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Fires

Designing the Future Army:

Creating a Regionally Aligned, Ready and Responsive Force

Fires July-August 2015 Contents

The Post-OEF Future of C-RAM
by CPT Kelly J. Langan and CPT James Burton

Shoot and Move to Survive
by CPT Ryan Schuler

Fires under Resolute Support
by CPT Steve Thomas

Black Magic
by COL Rodrigo R. Gonzalez III, CPT Patrick O. Boling and 1LT Dominic J. Pace

Division Shaping Operations in the Decisive Action Training Environment
by MAJ Sean Powell

Fires Art with Host Nation
by COL Edward O'Neill

Air Defense in the Ukrainian Conflict
by MAJ James Harvey

Training Mobile Fire Support: Hide, Seek & Destroy
by CPT Michael A. Raymond, SFC Cory Howland and SSG Adam Petersen

Addressing Family Readiness in a downsizing Army
by Erica Koelder

Speaking Truth to Maneuver
by LTC Pat Proctor, PhD.

Fires July-August 2015

On the cover: Soldiers from 2nd Battalion, 4th Field Artillery, 3rd Armored Brigade Combat Team, 1st Cavalry Division observe enemy territory during Decisive Action Rotation 15-07 at the National Training Center, April 27, 2015. Photo by SGT Ashley Webster, U.S. Army

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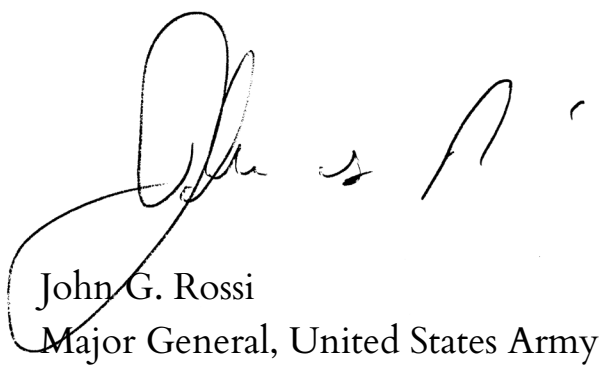

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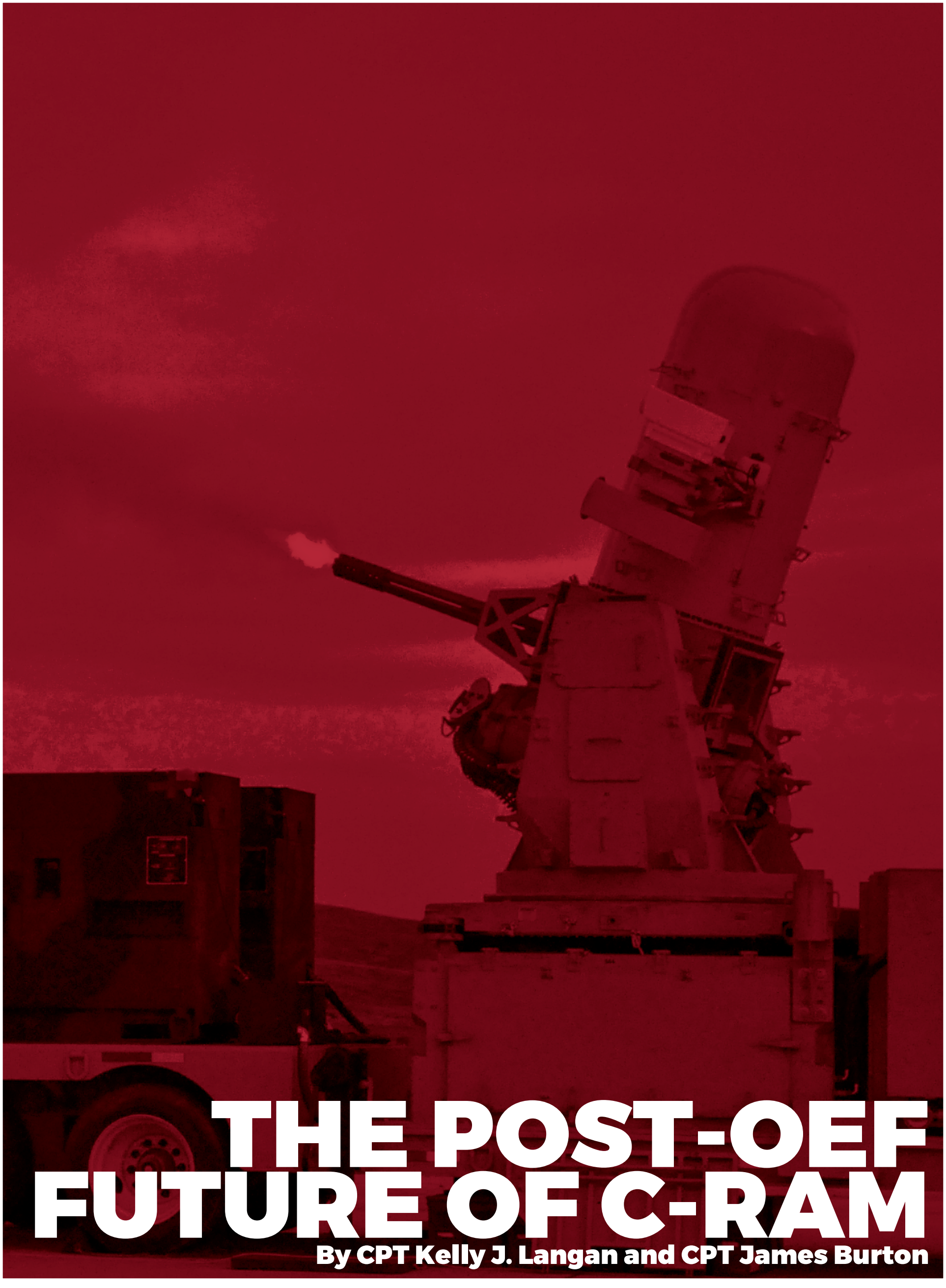
Purpose

Originally founded as the Field Artillery Journal, Fires serves as a forum for the discussions of all Fires professionals, both active and reserve components; 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.



THE POST-OEF FUTURE OF C-RAM

By CPT Kelly J. Langan and CPT James Burton

Counter-Rocket, Artillery, and Mortar (CRAM) Intercept is comprised of a modified Naval Close-In Weapon System (CIWS), mounted on a low-boy trailer for land-based operations. It was originally fielded by the Army during Operation Iraqi Freedom, and was deployed to Iraq to defend compounds in Baghdad, Balad, and Basra where it had great success in protecting the lives of the forces in theater. Only recently, has C-RAM made its way into Afghanistan. Nearly 10 years since its first installation into a theater of operations, its reputation for successfully defeating incoming rockets, artillery, and mortars has made C-RAM a household name in OIF and OEF where it remains one of the most valuable Fires assets. Due to the success of C-RAM Intercept while it was deployed in Iraq, the need arose to have the system as a permanent Army capability and it transitioned to an acquisition program in FY13. The 5th Battalion, 5th ADA and later 2nd Battalion,44th ADA were the only battalions to be chosen for fielding the Land-Based Phalanx Weapons Systems (LPWS) by the Chief of Staff of the Army.

The Army's moniker for the gun is the LPWS. It houses the M61A1 20 mm, six-barreled Vulcan Gatling gun, which can fire up to 4,500 rounds of M940 ammunition per minute. The rounds are designed to self-destruct beyond 2,000 meters to minimize collateral damage of protected assets and to prevent fratricide. It also utilizes overlapping radar coverage which ensures that targets are mitigated and engaged with split-second precision. Included in the C-RAM system-of-systems is the sense and warn capability, currently known as Wireless Audio Visual Emergency System (WAVES). This system provides early warning to personnel within the area of incoming indirect fire (IDF), thereby allowing them to seek shelter or take cover.

C-RAM and Operation Enduring Freedom

In 2013, the C-RAM Intercept capability arrived in Afghanistan when B Battery, 2-44 ADA began their mission of protecting service members and civilians from persistent enemy IDF. After the success that B Battery, 2-44 ADA had at their location, the need and request for additional C-RAM Intercept expanded to multiple bases within Afghanistan in FY14, in which 2-44 ADA deployed an additional C-RAM battery and a portion of the battalion headquarters. Recently, 2-44 ADA and 5-5 ADA conducted a relief in place and transfer of authority of the C-RAM Intercept mission in Afghanistan. In addition to the increased

mission requirement, the system has been upgraded several times since it was utilized in Iraq in order to meet the requests of commanders on the ground and to enhance its performance. These new upgrades have shown an increase in capabilities which have resulted in a higher number of successful engagements of IDF.

In the roughly 18 months since the C-RAM Intercept capability has been operational in Afghanistan, hundreds of indirect fire attacks have taken place at bases defended by C-RAM units. These IDF attacks have resulted in an incredibly large number of successful engagements which have significantly reduced IDF related casualties. With additional upgrades for the entire C-RAM system-of-systems scheduled to occur throughout 2015, the current trend of successful engagements are expected to increase an already effective intercept rate. Despite the accomplishment of C-RAM Intercept and the performance of the LPWS, there are still some people that have misconceptions about what the system should be able to do. The bottom line is that not every round of IDF fired towards an installation will be engaged because some rounds will not impact on the base and some rounds may impact outside of a defended area of an LPWS. The majority of people that have seen the system in action in combat are very grateful for it and the protection that it provides, to include the numerous times that service members have said that it saved their lives. On the other hand, there are also some that believe the system does not engage IDF enough and this has to do with misconceptions about the success rate. C-RAM Intercept is not a 'magical force field' that destroys every round of IDF that is fired in the direction of a base. The system is designed to defend a certain area based on its capabilities, and it does this with distinction. One key element for leaders and Soldiers in C-RAM units while deployed is to manage expectations of the other units that are on the same installation.

Regardless of the differing opinions on the capabilities of the system, it is important that individuals pay attention to the WAVES system when it sounds and not become complacent because there are LPWSs on the installation. The upgrades that have been made thus far and those that will continue to be installed will only improve upon C-RAM Intercept capability. All that being said, if C-RAM Intercept is able to engage one IDF round and save one life, then the entire system is worth it.

As the draw-down in U.S. forces and the troop-cap theater wide was implemented earlier this year, keeping C-RAM in Afghanistan was

deemed vital to mission success. This was made evident once again due to the success at former Forward Operating Base (FOB) 113, where remaining CJ-SOTF forces in country offered to decrease their own highly trained operators in number after realizing that they could not afford to lose the force protection of the LPWS and C-RAM. Over the last few years, FOB 113 received a plethora of indirect fire, earning the nickname Rocket City. The protection provided saved countless lives in that area.

Under Operation Freedom Sentinel: Is there a Future for C-RAM?

As far as C-RAM Intercept capabilities are concerned, is there a continuing need in Afghanistan under Operation Freedom Sentinel without ongoing combat operations? One could argue that the imminent threat from indirect fire will never be a thing of the past. Even though we are drawing down the number of coalition forces in Afghanistan, thousands of service members and civilians will still remain to carry on the new mission. With so many personnel remaining in Afghanistan, C-RAM will be necessary to protect those who remain because it is unlikely that the threat of IDF will diminish.

As the International Security Assistance Force (ISAF) mission ends in 2014, so does the combat mission that we have been accustomed to for the past decade-plus. As Operation Freedom Sentinel continues on, the mission itself transitions to a larger focus on training, advising, and assisting the Afghan National Security Forces alongside our NATO partners under Operation Resolute Support and the threat of indirect fire still remains. As more bases continue to close and personnel consolidate at a smaller number of installations, the enemy will have an opportunity to focus its efforts on these installations. Also, with the transition from combat operations, coalition forces will no longer be conducting large scale operations in the battle space to deny the enemy freedom of maneuver. This shift could allow the enemy to prepare for more large scale, complex attacks, as well as consolidate their indirect fire munitions against the few remaining coalition bases in order to cause more damage than in the past. It is very likely that this could result in an increase in IDF attacks at these installations compared to what we have seen historically during OEF. With fewer forces searching for weapons caches and interdicting on possible attacks, the possibility for increased IDF attacks is very real and C-RAM Intercept will be relied upon

heavily to protect everyone on these installations. During Operation Freedom Sentinel, C-RAM Intercept will continue to be tested by enemy IDF on a regular basis. With the scheduled upgrades to the system added to its current capabilities, C-RAM will continue to be successful defending designated bases as IDF attacks increase in these areas. With the likelihood of increased IDF attacks as we progress into Operation Freedom Sentinel, the need for C-RAM Intercept in Afghanistan remains paramount to the success of the mission. Added to the sense and warn capability, C-RAM Intercept will continue to save lives. The indirect fire threat will continue to exist during Operation Freedom Sentinel and C-RAM will continue to provide protection to the remaining U.S. and Coalition forces.

