Field Artillery

Professional Bulletin

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Contents

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Purpose

Originally founded as the Field Artillery Journal, the Field Artillery Professional Bulletin serves as a forum for the discussions of all U.S. Army and U.S. Marine Corps Field Artillery professionals, Active, Reserves and National Guard; disseminates professional knowledge about progress, development and best use in campaigns; cultivates a common understanding of the power, limitations and application of fires, both lethal and nonlethal; fosters fires interdependency among the armed services, all of which contribute to the good of the Army, joint and combined forces and our nation. The Field Artillery Professional Bulletin is pleased to grant permission to reprint; please credit Field Artillery Professional Bulletin, the author(s) and photographers.

Cover: *Soldiers assigned to A Battery, 2nd Battalion, 12th Field Artillery Regiment, 1st Stryker Brigade Combat Team, 4th Infantry Division, fire their section's M777 Howitzer during a combined arms live-fire exercise at Fort Irwin, California, Aug. 26, 2020. The 1st SBCT executed the live-fire as the culminating event after two weeks of training. (CPT Daniel Parker/U.S. Army)*

BG Phil Brooks
Field Artillery School Commandant

From the FA Commandant

What an exciting time to be part of the Field Artillery! I'm honored to be the 54th Chief of the Field Artillery and Commandant of the United States Army Field Artillery School (USAFAS).

I want to thank MG Stephen Smith and his wife Lynn, for the seamless transition into the Fort Sill and Field Artillery community. I am excited about the future and about where we as a branch are headed.

To support our mission and commanders in the field, our priorities here at Fort Sill are leader development and driving change.

We are doing everything we can to bolster professional military education and other learning opportunities for Soldiers, officers and warrant officers. For example, we have focused on performance-oriented program of instruction (POI) for all CMF-13 advanced leader courses and senior leader courses.

In the Captains Career Course, we removed 80 hours of "common core" requirements and replaced those with pure fire support and Field Artillery specific skills. We have drastically increased rigor for our newest officers in the FA Basic Officer Leaders Course (FA BOLC) by creating an opportunity in the field where they will execute "Danger Close" fires.

Additionally, the 1-30th Field Artillery Regiment, 428th Field Artillery Brigade has teamed with the Center for the Army Profession and Leadership to successfully launch the Project Athena lifelong assessments program for FA BOLC Class 6-20. The initial leader assessments for FA BOLC will be the Criterion Online Writing Evaluation Service and Nelson Denny Reading Test. The project will build

Soldiers assigned to B Battery, 1st Battalion, 119th Field Artillery Regiment, Michigan Army National Guard, observe where the last round fired from their M777 Howitzer landed in relation to their target as part of a direct fire training exercise during Northern Strike 20, Camp Grayling, Michigan, July 25, 2020. (SGT Adam Parent/U.S. Army)

upon these tests through evaluations, counseling and feedback to identify/develop key knowledge, strengths and behaviors throughout their careers.

On the Warrant Officer side, we've recently completed the Critical Task Site Selectin Board and have identified 28 individual critical tasks associated with our 131A Field Artillery Technicians. I would like to sincerely thank the board members who participated. Your expertise will significantly shape the development of our learning objectives and programs of instructions for our great warrant officers. Additionally, we have completed the memorandum of understanding between the USAFAS and JSOTF (75th Ranger Regiment) establishing a Quick Start Program. This allows USAFAS to temporarily assign new graduates from the Field Artillery Warrant Officer Basic Course to the United States Central Command area of responsibility in support of Operation Freedom's Sentinel for up to 179 days.

FM 3-60, *Army Targeting* is out for world-wide staffing. We have drafted strategic fires doctrine. We also have a revamped ATP 3-09.12, *Field Artillery Target Acquisition,* which incorporates emerging techniques on new equipment such as the AN/TPQ-50 and AN/TPQ-53 RADARs. It also introduces the new Army Structure of the division artillery and the Field Artillery brigade.

For our Master Gunner Course POI, we have ensured it has remained agile and rigorous to meet the requirements of emerging capabilities and weapons platforms. Additionally, the POI addresses the scope of duties for our master gunners at echelon, in both certification and deployed operations.

The more rigorous training we conduct at home station, the greater we optimize our valuable time at our Combat Training Centers and ultimately the better prepared we are to fight and win large-scale combat operations against peer or near-peer adversaries in a growing complex global environment.

No matter how technical our operations become or how wide our global missions expand, our people continue to be our most treasured resource. The Field Artillery has never been more needed or more relevant than it is today.

In closing, I want to thank you for all the great articles that were submitted for the Field Artillery Professional Bulletin's inaugural year. This is our last edition of the year and it is jam packed. We could not publish without your articles, so please keep them coming. Thank you for a successful year, and please look for another four editions in 2021!

Soldiers assigned to the 65th Field Artillery Brigade, and Soldiers from the Kuwait Land Forces fire their High Mobility Artillery Rocket Systems (U.S.) and BM-30 Smerch rocket systems (Kuwait) during a joint live-fire exercise near Camp Buehring, Kuwait. (SGT James Lefty Larimer/U.S. Army)

From the desk of the Command Sergeant Major

Redlegs,

I am humbled to serve our Soldiers and Families as the 14th CSM of the Field Artillery and Field Artillery School. Beth and I would like to personally thank CSM Kevin King and his wife Krissy, for such great stewardship of the branch, much of which is maturing now on our watch.

