since its origin in 2005, the LPWS has continuously provided protection in support of missions in Iraq and Afghanistan. Many units and organizations have deployed in support of the C-RAM mission over the years, but the primary contributors have been the short-range air defense units. These deployments have largely been joint in nature, as they have often incorporated the Navy's expert operators to provide the necessary expertise associated with their "gun."

In August 2013, based upon the system's success rate and the specific capability gap that it addresses, the Army transitioned the LPWS from an interim solution to an official program of record. The Army currently has two active indirect fire protection capability battalions, 2-44th ADA and 5-5th ADA, which provide early warning and intercept capabilities utilizing the RAM-Warn and LPWS. The Army National Guard also provided significant support towards the C-RAM mission, deploying air defense battalions from Florida, Ohio and Mississippi with the 1st Battalion, 265th Air Defense Artillery Regiment from Florida, which is currently providing this mission in Afghanistan.

In total, the LPWS has attained over 300 successful intercepts against rockets and mortars fired at high value assets and Soldiers. Additionally, C-RAM's RAM-Warn system has provided timely warning for more than 5,500 indirect fire attacks enabling Soldiers in a hazardous area the opportunity to take cover prior to impact.

The C-RAM success story, like the Patriot weapon system, is one reason why air defense units continue to be the most deployed asset within our Army. The LPWS has been going strong for 10 years, and continues to provide combatant commanders a capability to defend Soldiers and critical assets within hostile combat zones. As 1-265th ADA, also known as Task Force Iron Shield, prepares to hand the LPWS mission to 2-44th ADA they know the LPWS will continue to provide defensive coverage for Soldiers operating within hostile regions and act as a deterrent against enemy attacks.

Maj. Daniel Corbett is the counter-rocket, artillery and mortar action officer for the Fires Center of Excellence at Fort Sill, Okla.

Sgt. 1st Class Timothy Collier, Maj. Gregory Eldridge, Capt. Scott Haywood, Capt. Ron Metnzer, Chief Warrant Officer 2 Ryan Groves, Staff Sgt. Robert Hooks and Spc. Joseph Berg pose for a photo along with their weapon system. (Capt. Scott Haywood/U.S. Army)

Multinational Interoperability as a Priority

By Capt. Scott T. Haywood and

Chief Warrant Officer 2 Ryan G. Groves

After regaining digital fire support capabilities in the Field Artillery Squadron, 2nd Cavalry Regiment, Lt. Col. Deric Holbrook directed the regimental fire support element (RFSE) to enhance its operational reach in an effort to augment the regiment's combat power and strengthen the NATO alliance. Through hours of troubleshooting, research and dedication, the regimental fire support officers (FSO) Maj. Greg Eldridge and Capt. Scott Haywood identified the Artillery Systems Cooperation Activities (ASCA) program as a solution.

The ASCA program provides the digital fire support bridge between two or more partner nations leveraging a tactical advantage between one another on the battlefield. If one nation calls for fire, but its organic assets are not available or the target is out of range, another nation employing ASCA would be able to receive and fire that mission.

ASCA has been around since the early 1990's. It is generally underutilized and on reserve for multinational training exercises to act as the conduit in the fire support communication gap between partner nations. With the reliance on NATO becoming paramount in the U.S. European Command theater of operations, multinational interoperability is a priority. ASCA is the perfect tool to forge the NATO alliance and build lasting functional partnerships.

The concept of ASCA began as a collective venture that established the implementation of bilateral programs through formal member-to-member agreements, including memorandums of understanding (MOU) and memorandums of agreement (MOA). The current program still relies heavily on MOUs and MOAs to generate the interoperability between field artillery and fire support mission command nodes from participating nations. The process has been successful, but the limitations and constraints are directly related to the participating nations' national restrictions.

In order to minimize the constraints of national restrictions, the ASCA community turned to the Common Technical Interface Design Plan. This design plan has the ability to overcome national restrictions by providing a unique interface adapted for each participating nation, enabling ASCA's deployment in a dynamic, tactical and multinational environment.

> ***A regionally engaged Army shapes and sets theaters for regional commanders employing unique total Army characteristics and capabilities to influence the security environment, build trust, develop relationships and gain access through rotational forces, multilateral exercises, mil-to-mil engagements, coalition training and other opportunities.***
>
> *36th Chief of Staff of the Army*
> *Gen. Raymond Odierno*

Participating Nations and Objectives

The current nations participating in the ASCA program are Denmark, France, Germany, Great Britain, Italy, Norway, Turkey and the U.S. These eight nations primarily focus on communication security, policy as it pertains to common doctrine, real time translation, accommodations for future nations and a structure that clearly defines the least restrictive security standards:

1. Provide successful information sharing between nations while consider-

ing multiple levels of security and access requirements derived from each partner nation - direct focus on communication security and computer security;
2. Provide solutions to sharing information between fire support systems of different nations while supporting the planning and execution of operational requirements - direct focus on policy and doctrine;
3. Provide real-time language translations to enable more effective coalition partnerships, reducing the need for multiple liaisons and eliminating human error through a digital interface from sensor to shooter;
4. Provide enhanced situational awareness across a common tailored interface, capable of being adaptable to accommodate future partner nations;
5. Develop a clearly defined set of minimum capability requirements to contribute in the ASCA program, yet maintain network security standards. This reduces the requirement for interoperability training.

From Sept. 25 to Oct. 8, 2015, on Fort Bliss, Texas, Operation Bold Quest 15.2 demonstrated ASCA's ability to provide interoperability by networking seven different nations' fire support control systems. The nations in attendance stated that speed and accuracy increased during firing due to the digital transmission of fire control data through the ASCA network.

Historically, these types of training exercises take place once every seven years. With an interface program, that has so much potential, the following two questions need to be asked: Why is ASCA only used during major training rotations every few years? Why aren't Field Artillery units encouraged to capitalize on the benefits ASCA provides? Especially since building a regionally aligned multinational force is more capable of delivering timely accurate Fires in an environment of uncertainty.

The Way Ahead

The FA Squadron, 2nd Cavalry Regiment, chain of command realized the potential of ASCA and developed regular training sessions with its German partner battalion: 131st Artillery Battalion, 10th Armored Division, headquartered in Weiden, Germany. ASCA training events were coordinated at the lowest echelon, using a 131A targeting officer and German captain. Together they formulated a crawl, walk and run training concept that enabled focused training geared toward conducting multinational live-fire training exercises at the battalion level.

Initial training scenarios were slow and generally focused on establishing the trust and ASCA competency between participating Soldiers. As both of those levels reached maturity, the ASCA training sessions became more detailed and the training teams became larger. Early on, the U.S. training team only had three participants; a 131A, a 13F40 and a 13F10. The 131st FA relied on a captain and two senior noncommissioned officers who were ASCA trained. This audience was the right fit to establish basic digital communications through the ASCA interface.