SHOOT AND MOVE TO SURVIVE

A self propelled howitzer battery's lessons Learned from JMTC

By CPT Ryan Schuler

U.S. Soldiers with 1st Battalion, 82nd Field Artillery, 1st Brigade Combat Team, 1st Cavalry Division provide security on an M992A2 Field Artillery Ammunition Supply Vehicle during exercise Combined Resolve III at the Joint Multinational Readiness Center in Hohenfels, Germany, Oct. 29, 2014. *Photo by SSG Randy Florendo, U.S. Army*

One word can describe the problem set facing a 155 mm self propelled howitzer battery during a Decisive Action Training Environment (DATE) rotation at the Joint Multi National Training Center (JMTC); complex. The mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC) variables faced were far different than anything we had experienced during our home station training prior to Combined Resolve III, a joint multinational training exercise. The complexity, specifically the terrain and hybrid enemy threat, challenged us to alter the way we fought and ultimately led to tremendous organizational learning. We developed new tactics, techniques, and procedures (TTP) for centralized vs. decentralized operations, survivability moves, terrain utilization, resilience, risk reduction, suicide prevention (R3SP),

and battery defense. Through use of these techniques the battery fired more than 1,600 rounds in support of the airborne battalion combat team (ABCT), finishing the fight with a slant of six of six howitzers.

Mission Command: Centralized vs. Decentralized Operations

Decentralized intent based execution was emphasized during home station training through a deliberate leadership development program following the model developed by the 1st Squadron 7th Cavalry and LTC Jason Misel. Through a series of officer professional development tasks, the officers of the battery discussed the principles of mission command and read COL Douglas Crissman's article, "Improving the Leader Development Experience in Army Units" and LTC Christopher Hickey's article, "Principles and Priorities in Training for Iraq." From those articles the concept of 'rumble strips' and the principal of pushing leaders to their individual 'threshold of failure' manifested. These concepts set the foundation for designing all battery training events. The 'rumble strips' set the individual left and right limits for each leader within the battery, and the mission, enemy, terrain, troops, time available and civilian (METT-TC) variables for a training event could be controlled to ensure leaders were forced towards their 'threshold of failure' promoting individual growth.

Throughout the fight the battery operated in a hybrid of centralized versus decentralized operations. Our Fires were based on a centralized call for fire through a battery fire direction center (FDC) (with the second FDC operating as the battery operations center [BOC]), and the firing was conducted by platoons maneuvering independently of one another. When platoons were maneuvering the howitzers would be on the platoon command NET, however immediately upon entering the firing point the howitzers would transition to a battery Fires voice NET. The howitzers would at all times maintain the battery Fires digital NET on their second radio. Having the ability to maintain platoon voice NETs enabled the platoon sergeant and gunnery sergeant to ensure a mutually supporting defense.

This hybrid mission command structure was necessitated both by the terrain and the enemy threat. With the high counterfire environment it was necessary to maximize survivability, of the battery, and one way to accomplish this was to maintain dispersion of the platoons. Based upon the prevalent target description being armored targets there were few platoon missions, most were battery or larger. Having the second FDC act as a BOC enabled the battery to maintain a robust common operation picture (COP) and generate FDC crew rest via BOC to platoon operations center transfers. Force Battle Command Brigade-and-Below (FBCB2) usage was maximized to further develop the COP between battery and platoon leadership by disseminating updated graphics, and receiving refinements as necessary.

Survivability Moves

The number one task for a battery is to maintain responsive firing capability at all times. Simply put, the battery cannot fire if it is destroyed. This however seems to elude us as fire supporters at times. During situational tactical exercises (STX) prior to force-on-force the battery experienced lengthy delays waiting for end of mission. These delays were often attributed to an inexperienced observer but directly resulted in destruction of multiple howitzers and crews. This was mitigated by establishing one additional fire command standard.

If following rounds complete plus the time of flight and one additional minute we did not receive end of mission, corrections, or a repeat, the fire direction officer (FDO) was empowered to announce end of mission to initiate a survivability move. Following implementation of TOF+60 no firing sections were struck by counterfire. Given recent experience as a cavalry squadron fire support officer for rotation 14-04 at the National Training Center, Fort Irwin, Calf., I assessed this as a feasible and acceptable balance between providing fire support while mitigating the counterfire threat. The alternative to this is leaving a finite resource in a now known and exposed location

An M109A6 Paladin howitzer of 1st Battalion, 82nd Field Artillery Regiment, 1st Brigade Combat Team, 1st Cavalry Division advances on the objective while conducting a tactical movement during exercise Combined Resolve III at the Joint Multinational Readiness Center in Hohenfels, Germany, Nov. 8, 2014. *Photo by SSG Randy Florendo, U.S. Army*

subject to enemy engagement.

Terrain Utilization

The most immediate and daunting challenge the battery faced at Hohenfels Training Area (HTA), Germany was the terrain. The topography and vegetation at HTA is drastically different than that of Fort Hood, Texas or Fort Irwin, Calif. Large open positions for artillery to fire as a battery, sometimes even platoon, simply do not exist. Where the vegetation gives way to open areas often the slope or cant is beyond the limits of the M109A6 for firing. Maneuver corridors were restricted by terrain to no larger than a platoon and often forced movement in a file or column.

Ultimately we were able to utilize the terrain to our advantage. The hybrid enemy threat dismounted insurgency with small arms, forced us to prioritize concealment versus finding positions that allowed battery sized firing areas. We began to see the topography as advantageous by using the Inter-visibility (IV) lines to maneuver between positions while remaining undetected from observation posts. Furthermore, we maximized the use of natural concealment by using vegetation to camouflage vehicles, and 'hides' when we were not actively engaged in a fire mission. The howitzers would occupy firing points by sending updated piece status and site to crest data to the FDC, and then they would immediately back into a hide. Upon receiving a fire mission the FDC would instruct howitzers to reoccupy the firing point; howitzers would send updated piece status, and would be in position ready to fire within seconds. In this method we maximized the capability of the M109A6 howitzer to shoot and move, treating every mission as an emergency mission inside the firing area. The use of IV lines and natural concealment allowed us to remain undetected for much of the fight, further allowing us to make visual contact ahead of the enemy, develop the situation, and dictate the pace of any engagement.

Rearm, Refuel, Resupply, and Survey Control Point

During STX we attempted our rearm, refuel, resupply, and survey control point (R3SP) operations as described in our doctrinally founded tactical standard operating procedures (TACSOP) by use of multiple flat racks with ammunition, a fueler, survey control points, and class I resupply all in one location. It was a simple push concept where the battery trains simply brought everything, dropped it all, and the firing sections rotated through by platoon. Given the slow speed fixed nature of these sites once established this proved to be a mistake.

Pull supply chain concepts became the answer. The battery trains were concealed in a defendable location far from avenues of approach. At this centralized location the battery executive officer compiled all supply requests. This pull concept placed the onus squarely on the platoon leaders and chief of firing battery. The executive officer then tracked on hand supplies with refinement and consumption to trigger resupply only as needed or in anticipation of operational events. R3SPs

became tailored to only include the classes of supply required. To accomplish the mission of CL V-ammunition, resupply platoons would first internally resupply all howitzers to the designated combat load, and then would rotate Carrier Ammunition Tracked (CAT) to a predetermined rearm point. Palletized loading systems would have preconfigured loads that they would drop, but never fully unhook to facilitate an emergency displacement if aggressed. This methodology massively reduced our R3SP signature and footprint, while contributing to speed of maneuver and survivability. Prior to conversion all R3SP were aggressed. Following conversion, only one R3SP was aggressed and the R3SP was able to displace under inaccurate indirect fire without sustaining casualties. This can be accredited to the ability of the resupply site to quickly defend and evacuate.

Battery Defense: Wingman Concept

Given terrain, threat, and tempo the firing units never occupied a battery position with a doctrinal defense plan. This tempo, at one point displacing every 30 minutes for a 48 hour period, allowed us to utilize the common maneuver view of speed as security. The battery was directly aggressed by enemy dismounts on three separate occasions with no assessed casualties, repelling all enemy advances. This success can be credited to what we called our 'Wingman' concept. For those unfamiliar with a Paladin organization, each M109A6 howitzer is paired with a M992A2 CAT. The two work in tandem and are seldom separated. What we instituted was a concept where the Paladin and CAT would be responsible for their local security at all times. Each vehicle was armed with a crew served weapon, and would also position local dismounted security for early warning. The platoon leadership would then ensure each wingman team had mutual support or overwatch from at least one other wingman team so four crew-served weapons could defend, or attack, at any time. As part of occupation priorities of work each wingman team prepared a hasty engagement area with range card and sector sketches. By the end of force-on-force the concept had proven itself and it is something that will be sustained going forward.

We approached this DATE rotation with one objective; to learn as much as we possibly could and institutionalize as much of that knowledge as possible. Many of the Operation Iraqi Freedome style TTPs we used prior to this rotation were invalidated. However, with a prioritization on learning we developed and implement solutions tailored to the METT-TC variables presented during a DATE rotation. Future conflicts will emulate the hybrid threat faced currently at the combat training centers, and our nation requires us to be ready to change to the circumstances. Starting with a leadership development program that promotes agile, decentralized execution our junior leaders will never cease to amaze with the solutions they devise.

Captain Ryan E. Schuler, the commander of Charlie 'Rock,' 1st Battalion, 82nd FA, 1/1 CD, is a native of Burlington, Massachusetts. He was commissioned as a second

lieutenant in the Field Artillery through the University Of Massachusetts, Amherst ROTC Program. Following the Field Artillery Basic Officer Leader Course, Schuler was assigned to the 3rd Battalion, 7th Infantry of the 4th Brigade Combat Team, 3rd Infantry Division, Fort Stewart, Ga., where he served as a company executive officer and fire support officer. In 2010 Schuler deployed with C Company, 3-7 IN in support of Operation Iraqi Freedom as the company fire support officer. During deployment Schuler was assigned as platoon Leader, 1st platoon B Battery, 1st Battalion, 76th Field Artillery where the platoon served as the Personnel Security Detachment for the Anbar Operations Center Stability Transition Team. After Redeployment, Schuler attended the Field Artillery Captains Career Course. Upon completion he was assigned to the 1st Armored Brigade Combat Team, 1st Cavalry Division, where he served as the fire support officer for the 1st Squadron, 7th Cavalry. Schuler is a graduate of the Field Artillery Officer Basic Course, Field Artillery Captains Career Course, and the Cavalry Leaders Course. He received a Bachelor of Science in Mechanical Engineering from the University of Massachusetts, Amherst.

New York U.S. Army National Guard cannon crewmembers from A Battery, 1st Battalion, 258th Field Artillery fires an M119 howitzer July 17. The unit, part of the 27th Infantry Brigade Combat Team is at Fort Drum, N.Y. conducting gunnery training in preparation for its rotation at the Joint Readiness Training Center at Fort Polk, La., scheduled for summer 2016. *Photo by SPC Alexander Rector, New York U.S. Army National Guard.*

Fires under Resolute Support: Integrating Indirect Fires in a Non-Combat Mission

CPT Steve Thomas

As coalition forces have transitioned from combat operations under Operation Enduring Freedom to a strictly advisory role in Operation Resolute Support, the need for lethal Fires has diminished significantly. The amount of combat patrols conducting kinetic missions necessitates far fewer fire missions and our limited combat power simply does not demand the volume of indirect fire once commonplace in Afghanistan. Although fairly limited in scope, accurate indirect Fires remain vital to overall security. Integrating Fires, even in this non-combat mission, is essential to our overall security and force protection.

Task Force War's primary mission is to provide security to both Operating Base (OB) Fenty and the police advisory team while simultaneously providing critical life support functions on the base. LTC Jason Curl, the squadron commander for 1-33 CAV, 3rd Brigade Combat Team, 101st Infantry Division, is also the ground force commander responsible for security in the surrounding ground defense area (GDA), an area surrounding OB Fenty in which he is tasked with securing and defending the base. Task Force War also provides security for the advisory team, transporting and securing the advisors to different locations throughout

Nangarhar province.

Historically, the primary threat to Jalalabad Army Airfield has been indirect fire consisting of both 107 and 122 mm rockets. Throughout the past two years, OB Fenty has been targeted by more than 70 rocket attacks. In nearly every instance, hostile forces positioned rocket systems on timers, launching volleys of rockets towards the airfield in an attempt to destroy coalition infrastructure and personnel. Even now, one of our top concerns is the indirect fire threat from multiple hostile forces throughout Nangarhar.

In the winter months, Jalalabad and the surrounding areas experience low cloud ceilings and frequent storms that prevent the use of airborne assets. These conditions allow hostile forces to conduct indirect fire attacks. Unfavorable weather consistently affects our operations, forcing last minute changes in patrols and advising missions. Inclement weather restricts patrols, limiting the overall projection of combat power. In light of these challenging environmental conditions, we have been able to retain a full complement of indirect fire capabilities, from 60, 81, and 120 mm mortars and two M777A2 155 mm howitzers. The howitzer platoon, consisting of artillerymen from 3rd Battalion, 320th Field Artillery, provides 24 hour coverage for both preplanned missions and counter-fire operations. Artillery Fires provide an all-weather capability to the task force commander, enabling him to quickly respond to an indirect fire attack and project combat power when unmanned and rotary wing assets are grounded.