This is an exciting time in the Field Artillery. Our strategic leaders placed our fires forward once again, units are focusing on core skills to prepare for large-scale combat operations, and our commandant is dedicated to leader development and driving change across the branch. Capabilities that were unthinkable just a few years ago are scheduled for rapid delivery to the force, we are returning to our core leader and occupational competencies, and academic rigor was reapplied to our functional courses.

What you should expect to see from me based on the commandant's published priorities:

-Working with HRC and stakeholders to ensure we get the right Redleg, in the right place, at the right time.

-Flat, synchronized, and habitual information sharing in written and virtual forums from across the operational/generating/institutional Field Artillery community that is systematic and enduring.

-Re-vamping the FA Master Gunner (facility, duration, allocation, and composition) as our premier cornerstone course to ensure enlisted SMEs are able to advise commanders and units as new capabilities and platforms mature.

-Ensuring advanced individual training/NCO professional development/functional course programs of instruction retain or increase the rigor necessary to produce the best trained Field Artillery Soldiers and leaders possible. This includes closing the gap between Regional Training Institutes and Fort Sill.

-Be accessible to all members and units for dialogue, discussion, and visits. This includes virtual, in person when able, and on social media platforms.

-Reviews of our career maps to ensure we maintain relevancy in the future, enable leader development at echelon, and provide opportunities to compete at the most senior levels.

In closing, we are here to serve. We want to hear from you, get your input, and help solve your challenges. The Field Artillery has a bright future, and we look forward to seizing and exploiting opportunities with you.

Time to do work, guns up. *KING OF BATTLE!*
CSM Michael J. McMurdy

Offensive operations for the Field Artillery battalion and below

LTC Matthew M. Fox, CPT Jeremy A. Carrol, CPT Taylor A. Griffin, CPT Andrew S. Guglielmo, CPT Richard A. Moreno, CPT Christopher W. Mauldin, CW3 Rusty Hurley, SFC Christopher J. Guilbault, and SFC David A. Quintanilla

Soldiers assigned to Charley Battery, 3rd Battalion, 7th Field Artillery Regiment, 25th Infantry Division Artillery, 25th Inf. Div. culminate Table VI through XII qualifications with a live-fire exercise at Pohakuloa Training Area on Hawaii Island, Hawaii, September 24, 2020. In addition to certifying crews, the Soldiers conducted cross training with Marines of the III Marine Expeditionary Force. (MSG Andrew Porch/U.S. Army)

The purpose of this paper is to provide a context for Field Artillery (FA) units executing offensive operations in a decisive-action training environment. The specific unit of focus for this paper is the brigade combat team (BCT), direct support FA battalion (BN). The primary audiences for this paper are fires battalion staff officers and non-commissioned officers, battery and forward support company commanders, and first sergeants.

This paper is a collaboration from key and developmental (KD) billet complete (AKA: KD-complete) observer, coach and trainers (OC/Ts) with an aggregate of around 100 rotations-worth of file:///Users/rickpaape/Downloads/6370679.jpg ex file:///Users/rickpaape/Downloads/6370679.jpg perience at the National Training Center (NTC) at Fort Irwin, California.

This paper is separated into four focus areas consisting of battalion operations, battery operations, sustainment operations, and RADAR employment considerations. The battalion operations section highlights the FA battalion's tasks

associated with offensive operations. The battery operations section provides insights from a battery commander's perspective to highlight troop-leading procedures (TLPs), execution, and subsequent transition. The third section of this paper is sustainment operations insights for the offense. Lastly, this paper will identify RADAR employment considerations specific to the offense.

Battalion operations

The battalion operations officer (S3) is responsible for understanding the brigade fight and ensuring the battalion is postured to deliver fires in order to meet the BCT commander's desired effect in support of the brigade's defined deep and close fights. The success of the battalion is contingent upon the staff's ability to conduct deliberate parallel planning with brigade. The battalion staff is responsible for anticipating applicable Field Artillery tasks (FATs) in accordance with the enemy situation template (SITEMP) and friendly scheme of maneuver, positioning of Field Artillery assets, and proper management of Class V to accomplish the BCT commander's desired effect. The battalion S3 must maintain communication with the brigade fire support officer (FSO), the fire support coordinator (FSCOORD), and the brigade S3 to understand the brigade plan. During offensive operations, the battalion staff must continually ask the following questions enabled by the six tactical operations center functions, running estimates, and military decision-making process:

- Based on the enemy SITEMP and the brigade's maneuver plan where can we anticipate targets?
- How much obscuration, suppression, and special munitions will the brigade's plan require?
- Can we execute our PACE plan at speed to execute seamless fire mission processing?
- Does the intelligence preparation of the battlefield and assigned battle space/position areas for artillery (PAAs) support the most achievable firing solutions and transitions to affect an enemy counter-attack and exploit high payoff target list and targets of opportunity?
- Are we providing battery commanders sufficient time to conduct proper reconnaissance, selection and occupation of position (RSOP) and TLPs, specifically turret loads/Class V cross-loading?