Once basic communications were established, it was identified the Soldiers with Military Occupational Specialty (MOS) 13F did not have the technical knowledge base on Advanced Field Artillery Tactical Data System (AFATDS) to establish the proper communication parameters to maximize the full potential of ASCA. Those in the 131st FA also realized they needed to provide assets to

Soldiers from 131st Field Artillery Battalion fire a Panzer 2000 in Grafenwoehr Training Area, Grafenwoehr, Germany. (Capt. Scott Haywood/U.S. Army)

receive fire missions. In order to bridge the knowledge gap on AFATDS communication parameters, the Field Artillery Squadron, 2nd Cavalry Regiment, tasked a 13D40 and 13D10 to attend the ASCA training sessions. Over the course of three months, weekly training sessions furthered multinational interoperability and goals became reality.

The German commander Lt. Col. Wolfgang Schmidt asked the FA Squadron ASCA team to participate in a live-fire exercise. Up to this point both battalion commanders had been hands-off during training sessions, but Oct. 17 the FA Squadron ASCA training team devoted personal time to display competencies with ASCA to the 131st FA command team. It was a success. The 131st FA Battalion chain of command invited them to shoot on Oct. 20. This was of great significance as both nations enhanced their operational abilities relying on mutual trust and confidence through the ASCA program.

Knowledge Gaps

There are significant knowledge gaps between the capabilities and knowledge between the 13Fs and 13Ds. With the 13Fs lacking experience with AFATDS, the 13Ds have the technical knowledge on the system, but the 13Ds lack the ability to understand tactical operations at the brigade/regimental level.

The ASCA program is designed to originate at the regimental/brigade level to achieve the desired effects with limited liaisons. During the FA Squadron's ASCA training sessions, it was quickly identified the 13F lacked the neccessary knowledge with the AFATDS. To accommodate the ASCA training events, the FA Squadron provided 13Ds. The 13D MOS does not operate at the regiment/brigade level except for at a division artillery and tends to focus on the technical aspect of operations versus the tactical situation.

It is recommended that 13Fs develop a skill identifier for senior noncommissioned officers who complete an in-depth block of instruction on the available options and parameter configurations of AFATDS. A secondary option is to provide modified table of organization and equipment slots for the 13D MOS to perform as a digital master gunner and liaison officer

embedded within the regiment/brigade fire support element.

Without properly training 13F or 13D MOSs, tactical and technical knowledge gaps emerge. The knowledge gaps are currently visible across the Army, creating a loss of confidence among digital fire support systems. This training deficiency becomes more relevant while conducting advanced AFATDS operations such as ASCA. During weekly digital sustainment training scenarios in the FA Squadron, 13Fs and 13Ds collaborated to facilitate an understanding of each other's needs. Without adopting a solution to the identified knowledge gap, the FA community risks losing the technological advantage they have striven to obtain in a multinational digital environment.

Multinational Partnerships and Uninhibited Initiative

Personal relationships, trust and competence are the keys to success when forging partnerships. The ASCA training sessions rely heavily on coalition efforts and the camaraderie among participating members.

The FA squadron commander sets the conditions for success by instilling disciplined initiative in junior staff members working on the ASCA partnership. The commander's intent was clear and concise. This allowed the staff to operate unimpeded and with limited interruptions. This intent-based approach instilled a sense of confidence among the ASCA training team and their partner battalion. Rather than being told to complete a task, Soldiers felt as if they were part of the effort. They had a purpose, direction and motivation to succeed. When training sessions took longer than normal working hours, or occurred over the course of a weekend, there was no shortage of volunteers. Interoperability is far less technical than portrayed. Multinational operations are still human based; don't allow technical limitations to thwart training objectives.

Commanders who provide clear intent with a solid end-state generally get to better solutions in a fraction of the time. Training is an important aspect that will ensure success when conducting multinational operations. Think your way through the planning process and develop common training objectives to meet coalition training objectives.

If training teams are too robust, personal relationships take on less meaning and degrade coalition training objectives. With meaningful relationships, a number of bureaucratic obstacles can be overcome through the power of influence. Multinational partners can communicate with their chain of command and national government more effectively than formal channels allow and with a quicker response time.

Roles and Responsibilities

Keep a "one-team, one-fight" mentality. Understand the unit's role during operations. Develop a formalized and detailed ASCA training plan that covers roles, responsibilities and AFATDS parameters.

Ensure all Soldiers participating in multinational training understand the differences between supported and supporting relationships. Any force that is participating in multinational operations will always have two chains of command; a national chain of command and a mul-

tinational chain of command. It must be realized they do not need to own partner nation's assets to influence their capabilities. Develop a program of instruction (POI) geared toward ASCA that is taught in accordance with Training and Doctrine Command (TRADOC) standards; this could also be developed and tailored to the aforementioned 13F MOS additional skill identifier.

To ensure complete understanding and comprehension of all tasks and objectives, conduct informal briefings and reviews prior to execution. Choose words that are simple in nature, avoiding slang and acronyms. Adhere to NATO doctrine aids during planning and execution to ensure relevant factors are not overlooked. In the absence of formalized ASCA training, seek knowledge through reading material and the published points of contact accompanied with this article (see below). Provide scheduled training in a manner that covers ASCA operations as they pertain to NATO doctrine. Develop a formal POI in TRADOC and USAEUR area of responsibility geared towards ASCA and multinational objectives in the digital Fires environment.

The Soldiers who fail to understand their roles during multinational operations can deter competence. The majority of NATO partners have a better understanding of their operational roles than their U.S. counterparts. The lack of formalized ASCA training presents problem sets during training that will become more complex as digitalized globalization takes a strong hold in the FA community.

Chief Warrant Officer 2 Ryan Groves, German Pvt. 1 Barco-Rubio and German Capt. Ron Metnzer discuss the exercise. (Capt. Scott Haywood/U.S. Army)

Regionally Aligned Force (RAF) Training Concept

There is a failure to use the regionally aligned force (RAF) concept at the lowest echelons possible; fostering a unique training opportunity for Soldiers. The opportunities presented would increase combat readiness and generate a sense of achievement between partner nations.

The Army defines the RAF as units aligned or allocated to combatant commands. Combatant commands are aligned forces prepared for regional missions. The RAF concept is capable of providing support during operational missions and multinational exercises, which can be scaled down and tailored to fit a number of situations and training scenarios. In a dynamic environment, the demand for deployable Fires and the systems to regulate those Fires across multinational boundaries will increase. Currently the formalized ASCA training and training exercises are reserved for higher echelons, partly due to the non-traditional military training requirements.

It is recommended that the community provide formalized ASCA training for battalion-sized elements that work within the RAF concept. By developing the RAF concept as it pertains to the Field Artillery branch, Soldiers are more effective and culturally aware to the environments they are assigned. Battalion-level training POIs could be developed supporting the lowest echelon during decentralized training with partner nations.

Without properly implementing the RAF concept to support each nation currently participating in the ASCA program, training efforts are tainted, duplicated and minimized. With each partner nation having its differences in capabilities, the ASCA program combined with the common technical interface design plan allows for regional forces and equipment to be properly matched to support a range of mission sets.

Conclusion

Combat operations in Iraq and Afghanistan are drawing to a close. It is imperative that the Field Artillery branch does not abandon what it means to operate in a multinational environment. Now is the time to forge partnerships through an established alliance to avoid duplication of assets, resources and capabilities while focusing on future technologies. Commitment at the tactical level combined with determination to work through traditional barriers, such as language and security caveats, will improve combat readiness and interoperability. With proper training, there is great value with low risk. The Army is only limited by their ability and willingness to work with others.