In order to minimize unnecessary troops on the ground and limit exposure when conducting disruption operations, we have utilized numerous nonstandard observer platforms in place of the standard 13F fire supporter. Attack aviation, unmanned aircraft, and static high resolution cameras provide the ability to safely observe rounds without requiring observers to be physically present and still provide accurate Fires. All assets are limited by the elements, but if weather is favorable, they provide an array of options that do not necessitate boots on the ground.

Employment.

The primary means to maintain proficiency and conduct preplanned fire missions is through Observed Fire Training (OFT), a deliberate process that requires approval through our higher headquarters at Train, Advise, and Assist Command-East (TAAC-E). All targets are mensurated through the Combined Air Operations Center (CAOC) and are outside of the minimum safe distance for the 155 mm projectile – 725 meters. We plan and resource these missions just as we would a patrol, providing task and purpose to the mission in order to produce measures of effectiveness that align with our commander's overall targeting guidance. While Fires are not principally used for counterfire, OFTs instill confidence in the local population that we are protecting in the area, impact hostile forces, and maintain crew proficiency on the gun line as they conduct drills and rehearsals in preparation for routine fire missions.

Within Resolute Support rules of engagement, the environment surrounding collateral damage prohibits damaging civilian personnel or civilian infrastructure. Our unit, at multiple levels, takes great precaution in planning Fires; therefore, no fire missions – precision or otherwise – are authorized within the minimum safe distance.

Throughout Nangarhar, hostile forces also emphasize collateral concerns, issuing guidance to avoid populated areas in order to minimize their negative effect on the civilian population. Historic points of origin are often in rural and uninhabited areas because ultimately, the enemy's information operations campaign is just as important as ours. Indirect Fires from OB Fenty directly impact their ability to stage and launch, complicating their decision making process.

Precision munitions provide a more accurate first round, enabling accurate target engagement with fewer munitions. Critical to operations under Resolute Support, Excalibur and PGK provide reliable options that achieve effects on target with a significantly lower probability of collateral damage. Additionally, the increased range of the M982 Excalibur extends our overall reach to 37.5 kilometers, well beyond the GDA boundary.

TAAC-E employs a unique disposition that enables two bases – Tactical Base Gamberi and Operating Base Fenty – to conduct fire missions with a shared fire direction center. The hot gun and Soldiers reside at OB Fenty, providing 24 hour coverage, yet we maintain the ability to insert a section into TB Gamberi at any time and quickly establish firing capability. Similar to an Artillery raid, the section occupies an already verified position, establishes a hasty fire direction center, establishes communications with higher headquarters and is capable of providing lethal Fires in support of TB Gamberi. This competency affords both ground force commanders the ability to employ Fires in support of preplanned missions and in extremis, provide the ability to conduct defensive Fires. This arrangement sends a strong message to hostile forces within each GDA that there is a weapon capable of incredible firepower in position and ready to fire. Such a unique ability also possesses significant limitations. Routine maintenance, such as the fire control alignment test (FCAT), borescope, pullover gauge readings, and regular preventive maintenance checks are required by a force that is not consistently at the gun position. Additionally, all fire direction and communications equipment must be brought with the section for every fire mission.

Preparation.

Prior to the deployment, we conducted numerous live-fire training exercises, enhancing our overall ability to integrate joint Fires. Through squadron live fire exercises, a brigade air assault, and the joint forced entry at JRTC, leaders and soldiers were equipped for the mission sets required in Resolute Support.

In May 2014, to prepare for Joint Readiness Training Center Rotation 14-

09 and the upcoming deployment, 3-320th FA invited LTC Scott Collins and the PGM Fires Team from Fort Sill, Okla., to Fort Campbell. His team conducted initial precision Fires training, integrating fire supporters, fire direction and howitzer personnel, and battalion leadership. The training provided a general overview of the capabilities of precision munitions and gave practical guidance on how to employ precision munitions as an observer, FDC, gun line, and as a higher headquarters. The introductory course set the stage for additional hands on training at Fort Polk, La., whereby the platoon fired seventeen M795 with PGK throughout the rotation. Throughout JRTC and our time in theater, we have fired 22 rounds with an overall circular area of less than 36 meters. Overall, TCM Fires at Fort Sill reports an average success rate of eighty nine percent. Of the 22 rounds fired, only one failed to function, resulting in a reliability rating of 95 percent.

Most of the firing section from C Battery, 3-320 FA participated in the precision Fires training at JRTC. Eighteen out of 22 conducted the training and received initial instruction and practical application of the PGK and Excalibur. Once on ground, SFC Erik Olson, the section's platoon sergeant, and SSG Benjamin Gonzales, the Fire Direction NCO, conducted refresher training to solidify proficiency. The squadron Fires cell conducted numerous rehearsals, ensuring fire direction procedures to regain expertise in the employment of precision munitions.

Implementation.

Within the confines of Resolute Support, whereby offensive operations are no longer authorized, the overall purpose of Fires in this dynamic environment is to augment force protection, extending our operational reach to areas unable to be influenced by a more consistent presence on the ground.

One of our greatest fears in establishing a firing point on a base that has not housed an artillery platform in several years is the effect on the local populace. After all, the M777A2 is a violently loud 155 mm cannon. OB Fenty is situated on the outskirts of Jalalabad, directly adjacent to numerous houses. Firing such a weapon would undoubtedly disrupt and annoy the neighboring community; however, this is not the case. Simply stated, since we began regularly firing the howitzer in support of defensive operations, rocket attacks in the area have decreased dramatically. Local maliks readily admit their dissatisfaction with the loud noises in the middle of the night, but praise the results. They are more confident that we are able to provide indirect fire deterrence and have commended Curl that he has provided such a capability in support of JAF.

Being at an airfield where nearly 300 flights come in and out daily, airspace synchronization plays a significant role during each fire mission. To avoid any synchronization conflicts, the howitzer is positioned away from the flight line and the gun target line directed away from the airfield and oriented towards our primary threat. Prior to firing, we establish a restricted operations zone (ROZ) that limits

aircraft along the gun target line. Through these simple parameters, we are capable of firing without significant airspace clearance headaches. Consistent communication with the airspace control tower and the local aviation unit alleviates most issues, enabling simple airspace clearance for any fire mission in what would otherwise be a difficult problem set.

With our restricted ability to project combat, indirect Fires allow us to impact areas across the battlefield. Although considered a training mission, precision indirect Fires enable us to accurately fire fewer rounds with minimal circular error, significantly decreasing the likelihood of collateral damage while simultaneously enhancing force protection. Coupled with focused intelligence collection, artillery Fires prove an invaluable resource that enhances our presence throughout the GDA, providing both lethal and nonlethal capabilities throughout Train Advise Assist Command-East.

A Soldier assigned to the 1st Battalion, 41st Field Artillery, 1st Armored Brigade Combat Team, 3rd Infantry Division plots points on a map in a tactical operations center during exercise Combined Resolve IV at the U.S. Army's Joint Multinational Readiness Center in Hohenfels, Germany, May 27, 2015. *Photo by SPC Brian Chaney, U.S. Army.*

Division Shaping Operations in the Decisive Action Training Environment

By MAJ Sean Powell

The inspiration for this article came after observations of multiple Field Artillery and Aviation units during numerous warfighter exercises. These units engaged a near peer threat in the Decisive Action Training Environment (DATE). Fire support units are no longer focused on precision engagements against a small group of enemy personnel. Now, in the context of a near peer threat, fire support has expanded expectations to target large formations of enemy equipment, enemy integrated air defense systems and other targets chosen by the division leadership. Each exercise successfully trains unit staffs in a positive learning environment. This training results in new awareness, and development of new processes for employment of fire support and combat aviation, and the importance of good, targetable intelligence. This article will discuss three main topics, a recommendation for how to build a purpose

built cell at division to plan and coordinate deep and shaping operations including part of the Division Artillery (DIVARTY), how to improve collection management tied to the intelligence required for the targeting process and the need to synchronize effects.

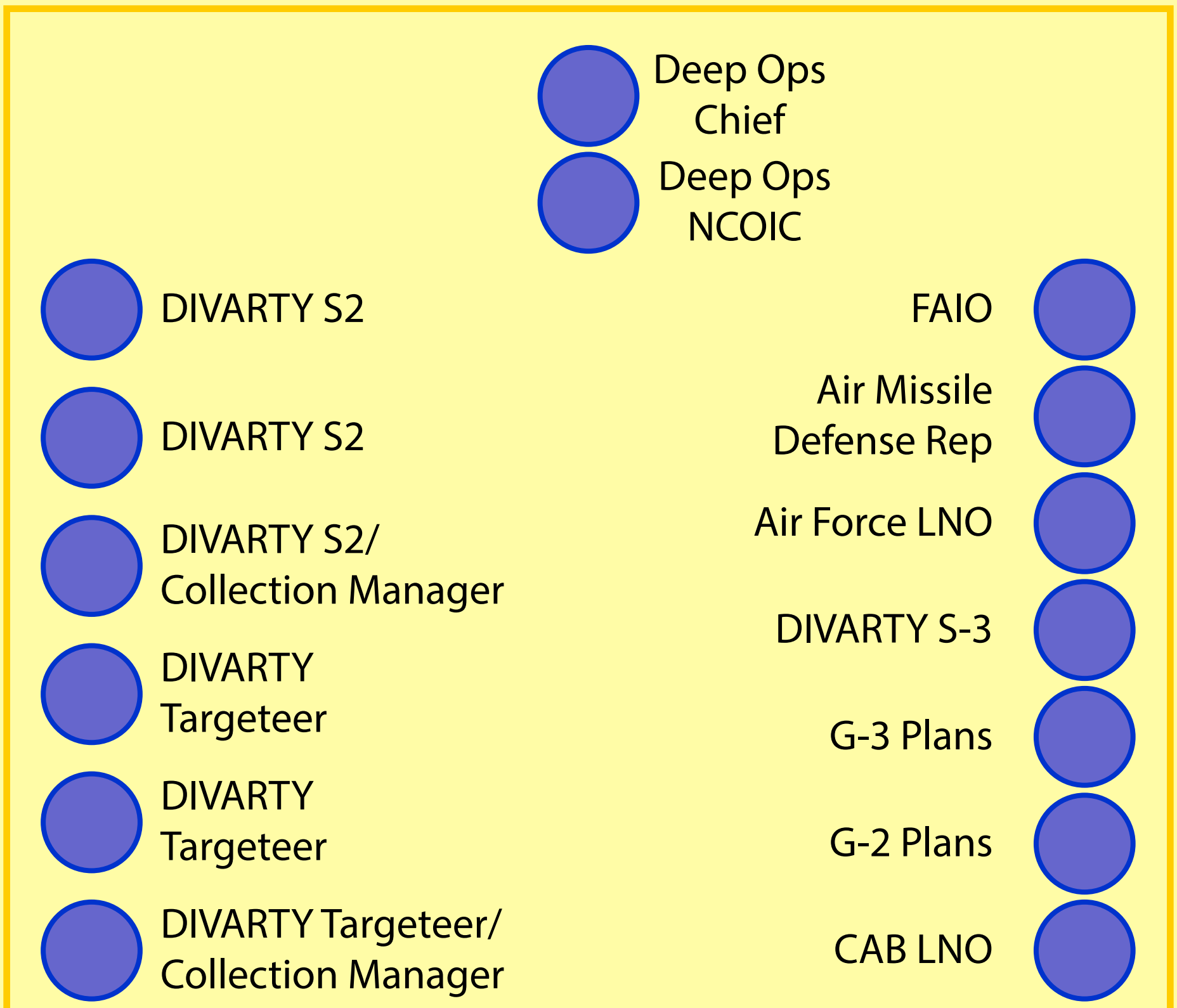
With advances in technology and capabilities, the expectation and need for a division to routinely conduct deep operations has returned. When exercises use the DATE, three themes became clear, both positive and negative. First, it was critical that the Headquarters for the DIVARTY and Field Artillery brigades (FAB) be closely tied to the planning of division shaping and deep operations. Second, information collection remained an area that needed attention because it became easily disconnected from the deep fight. Third, on the positive side, the Army Battle Command System (ABCS) architecture while a work in progress due to constant updates, displayed both impressive capabilities and at times provided significant results for the units. The best technique observed by the observer coach / trainers (OC/T) was one FAB requested a dedicated Distributed Common Ground System - Army (DCGS-A) civilian subject matter expert present during the exercise who mentored the unit to fully leverage all of DCGS' capabilities. The efficiencies gained by the unit resulted in refined predictive analysis and timely effects on large formations of enemy combat power. One successful tactics, techniques and procedures (TTP) the OC/Ts observed was when a FAB headquarters linked their DCGS-A to the Command Post of the Future (CPOF) enabling a shared S-2 enemy situational template in the command post (CP). They also leveraged the Tactical Entities Database (TED) through their DCGS which filtered hundreds of reports and located relevant reporting on a map for planning. This was a first for both actions that I observed which greatly improved their predictive analysis during a warfighter exercise.