To answer these questions ensure recommendations can be made to the FSCOORD for decision(s), conditions are set to support the brigade fight, and batteries have adequate time to conduct TLPs.

Battery operations and troop-leading procedures

The battery commander (BC) and battery leadership should fundamentally follow the eight steps of troop-leading procedures to prepare for offensive operations. Also, using the elements of METT-TC and Five Requirements for Accurate Predicted Fire (5RAPF), BCs are well able to effectively analyze their mission as directed by the battalion Field Artillery support plan. During the offense, a battery may be assigned FATs of suppression, screening smoke, obscuration, counterfire, and precision fires. The BC must thoroughly understand his or her assigned FATs, as they will frame the means in which they will achieve the commander's desired effect. An enemy formation in the defense is at an advantage based on the amount of time they had to dig in and shape the operational environment. Also, an assessment of near-peer adversaries will determine that they possess a higher ratio of indirect fire assets with further range capabilities. The BC must consider these facts as they consider direct fire, counterfire threats, and necessary force protection postures to reduce the risk to force and mission. The nature of offensive operations in large-scale combat operations will force the BC to backward plan from a specified in position ready to fire times in accordance with the brigade reconnaissance squadron line of departure (LD) time. Leader adherence to the one-third, two-thirds rule allows maximal time for subordinate leader planning, rehearsals, and execution.

Having conducted their analysis, the BC must issue a warning order (WARNO) with the proper balance of detail to achieve shared understanding. BCs must rely on practiced standard operating procedures (SOPs) to streamline their WARNO. SOPs should cover topics such as pre-combat checks and pre-combat inspections criteria and subordinate responsibilities for movement, occupation, and special teams so the commander need not dictate these tasks in their order. The WARNO should also include relevant analysis of the enemy situation, terrain, and weather at their echelon and two levels up. BCs must be careful not to simply restate the battalion mission to their subordinates, but provide appropriate and applicable analysis that their subordinates need to know. WARNOs should include priorities of work, general timeline, and direction for initial movement and reconnaissance. Finally, the WARNOs should direct action, enable dialogue, and the execution of implied tasks down to the 10-level junior Soldier.

In an offensive operation, the BC may not be able to lead RSOP operations for all templated PAAs until maneuver units have crossed LD. BCs may be required to use other assets to conduct their initial reconnaissance, including maps, imagery, Ravens, or other unmanned aircraft systems, or querying higher headquarters and adjacent units to help judge routes and positions until their advance party can conduct RSOP.

As the BC completes the plan and prepares to issue the opera-

tions order for an offensive operation, they must give special attention to triggers and speed at which they must move their battery to the next PAA, the counterfire threat, survivability movement criteria, ammunition resupply triggers, and resupply procedures. When completing their plan, the BC should ask themselves: Do I have the correct ammunition to complete my FAT? Are triggers for battery emplacement and displacement clear? Will my platoons understand the triggers and timing of the targets for which they are responsible? Are we able to effectively communicate internally and externally? Are we meeting all 5RAPF?

As the commander issues the plan, they must ensure subordinate retention of information through back briefs or quizzing. The commander must also be prepared to refine their plan through effective supervision, inspections, and completion of RSOP procedures.

Execution

The cannon battery conducts operations through decentralized execution based upon mission orders. Battery leaders exercise initiative to accomplish the mission within the commander's guidance. The capability of the cannon battery is enhanced through the flexibility and survivability of the platoon-based organization. The platoon fire direction centers (FDCs) are equipped with the AFATDS computer as the primary digital interface between the battalion command post and the Howitzers.

Methods of operational control

Howitzer batteries operate as either two independent platoons with one platoon operations center controlling three Howitzers or a battery operations center (BOC) with one FDC controlling all six Howitzers in the battery. For offensive operations, the recommended method of control is FDCs operating as a BOC controlling all Howitzers within the battery. The primary reason for operating as a BOC under these conditions is the number of Howitzers required to conduct an obscuration or screening mission is typically more than three for a combined arms breach at the BCT level. Based on the perceived enemy direct or indirect threat, the BC's guidance for survivability dictates the movement and employment of Howitzers throughout offensive operations. Typically, the largest threat during offensive operations is enemy indirect fire (IDF) during long-duration fire missions such as obscuration or suppression for a BCT combined arms breach. To avoid the enemy IDF threat, it is recommended to increase dispersion between elements to 300–400 meters to reduce enemy IDF effectiveness. However, as the distance between elements increases, so does the difficulty of command, control, and sustainment.

Fire direction center

In offensive operations, the controlling FDC, at the battery level, is responsible for maintaining all five requirements for accurate fire. Additionally, the FDC must maintain accurate digital and analog fire support coordination measures (FSCMs). Once the FDC receives a target list worksheet (TLWS) from battalion, it is imperative for the battery-level FDC to conduct multiple internal technical rehearsals before the brigade or battalion driven rehearsal. During offensive operations, the internal technical rehearsals must at a minimum focus on all aspects of the FATs: obscuration and suppression. How much smoke do we have on hand? Do we have an achievable firing solution? How many Howitzers are required to provide obscuration? How many rounds are required for the build and sustain phases of obscuration? The internal technical rehearsal also ensures the correct ammunition, such as propellant, projectiles, fuses, primers, etc. are on the correct Howitzer to support the TLWS. The FDC also utilizes the technical rehearsal to identify and report FSCM violations, intervening crests, range, or other ammunition issues that ultimately prevent the successful firing of the mission. The TLWS is a key fighting product that provides essential information for the FDC and battery leadership to continue executing TLPs. The battery-level FDC provides refinements to battalion FDC. These refinements include, but are not limited to, gun target line, max ordinate, charge, or any other variable that will prevent the mission from firing. This data is useful to the BCT fires cell to maintain a permissive joint fires environment allowing the synchronization and integration of fixed-wing, rotary-wing, and other echelons above brigade assets in support of the offensive operation.