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Short Range Air Defense Artillery at the Joint Multinational Readiness Center

By Capt. Kellen W. Howell

There are several reasons U.S. Army units consistently fail to conduct effective air defense while training at the Joint Multinational Readiness Center (JMRC) at Hohenfels, Germany. The first reason is a lack of resources because we have eliminated the ADA-specific weapons necessary to fight near-peer armies. The second is a failure to deliberately plan air defense. The third is the failure to adapt organic weapons systems to work as ADA and the last is the failure to integrate the allies who still have and use short range air defense (SHORAD) weapons.

Where We Struggle

The most critical factor limiting ADA success for U.S. units at JMRC is the simple lack of resources. The U.S. Army removed the bulk of the Stinger and Avenger weapon systems from the inventory a decade ago based on the expectation that the Air Force would maintain air supremacy against fixed and rotary wing air threats. According to Mike Maloney in AMD Transformation Update, the Army forecasted the future threat in the operational environment to be ballistic

and cruise missiles, threats which Patriot and Terminal High Altitude Air Defense (THAAD) systems are designed to defeat. However, the loss of almost all SHORAD weapons leave forces vulnerable to fixed and rotary wing threats should the Air Force fail to maintain air supremacy. Effective employment of attack aviation can win the battle at JMRC in a matter of hours, and the absence of SHORAD to deter and destroy rotary wing aviation leaves the command posts and maneuver units vulnerable to the air threat.

Brigade combat teams (BCTs) are nominally able to defend themselves from the air using organic weapon systems such as heavy machine guns and tanks' main guns, but rarely implement a deliberate plan to do so at the JMRC. The planning for ADA should take place at all phases of the military decision-making process, but rarely does. Typically, units either do not have an Air Defense Artillery officer assigned, or they re-task him to serve elsewhere.

Army doctrine, specifically Field Manual 3-22.65, Browning Machine Gun, directs units to repel and defeat enemy air using heavy machine guns. "The machine gun can provide units with a self-defense capability against hostile, low-flying aircraft. These guns are employed in the air defense role as part of the unit's local defense… Hostile aircraft within the range of the gun should be engaged." However, ground maneuver units usually forego planning deliberate air defense using their organic weapon systems, arguing that using a weapon for air defense denies the unit the option to use that weapon for local force protection or offensive roles. The logic is difficult to dispute, but effective leaders find a way to maximize the employment of limited resources.

U.S. units have abandoned the employment of passive air defense measures. Passive air defense measures are deception, hardening, concealment and dispersal, according to FM 3-0.86 "Air Defense Artillery Patriot Brigade Gunnery Program."

Each of these measures is aimed at either avoiding detection by the enemy or mitigating the effectiveness of the enemy's attack. U.S. units are particularly bad at passive air defense when compared with our allies. Those armies who have consistently been under the threat of enemy aviation go to great lengths to conceal and camouflage their equipment and personnel, but U.S. units very often make no attempt at all to avoid detection. This failure is due to the years of counter-in-

U.S. units have abandoned the employment of passive air defense measures.

surgency based on forward operating base warfare. We have lost the urgency to conceal ourselves from the enemy to such a degree that we have adapted weapons systems such as the Land-based Phalanx Weapon system to defeat an attack when detection by the enemy is treated as a forgone conclusion. An action like this one is simply an abandonment of force protection fundamentals.

The U.S. BCTs often fail to integrate allied or partnered air defense resources into their plans when training at JMRC. Part of their failure is due to poor liaison operations between U.S. and multinational partners. Often the subordinate unit does not provide a liaison, or the liaison's voice is never heard during the planning process. The result is the same, with the commander not understanding or not caring about the value of an ADA weapon system. Some of the failure is also due to simple neglect. BCTs have innumerable variables and threats against which they have to plan, and tanks usually receive the bulk of the brigade's focus.

The efficacy of effective ADA employment is impossible to deny. U.S. units, employing poor air defense plans with only organic weapon systems, typically destroy one or two helicopters over the course of a decisive action training event rotation. Historically, the most effective weapon for shooting down helicopters at JMRC has been a tank's main gun. However, a NATO ally brigade who recently trained at JMRC incorporated air defense into their plan very effectively. They destroyed 11 helicopters in three days of fighting using Stinger missiles, which replicate their own RBS-70 missiles. The effect was clear in that the unit eliminated the enemy air threat, thus greatly increasing the ground forces' maneuverability and the force protection of the command posts.

Where do we go from here?

The U.S. Army has not faced a substantial threat from enemy aircraft since the Soviet Union's collapse, but the face of the threat is now changing to small unmanned aerial vehicles (SUAV). These SUAVs are inexpensive, easy to operate, can deliver a variety of threats and are difficult to detect and intercept with the current U.S. Army's ADA assets. The proliferation and ease of access to these systems in the civilian market will lead to a significant, possibly game-changing increase in their use by enemy forces, and we currently have very few assets to detect and destroy this particular threat.

While the active Army must now fight with fewer short and medium-range Air Defense Artillery assets, understanding what multinational partners bring to the fight is critical to crafting an effective plan. It is simply unwise to ignore enemy aviation when we have the assets to counter the threat. U.S. BCTs should incorporate Air Defense Artillery into their plans, and they can enable this by integrating multinational air defenders during all phases of the planning process.