Streamlining Deep Operational Planning

As I considered a concept to enable the division staff and DIVARTY to plan and execute shaping operations or deep operations before the enemy entered the close fight, the term Deep Operations Coordination Cell (DOCC) kept coming up in discussions. The subordinate units in each division are taking heavy casualties from large enemy formations because Divisions are not effectively planning, executing or supervising shaping operations. The Joint Air Ground Integration Cell (JAGIC) has some of these capabilities to shape such as integrating division Fires with other complementary and reinforcing functions for achieving air ground integration, according to FM 3-94, Army Theater, Corps, and Division Operations. However, in FM 3-94, Army Theater, Corps, and Division Operations the JAGIC lacks a planning role since it falls within the current operations cell and focuses heavily on the integration of air power. The OC/Ts observed how the planning for shaping and deep operations was an ad-hoc effort across the division and would often get side tracked or minimized by other tasks. There

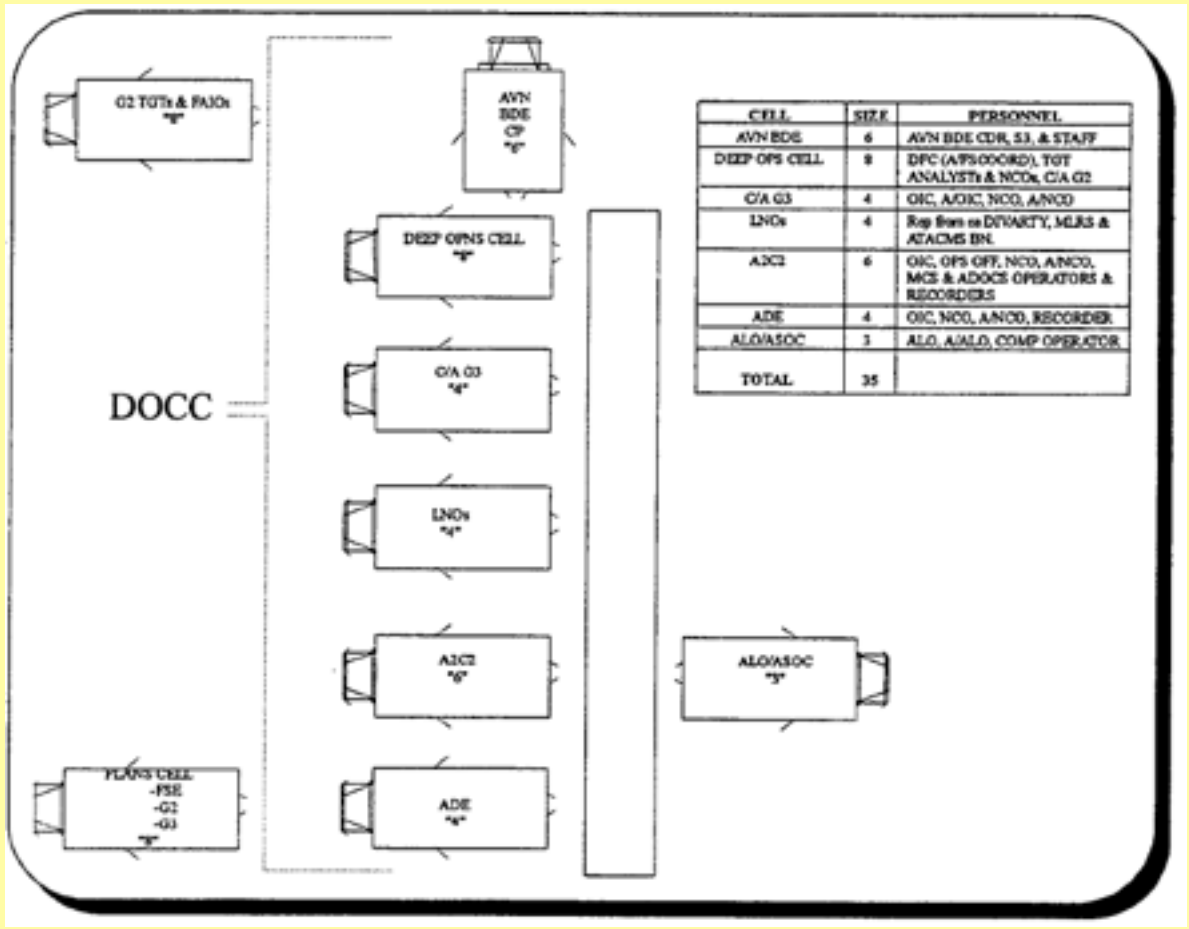
was a frustrating loss of efficiency and lack of common understanding between the division and subordinate brigades. Upon review of FM 100-15, Corps Operations from 1996; FM 3-09.22, U.S. Army Combined Arms Center from 2001 and professional articles discussing the DOCC, they provided a good historical perspective, but the reality is that at the division-level the DOCC or similarly purposed organization would need a revised composition and tasks. One of the intents for the DIVARTY described using the DIVARTY fire support cell (FSC) to manage information collection sensors, which is a historical role for the FSC and a great start to the recommendations discussed below, as stated in the DIVARTY White Paper.

Figure 1. Division main shaping and deep ops cell. *Illustration by Rick Paape.*



What if there was a purpose built cell within the division CP to focus on planning division shaping operations and deep operations and then ensuring their execution? Since both deep operations and shaping operations rely heavily on Fires and aviation, a total team of approximately twenty to thirty personnel would be optimal. A DOCC-like team could consist of cell within the division CP that had representation from the division G-2, Fires planners, targeteers, the combat aviation brigade (CAB), the U.S. Air Force and they focused on the deep fight. This team would be split between two shifts in the division CP that focus on the deep fight but remain aware of the overall division plan. Further, they would have a robust intelligence and collection management capability to support the required targeting. Through clarifying roles and responsibilities with such a team as the DOCC, the targeting process would become more efficient. The DIVARTY leadership could still monitor Fires at the brigade combat teams (BCT) in support of the division close fight and, through the DOCC, ensure focused effort on deep operations.

FM- 3-09.22, Tactics, Techniques, and Procedures for Corps Artillery, Division Artillery, and Field Artillery Brigade Operations, provided two short paragraphs on general expectations of the division DOCC, but without any significant depth.



CELL	SIZE	PERSONNEL
AVN BDE	6	AVN BDE CDR, S3, & STAFF
DEEP OPS CELL	9	DPC (A/PSCOORD), TGT ANALYSTs & NCOs, C/A G2
C/A G3	4	OIC, A/OIC, NCO, A/NCO
LNOs	4	Rep from ea DIVARTY, MLRS & ATACMS BN
A2C2	6	OIC, OPS OFF, NCO, A/NCO, MCS & ADOCS OPERATORS & RECORDERS
ADE	4	OIC, NCO, A/NCO, RECORDER
ALO/ASOC	3	ALO, A/ALO, COMP OPERATOR
TOTAL	35	

DEEP OPERATIONS COORDINATION CELL (DOCC) ANALYSIS, FINAL REPORT, TRADOC Analysis Center-Study and Analysis Center, Study Directorate, Fort Leavenworth, KS, JAN 1994, PG 5-3

A recommendation is that the division use most of the DIVARTY S-2 section and Targeting section as the core of the division DOCC. Then include representatives from the aviation brigade, the division Air Missile Defense element, the U.S. Air Force, and the division G-3. This should be the starting point with roughly twenty members in the DOCC led by, at minimum, a lieutenant colonel. This directly supports the intent for the DIVARTY in the words of the recent DIVARTY White Paper, “Providing responsive fires in support of combat aviation brigade attack operations. Coordinating, integrating and synchronizing UAS and other sensors for targeting.”

Collection Management for the DIVARTY

Tied to the DIVARTY White Paper’s intent to more closely integrate sensors into the DIVARTY targeting, collection

management remains an area for improvement and is rightfully a difficult task due to all of the recent technological advances. An observed trend is for subordinate brigades to rely on the division G-2 collection manager for all collection management to mitigate the brigades' lack of an information collection request process. However, the G-2 collection manager is always overworked, has minimal time in the position, has a team of three or less and has competing collection priorities. Compounding the difficulties with collection management, the OC/Ts observed an obvious lack of comfort and understanding within the brigade staffs of how to leverage and request information collection in direct support of fire support planning and operations. Unfortunately, there was usually not a collection manager on the brigade staff and if there was one designated, they did not understand their responsibilities in the planning process. Further, collection managers did not comprehend their importance in the 'sensor to shooter' process and how they facilitate proactively finding and quickly killing an observed target instead of recording the location for future engagement.

What if a non-military intelligence service member served as the collection manager and the team was expanded or there were collection management focused personnel in the DOCC as well as the division G-2? Based on the operational requirements of near, deep and support operations there is justification to expand the collection management capability at division with multiple military occupational specialties (MOS) within the team, especially within the DOCC. Therefore, in a departure from traditional collection managers being only drawn from the intelligence branch, it is logical to now support having both field artillery and aviation personnel performing collection management in addition to the typical G-2 collection managers. Any additional collection managers do not have to all work directly within the G-2, but there should be close ties to ensure a common understanding of the ever changing collection plan. The DIVARTY S-2 should be working with whomever is the DIVARTY collection manager to advocate for the use of all collection capabilities for targeting in support of shaping and deep operations. The lack of a dedicated DIVARTY collection manager to advocate for and request collection support through the overall division collection manger, will degrade planning due to the lack of information at the precise time. In addition, the DIVARTY collection manager needs to translate and track the Division collection efforts to anticipate indirect fire needs of the shaping operation.

The intelligence MOS is not the only specialty with the qualities of a good collection manager. Speaking from experience, prime collection manager candidates, beyond the requisite security clearance, are detail oriented, have acceptable people skills to advocate for collection requirements tied to their unit's priorities and are willing to seek out information such as sympathetic collection efforts in other

organizations or how to correctly request for collection. During one exercise, I observed a Fires brigade realize that though they may not have dedicated collection assets, the brigade staff could reference the division collection plan to access full motion video of a specific UAS looking at locations relevant to their planning. The Brigade referencing the division collection plan resulted in continued forward progress of their planning efforts through their own initiative instead of waiting for division to provide information.

After looking at the manning documents, I recommend that the DIVARTY assistant S-2, a targeting warrant officer, a targeting noncommissioned officer (NCO) and an S-2 Soldier form the collection management team for the DIVARTY and deep operations planning cell. Admittedly, the Army does not have the robust training program and designated career fields as some of the other services. However, the Intelligence Center of Excellence (ICoE) conducts a four week collection management course titled The Information Collection Planners Course. The ICoE developed this course in response to the demand for better trained collection managers across the Army. Non-intelligence MOS Soldiers are welcome to attend the course which is held exclusively at Fort Huachuca, Arizona.

Refreshing the Role of Intelligence in the Targeting Process.

Using the four steps of the targeting process, I will discuss some of the observed pitfalls and successes with integrating multiple intelligence disciplines down to the brigade-level.

Decide.

The first step of the targeting process, decide, initially relies on intelligence preparation of the battlefield, and specifically information collection, to develop targets based on the enemy situation. Upon receipt of the mission and division commander's guidance, the fires, intelligence and operations staffs will collaborate to determine which targets help the commander reach his end state. The role of the fires and intelligence warfighting functions is to collaborate and, through the collection managers within the division, organize all available collection resources to develop and engage targets. In addition to their enemy assessments produced from order of battle analysis and reporting, both targeteers and intelligence analysts need to have a firm grasp on what collection capabilities, not systems, are available to request.

The observed pitfalls during this step revolve around the units not understanding three processes. First, how to request collection capabilities for target development and engagement. Second, not being aware of the division's collection dissemination architecture to receive the information. Third, not gaining access to the relevant network based chatrooms used to coordinate collection operations. All of these tasks seem straightforward, however it takes time for the unit to realize they don't have these processes and then take the steps needed to gain awareness of the collection operations. The result is the unit loses valuable time

during the initial planning steps learning administrative processes which cause them to miss opportunities to coordinate for or tie into limited collection resources.

Detect.

When looking at the detect step I found a great success demonstrated in part of the discussion at a recent Mission Command Training Program (MCTP) Mission Command Training between the leadership and staffs of a CAB and a DIVARTY which generated a much improved understanding of how to synchronize the effects of the CAB and the DIVARTY. The discussion was phenomenal describing the proposed technique for the DIVARTY to confirm or deny enemy locations with an UAS coordinated via an instant messenger type chat function. Having this process to utilize the UAS established prior to the exercise or deployment and incorporated into a unit standard operating procedure (SOP) is a great efficiency, and usually the OC/Ts have to prompt units to develop this process over the course of days during the warfighter exercise.

The time savings gained from developing this process early enables the fire support planners to conduct such operations as suppression of enemy air defenses (SEAD) in advance of an air assault or a deep strike by the division CAB. As stated in FM 3-60, The Targeting Process, "It is the function of targeting to achieve efficiently those objectives within the parameters set at the operational level…" I observed an instance of effective planning to execute Joint SEAD 24 hours in advance of a CAB operation which was in fact a division shaping operation. The CAB had a cross forward line of troops (FLOT) interdiction operation with AH-64 Apache helicopters against an enemy armored brigade. Within a few hours, the Fires systems eliminated ten out of twelve confirmed enemy air defense systems, with two two systems destroyed by the U.S. Air Force. With a committed firing unit, the fire supporters controlled a dedicated UAS which flew the route in advance of the AH-64 helicopters to destroy enemy air defenses and assess battle damage as the UAS flew.