Artillery raid

Another commonly employed tactical method for offensive operations is the artillery raid. The artillery raid is a rapid air or rapid ground movement of elements into a position to attack a high-payoff target currently beyond the maximum range of available Field Artillery weapons. This could involve operations across the forward edge of the battle area. Normally, a raid is extremely short and does not involve sustained operations. A detailed plan, surprise, and speedy execution are key factors in a successful raid. Firing units will move forward only the number of vehicles necessary to accomplish the mission. When the fire mission is complete, the Howitzer crews prepare the Howitzers for movement. Key elements to ask during an artillery raid are as follows: Where are we going? What unit is in the area? Which unit am I supporting? What is the fire mission routing? When is the tactical and technical rehearsal? Who is my point of contact? Where is the nearest role

one for medical support? Did we rehearse a rear passage of lines?

Transition

Units at NTC often struggle during transitions either from offensive operations or into defensive operations. Preparation for transitions is paramount for units to succeed in the next phase of operations. The responsibility for planning successful transitions lies primarily at the BCT and BN level; however, BCs need to understand how they fit into the larger plan in order to succeed. Primarily at the battery level, commanders need to understand their FATs, current location, next location, and ammunition needed for their transition to the next phase. Artillery units often fail to preposition ammunition loads for the next phase of the operation. For instance, units transitioning from offensive to defensive understand their next location, but they lack detail in understanding the munitions required at the next PAA. Units must have a TLWS that encompasses transition targets to influence a possible enemy counter-attack and friendly branch plans. BCs need to understand transition points with associated FATs to set conditions for the next phase of the operation. If units understand the upcoming FATs and plan, they will know if their battery is in the correct position, have the correct ammo, and are prepared to transition into the next phase of operations.

Sustainment operations

During offensive operations, sustainment planners must consider the locations of both the batteries as well as the enemy. The analysis of this information provides the pertinent information on which munitions, including propellants, are required to either suppress, neutralize, or destroy the enemy. Two principles of sustainment are responsiveness and anticipation. These two principles are extremely important in FA offensive operations as well as to ensure the unit is sustained properly through the transition. Sustainment planners within the FA battalion must maintain constant communication with the S3 and understand both current and future operations. This communication flow enables the forward support company (FSC) to maintain responsiveness to ensure the battalion can fight through transitions following offensive operations. During offensive operations, mission success depends on providing the firing batteries the necessary ammunition to support FATs and assigned TLWS. Understanding each battery's FATs, TLWS, and an accurate understanding of expenditures enables sustainment planners to project where and when ammunition is needed. This provides accurate resupply triggers and ensures the FSC understands how to keep the battalion in the fight. During offensive operations, sustainment planners must also anticipate the pending breach and understand how much smoke is available within the batteries as well as the FSC. Successful units at NTC understand how much smoke is required to provide obscuration for a BCT breach as well as how to execute resupply triggers to ensure the FSC is pushing the right ammunition to the right battery at the right time. In addition to planning for BCT breach operations, the transition to the defense must also be considered. As stated above, sustainment planners must understand the transition from offensive operations, changes to FATs, and what

Soldiers assigned to B Company, 5th Battalion, 20th Infantry Regiment, fire missiles with M142 High Mobility Artillery Rocket System during Decisive Action Rotation 20-05 at the National Training Center in Fort Irwin, California, March 17, 2020. (SPC Jessica Rutledge/U.S. Army)

upcoming ammunition, fuel, or other supplies is essential to keep the battalion fighting through the transition.

RADAR employment considerations

The employment of weapon locating RADAR (WLR) in support of offensive operations is key to the success of the maneuver forces as they tactically seize or execute an objective. The BCT FSO or targeting officer must first understand the operational environment and the critical task associated with the scheme of maneuver. As situational understanding is achieved, the planner conducts a "reverse" time and distance analysis from the point of attack to the actual distribution of the RADAR deployment order (RDO). An example is Unit A will seize the objective at H+10, the WLR needs to be in position ready to observe at location NV123456 by H+9; it will take two minutes to march order the system and five minutes to emplace. The section must travel X kilometers from position A to position B. It will take X amount of time for the WLR to travel from position A to position B. Once WLR has arrived at position B, a refined reconnaissance is required to ensure the WLR is at an optimal location or position ready to observe. This process could take a significant amount of time due to the competing factors such as time, terrain, training, and experience. The planning and execution of WLR employment and understanding all considerations associated is vital and may be the difference in the overarching success of fire support operations.