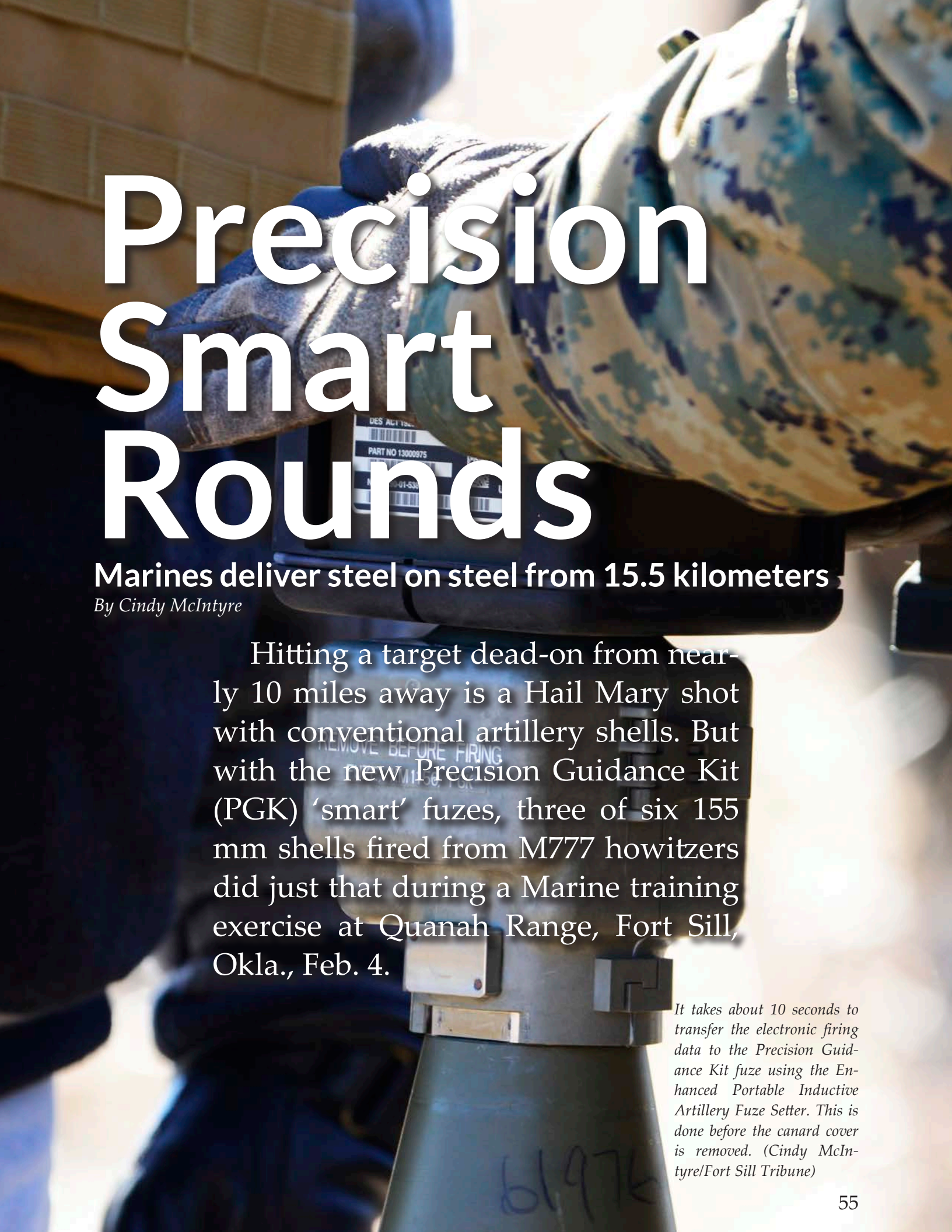
Capt. Kellen W. Howell is the Air Defense Artillery observer coach trainer at the Joint Multinational Readiness Center, Hohenfels, Germany.

Precision Smart Rounds

Marines deliver steel on steel from 15.5 kilometers

By Cindy McIntyre

Hitting a target dead-on from nearly 10 miles away is a Hail Mary shot with conventional artillery shells. But with the new Precision Guidance Kit (PGK) 'smart' fuzes, three of six 155 mm shells fired from M777 howitzers did just that during a Marine training exercise at Quanah Range, Fort Sill, Okla., Feb. 4.



It takes about 10 seconds to transfer the electronic firing data to the Precision Guidance Kit fuze using the Enhanced Portable Inductive Artillery Fuze Setter. This is done before the canard cover is removed. (Cindy McIntyre/Fort Sill Tribune)

A Marine artillery gun crew fires an M777 howitzer during a training exercise at Quanah Range on Fort Sill, Okla., Feb. 4. Marines from regiments as far away as California and Japan fired new Precision Guidance Kit smart-fused 155 mm shells capable of dropping a round within 30 meters of the intended target. (Cindy McIntyre/Fort Sill Tribune)

Even seasoned artillerymen seemed impressed by the power of the 4-Hotel charges they set off to test the capabilities. However, the exercise was mostly about training the trainers, the NCOs who will show their units how to insert and program the GPS targeted fuses that have the capability of mid-course correction.

"In the most recent conflicts we've had, we've been extremely concerned about civilian casualties," said Master Gunnery Sgt. Norman Crowe of Fort Sill's Marine Artillery Detachment and director of the Enlisted Gunnery School. "With the accuracy of this round, we'll still be able to shoot into populated areas and engage targets knowing the commander's got confidence the round is going to go at the target."

Compared to a typical 250 to 300 meter accuracy zone of conventional shells fired at long range, the PGK guided shells have an accuracy of 30 meters or better. Crowe said the PGK system is being used in combat in Afghanistan.

Thirty senior NCOs from Marine regiments in Okinawa, Japan; Camp Pendleton, Calif.; Camp Lejeune, N.C., and the 14th Marine Regiment out of Fort Worth, Texas, participated in the training.

Two seven-man teams each fired two conventional shells first, then three PGK shells. The first two conventional shells armed with the M782 Multi-option Fuze for Artillery (MOFA) came within 130 and 110 meters of their targets, and after taking the new data into account the next two landed 10 and 30 meters from the target.

"That's a testimony to how good that gun is," said Crowe.

The PGK 'smart' rounds fell within 10 meters of their target, with three 'steel on steel' direct hits.

"I've only done that seven or eight times in my life," said Crowe of conventional shells. "I've shot maybe 50,000 rounds." He said feedback to the gun crew made them feel great. "That's a bragging right," said the Oklahoma City native. "It's like a hole-in-one on a par four."

A shell fired with a 4-Hotel charge travels at 1,526 miles per hour, twice the speed of sound.

During training, when a mission was received, a cable attached to the computer transmitted data to the fuze setter, a black box placed over the jacketed fuze to program it. Just prior to insertion, the jacket was removed, exposing the canards, or fins, that help guide the projectile. Once the fuze is programmed, it must be fired within seven minutes, or the program data is deleted.

Target information was relayed from Observation Post Andrews 12 miles away. The Fire Direction Center team positioned behind the howitzers determined the firing data using the Advanced Field Artillery Tactical Data System (AFATDS) which contains ballistic information that provides firing data for the howitzer to engage the target. The AFATDS accounts for nonstandard conditions and checks against known fire support control measures to ensure no friendlies are in the firing area.

That exercise was the first time the Fort Sill Marines fired the PGK shells, and the first time a charge of that magnitude had been used here.

"We usually use a 1-Lima charge," said Crowe, saving the more powerful charge for training at the Marine Corps

Marine Staff Sgts. Jorge Loera and Jose Hernandez ram a 155 mm shell into the chamber of the M777 howitzer while Staff Sgt. Alex Rodenhaber stands ready to insert the propellant increment sleeve during a training exercise at Fort Sill, Okla., Feb. 4. (Cindy McIntyre/Fort Sill Tribune)

Air Ground Combat Center, Twentynine Palms, Calif., where they have longer ranges.

A propellant canister holds five increments, which would be used for the most powerful charge.

Seven civilian instructors from Subsystem Technologies, Inc., Picatinny Arsenal, N.J., provided training support for the Marines as they learned the mechanics of inserting and programming the fuzes.

Cindy McIntyre is currently a writer for the Fort Sill Tribune.

Train as We Fight:

Lessons Learned from 25 Years of AMD Steady-State Operations

By Lt. Col. Todd Schmidt, Capt. Jessica Perales-Ludemann and Capt. John Moriarity

In the archives of Army Magazine, dating back to January 2004, then Col. Charles Anderson, wrote an article entitled Air and Missile Defense: Operation Iraqi Freedom. Serving as the deputy commanding officer of the 32nd Army Air and Missile Defense Command (AAMDC), Col. Anderson wrote a summary essay of the exploits of air defenders during Operation Iraqi Freedom (OIF). In his article, he briefly mentions an important, yet often overlooked, fact in the history of air and missile defense (AMD) operations in the region. He states, "During the years between Operation Desert Storm and Operation Iraqi Freedom, 'Patriot Diplomacy' made the familiar silhouettes of Patriot Launchers on foreign soil symbols of American resolve around the world."