Things in the above vignette went well, and the UAS is convenient, but some limitations to consider are weather impacts to the UAS, as well as the vulnerabilities of the UAS against an enemy air defense network. If the enemy air defenses detected and shot down the UAS before friendly fire support destroyed the enemy systems, what was the backup plan? Would we accept the risk of using old information on the location of enemy systems to fire on targets without observation? Is there redundancy in the collection plan where friendly collection transitions to reliance on ground collection or forward observers of some type? What are the abort criteria for the operation and does the loss of the supporting UAS terminate the operation? Regardless of the UAS limitations, this event validated the current UAS doctrine's message regarding employment of Fires and Army aviation.

Delivery and Assess.

In looking at the final two steps of the targeting process of both deliver and assess, the above vignette highlights the prudence

to have dedicated shooting systems. This is regardless of the sensor type as well as planning for the collection of battle damage assessment, preferably before transitioning to the next target. Also, in the absence of having a dedicated UAS, the Fires units need to be flexible enough to tie into other target acquisition assets. This is useful for conducting timely battle damage assessment as well as confirming the location of a suspected enemy unit.

In conclusion, being adaptable is a trait which we as professionals must embrace in order to anticipate and prioritize future requirements. The incorporation of a DOCC capability into the division CP will enable operational successes through being proactive. Also complimentary to fire support planning is the growth of a high quality collection management capability through training and selection of capable personnel. Achieving the desired effects on the enemy is inevitable when the fires and intelligence warfighting functions have the strong capacity to plan deep operations and effectively collect the required information in support of the targeting process.

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A patriot ballistic missile exits a launcher during an exercise held at an undisclosed location in Southwest Asia. The exercise is a U.S. Army Central-led, bilateral combined patriot live-fire exercise with the host nation, U.S. Air Force Central Command. *Photo by Tech. Sgt. Henry Hoegen, U.S. Air Force.*

Fires Art with Host Nation

By COL Edward O'Neill

In the hot deserts of the Middle East, the 3rd Battalion, 4th Air Defense Artillery found itself on the cusp of making history; the first Combined Patriot live fire Exercise between the United States and a Gulf Cooperation Council (GCC) Country. While standing on the rolling sand dunes, launchers poised and positioned in the foreground, the sound of the monotonous hum of the EPP generators, radar, and ECS groaning in the desert heat; the Skystriker Soldiers and Leaders remember the long road that has led them to this historic moment.

The journey began back in November 2013 as the battalion finalized preparations and training for deployment and Skystriker Soldiers first met and befriended their host nation partners. The Skystrikers and host nation partners would train together over the next year and continue the planning for what would become the first exercise of its kind. This combined planning process proved to be complex and challenging compared to the standard doctrinal Military Decision Making Process and Troop Leading Procedures most staffs and units are familiar with when preparing for a major exercise. It became clear to the planners, during this nine month process, that in order to be able to accomplish this historic feat, both nations were going to have to be extremely flexible, responsive, and committed to the successful execution of the exercise. Skystriker leaders knew that no matter how badly an individual wanted to achieve this goal, it would be realized through the combined efforts of two battalions with very different backgrounds to make it possible. Leaders and planners from both countries adopted a spirit of unwavering flexibility that allowed Soldiers and operators, at the lowest levels, to fully understand not only their role but the role of their counterparts.

Joint planning with host nation, brigade planners and the U.S. Air Force continued into April 2014 and approximately 60 days into the Skystrikers' deployment. Dates and resource requirements were identified to include civilian contractors and experts to help facilitate the exercise. One of the first joint efforts in this preparation was an initial aerial and land reconnaissance of the proposed live fire range May 2014. Civilian contractors from Raytheon and the lower tier project office travelled from the U.S. to identify viable site locations for Patriot as a target (PAAT) launch locations and intercept fire unit locations based on distance and terrain. Once key leaders and technical experts from both nations were able to agree upon a PAAT launch site and shared 'asset' defense site, a detailed analysis to determine trajectory, intercept points, and safety keep out areas were completed by computer modeling and simulations. An additional range reconnaissance was conducted in early September with battery, battalion, and brigade-level leadership touring the range and barracks where both U.S. and host nation Soldiers would live for the duration of the exercise.

During the simulation and testing phase of this intricate process, planners, subject matter experts and tacticians were tasked to create the scenario that would be utilized throughout the exercise. This was particularly difficult, given the foreign disclosure constraints that were already in place at the time. While remaining mindful of how the proposed scenario would be received by host nation partners, the Soldiers and leaders of both nations ensured exercise objectives were still being met. They created a scenario that required the deployment of two fire units from two countries to jointly defend a shared asset. By embracing the universal concept of 'train as we fight,' planners worked together

to script a scenario that would replicate what operators and crew members would experience at the live fire. In particular, the development and execution of a combined joint kill chain to pass engagements between the two fire units proved to be an extremely crucial stage of the process and ultimately the most important. Planners designed the training to exercise both the U.S. and the host nation's ability to jointly defend an asset that could become a reality in the future. Driving this point home was the fact that both the U.S. and the host nation were already defending a shared asset. While it was difficult at times to relay this concept, given the language barrier, both nations' participants were outstanding team players and always demonstrated the patience to fully understand complex concepts.

Following the scenario development phase, the units began conducting collective training with their host nation partners. One of the first of many combined training events was a combined reconnaissance, selection, and occupation of site (RSOP). These training events were conducted both at 3-4 ADAR's and the host nation's PAT Sites. Although there was a requirement to have 'selected' the site prior to the RSOP execution, it was still important to again, 'train as we fight,' as if the operation would be conducted in a real world scenario. In the heat and humidity of August, both Skystriker Soldiers and host nation crews continued to pave the way for the rest of the exercise through multiple training events. The combined RSOP teams would execute this procedure again just prior to the arrival of equipment, which helped to minimize issues and confusion during the combined emplacement phase at the live fire Range. Additional training engagements included Air Battle Management (ABM) Training for the scripted Troop Proficiency Trainer (TPT) Air Battle and Launcher Crew training. Weekly combined training events also included review of the combined joint kill chain during tabletop discussions with Air Defense Liaison Teams and Remote Table Top Trainer (RT3) exercises at the host nation's RT3 training lab. A steep learning curve existed among both U.S. and host nation forces as Soldiers gained a mutual understanding and respect for each other's tactics and procedures. All of these events were combined efforts on both sides and only strengthened the partnership, as well as the proficiency of the crews. For example, the launcher crew training consisted of missile reload drills, march order and emplacement (MO&E) drills, and hot crew training. While these tasks must be accomplished by a certified crew from the same nation, Skystriker and host nation Soldiers created a competitive atmosphere that enabled joint training. The launcher crew competitions were designed to see who could execute the required tasks in the quickest time, while making the fewest mistakes. GEN Douglas McArthur once said "competition breeds excellence," a statement that proved to be true in every combined crew drill event and resulting in excellence across the board during the live fire. Events like these allowed the Soldiers to work side-by-side with their host nation partners,

which reinforced the mutual respect for one another from the lowest levels all the way to the general officer level. The resounding atmosphere of respect and dedication was undeniable by anyone who participated or simply attended as a spectator at the live fire.

Another mission critical capability that had to be tested and perfected was the use of the combined communications link architecture. For this exercise, both the host nation, as well as U.S. forces created a communication link that was specific to the needs of the participants. In order to accomplish this, the U.S. requested joint support from their Air Force partners in country. Through the use of AWACS, an Air Force airborne sensor, and the development of a bilateral Link 16 architecture established for use during the live fire, the U.S. was able to relay a shared air picture with their host nation counterparts and up to the higher echelon units in their respective Airspace Operations Centers. Beginning in June and continuing throughout September, this capability was exercised twice a month and helped to ensure operator proficiency, as well as validate the transmission of all necessary information via voice and data. Through multiple coordination meetings and monthly IPRs, leaders from both countries gained an appreciation and understanding of the necessity in establishing a bilateral link architecture network that would provide shared early warning, prevent fratricide, and facilitate missile management during engagement operations.

Again, both nations worked together to overcome foreign disclosure requirements. Both nations were careful not to violate any standing agreements, while ensuring critical information was relayed properly. The seemingly endless theme of patience and mutual respect was evident in this entire process. The professionalism of all participants kept the ball rolling at lower levels; even at times when the required tasks seemed unachievable. It may have taken thirty attempts to properly execute the use of this unique communications link; however, the perseverance from both nations would again prove to be the fuel to the exercise success. After the majority of these training events were complete, additional Link 16 tests continued routinely until the live fire concluded. Moving forward, the battalions were now ready to tackle their final preparatory combined training event--the 'ROC' drill.

Sometimes describing U.S. military planning processes and procedures proved challenging with the host nation when coordinating the production of an Operations Order or conducting Troop Leading Procedures. However, the Skystrikers successfully introduced to their partners the Rehearsal of Concept (ROC) Drill. This was an event that the host nation had never even heard of before, much less ever conducted for previous live Fires. The Soldiers and leaders at the battalion level worked diligently together to not only prepare, but explain how the ROC drill would be presented to senior leaders of both battalions. Host nation partners were enthusiastic about constructing a sand

table, receptive to feedback on briefing techniques and critiques during multiple rehearsals, and really internalized the significance and purpose of the ROC Drill. U.S. Air Force AWACS pilots provided valuable information regarding how they would support the exercise while U.S. and host nation battery commanders described how they would move their Soldiers and equipment to the range. The ROC drill afforded the leadership, at an execution level, to demonstrate their understanding of the decision maker's intent for the mission. In this case, battery leaders and crew members from both Nations had to demonstrate this detailed understanding to U.S. and host nation's leaders at the same time. The partnerships that were strengthened, and continuously solidified during this process would prove to be essential during the exercise execution in October. By the time the ROC drill was presented to leadership in mid-September, all key players knew each other's roles inside and out, confidently briefed their duties and responsibilities, and articulately answered detailed questions about the deployment of equipment to the range and execution of the live fire. Both U.S. and host nation partners were proud to smoothly present a polished product in the end; however, the journey leading to the ROC Drill allowed for a deep understanding and mutual respect of all participants and their valuable roles in the accomplishment of the mission. It was not as apparent in the moment, but looking back, the preparation of the ROC drill was, without a doubt, absolutely crucial to the successful execution of this combined live fire.

Finally, in late September all necessary participants deployed with their equipment to the selected live fire range and applicable execution locations under the cover of night into the early morning. The more than 40 vehicle convoy and line haul of C/3-4 ADAR's Patriot equipment took nearly 6 hours to transport to the live fire range. Stretching from one border of the host nation's country to another and with a communications architecture that reached back to other GCC nation installations, the desert was full of excited and motivated Soldiers waiting for the first tactical engagement. All of the hard work, perseverance, and complex briefings were about to pay off in the simplest of ways—the successful engagement of multiple ABT and TBM targets by a multi-national and joint service group of air defenders executing their jobs. Not everything went according to plan and there were many unforeseen challenges that occurred during this final phase. However, the ability of leaders and Soldiers to adapt and trust in the relationships they had forged for almost a year allowed the battalions to eventually overcome any challenges out at the range. Both U.S. and host nation leadership have asserted that one of the largest lessons learned had nothing to do with tactical procedures or system nuances. The concept of mutual flexibility and patience carried both nations successfully through the exercise, as well as the rest of 3-4 ADAR's time in country. Both nations emerged with a universal level of respect for each other and understood that

every nation does things slightly different. However, when working together, both countries remain willing to adapt in order to "meet in the middle" at times. As one Soldier stated, "it was hot, it was sandy, but by God, it was fun!" The participating service members did not just execute another routine Table VIII or field problem; rather, they accomplished something that had never been done before. They trained and worked hard towards a mission and they were honored to be a part of it and serve side by side with their host nation counterparts. This positive atmosphere fostered an attitude that regardless of the challenge, together they can find a way to overcome it.

Finally, Oct. 1, 2014, both U.S. and host nation ADA battalions successfully engaged two ABTs and two PAAT TBMs and coordinated these engagements through the execution of a combined joint kill chain via bilateral link architecture and shared air picture. Undoubtedly a highlight of 3-4 ADAR's deployment to the CENTCOM AOR, the Combined Patriot live fire Exercise will be remembered by both Nations as a pillar in the foundation of a strong bi-lateral Air Defense capability and what will surely be a long lasting partnership!

The 3rd Battalion, 4th Air Defense Artillery would like to sincerely thank all of the U.S. participants both civilian and service members in the U.S. Air Force and throughout the entire 108th Air Defense Artillery Brigade. The Skystrikers would also like to especially thank our host nation sister battalion and all of their support personnel, whom without this historical exercise would not have been possible!

Air Defense in the Ukrainian Conflict

By MAJ James Harvey

The conflict in eastern Ukraine has escalated from local disapproval of the newly-formed Ukrainian government to outright war between Ukrainian forces and rebels. The rebels consist of Ukrainians and forces presumably supported by Russia. The body count rises daily, as does the level of weaponry seen in the states (oblasts) of Luhansk and Donetsk. Air defense played a part in the annexation of Crimea and is very relevant in the conflict in eastern Ukraine. Air defense assets were the first Ukrainian land units overtaken in Crimea. The rebels' air defense capabilities exacerbated the conflict and brought Ukraine's air capabilities to an abrupt halt within the first three months of fighting.