Target acquisition in support of offensive tasks

The effective assignment of target acquisition assets enables responsive fires during offensive tasks. Quick-fire nets allow the observers to communicate with specific Field Artillery or mortar fire units. These kinds of communication arrangements enhance responsiveness. Communication planning should also include communications nets for the clearing of targets for air assets.

During offensive tasks, target acquisition RADARs support the protection of friendly forces by locating enemy indirect fire systems. With offensive tasks, particular attention must be given to planning target acquisition that enables future operations. For example, fires cell targeting officers focus on the identification of enemy indirect fire assets. They must identify and coordinate the use of the terrain for the RADAR and recommend RADAR zones to the BCT commander. Detailed planning should provide for continuous coverage of the supported command's area of operations.

Control and cueing for RADARs should be decentralized during offensive tasks. The Field Artillery controlling headquarters should designate cueing agents that can directly contact the RADAR through the RADAR deployment order. The RADAR deployment order identifies the cueing agents and their priorities to the RADAR section.

Requirements for RADAR positioning and movement are identified early in the operations process and tied to specific events. This allows continuous coverage by facilitating mutually supporting coverage between RADARs. The Field Artillery battalion commander monitors this process closely to ensure that the use of terrain, movements, and RADAR zones are properly coordinated. General considerations for target acquisition during all types of offensive tasks include:

- Execute target acquisition in support of the supported command's operations.
- Position observers and RADARs to support the observation and collection plans.
- Plan for frequent repositioning of target acquisition assets.
- Use call-for-fire zones to provide target acquisition coverage on suspected enemy firing positions.
- Coordinate RADAR employment across the supported command's area of operations to ensure there are no gaps in coverage.
- Position RADARs to maximize range and provide maximum flexibility.
- Position RADARs to cover critical point targets that are vulnerable to indirect fire.
- Plan for 6400-mil (360-degree) coverage and flank security support the observation and collection plans.

Optimal site considerations are: The best countermeasure to enemy electronic warfare is to occupy optimum sites. An optimum site is one in which the WLR is emplaced on level terrain having a gentle downward slope for the first 200-300 m in front of the WLR then a sharp rise to a screening crest. The main considerations are the following: Slope, the area in front of the antenna, screening crest, aspect angle, electronic line of sight, track volume, proximity of other RADARs, and cable lengths. The directive to employ the WLR requires an RDO. The RDO consists of the DA Form 5957 defined as an enclosure to the target acquisition tab within Annex D. The RDO provides the information required to deploy the RADAR section and begin operations.

During offensive operations, a method for providing continuous RADAR coverage is to leapfrog RADARs forward. This is done by moving one or more RADARs forward while another RADAR covers the moving RADARs sector of search. This can be enhanced by the FA brigade or division artillery RADARs assisting the BCT RADARs by providing coverage while they move. Triggers for initiating this

movement can be based on phase lines, events, or time determined during the planning process. The movement of RADARs must be synchronized with the scheme of maneuver.

Conclusion

In conclusion, this paper provides key lessons learned for FA battalions executing offensive operations. The FA battalion staff and S3 have a large role in ensuring BCs have the necessary information, FATs, or fighting products available to conduct TLPs, identify friction, and ultimately ensure they have a firing solution for all primary and alternate targets assigned on the TLWS. Additionally, BCs must understand what is next. What is expected of the battery during the next phase? Am I ready to execute offensive operations and transition to the next phase? The FSC must also maintain communication flow with the FA battalion staff, S3, and BCs to ensure the battalion is postured to support offensive operations and beyond. Lastly, successful RADAR employment is critical to providing necessary counterfire locating capability during offensive operations in support of a BCT breach.

LTC Matthew M. Fox served as "Wolf 03" the fire support operations trainer at the National Training Center, Fort Irwin, California, from July 2018 to August 2020. He previously served on the United States Forces Korea Staff from July 2016 to July 2018. LTC Fox has deployed in support of Operation Iraqi Freedom, Operation Enduring Freedom and Operation New Dawn.

CPT Jeremy A. Carroll served as "Wolf 13" and "Panther 27" Firing Battery and Task Force Fire Support officer trainer at the National Training Center, Fort Irwin, California, from August 2018 to August 2020. He previously served as the commander of Charlie Battery of the 5th Battalion, 25th Field Artillery, 3rd Infantry Brigade Combat Team, 10th Mountain Division, Fort Polk, Louisiana, from June 2016 to June 2017. Then he went on to be the commander of Headquarters and Headquarters Company of the same brigade from July 2017 to August 2018. CPT Carroll has deployed in support of Operation Iraqi Freedom, Operation Enduring Freedom and Operation Inherent Resolve.

CPT Taylor A. Griffin served as "Wolf 11" the Alpha Battery observer, coach and trainer (OC/T), and "Wolf 32" the battalion fire direction center OC/T at the National Training Center, Fort Irwin, Californiia, from January 2019 to June 2020. He previously served as the commander of Headquarters and Headquarters Battery, 3-16th FA, 2nd ABCT, 1st CD Fort Hood, Texas, from November 2015 to May 2017. CPT Griffin has deployed twice in support of Operation Enduring Freedom with 4th Brigade Combat Team, 101st Airborne Division.