Since Operation Desert Storm in 1990, AMD forces, Patriot battalions, have been on constant, steady-state operations and deployments into the U.S. Central Command (CENTCOM) area of responsibility (AOR) for the past 25 years and counting. There is no indication Patriot battalions will cease rotational deployments in this AOR. In fact and to the contrary, our allies in this region, and beyond, continually and consistently request more AMD presence from their U.S. partner in defending their freedom.

Brigadier Generanl Christopher Spillman, Air Defense Artillery School house commandant and chief of ADA, has challenged the branch, as a professional community of practice, to review current doctrine and training manuals in an effort to initiate a professional dialogue and conversation, on to improve training, doctrine, readiness and relevancy in the face of an ever-increasing complex operating environment. The branch must continually adapt and evolve in the face of a future operating environment that is fraught with emerging challenges and threat systems, interdependent problem sets and non-linear, often chaotic, conditions.

This paper is a contribution to that dialogue; a dialogue led by a host of phenomenal Training and Doctrine Command (TRADOC) experts with decades of operational experience in Patriot operations. The initiative we are sharing is not new. It has been discussed within TRADOC, partially developed, but never fully and formally operationalized. Our initiative was vetted through higher headquarters, approved by Brig. Gen. Donald Fryc, 32nd AAMDC commanding general, and reviewed with input by senior officers and warrant officers throughout the branch.

Our efforts stem from a recent challenge posed by Fryc that caused 4th Battalion, 3rd Air Defense Artillery to relook how we conduct gunnery certifications and the requirements we place on our operators in a forward-deployed environment during steady-state operations. Additionally, as a battalion, we spent significant time and effort developing our company-grade leaders in the art and science of Training Management and Mission Command. Given a completely new way of doing business in our gunnery program in the lead up to a deployment to the CENTCOM AOR, the following essay shares the essence of our initiative and our lessons learned.

The Principles of Army Training are clear. As stated in ADP 7-0, Training Units and Developing Leaders, "Train to standard. Train while operating. Train to sustain. Train to maintain. Train as you will fight."

The Challenge

In October 2014, 4-3rd ADA provided a mission assumption briefing to Fryc. On Nov. 1, 2014, the battalion assumed

the global response force (GRF) mission for the Army. This required the battalion to be ready to deploy Patriot forces worldwide on a seven-day prepare to deploy order (PTDO). During the mission assumption briefing, we walked. Fryc through our training strategy that concluded with a mission readiness exercise. We prepared for the GRF mission by the book. We built combat power one battery at a time, strictly following the Air Defense Artillery Patriot Brigade Gunnery Program, FM 3-01.86.

As our briefing concluded, Fryc challenged the collective audience to consider how the organization, as a whole, could improve gunnery and, additionally, to include maintainers in the certification process. It was a simple question, alluding to the principles of training; how to do a better job of training as we fight, as we operate, as we sustain and maintain. How to incorporate lessons learned from our 25 years of sustained operations in the CENTCOM AOR? To our battalion, there was nothing rhetorical, hypothetical, vague or ambiguous in the CG's challenge. We immediately took the initiative to develop a proposed modified gunnery program intended to allow us to train as we fight.

Current operations in combatant command AORs all over the world do not correspond with the original foundation from which FM 3-01.86 was drafted – it is not currently a living document. We have evolved as a branch, through years of trial and error, to establish best practices in deployment of the Patriot weapon system to act as a deterrent and ultimately neutralize the enemy. To do this effectively requires full-time manning in steady-state operations. This was not a driving factor behind FM 3-01.86, as it was originally written. At that time, Patriot was deployed in conjunction with major combat operations and the maneuver force, jumping with units as they moved forward throughout the battlefield. We must continue to train to perform these requirements and maintain these capabilities. However, training for steady-state operations is equally as important.

Most units do not train for sustained operations until they arrive in theater because of valuable time lost with a dedicated train-up period. There is time allocated for units to pass on lessons learned and present the current situation in theater during the relief-in-place (RIP) and transfer-of-authority (TOA) period. However, most of this is typically spent teaching units how to perform a new mission, in a theater they may not be accustomed to, and have never had the ability to replicate in garrison training operations. It is not because of a lack of deployment experience; our certification requirements simply do not call for it.

Modified Gunnery Program Focused on Sustained Operations

The purpose of FM 3-01.86 is to develop and test individual and crew proficiency in standardized gunnery techniques. It standardizes Patriot training and gunnery skill qualifications, all conducted in a garrison or field environment. Although it is meant to provide realistic and challenging training, it is not necessarily designed to be conducted truly as we maintain and sustain our force over a long duration.

The current version of FM 3-01.86 considers battery crews certified in intermediate level gunnery after successful completion of a series of collective drills and operations during daylight hours, including march order, emplace, initial-

ize and conduct air battle operations. Engagement control station (ECS) and information and coordination central (ICC) secondary and sustainment crews are also required to certify in the process.

However, there is little emphasis placed on the individual crew's ability to sustain operations for an extended period of time. As it currently stands, there are individual emplacement crews for each piece of equipment, thus putting the responsibility of maintaining that piece of equipment on the emplacement crew. However, once emplaced, the Patriot battery then becomes responsible for maintaining the entire battery's worth of equipment, regardless of the Soldier's position on the emplacement crew. This is not how we certify and fight while continuously operating in an expeditionary environment.

Reviewing multiple after action reviews from previous battalion deployments across the CENTCOM AOR, as it regards deployment train-up and certification, there seemed to be a recurring theme. Battalion's had not trained and certified as they would eventually fight, once RIP/TOA had occurred. We were failing to train and condition our Soldiers for how they would manage sustained operations in a deployed environment.

When units arrive in the AOR to assume mission and conduct a RIP with an outgoing unit, they go through a process called operational readiness evaluation (ORE) and crew certification and validation (CCV). This process validates a Patriot battery's ability to conduct sustained operations over the course of a 12-month deployment and focuses on crews that work 24-hour shifts, managing a Patriot site, maintaining full mission capability and operational readiness. A shift crew trains, fights and conducts sustained operations differently than a crew based solely on a Patriot system component.

The consistent results for battalions deploying into theater, over time, were repeated, frustrated attempts by Patriot batteries to complete RIP/TOA. They were battling against time available for RIP, because of multiple failed attempts to pass OREs and CCVs for their shift crews.

So, how do we take this process and modify it to truly train as we fight?

The idea is simple. Rather than defining a crew based on a system component of the Patriot battery (as we normally do), e.g. launcher crew, radar crew, engagement control station crew, battery command post (BCP) crew, etc., we modified our definition of the crew. For our purposes, we defined a "crew" as the team of Soldiers that will be "on shift" at any given time while deployed in combat, manning a Patriot site. Current gunnery and crew certification allows for system crews to conduct stand-alone Table VIII certification. However, under our modified gunnery program, the entire shift crew (or site manning crew) passes or fails together, as a team.