This paper will focus on air defense in Ukraine, as well as the future of Russian air defense. This conflict is relevant to U.S./ NATO air defense as it poses issues that we have not fully addressed ourselves. President Putin expressed Russia's similar concerns in the December unveiling of Russia's new military doctrine. The doctrine stresses the importance of air defense and has been supported by unprecedented air defense exercises and allocation. Russia's lofty air defense aspirations remain to be seen but its intentions have been clearly laid out for us.

Ukrainian Disadvantage

Ukrainian air defense capabilities are at a blatant disadvantage compared to the rebels. Early in the conflict, rebels successfully used the Pantsir-S1, ZU-23 mm AAA gun, and MANPADS air defense systems. Rebel air defense capability was horrifically displayed in July 2015. In this case, the Russian-made Buk air defense system reportedly destroyed flight MH-17 from rebel-held territory. Ukraine does have air defense systems such as the Osa, Buk, and Tor, however their serviceability and manning requirements are severely lagging.

UAV Shoot-downs

Ukraine, Russia, and rebels have claimed to have shot down UAVs during the conflict, but the evidence is largely unsubstantiated. In March 2014, a Russian newspaper reported that two UAVs of Israeli origin had been shot down. Ironically enough, the alleged incident occurred on the 100th anniversary of the creation of Russian air defense. In December Russian media reported that a Russian Pantsir-S1 battery in the Choghar peninsula shot down 'several' Ukrainian UAVs. The Ukrainian Border Guard Service claims to have shot down Russian UAVs, however the photographic evidence appears inconclusive.

Russian air defense Build-up in Crimea

The Russian air defense build-up in Crimea began in early 2014. In February, 'Little Green Men' (Russian soldiers) appeared in Sevastopol and Simferopol on the Crimean peninsula. They surrounded airports in each of those cities with little-to-no resistance as the newly-formed Ukrainian

> **“Threat is greatest from the air and consequently air defense should be the strongest element of the force.”**
> – Admiral Vladimir Komoyedov, chair of the State Duma’s defense committee.

government tried to sort out this scenario. The first Ukrainian military sites to be taken over just days later were air defense facilities.

Russia air defense aspirations did not stop in Crimea. On March 6, Russia initiated an air defense exercise approximately 450 km from Ukraine’s border. According to Russian colonel, Col. Oleg Kochetkov, the exercise involved 3,500 air defense ‘experts,’ and 1,000 pieces of equipment including the S-300, Buk-M, Osa, Strela 10, Tunguska, and Igla, missile systems. It was the largest exercise ever in Russia’s ‘Western Military District.’ Just days later on March 8, Ukrainian news sources reported that Russia emplaced the Pantsir-S1 air defense system in Crimea. The Pantsir-S1 is a short-range mobile system with an effective range of approximately 20 km.

On March 9, Ukrainian military personnel in Yevpatoriya, in western Crimea, were threatened to be ‘stormed’ by Russian troops unless they placed their weapons in a depot to be guarded by Russians. This was reportedly the order received by deputy commander of military unit A4519 Ukrainian), from the Council of Ministers representative, Yuriy Zherebtsov. Taking the air defense sites first mitigated Ukrainian or NATO air attacks, and allowed them to safely use Crimean airfields. On March 27, Ukraine countered Russia’s exercise with one of their own. According to the Commander of the Air Force, all aviators and air defense personnel participated in the exercise.

In October, Aerospace Defense Troops Commander Aleksandr Golovko announced that Russia would expand its military capabilities in Crimea, specifically, air defense. The ‘long-range space communications center’ in Yevpatoriya will reportedly be refurbished and able to track missile launches anywhere on the globe by early 2015. Golovko stated that Russia will add such tracking stations yearly with as many as 20 being placed in and around Crimea. Astrakhan, on the northern Caspian Sea, will receive S-400 systems for defense of the Ashuluk region. The S-400 ‘Triumph’ medium-long range SAM system can allegedly engage any aerial target, (aircraft, UAVs, cruise and ballistic missiles) ‘at a distance of up to 400 kilometers (250 miles) and an altitude of up to 30 kilometers (18.6 miles).’ Russia emplaced the same system near Moscow and it will be the cornerstone of Russian air defense over the next five-to-six years. Russia further beefed-up their forces in December with a newly-created unit for the ‘defense of the Black Sea Fleet’ – a brigade-sized unit which includes air defense.

This is exemplary of the way Russia’s leadership viewed the military priority of tasks to be conducted in Crimea. As Russia sets up indefinitely in Crimea, it is becoming clear that the plan will be based on Russia’s current military footprint in Kaliningrad.

> “Apart from the fleet, the operational-strategic command will include the Arctic brigade and Air Force and air defense formations and units. The main task of the command that is being created is to ensure the protection of the Russian Federation’s national interests in the Arctic.” - General of the Russian Army, Valeriy Gerasimov

Air defense in Kaliningrad and the Arctic

Military development in Kaliningrad has been robust recently, especially since the annexation of Crimea. The area has seen an increase in troops, full-scale exercises focusing on air operations, and emplacement of Russia’s most advanced radar systems. In October Russian media reported on an exercise in which ‘over 60’ simulated air targets were successfully engaged by the S-300 air defense system. In Kaliningrad air defense exercises aren’t limited to land-only usage but include naval assets as well. In December a corvette-class ship successfully engaged a cruise missile (simulated) in a ‘complex jamming environment.’ The naval system can also reportedly simultaneously track 16 air targets and use multiple air defense systems to engage.

Air defense finds itself central in the international race for access to the Arctic. In 2013 President Putin announced that Russia would take steps to ensure its border security in the Arctic.

Specifically, Russia will deploy an S-400 air defense regiment, a UAV unit (Orlan-10), for area coverage and the Pantsir-S1 air defense system for defense of an airfield. Additionally, Russia’s Defense Minister says that Russia will construct ‘13 airdromes and 10 radars in the Arctic’ in 2015.

Current air defense Situation in Eastern Ukraine

Air defense problems in Ukraine are nothing new. Ukraine’s best-known incident is the shooting down of Malaysian Airlines flight MH-17 on July 17 2014. After extremely detailed and thorough research, an investigation team concluded that a Russian Buk air defense system shot down the plane from within Ukrainian territory. Regardless of who fired the Buk, Ukrainian air defense capabilities are inferior to the rebels’. Ukrainian military funding was misdirected for years under a corrupt Yanukovich regime. Air defense training stagnated due to the accidental downing of Siberian Airlines flight 1812 in 2001, likely by an S-200 SAM. However, even if Ukrainian forces currently had fully operational air defense systems, the manning and maintenance required would pose serious challenges.

In January 2015, NATO Commander, General Breedlove, mentioned the detection of air defense assets accompanying the movement of rebel forces in Luhansk. This particular reference is supported by social media and web-sites that track events in eastern Ukraine. Confirmation of equipment is difficult however as it is increasingly dangerous to have observers on the ground.

> **"We can't win the war against Russia… what we need is not to lose the war…There are discussions ongoing about additional military technical assistance and I very much hope that could materialize in the nearest future,"**
> – Ukrainian Foreign Minister Pavlo Klimkin

There have been multiple incidents involving the alleged shooting down of UAVs in eastern Ukraine. The most recent incident involved the Organization for Security and Cooperation in Europe (OSCE). Between October and December, the OSCE reported that its UAVs came under fire from rebels. The UAVs were not struck during these incidents and confirmed the presence of air defense weapons ZU-23 (23 mm gun) and MANPADS.

The Way Ahead for Russian air defense

Soviet and Russian military doctrine has always stressed the importance of air defense. 2015 military doctrine has air defense as Russia's top strategic priority concerning conventional warfare. Integrated air defense training has been underway for months and increased spending will expand air defense exercises and capabilities. A Russian general reported Russia will increase portable SAM systems Verba and Igla, as well as the Tor-M2U SAM. Also, the Buk-M2 ZRK will be introduced and the 57 mm AA gun may reappear.

In August counter-UAV training was conducted at three locations in western Russia. The training included using the 9K38 Igla MANPADS during day and night conditions. The St. Petersburg area recently hosted the largest air defense exercise in the region in 25 years. Russia is also forming and improving air defense units in fellow Customs Union partners Armenia, Kazakhstan, and Belarus.

Implications For NATO air defense

The Ukrainian conflict has exposed the irrelevance of NATO air superiority when there is no will to use it. This conflict is complex and exacerbated by Ukraine's non-NATO/non- EU status, globally-connected economics, and decreased defense funding. Rebel air defense is successful because it has found a niche that cannot currently be overmatched. Air attacks and air defense operations elevate conflicts because they are deciding factors in a conventional war. The rebels are prepared to defend against air attacks whether of Ukrainian or NATO origin.

As fighting and political rhetoric continue, we can expect to see NATO and Russian-produced air defense systems employed. This will be a significant for NATO members since Ukraine is a non-member. Assets however, are not enough – significant training, logistics, and political navigation would be required for air defense operations. A 'total package' approach would be needed to ensure that air defense assets were properly employed and maintained. This can only come from a commitment of NATO air defense operators manning those systems. This is a very real possibility since

NATO members have already committed to increased footprints in Eastern Europe.

The conflict in Ukraine demands that NATO address its commitment to air defense. Except for rebel UAVs, eastern Ukraine has essentially been a no-fly zone since the shooting down of flight MH-17. Rebel UAVs very often are followed by artillery strikes which are spreading westward into Ukraine. Eventually, assets such as MANPADS and Avengers will be deployed to Ukraine if an equalization of force is desired. NATO members are more likely to send defensive weapons systems as opposed to offensive weapons. Offensive weapons may assist Ukrainian forces but could increase civilian casualties, be seized, or spread the conflict beyond Ukraine's porous borders. Even if air defense assets are not deployed, there will be a renewed emphasis placed on NATO's future air defense footprint in Eastern Europe and Eurasia.

Training Mobile Fire Support: Hide, Seek & Destroy

CPT Michael A. Raymond, SFC Cory Howland, and SSG Adam Petersen

Soldiers of C Battery, 2nd Battalion, 12th Field Artillery Regiment, 1st Stryker Brigade Combat Team, 4th Infantry Division, observe where rounds impact during a joint training mission with the U.S. Air Force Weapons School near Nellis Air Force Base, Nevada. Field artillery forward observers direct the fire of an artillery unit from a forward position. Photo by SGT Meghan Berry, U.S. Army.

When 13Fs graduate from Advanced Individual Training they bring a basic understanding of indirect fire procedures to their new units. They know how to occupy observation posts, develop terrain sketches, and call for fire. Their units must continue the education process. The most important skill taught to junior 13Fs in the unit is the ability to call for fire in a mobile environment. In this article we discuss a method to practice these tasks in a high intensity competitive environment with a minimum of resources.

The Problem.

During a recent assessment of our fire support detachment's competencies, we identified mobile fire support as the greatest training need. The battalion had just returned from a non-doctrinal mission and was beginning its training reset. The detachment's Soldiers demonstrated proficiency of basic skills with the Call For Fire Trainer but after a decade of non-doctrinal missions most had never operated from anything but a static observation post.

Walk-and-shoots were identified as an initial solution. Senior detachment members served as observer controllers (OCs). The OCs walked two to four man 13F teams through short dry fire lanes. Every 20 to 50 meters the OC would halt the team, identify a distant target, and evaluate the

team's call for fire against it. Basic scenarios were worked into the lane in order to force the team leaders to do simple fire planning. This work was partially inspired by GEN Petraeus's article, "Walk and shoot training," Infantry, January - February, but unlike their situation we did not transition to live fire.

This training method had good initial results. Soldiers who had never called for fire on the move struggled with self location, the inability to use a terrain sketch, and the general concept, but quickly adapted. Team leaders appreciated the ability to mentor their Soldiers in the field instead of the classroom. Once the Soldiers developed basic mobile fire support skills, they began to ask for more.

To increase the difficulty of training we began to include injects. Different mission types were required, specific target effects and engagement criteria were added, equipment was added, taken away or degraded, and different common tasks were added. Multi-echelon training allowed FISTs to control several FO teams as they moved through the lane. This training was successful but lacked battlefield dynamics. Not all leaders make good OCs. Also, the trainees wanted more challenging targets.

Difficulties with the training mechanics seemed to rule out the effective use of an OPFOR. Imagine two opposing forces in a training area, each with the goal of locating and calling for fire on the other force. It seemed very difficult to verify if a call for fire placed the notional impact near another team's location, especially as teams were expected to be constantly on the move. The detachment lacked access to any kind of automated Soldier tracking systems as might be found at a combat training center. Fire markers were ruled out as the leadership felt that the teams would see them coming and just move away.