CPT Andrew S. Guglielmo served as "Wolf 11" the Alpha Battery observer, coach and trainer and "Dragon 37" the live-fire exercise fire support trainer at the National Training Center, Fort Irwin, California, from February 2019 till present. His previous assignments include commander, B Battery, 2nd Battalion, 2nd Field Artillery, Fort Sill, Oklahoma, Field Artillery Basic Officer Leaders Course instructor, Fort Sill, Oklahoma, and battalion fire support officer, 1st Battalion, 64th Armor, Fort Stewart, Georgia. CPT Guglielmo has served in Afghanistan as a part of Operation Enduring Freedom.

CPT Richard Moreno served as "Wolf 12," firing battery trainer at the National Training Center, Fort Irwin, California, from January 2019 to June 2020. He previously served as the commander of B Battery, 1-9th FA, 2nd ABCT, 3rd ID, Fort Stewart, Georgia, June 2018 to January 2020. He also served as a squadron fire support officer for 6-8th CAV, 2nd ABCT, 3rd ID from March 2017 to May 2018. CPT Moreno has deployed in support of Operation Enduring Freedom and Joint Multinational Training Group - Ukraine.

CPT Christopher W. Mauldin served as "Wolf 17" the Field Artillery battalion's forward support company trainer at the National Training Center, Fort Irwin, California, from May 2019 to March 2020. He previously served as the commander of the Headquarters and Headquarters Battery, Field Artillery Squadron, 3rd Cavalry Regiment, Fort Hood, Texas, from April 2018 to April 2019 and as the commander of the Forward Support Company, Field Artillery Squadron, 3rd Cavalry Regiment, Fort Hood, Texas, from April 2017 to April 2018. CPT Mauldin has deployed to Iraq in support of Operation Inherent Resolve.

CW3 Rusty "Rus" Hurley served as senior RADAR/battalion targeting trainer at the National Training Center, Fort Irwin, California, from August 2019 to July 2020. He previously served as a senior brigade targeting officer of 1st Battalion, 37th Field Artillery, 1st Stryker Brigade Combat Team, 2nd Infantry Division, Joint Base Lewis-McChord, Washington, from July 2016 to July 2019. He also served as division Field Artillery intelligence officer for HHB, 82nd Airborne Division, and as a brigade targeting officer of 3rd Battalion, 319th Field Artillery Regiment, 1st Brigade, 82nd Airborne Division. CW3 Hurley has deployed to Operation Iraqi Freedom I and III, Operation Enduring Freedom, and Operation Inherent Resolve.

SFC Christopher J. Guilbault serves as "Wolf 36A" RADAR trainer at the National Training Center, Fort Irwin, California, from June 2018 to present. He previously served with 1st BCT 3-6th FAR, 10th Mountain Division, Fort Drum, New York, from 2015 to 2018, with 1-38th FAR, 210th Field Artillery Brigade, Republic of Korea from 2014 to 2015, and with 4th BCT 5-82nd Field Artillery, 1st Cavalry Division, Fort Hood, Texas, from April 2007 to 2014. He deployed in support of Operation Enduring Freedom, Operation New Dawn, and Operation Iraqi Freedom.

SFC (P) David A. Quintanilla served as "Wolf 36A" RADAR observer, coach, and trainer at the National Training Center, Fort Irwin, California, from July 2017 to July 2020. He previously served as target acquisition platoon sergeant and senior field artillery targeting NCO at 3rd Battalion, 7th Field Artillery, 3rd Brigade Combat Team, 25th Infantry Division, Schofield Barracks, Hawaii, from June 2014 to June 2017. SFC (P) Quintanilla has deployed in support of Operation Iraqi Freedom.

Defensive operations for the Field Artillery battalion and below

LTC Matthew M. Fox, CPT Jeremy A. Carroll, CPT Taylor A. Griffin, CPT Andrew S. Guglielmo, CPT Richard A. Moreno, CPT Christopher W. Mauldin and CW3 Rusty Hurley

SSG Nicholas Haynes, a cannon crewmember assigned to A Battery, 2nd Battalion, 12th Field Artillery Regiment, 1st Stryker Brigade Combat Team, 4th Infantry Division, monitors the safe execution of his section's portion of a combined arms live-fire exercise at Fort Irwin, California, Aug. 26, 2020. (CPT Daniel Parker/U.S. Army)

The purpose of this paper is to provide a context for Field Artillery (FA) units executing defensive operations in a decisive action training environment. The specific unit of focus for this paper is the brigade combat team's (BCT) direct support FA battalion. The primary audiences for this paper are fires battalion staff officers and non-commissioned officers, battery and forward support company commanders, and first sergeants.

This paper is a collaboration from key and developmental (KD) billet complete (AKA: KD-complete) observer, coach and trainers (OC/Ts) with an aggregate of around 100 rotations worth of experience at the National Training Center (NTC) at Fort Irwin, California.

This paper is separated into four focus areas consisting of battalion operations, battery operations, sustainment operations, and RADAR employment considerations.

The battalion operations section highlights the FA battalion's tasks associated with defensive operations. The battery operations section provides insights from a battery commander's perspective to highlight troop-leading procedures (TLPs), execution and subsequent transition. The third section of this paper is sustainment operations insights for the defense. Lastly, this paper will identify RADAR employment considerations specific to the defense.