Current intermediate gunnery certification takes place in the course of one day. Our modified gunnery program takes place in two phases with a minimum 72-hour pause in the middle. This allows the shift crew to abide by a battle rhythm that exercises and certifies their ability to conduct daily maintenance. Additionally, their assigned mechanics and system maintenance personnel demonstrate the ability to transition from a garrison maintenance battle rhythm to a continuous deployed/operational maintenance program, giving operators the ability to sustain the fight and equipment without impact to operational capability.

Crews must methodically work through the varied maintenance challenges that may occur between Phase 1 and Phase 2, ensuring full mission capability. Additionally, shift crews sign over the Patriot site at the end of their shift, requiring the oncoming crew to inspect the condition and maintenance status of the site and each piece of equipment, signing over the site following a comprehensive inspection and inventory. This process is a forcing function that holds shifts accountable for the tasks, maintenance and sustainment required to run the site during their assigned shift. If the oncoming shift crew finds shortfalls, they do not sign for the site or relieve the outgoing shift until the site and/or shortfalls are fixed. If they do accept a substandard site, waive the inspection and sign for the site, they are then held accountable.

This system provides for checks and balances that result in the site being kept at a high-state of readiness during steady-state operations incorporated into the gunnery certification program. Whereas, traditionally, the transition to steady-state operations is not incorporated into the unit's training strategy and program until a unit has received a deployment order and is preparing for and conducting the final mission readiness exercise and culminating training event prior to deployment. We believe that by integrating sustainment operations into the current gunnery program, it prepares and conditions commanders, leaders and operators for the demands of daily tactical site requirements, challenges and operations.

Theory versus Practice and Our Lessons Learned

It all sounds great, doesn't it? However, as von Moltke (the Elder) warned, "No plan survives first contact." Or, in our case, the theory of our modified gunnery program was easy to put in a memorandum of instruction format and slick PowerPoint brief, but putting it into practice caused us to hit a few minor bumps along the way.

The first challenge we ran up against was time and resources – we were taking significant risk. We were implementing a completely new way of conducting gunnery, but we had limited time to do it in, because we would literally be putting our equipment on planes, trains and ships within weeks. This required deliberate and detailed management of time and resources to ensure two critical requirements.

First, we were still required to maintain a high state of mission readiness and deployability to fulfill our obligation to execute a GRF mission. This required a minimum engagement package (MEP) to be on a seven-day PTDO worldwide. We had already executed the deployment of a MEP to Fort Bliss, Texas, on a deployment readiness exercise that was initiated no-notice and culminated with a Patriot live fire, a deployment of MEP personnel to the Korean Theater of Operations to validate U.S. Forces Korea reception, staging and onward movement and integration procedures, as well as a reconnaissance, terrain walk and combined air defense working group with an allied nation in United States European Command. The battalion was a "T" in our GRF mission requirement. Secondly, we needed to maintain a high state of operational readiness and maintenance, because our intent was to put two firing batteries through the modified gunnery program at a time, retaining the equipment of the remaining firing batteries that were "on deck" to support the GRF mission and/or any equipment failures that might de-

velop during our modified gunnery that would cause unacceptable delays.

The second set of challenges we encountered was at the battery level. Battery commanders have differing levels of deployment experience, and not all deployment experience translates into training experience and preparing a Patriot battery for continuous operations in the AOR. Ambitious, aggressive commanders can rush their training programs, over-estimate and/or inaccurately assess their training, and be unable to manage their own expectations in the deliberate, and sometimes grueling, process of gunnery. They want to go from zero to 60 at record speed, rather than utilize the time-honored system of crawl-walk-run.

This method is not always easy, as it takes time, focus and experience. Starting with and re-emphasizing the basics ensures success during traditional gunnery, as well as for our modified gunnery program. At the battery level, the importance of a strong foundation in basic gunnery skills and training remains the same. Leaders must ensure that operators are given the time and resources to train properly on all tables to achieve success. This is the point at which it is imperative that battery commanders manage expectations and accurately assess their training. An inherent flaw in the way the Patriot force currently certifies is current gunnery tables leave out the fact the equipment must be manned, maintained and sustained continuously over an extensive amount of time that simulates 24-hour operations in a forward deployed environment. Again, training as we fight.

Enter Phase II of our gunnery program. Phase II of the modified gunnery program is built to mimic a tactical Patriot site that is required to function 24/7. This allows the battery commander and operators to identify weak areas of operational knowledge and begin to acquire the operational experience necessary to sustain steady-state operations. It is this knowledge and experience that will pay dividends when assuming any mission and make a smooth RIP/TOA for both the incoming and departing units.

If the right fundamentals are drilled during the initial phases of training, the transition to steady-state operations is smooth and the focus can shift to maintaining a tactical site and air battle management. Failures to ensure proper standards are being enforced from the beginning of training can and will be felt in Phase II. Simple maintenance issues that can be glossed over in Phase I, become glaring operational issues in Phase II. Starting crews out slowly and deliberately is a tried and true way to set up the battery for success.

The third challenge we encountered was at the battalion level, related to our evaluations process, as well as our trainers and evaluators. This was the first time for the battalion to evaluate battery gunnery certifications in such a manner. Although all evaluators were briefed, trained and certified to evaluate in our modified gunnery program, old habits die hard. There were two solutions to ensuring our evaluators were best prepared. First, we ensured evaluators had recent deployment experience. Secondly, we command-directed a heavy emphasis and effort on Patriot master gunner (PMG) training and certification.

When the battalion entered the TRAIN/READY Phase of the Army Force Generation Cycle, we only had four of 14 required PMGs in the battalion. By the time the battalion deploys, we will have 20-24 PMGs across the battalion. The undertaking is not easy and it causes seri-

ous reflection within our noncommissioned officer population. In the end, as they always do, they made the initiative a success. When you are a leader in an air assault unit, you need to be air assault qualified – it is what professional leaders do. When you are a leader in an airborne unit, you need to be airborne and jumpmaster qualified – it is what professional leaders do. When you are a leader in a Patriot unit, you need to be PMG qualified – qualified to train, evaluate and certify your Soldiers – it is what professional air defenders do.

Regardless of these significant challenges, the results, thus far, are on target. The true results, however, will be in the performance of our unit as we conduct RIP/TOA in the CENTCOM AOR. More to follow.

Training Management and Understanding the Fundamentals

For all the professional discussion and debate revolving around whether or not our current company-grade officers know how to manage training, an old Army axiom rings true, "You can only expect what you inspect." In other words, if you have high standards and expectations for how battery commanders are managing training and you develop them, trust them, give them the resources and tools to do it correctly and to a high standard, and you inspect, attend and have a consistent leadership presence at training meetings, rehearsals and in the field, rest assured that today's company-grade leaders can plan, manage and execute great training strategies.

As an Army, we tend to be good at planning, writing and issuing orders and executing the plan. We often fall short or take shortcuts on those other five steps of the 8-Step Training Model – training the trainers, conducting a recon, rehearsing, evaluating and retraining. To counter this challenge, we focused heavily on training our trainers and rehearsing our mission. Rehearsals, seemingly a lost art, are a standard, non-negotiable training event that involves battalion-level leadership attendance, evaluation and feedback.