The Solution

Our key innovation in developing improved training was in limiting the mobility of the opposing forces. Specifically, we changed from constant movement to alternating two minute turns. When it was not a force's turn, they were required to stay fixed in place. The active force was given two minutes to move and try to call for fire on the other force. At the end of their two minutes, the active force was required to freeze in place and call up their observer location (OBLOC) to the umpire's station. After this, the opposing force's turn would begin and they would have their own two minutes to move and call for fire. This continued until all of one force's FO teams were destroyed. Calls for fire were processed at the umpire's station by comparing the shooting team's targeted grid to the OBLOCs of the opposing team.

The trainees enjoyed having an opposing force to fight against and the success of the training grew as the force sizes increased. In the initial trials, the force sizes were limited to one or two Soldiers. These individuals quickly converged on a strategy of 'camping' in a fixed location and waiting for their opponent to move out into the open to attack them. While a valid strategy, this removed most of the training value. Just as Grossman explains in

his article, “On combat: The psychology and physiology of deadly conflict in war and in peace” (Warrior Science Publications), we found that battle buddies increased each other’s combat motivation, we found that once training grew to several 13Fs on the two forces, broken into separate FO teams, mobility was restored.

In the most successful incarnation of this Hide, Seek & Destroy (HSD) exercise to date, a full tactical scenario was added along with multi-echelon control. We developed a scenario that required one of the two forces to attack an objective, while the opposing force defended it. The attacking force was given more FO teams. As part of the scenario, each side was given two howitzer targets to plan that could include special munitions, and two notional mortar teams. Special munitions included notional minefields and smoke screens. Each mortar team could only shoot one mission per turn. The mortars were limited to a very short range, requiring the force leaders to reposition them throughout the exercise. Mortars that move during a turn cannot also shoot that turn. Each force was broken down into a company FIST and several FO teams working for it. This helped to teach the value of battle tracking. Personnel from our battalion Fires cells worked in the umpire’s station to practice their own battle tracking skills.

HSD still has its challenges. Gameplay requires finding the right mixed terrain; too dense terrain limits long range missions. We had to add small numbers of paintball guns to the training as some Soldiers realized that they could dash to the location of a frozen opponent, get the grid on their GPS, and then dash away to call for fire on them. The biggest problem is the amount of time that it takes all the FO teams to send their OBLOCs up through their FIST. Two to three minutes are sometimes consumed collating OBLOCs, which keeps the frozen force sitting for long stretches at a time. Adequate supervision is also required to ensure that Soldiers are correctly practicing their tasks and not optimizing towards gamisms.

The Future

In the future we plan to experiment with moving back to a full-motion exercise. Forces will no longer take alternating two minute turns. This will require the use of fire markers. Several personnel will be distributed about the training area. As fire missions come in to the umpire’s station, the Fires cell manning it will move the closest fire marker to the target grid to assess the effects of the mission. We hope that by keeping several fire markers moving around the training area the trainees may grow used to them and not always run away. We may also add direct fire components to the exercises.

Hide, Seek & Destroy has proven highly successful. It gets our Soldiers out in the field conducting training. Soldiers view the exercises as a skills-based competition and our leaders another venue to teach and mentor. We hope that it continues to evolve as an exemplar tool for training mobile fire support.

Families reunite at a welcome home ceremony for the Wisconsin Army National Guard's 32nd Base Defense Operations Center (BDOC) at Dane County Regional Airport in Madison, Wisconsin, Jan. 24, 2015. *Photo by Sgt. Oscar Gollaz, Wisconsin Department of Military Affairs*

Addressing Family Readiness in a downsizing Army

By Erica Koelder

Family Readiness…those two words are some of the most misunderstood words in the Army today. For the past 13 years, Soldiers have left and returned home countless times. They have had to reintegrate with their families after being separated for nine-18 months, only to leave again a few months later when the mission called. The Army's current environment is rapidly changing, and it is changing in a way that hasn't been seen since the end of Desert Storm in 1991. Soldiers are going through Quarterly Separation Boards and Separation Boards. They are constantly looking over their shoulder for the next iteration of cuts from the Department of Defense. One of the things that has not been looked at is the impact these decisions are having on the Families who have served

right alongside their Soldier.

A key player in the unit's family readiness role has been the Family Readiness Support Assistants (FRSAs). The FRSAs, as paid civilian staff assistants, have been part of units throughout the Army for the past nine years. The Department of Defense has reallocated the funding for the position, and it will be phased out through FY16 where the role will fall back to the commanders, volunteers and Family Readiness Liaisons (FRLs). So, how can you, as a leader, prepare for this transition?

1. Establish family readiness as a priority
2. Ensure you take the time to work with your current FRSA to understand what some of the 'day-to-day' duties of their job entails, given your unit's mission and the community where you live
3. Choose a Family Readiness Liaison (FRL) who will be able to work with spouses and volunteers
4. Work to build your volunteer base

In order to establish family readiness as a priority in your unit, ensure you are able to do two things. Ensure that you are conducting business and administrative tasks IAW AR 608-1 Appendix J and your local policies, and ensure that you are communicating with your families. One of the critical roles a FRSA has served these past years is being the subject matter expert on AR 608-1, and being able to assist all levels of Command in preparation for inspections from their higher headquarters. Become familiar with the requirements in the regulation, as well as what is covered on the inspection checklist. This checklist varies slightly across installations, so make sure you are using one that applies to your most current location. Your FRL will become your subject matter expert on the list, and will be able to provide assistance to commanders in preparation for an inspection, just as a senior leader

An Airman assigned to the 156th Maintenance Group, 156th Airlift Wing, Puerto Rico Air National Guard, reunites with his family after being deployed in Kabul, Afghanistan for a year. After a long flight that arrived Oct. 12, 2014, the Airmen received a heroes welcome at Luis Muñoz Marin Airport, Puerto Rico. The 156th Maintenance Group assisted the NATO Air Training Command-Afghanistan at Kabul International Airport in training the Afghan Air Force with C-130 cargo aircraft operations and maintenance. *Photo by Sgt. Pablo Pantoja, Puerto Rico Air National Guard.*

(Officer, Warrant or NCO) would assist the S1 shop with preparing to have the unit meal card program inspected. Communication with all the family members across the formation is also critical. The more information that family members have, the easier it is for them to make good decisions. You are familiar with pre-deployment briefs (often given prior to a large-scale FTX or a deployment), and the reason that you conducted them was to make sure that the family in the rear was taken care of so that the Soldier deployed could focus on the mission and come home. Communication was critical during those times, and it is just as important now. Units are reflagging and restructuring, Soldiers are being told that their service in the U.S. Army is no longer needed and reenlistment is no longer a given. All of these things are new stressors to Army families. Clear and concise communication with family members, through email or town halls or other means, will go a long way toward shaping your credibility as a leader. It will also shape that families perception of the Army (positive or negative) for years to come.

As leaders in the Army, you should have already established a strong professional relationship with your FRSA. They have been the subject matter experts in the rear while the unit has been deployed. This knowledge is in danger of being lost in the upcoming years as the program is shuttered. Determine what you believe their priorities should be in the upcoming months and have your FRSA do the same, if you have not already. This will ensure that you are on the same page and will work in the same direction in the upcoming months. This is important because that FRSA should be working diligently to transition to a new job or a new duty station in the upcoming months. Proactive communication will save lots of headaches and misunderstandings, since the FRSA's schedule will get very busy as the program comes to an end. Some things to pay special attention to are: requirements to pass a command inspection, best practices regarding pre-deployment and redeployment trainings/briefings, community resources, post/community meeting schedule and the flow of a unit FRG steering committee meeting. This is just a small list of things to look for and is in no way to be construed as all inclusive. Many of the things will be based on the makeup of the unit, the community where you are located, and your knowledge of the formation that you are leading.

Once you have that list, use those points to decide who your FRL should be. This decision should be made jointly by the commander and the command sergeant

major, because the decision will impact every Soldier in the formation. Your FRL should be (at a minimum) a senior NCO or a 1LT/CPT, should be with the unit for at least 12-18 months once appointed, and should have great communication skills. The communication skills are critical to their success, as they will be 'working outside the motor pool' dealing with spouses, family members, volunteers and community agencies/partners. Your FRL will be experiencing something very new and potentially unfamiliar to them. Ensure that they are afforded the opportunity to attend trainings throughout the community, and to spend time with the FRSA to do a proper left seat, right seat transition. This will allow for the most knowledge to get passed from the FRSA to the FRL in a thoughtful and deliberate manner.

Another thing you should do now is lay the foundation for your volunteer base. Family readiness (specifically 'family readiness groups') has received a bad rap in the past few years. This is the time to make sure that your formation has a strong, supportive, positive Family Readiness and FRG program. With the loss of the FRSAs, volunteers will be relied upon more and more to accomplish the family readiness mission. They will be the ones attending community meetings and working with community partners in addition to working with the FRL. Volunteers must come from all areas of the formation (officers, NCOs and Soldiers). Regardless of the rank of the Soldier, all volunteers should be welcomed and included as often as possible. Make sure that you are taking time to recognize and acknowledge what your volunteers are bringing to your formation: positive reinforcement of the volunteers will create more of a desire in people, which in turn expands the size of your volunteer pool.

Now you have the tools to create the way ahead for your family readiness program: establishing your priorities, working with your FRSA, choosing an FRL, and expanding your volunteer base. Take advantage of this time to get your family readiness house in order. Small moments of preparation, consistently applied throughout the year versus hours of 'catching up' when a crisis occurs will be the key to success for leaders and Army Families in the future.

The author would like to thank COL Robert F. Whittle, COL Heyward G. Hutson III, CSM Franklin M. Jacobs and CPT Kyle P. Moore for their assistance during the creation of this article.

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Her awards and accomplishments include: the Steel Order of the de Fleury Medal, the Artillery Order of Molly Pitcher, Commander's Award for Public Service (2), Commander's Award for Civilian Service (1). She published an article in conjunction with CPT Kyle P. Moore titled "Family Readiness in the ARFORGEN Cycle" in May-August 2010 edition of ENGINEER.

Speaking Truth to maneuver

Over-Promising Is Crippling Our Ability to Get Field Artillery Fires into the Fight

By LTC Pat Proctor, PhD.

Author's Note: Special thanks to MAJ Ryan Berdiner for his assistance in editing later drafts of this article.

Brigade combat teams (BCT) in decisive action rotations at the Joint Readiness Training Center (JRTC), Fort Polk, La., typically go into battles—offense and defense—with as many as 100 targets or more on their target list worksheets, vastly more than the Field Artillery (FA) battalion can shoot in a single fight. We, as a FA community, are lying to our maneuver brethren about our true capacity to support them with Fires.

Not only is this huge volume of targets physically impossible to deliver in a single battle, it overwhelms brigade and battalion Fires cells (FC) and FA battalion staffs, crippling their ability to deliver any Fires at all. Because there are so many targets, battalion fire support officers (FSO) do not have time to properly plan or synchronize them with the maneuver plan. Either the maneuver battalions have no observers in position to see the targets with the ability to communicate back to the FA battalion or the airspace or ground is not clear when the target is needed by maneuver. Moreover, because their brigades have given them so many targets, FA battalions are not able to properly plan to shoot them all. In exasperation, FA battalion staffs typically default to simply positioning their firing platoons in the best location on the battlefield to cover most of the targets, hoping that they will be in position to shoot the targets that end up being fired. When the battle begins, FA battalions are frequently on the move, in the wrong position, or have the wrong ammo on hand to shoot needed targets. This inability to deliver Fires breaks trust with maneuver and erodes the entire brigade's confidence in the FA's ability to contribute to the fight.

The root cause of this problem is not difficult to identify. Brigade FSOs are not limiting the number of targets that their subordinate maneuver battalion FSOs plan. As a result, each maneuver company and battalion FSO plans every target that could possibly be needed, over-promising to their maneuver commanders what the FA can deliver during the fight. With three infantry battalions and one cavalry squadron all planning as many targets as they want, target list worksheets rapidly swell to pages in length. The Artillery battalion staff, which is planning the FA support plan (FASP) concurrently with the brigade's maneuver plan, is invariably swamped by this deluge of targets, frequently well after its plan is complete. The Artillery battalion staff can't figure out which targets are essential to meeting the brigade commander's intent for FA Fires. Moreover, because it is physically impossible for the FA battalion to shoot so many targets in a single battle, the Artillery

battalion staff cannot possibly build a plan to execute them all.

The solution is equally simple: we as a FA community must re-learn how to tell maneuver commanders, "No." Or, more precisely, we must do a better job of providing maneuver commanders with a realistic assessment of what FA Fires can—and cannot—do to support them. And it all starts with the brigade FSO setting limits on how many FA targets get planned.

The Root of the Problem

One of the first things every FA lieutenant learns about fire support planning is "top-down planning, bottom-up refinement." However, over the past 14-years of the Global War on Terrorism, we as a FA community have forgotten what this time-tested maxim really means.

Today's junior field grade officers and mid-grade captains have been conditioned by their experiences executing fire support planning in support of wide area security in Iraq and Afghanistan; assets from FA, close combat attack (CCA) and close air support (CA) were plentiful and there was no competition for these Fires. In fact, maneuver battalions often had a Platoon of howitzers dedicated to supporting them, frequently on their own forward operating base. Every unit in contact with the enemy received as much fire support as it could handle (and rightfully so). To be prepared to rapidly employ Fires when they were needed, the prudent FSO planned targets all along his patrol route. Targets were habitually planned on easily identifiable terrain features such as hilltops and road intersections so that, if the FSO or his forward observers became incapacitated, maneuver leaders could easily call for and adjust fire from these known points.