Battalion operations

The battalion operations officer (S3) is responsible for understanding the brigade defense and ensuring the battalion is postured to deliver fires in order to meet the BCT commander's desired effect in support of the brigade's defined deep and close fights. The success of the battalion is contingent upon the staff's ability to conduct deliberate parallel planning with brigade. The battalion staff is responsible for anticipating applicable Field Artillery tasks (FATs) in accordance with the enemy situation template, enemy event template (EVENTEMP), a friendly scheme of maneuver, positioning of artillery assets, and proper management of Class V to accomplish the BCT commander's desired effect. The modified combined obstacle overlay is an essential tool developed during mission analysis that can be used to facilitate parallel planning with the brigade staff. The battalion S3 must maintain communication with the brigade fire support officer (FSO), the fire support coordinator (FSCOORD) and the brigade S3 to understand the brigade plan. During defensive operations, the battalion staff must continually ask the following questions enabled by the six tactical operations center functions, running estimates, and military decision-making process:

- Based on the enemy EVENTEMP and the brigade's defensive plan where can we anticipate targets?
- How much remote anti-armor mine system (RAAMS), suppression, and obscuration will the brigade's plan require?
- Can we execute our PACE plan at a level to execute seamless fire mission processing?
- Does the intelligence preparation of the battlefield and templated position area for artillery (PAA) support the most achievable firing solutions and transitions to disrupt an enemy attack and engage targets on the high payoff target list or targets of opportunity?
- Are we providing battery commanders sufficient time to conduct proper reconnaissance, selection, and occupation of position (RSOP) and TLPs, specifically turret loads/Class V cross-loading?

The staff's ability to answer these questions ensure recommendations can be made to the FSCOORD for decision(s), conditions are set to support the brigade fight and batteries have adequate time to conduct TLPs.

Battery operations troop-leading procedures

As in all operations, battery commanders and other battery leaders will follow the familiar eight steps of TLPs during defensive operations. Since the enemy retains the initiative during defensive operations, the amount of time allocated for battery and lower-level TLPs could be limited. Commanders must practice and rely on unit standard operating procedures (SOPs) to help streamline the process. Using a blank operations order template, a practiced tactical SOP, and clear priorities of work and rehearsals will ensure the battery is prepared for defensive operations. TLP steps may be out of order or repeated as the brigade's and battalion's defensive plans are developed and refined.

The battery commander's thorough understanding of assigned FATs is critical. The battery's FATs will dictate the ammunition load within the firing section, battery trains employment, movement options, and resupply triggers among other considerations.

The battery commander's plan must balance coverage at multiple areas which include reconnaissance elements, units that may be well forward of the engagement area, the actual engagement area itself, and the eventual transition to the counterattack. However, the battalion should provide initial positioning guidance, a bottom-up refinement timeline and technical rehearsals schedule. These are key for battery commanders to complete their plan by ensuring they can achieve technical solutions to all assigned targets. Also, commanders and subordinates must ensure their plans are nested into their higher headquarters plan to transition to the counterattack. Ensuring triggers are identified to dispatch RSOP and to move PAAs, maintaining firing capabilities as the battery moves forward, and rehearsing the technical solutions to counterattack targets are all essential requirements of the defensive plan.

Reconnaissance, selection, and occupation of a position

The battery commander will conduct a reconnaissance of the proposed position as time allows. Ideally, the reconnaissance will consist of a ground reconnaissance with the identification of proposed routes, obstacles, ambush sites, survey locations and Howitzer positions. Reconnaissance allows the battery commander to traverse the terrain that the battery (platoons) will cover en route to the position. Reconnaissance can also accom-

plish survey coordination, engineer support, route security, adjacent unit coordination, and fire support. During the reconnaissance, the battery must consider the movement criteria and how it affects the mission or support for the maneuver force. The battery cannot lose firing capability and must be prepared at all times to receive emergency missions if other batteries are also maneuvering. The enemy's situation is another factor to consider, and it must be thoroughly understood. The disposition, intentions, and capabilities of enemy forces must be analyzed as this could determine the route, positioning, dispersion techniques, and occupation techniques utilized to support the maneuver force.

Upon completion of RSOP, the battery must prepare an adequate defense to survive and provide continuous fire support to the maneuver commander. A defense is more effective when there is adequate time to thoroughly plan and prepare defensive positions.

Battery defense against enemy capabilities

Enemy forces direct their actions against the Field Artillery to affect their ability to deliver fires. Enemy forces may try to detect Field Artillery elements through the study of doctrine and the processing of information collected by using reconnaissance and surveillance as sources of information. Personal communication devices, such as cellular phones, permit untrained observers or irregular forces to report unit positions for targeting. Visual observation predicted activities, bumper markings, and leftover rubbish can also be used for the collection of information supporting the enemy targeting effort. However, the greatest threats to the Field Artillery battery come from counterfire, air attack and ground attack.

To defend against these threats, the battery must understand the tactical situation and identify potential friendly and enemy weaknesses. The battery must undertake actions to provide for early and accurate warning of threat activities. This will protect the battery from surprise and reduce the unknowns in any situation. Unit operating procedures must contain provisions for battery self-defense. A defense diagram must include all direct fire crew-serve weapons integrated with gunnery techniques such as firing Killer Junior (time-fused, high-explosive rounds fired indirect fire) on dismounted avenues of approach and flechette (antipersonnel-tracer) rounds for perimeter defense.