As it directly relates to our modified gunnery program, the challenges we encountered centered on training and enforcing some basic fundamentals. Reading several years' worth of battalion after action reviews concerning gunnery, it is abundantly clear the stumbling blocks that frustrate collective gunnery training fall into three main categories: safety, maintenance and communication. Crews are going to know their crew drills. Soldiers know their primary job.

It is the small things that trip us up. Simple things like walking backwards while ground-guiding; not using three points of contact while climbing on equipment or failing to have proper personal protective equipment fall under common safety issues. Not understanding how to read a 5988-E, conduct disciplined, by-the-book preventative maintenance checks and services and ensuring we are tracking parts received and parts installed statuses, cause us to fail in meeting the standard for maintenance. Finally, just the basics of communicating, either internally to the crew, or over the net with the battery command post and higher headquarters, cause us to make mistakes in our ability to battle-track during increasingly intensive air-battle exercises.

Oftentimes, in the competitive race to see which battery can be the first to Table VIII, we repeatedly rush to failure. Remember the Aesop fable of the tortoise and the hare? Slow and steady wins the

race. The tried and true method of crawl-walk-run is reinforced time and again, as one battery rushes to be evaluated, while a sister battery takes its time establishing high standards in their field site, conducts good, disciplined maintenance and drills crews deliberately from the individual level up to the battery collective level.

"Slow is smooth and smooth is fast," is what they teach in Jumpmaster School. Some get it; some do not. Those who do are usually doing recovery operations while a sister battery that rushed to failure remains in the field for multiple evaluations, until they finally pass. The battery that knows how to conduct disciplined training management in garrison, coupled with understanding the basics of the 8-Step Training Model will always be successful in meeting their training objectives.

Conclusion

In the end, it is about mission command. It is about building a strong, cohesive team that shares a mutual trust down and up the chain of command. Building great teams is not easy. It takes time. It requires investing in the professional development of leaders at all levels. It is about building a foundation of good order, discipline, trust and frank, transparent communication, ultimately building a shared understanding of the commander's intent and desired end-state.

For commanders, we must earn the trust of subordinates, provide clear intent and underwrite and accept prudent risk. As Jim Collins writes in Good to Great, "Good leaders are focused on accomplishing the mission, no matter the cost; great leaders focus first on building the team, creating a shared vision and then tackling the mission." For leaders at all levels, it's about getting after exercising disciplined initiative, continually learning, developing and adapting themselves and their organizations.

When we think about and consider the challenges of training the future Fires force and how we grow, develop and nurture learning, adaptive organizations and leaders, it is really about how we best invest our resources of time and money. Military historian Williamson Murray writes that innovation and organizational adaptation are driven by well-educated, intellectually curious leaders that take the time to study, reflect and critically examine organizational challenges.

Whether the challenge is how to best prepare for an impending deployment by modifying doctrinal gunnery certification programs to train as we fight or how to best develop company-grade officers in the Principles of Army Training and training management, it takes time. Time to develop our junior enlisted Soldiers, noncommissioned officers, warrant officers, and commissioned officers. Time to provide them with personal, meaningful and tailored counseling. Time to spend with the Soldiers in the field and at key training events. Time to give constructive feedback and criticism to achieve consistent improvement.

Lt. Col. Todd Schmidt currently serves as the battalion commander of 4th Battalion, 3rd Air Defense Artillery.

Capt. John Moriarity currently serves as the 4th Battalion, 3rd Air Defense Artillery fire direction center officer in charge.

Capt. Jessica Perales-Ludemann currently serves as the battery commander of A Battery, 4th Battalion, 3rd Air Defense Artillery.

The 2015 Air Defense Artillery Knox, Hamilton and Shipton Awardees

The 2015 Henry A. Knox Award

The 2015 Henry A. Knox Award for Excellence has been awarded to A Battery, 5th Battalion, 5th Air Defense Artillery Regiment, 31st Air Defense Artillery Brigade. This is the second year in a row A Battery, 5-5 ADA has produced the best battery within the Army Air Defense community.

A Battery started by winning the Battalion Best Crew competition. A Battery followed that by being the first battery to ever conduct an Indirect Fires Protection Capability Conversion Validation Exercise. Once deployed, the impressive degree of knowledge and capabilities displayed by A Battery Soldiers led to them being assigned not only the Tier One Air and Missile Defense Cell mission but two additional airspace de-confliction missions in two geographically separated locations at the same time. The battery transitioned from Lightweight Counter Mortar Radars to Ku Radio Frequency System Radars while continuing to conduct the complex array of air defense and air space de-confliction missions; resulting in the destruction or deflection of over 40 rockets or mortars aimed at the assets they were protecting.

The battery exceeded all requirements for ammunition storage at Bagram Airfield, Afghanistan. The battery's Explosive Safety Program was noticed by Bagram's commanding general who adopted it as the standard operating procedure for the rest of the airfield.

A Battery has proven that they can accomplish any mission given to them at any moment. They have demonstrated they are technically and tactically proficient at various levels of air defense operations, maintain their equipment and themselves, keep safety awareness at the forefront of every operation and exude excellence in all areas. The unit's competency is beyond reproach and exemplifies the spirit and intent of the Henry A. Knox Award.

The 2015 Alexander Hamilton Award

The 2015 Alexander Hamilton award goes to A Battery, 1st Battalion, 174th Air Defense Artillery Regiment, Ohio Army National Guard.

A Battery developed the first ever National Capital Region (NCR) Gunnery program. The battery participated in a military exercise at Fort Washington, Washington, D.C., the first in over 80 years, in order to enhance detection of a new threats in the NCR which resulted in a revised NCR visual aircraft recognition hotlist. During a month-long training exercise that incorporated a live-fire phase, the battery Avenger teams fired 41 mis-

siles and achieved a 90 percent hit rate. The battery's Soldiers were required to practice and pass all Gunnery Table tasks I- VIII on a monthly basis while deployed on the NCR mission.

The professionalism of the battery's Avenger teams continually impressed the many VIPs that observed them throughout their deployment; due to the responsibility and maturity shown by battery junior enlisted leaders. A battery Soldier received the Missile Defender of Year Award for his accomplishments in the NCR. One of the battery platoon sergeants was awarded Honor Graduate at Senior Leader Course given at Fires Center of Excellence.

The Soldiers of A Battery, 1-174th ADA, Ohio Army National Guard, have proven that they can accomplish the mission at any moment and demonstrated their proficiency at countless levels of air defense operations, maintaining their equipment and themselves and keeping safety at the forefront in all areas. The unit's competency is beyond reproach and exemplifies the spirit and intent of the Alexander Hamilton Award.

The 2015 James A. Shipton Award

The 2015 James A. Shipton Award goes to Capt. Jason E. Roberts, Headquarters and A Battery, 2nd Battalion, 6th Air Defense Artillery Regiment, 30th Air Defense Artillery Brigade. Capt. Roberts was awarded the Shipton award because of his overwhelming evaluations in all categories including outstanding performance and contributions that significantly enhance the air defense mission.