But in combined arms maneuver, there are many more enemy than there are fire support assets to shoot at them. FA, CCA, and CAS are scarce resources and there is intense competition for these assets. Moreover, the FA battalion is not divided amongst the maneuver battalions; it is the brigade commander's asset, in direct support of the entire brigade. In this environment of intense competition for fire support assets, all of the tools of fire support planning—not just targets—suddenly become vitally important. High payoff target lists (HPTL), target selection standards (TS), attack guidance matrices (AGM), and priorities of fire settle arguments when two or more elements are both calling for FA Fires. Brigade and battalion FSOs seem to understand this and are generally using these tools reasonably well to prioritize the employment of FA Fires against targets of opportunity.

Yet, targets of opportunity are only half of the FA fight. Equally important is the planning of pre-planned targets. And here is where we as a FA community are setting expectations unreasonably high for our maneuver brethren. Brigade FSOs are generally effective at planning a realistic number of targets in support of the brigade's "deep" fight (which shape the conditions for the maneuver battalions' "close" fight). However, they fail to set any limits on how many targets their

subordinate battalion FSOs develop in support of their battalions' maneuver plans. Battalion FSOs, in turn, set no limits on how many targets their Company FSOs plan. Fifteen Company Fire Support Teams and four battalion/squadron FCs can rapidly generate 80 targets or more, way more than the FA battalion could possibly shoot in a single battle. And the unfortunate trend observed at the JRTC is that, as long as these targets arrive at the brigade FC before the target cut-off time, they end up on the brigade's target list worksheet.

How Many Targets Can a FA battalion really Shoot?

The answer to this question lies in the lost art of "battlefield calculus," simple math and educated guesses based on expected friendly and enemy capabilities. If all of its Fire Support systems are working well, the typical BCT on rotation at the JRTC takes about ten minutes to shoot a single FA mission (from the call for fire through "shot" on the first volley, including the communication from the sensor through the brigade to the gun line and the clearance of airspace and ground). The typical battle (offense or defense) at the JRTC lasts about four hours, from line of departure (LD) to the culmination of friendly or enemy force. FA battalions training at the JRTC generally have three batteries. This provides enough information to do some rough math:

(4 hour battle ÷ 10 minutes per fire mission) X 3 firing batteries = 72 fire missions

To be sure, this is rough math. Every time the FA battalion masses all three batteries on one target (which could happen frequently if the battalion is shooting at armored target), three fire missions must be subtracted from this total rather than one. But, more importantly, nearly half of the fire missions shot during a typical battle will be targets of opportunity such as high payoff targets identified by information collection assets or counter-fire missions against enemy indirect fire assets detected by friendly counter-fire radars. This leaves the FA battalion with the capacity to fire only around 30 pre-planned fire missions in a typical battle at the JRTC. Thus, only around 30 targets should be planned by all of the FSOs in the brigade and appear on the target list worksheet that the BCT takes into a fight.

This estimate can be further refined with a little more mission analysis by the brigade FSO and the FA battalion staff. How much smoke does the FA battalion have? Do they have a family of scatterable mine (FASCAM) capability? Does the FA battalion have precision munitions and, if so, how many? How much longer does it take to employ these special munitions than it does to fire high explosive (HE) rounds? All of these facts, which can be provided by the FA battalion staff during parallel planning, will help the brigade FSO refine the number of FA missions, by type, that his brigade should plan for an operation.

How does the brigade FSO Limit the Number of Targets the brigade Plans?

The simple answer to this question is that the brigade FSO plans all of the FA targets, not just the targets for the brigade's "deep" fight. Put another way, the brigade FSO plans targets in support of the brigade-level fight during the brigade's course of action (COA) analysis (war game) and then apportions the rest of the pre-planned targets the FA battalion can feasibly fire to the maneuver battalion/squadron FSOs, probably weighting the main effort. He then ruthlessly enforces this limit, forcing subordinate FSOs—and their maneuver commanders—to decide which targets are the most important.

However, the art lies in how this limit is communicated to subordinate FSOs. Of course it is communicated in Annex D (the Fire Support annex) to the brigade operations order (OPORD). In fact, it should be sent to battalion FSOs and the FA battalion staff as a draft version of Annex D included with the warning order (WARNORD) published by the brigade staff as an output of war gaming so that subordinate battalions can execute parallel planning. However, the best way to communicate this allocation of FA targets is not simply to say, "battalion X, you are apportioned Y number of FA targets during phase Z."

Why isn't this the best method? One answer is that the FA battalion, which is planning in parallel, is a critical audience for the apportionment of targets published in this draft version of Annex D. Telling the FA battalion staff how many targets are apportioned to each maneuver battalion does not provide them with enough information (specifically where in each battalion area of operations (AO) the target falls, when each target will be shot, and what type and how many rounds should be shot at each target) to effectively plan to support the brigade commander's intent for Fires.

Another reason that this is not the most effective way to apportion FA targets is that it gives no guidance to the battalion FSOs as to how to employ the apportioned targets in accordance with the brigade commander's intent for FA Fires. For example, in the defense, FA smoke is a great way to silhouette the enemy inside the engagement area to make them easier to engage with direct fire weapon systems. FA smoke is also a great way to conceal a maneuver element's move from a primary to an alternate battle position. But if the brigade commander's guidance for FA Fires is that they be massed at obstacles to suppress the enemy while he is attempting to breach, these planned smoke targets are outside the brigade commander's intent. The brigade FSO must provide battalion FSOs with guidance on how to plan their apportioned targets within the brigade commander's intent for FA Fires.

For this reason, the best way for the brigade FSO to apportion FA targets is to plan the targets for the battalion FSOs and then allow the battalion FSOs to refine

them—top-down planning, bottom-up refinement!

Top-Down Planning

It is enshrined in our doctrine because it works. When executing the war game as part of the military decision-making process (MDMP), staffs at each level war game two levels down. As FM 6-0, Change 1 (dated 11 May 2015) puts it, during war gaming a staff "identifies tasks that the force one echelon below it must accomplish, using assets two echelons below the staff." In other words, the brigade staff assigns tasks to its subordinate maneuver battalions in the COA sketch and COA statement produced during COA development. Then, during the war game, the brigade staff makes educated guesses as to how subordinate companies will execute these tasks. Where needed, the brigade staff allocates brigade assets—including FA targets—to the maneuver battalions to assist their companies in winning these war gamed fights.

For the brigade FSO, this means planning all of the FA battalion's pre-planned targets, not just the ones that support the brigade's "deep" fight. While participating in the war game, the brigade FSO should plan targets to support the battalion and Company fights and record these targets on a working copy of the brigade synchronization or execution matrix as well as the draft fire support execution matrix and the draft target list worksheet. At the end of the war game, the brigade FSO sends these draft products out to his subordinate battalion FSOs and the FA battalion staff as part of a draft Annex D attached to the brigade's WARNORD 3 (published at the end of war gaming). This is top-down Fires planning.

The more detail the brigade FSO can provide for these targets in this draft Annex D the better. Ideally, the FSO should have already produced draft fire support tasks (FST), each complete with a task and purpose, during COA development. Now, with all of the FA targets (as well as the other fire support assets such as CAS, CCA, and electronic warfare attack) apportioned, the brigade FSO can fill in some of the detail of the method for these FSTs. Each target can be given a munition type and a volume/duration of fire. Tactical triggers and phases can be given for each target. This information will provide the FA battalion staff with enough information (where, what, when, and how much fire) to allow it to begin doing its own COA development to develop a FASP to support the brigade with FA Fires.

But, more importantly, communicating these planned targets to the maneuver battalion FSOs as part of FSTs gives battalion FSOs an understanding of the purpose for each target they have been apportioned. This "why" allows them to do bottom-up refinement while remaining within the brigade commander's intent for FA Fires.

Bottom-Up Refinement

The "why" is the critical component of bottom-up refinement. It tells subordinate maneuver battalion and Company FSOs what they can and cannot do in refining

each target. The target can be moved, its method of engagement can be changed, or its tactical trigger can be refined. However, changes cannot be so extensive that they change the purpose of the target. The purpose is the anchor that keeps the target tied to the brigade commander's intent for FA Fires.

How does a battalion FSO know that a FA target is his to refine? The brigade's draft Annex D will provide plenty of queues. The purpose in each FST should be focused on friendly forces; if the purpose of a smoke target is, for example, "allow Task Force X to complete the breach," then the battalion FSO for that Task Force knows that the target is theirs to refine. If the purpose is less obvious, or applies to multiple maneuver battalions, the brigade FSO can provide other clues. If his battalion is assigned as the primary observer, or if the target is in his maneuver battalion's AO, then a battalion FSO knows that the target is probably his to refine. Most brigades have standard operating procedures that provide "target blocks" designating which target numbers are to be used by each element in the brigade. The brigade FSOs can indicate which targets may be refined by which maneuver battalion by using numbers corresponding to each battalion's target block. If all else fails, the brigade FSO can simply explain in the coordinating instructions of his draft Annex D which targets may be refined by each maneuver battalion FSO.

Once the battalion FSO identifies that a FA target is his to refine, he takes the target into his own maneuver battalion staff's war game as an asset available to support the plan. As the staff war games the event for which the target was envisioned (smoke for the breaching operation, suppressive or disruptive Fires for an enemy stuck in an obstacle, etc.), the battalion FSO adjusts the target location or fire order so that it better fits his battalion's scheme of maneuver.

If, during the maneuver battalion's war game, the battalion FSO identifies a need for FA Fires for a purpose not envisioned by the brigade FSO, he must not use one of the allocated FA targets, allocated for a different purpose, to fill this gap; altering a target to this extent will de-synchronize the brigade's fire support plan, since the FA battalion is already planning against this target with its original purpose, location, trigger, and fire order. More importantly, refining a target to such an extent will place it outside of the brigade commander's intent for FA Fires.

Likewise, the battalion FSO must not plan a new FA target to cover a need not filled by an allocated target; this is over-promising to maneuver. This new target is not being planned for by the FA battalion and will not be ready to shoot when the maneuver battalion commander needs and is expecting it. If the battalion FSO cannot fill this gap with organic internal fire support assets (battalion or Company mortar), the maneuver battalion staff must alter its maneuver plan or find some other way, such as a maneuver asset, to fill this gap in capability. If the need is so critical that not having an additional FA target will result in mission failure, the maneuver

battalion commander must talk directly to brigade commander and the brigade fire support coordinator (FSCOORD) along with the FA battalion commander and convince them to change the brigade's entire fire support plan.

How does the brigade FC decide whether to accept a refinement to a FA target from a subordinate maneuver battalion FC? The first and most important measure is whether the refined target still meets the original purpose articulated in the FST for which it was planned. The brigade FC is the first, most important line of defense in ensuring that revisions to pre-planned FA targets still meet the brigade commanded intent for FA Fires. Another important factor in deciding whether to accept a revision is whether the refinement arrived before the target cut-off time published in Annex D of the brigade OPORD. Refinements that arrive too late are likely to be ineffectively disseminated throughout the brigade and may well de-synchronize the brigade fire support plan during execution. Equally important is whether the refinement is feasible. Is the refined location still inside the FA battalion's range at the time it will be shot? Does the FA battalion have enough ammunition to fire the refined fire order? The brigade FC has to ask these questions and more before it accepts any refinement to a FA target.

At target cut-off time, when all of the refinements have been reviewed and accepted or denied, the overriding concern of the brigade FSO must become building a common, shared understanding of the final target list. While the Advanced Field Artillery Tactical Data System (AFATD) can manage target lists, updated target list worksheets should still be handed out at the brigade fire support rehearsal. The FA battalion fire direction officer (FDO) should also review the target list worksheet at the FA technical rehearsal to make sure all participants have received all of the refined targets. Brigade FSOs can also use "tricks of the trade," such as numbering targets in increments of fives (e.g., AB1000, AB1005, AB1010, etc.) and replacing refined targets by adding one to the target number (e.g., AB1000 is refined to AB1001, AB1005 is refined to AB1006) to eliminate target duplication.

None of the ideas presented here are new. Before the Global War on Terrorism, combined arms maneuver was the only core competency of the United States Army. The techniques described above are only some of the many tools Field Artillerymen routinely used to integrate FA Fires into the maneuver fight. Frankly, even at the height of the American Army's competence in combined arms maneuver—during the Gulf War and during the initial invasion in the war in Iraq—BCTs still struggled to do this well. But, the core concept described here—top-down fire planning, bottom-up refinement—was a universally understood and generally well executed method to keep FA Fires focused on the brigade commander's intent and avoid over-promising to maneuver at all levels.

As our Army became more practiced and more effective in wide area security, we forgot how to use these tools. But as we return to a focus on training in combined arms maneuver at the JRTC and other combat training centers, we will re-learn these lessons. And, as the FA community regains these skills, we will once more reign as the King of Battle.

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