Based on Capt. Roberts' leadership abilities, he was hand-selected to be Air Defense Artillery Career Course program manager, supervising six senior captain instructors, one Australian military exchange instructor and two defense contractors. In his role as course manager, he was responsible for curriculum development and execution of the Air Defense active duty Captains Career Course (CCC), reserve component CCC (phase 1 and 3), International Preparation Course and the battery commander's pre-command course. Capt. Roberts worked diligently across the Fires Center of Excellence (FCoE) in integrating people and resources to transform professional military education (PME) while at the same time continuing to conduct current course loads.

Capt. Roberts developed the educational model for the Officer Education System that supported and complemented the ADA branch transformation effort. The model he created is now reflected throughout all ADA PME. The redesigned course allows students to receive doctrinal education based on their next unit of assignment. He personally wrote, developed and executed the first Avenger and Indirect Fire Protection Capability planners' course; another first of its kind.

Capt. Roberts' commitment to excellence has been displayed throughout his time in 30th Brigade. He was selected as FCoE officer Instructor of the Year, earned his second graduate degree in 2015, published two articles in the Fires Bulletin and increased the rigor and operational relevance of the Air Defense CCC.

Roberts' commanding officer, Col. James P. Payne said, "No other air defender epitomizes the leadership qualities, commitment to excellence and innovative drive of the Air Defense Artillery's founding father, Brig. Gen. James A. Shipton, as does Capt. Jason E. Roberts."

The 2015 Field Artillery Knox, Hamilton and Gruber Awardees

The 2015 Henry A. Knox Award

Congratulations to C Battery, 2nd Battalion, 319th Airborne Field Artillery Regiment, 82nd Airborne Division Artillery, Fort Bragg, N.C., the recipient of the 2015 Henry A. Knox award.

C Battery is a M777A2 howitzer equipped airborne battery with the mission of providing close supporting Fires to the 2nd Brigade Combat Team, 82nd Airborne Division and the 82nd Airborne Division Artillery. During 2015, the battery's achievements were numerous and they are highly deserving of this prestigious award.

C Battery conducted 12 separate live-fire training exercises, firing over 1,600 rounds in order to maintain readiness. In October 2015, the battery placed second in DIVARTY's 'Best of the Best' section competition. Both firing platoons conducted table XII qualification, immediately followed by a battalion gunnery exercise, and a Fires coordination exercise, providing fire support to the brigade's cavalry squadron early in the year. The battery has mastered the delivery of all types of munitions; to include live-firing eighteen rounds of M107, high-explosive munitions fitted with precision guidance kits.

Paratroopers from C Battery also participated in several interoperability training exercises such as: Pegasus Cypher, Steel Saber and a Combined Joint Operation Access Exercise. These events partnered the battery's paratroopers with members of the 7th Parachute Royal Horse Artillery, 16th Air Assault Brigade, from Colchester, England, and culminated in two joint live-fire exercises.

During the last 12 months, C Battery has maintained a platoon's worth of men, weapons and equipment on an eight-hour recall; ready to jump, fight and win tonight.

The award is named after the first Chief of Artillery and first Secretary of War Maj. Gen. Henry A. Knox. The award recognizes the most outstanding active component battery. Originally called the Knox Trophy and Medal, the awards were established in 1910 by the chief of field artillery and presented annually. They recognized the best Field Artillery battery and best enlisted Field Artillery Soldier based on performance, excellence, leadership and proficiency. The awards recognized hard work, talent and determination that resulted in performance of the highest of standards. The awards were halted during World War I and were not re-initiated until 2002.

The 2015 Alexander Hamilton Award

Congratulations to A Battery, 3rd Battalion, 197th Field Artillery Regiment, with the New Hampshire Army National

Guard, the recipient of the 2015 Alexander Hamilton Award.

A Battery is a storied combat unit that has been activated for federal service on numerous occasions throughout the Global War on Terror in support of Operation Iraqi Freedom, Operation Enduring Freedom, Operation New Dawn and Operation Spartan Shield. The regiment's achievements were 'above and beyond' and earned them the award.

In 2015, A Battery made several monumental achievements that led them to be one of the most successful High Mobility Artillery Rocket System units in the Army. They were part of the first National Guard battalion to perform an artillery mission in support of Operation Spartan Shield.

They were also the first National Guard unit to participate in Operation Eager Lion, serving as the only reserve component element during the entire exercise. A Battery trained coalition partners and performed in an outstanding manner during their deployment, increasing regional stability across the U.S. Central Command area of responsibility.

This award was created in 2002 and is named after American statesman and Continental Army Artilleryman Alexander Hamilton. Hamilton was an outstanding artillery battery commander and a skilled cohort of Gen. George Washington during the Revolutionary War. Hamilton helped write the U.S. Constitution and also served as the nation's first secretary of the treasury.

The 2015 Edmund L. Gruber Award

Congratulations to Sgt. 1st Class Jorge A. Moraguzman of C Battery, 2nd Battalion, 15th Field Artillery Regiment, Fort Drum, N.Y., the recipient of the 2015 Edmund L. Gruber Award.

This award recognizes superb individual talent and significant contributions to the Field Artillery's warfighting capabilities. Moraguzman's successes were many in 2015. This is an NCO who has a strong history of excellent leadership. Following redeployment from Afghanistan in 2014, he led 1st Platoon through a transition from 3rd Brigade Combat Team to 2nd Brigade Combat Team, 10th Mountain Division. In nine short months, he led his platoon through reset operations, transitioned to a new brigade, completed readiness training and geared up for a second deployment to Afghanistan.

Despite an extremely demanding operational tempo that included new equipment fielding/new equipment testing for their new M777A2 howitzers, a grueling sub-zero temperature brigade fire support coordination exercise, a rotation to the Joint Readiness Training Center in Fort Polk, La., selection to provide support to the U.S. Army Operational Test Command to test the advanced precision guided munitions and then ultimately deploying in support of Operation Freedom's Sentinel, Moraguzman led his platoon to excellence.

Within four months of deployment, Moraguzman supervised his platoon as they fired over 150 fire missions in support of multinational operations within the TAAC-S area of operations and Kandahar Airfield Ground Defense Area, Afghanistan.

The award is named after Brig. Gen. Edmund L. Gruber, a noted Field Artillery officer, who as a first lieutenant in 1908 composed the "Caisson Song," which the Army adopted as "The Army Song" (The Army Goes Rolling Along) in 1952. The Gruber Award was established in 2002.

IN THE NEXT ISSUE:

Optimizing Fires: Creating Synergies with Leaner Force Structure. With the Army's active-duty end strength dropping to 450,000 by the end of FY 2017 the Fires force is leveraging the human dimension to support the Army's implementation of Force 2025 and Beyond. A leaner, more dynamic Army is navigating its way against elusive enemies in a time when restructuring and the return of division artillery and downsizing are occurring simultaneously. This issue will look into how enhancing the Fires platform through training, doctrine, and leader development allows Soldiers to effectively fight with new efficiencies.

Submissions are due by April 1, 2016. Send your submissions to usarmy.sill.fcoe.mbx.fires-bulletin-mailbox@mail.mil or call (580)442-5121 for more information.

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