Survivability

After the battery has occupied its PAA, the battery commander must consider survivability criteria to effectively mass indirect fires for the brigade and maintain combat power. Mission analysis will dictate survivability criteria and it will continuously change to meet the dynamic variables of the operation. Survivability criteria are most commonly constructed at the battalion echelon with guidance from the battalion commander and input from running estimates of the battalion staff. Survivability criteria will trigger movements within designated PAAs based on METT-TC or SOPs. It is important to continuously adhere to the survivability criteria to defend against enemy counterfire as the battery masses indirect fires to neutralize the enemy during defensive operations.

Fire direction center

In defensive operations, the controlling FDC, at the battery level, is responsible for maintaining all Five Requirements for Accurate Predicted Fire. Additionally, the FDC must maintain accurate digital and analog fire support coordination measures (FSCMs). Once the FDC receives a target list worksheet (TLWS) from the battalion, it is imperative for the battery-level FDC to conduct multiple internal technical rehearsals before the brigade or battalion driven rehearsal. During defensive operations, the internal technical rehearsals must at a minimum focus on all aspects of the FATs.

- How many RAAMS rounds do we have on hand and do we have an achievable firing solution?
- Are there enough PAAs planned to survive during high volumes of fire?
- Will the FDC need to move for survivability or just Howitzers?
- Should an alternate FDC be established for redundant technical control at the battery level?

The internal technical rehearsal also ensures the correct ammunition, such as propellant, projectiles, fuses, and primers are on the correct Howitzer to support the TLWS. The FDC also utilizes the technical rehearsal to identify and report FSCM violations, intervening crests, range, or other ammunition issues that ultimately prevent the successful firing of the mission. The TLWS is a key fighting product that provides essential information for the FDC and battery leadership to continue executing TLPs. The battery-level FDC provides refinements to the battalion FDC. These refinements include, but are not limited to gun target line, max ordinate, charge, or any other variable such as MET updates that will prevent the mission from firing or require the battalion commander to make a decision. This data is useful to the BCT fires cell to maintain a permissive joint fires environment allowing the synchronization and integration of fixed-wing, rotary-wing, and other echelons above brigade assets in support of the defensive operation.

Transition

Units at NTC often struggle during transitions from defensive

operations into the counter-attack. Preparation for transitions is paramount for units to succeed in the next phase of operations. Planning for successful transitions lies primarily at the brigade and battalion level; however, battery commanders need to understand how they fit into the larger plan to succeed. At the battery level, commanders need to understand their FATs, current location, subsequent locations, and ammunition required for their transition to the next phase. Artillery units often fail to preposition ammunition loads for the next phase of the operation. For instance, units transitioning from the defense to the counter-attack understand their next location, but they lack detail in understanding the munitions required at the next PAA. Units must have a TLWS that encompasses transition targets to influence a possible enemy counter-attack and friendly branch plans. Battery commanders need to understand transition points with associated FATs to set conditions for the next phase of the operation. If units understand the upcoming FATs and plan, they will know if their battery is in the correct position, have the correct ammo, and are prepared to transition into the next phase of operations.

Sustainment operations

Sustainment planners and leaders must plan for sustainment functions required to build combat power such as personnel services, health service support, and logistics. The battalion S1 tracks personnel and coordinates for personnel replacement as necessary. The medical platoon conducts medical treatment, medical evacuation, and medical logistics/supply. The forward support company (FSC) is responsible for executing logistics functions within the battalion. During the defense, units must focus on building combat power and providing necessary supplies to the batteries as the unit strives to regain the initiative.

As stated in ATP 3-09.23, *Field Artillery Cannon Battalion,* supply lines are frequently shorter in the defense. Establishing a rearm, refuel and resupply point (R3P) as batteries conduct rearward movement is advantageous. Key supply classes for this R3P include Class V (S RAAMS, and M825/A1 Smoke depending on the defensive tasks), Class III (B), and Class IX (repair parts). This will enable the firing batteries to execute their assigned FAT as well as repair equipment with maintenance issues upon arrival to their PAA. Generally, RAAMS is required during the early stages of the defense and M825/A1 Smoke is required in the early stages as the cavalry squadron conducts a rear passage of lines and in the later stages of the defense in preparation for the transition to the counter-attack.

During defensive operations, sustainment planners must maintain an accurate operational picture as the unit progresses through the defense. Planning, communicating and executing resupply triggers is critical for sustainers to supply the required ammunition to the firing batteries on time. This understanding will enable the FSC to be responsive to ensure the battalion can fight the current defensive fight as well as create conditions for a successful attack. Overall, sustainment planners must anticipate ammunition requirements based on assigned FATs and always stay synchronized with operations.

RADAR employment considerations

The employment of weapon locating RADAR (WLR) in support of offensive operations is key to the success of the maneuver forces as they tactically seize or execute an objective. The brigade FSO or targeting officer must first understand the operational environment and the critical tasks associated with the defense. As the situational understanding is received, the planner conducts a "reverse" time and distance analysis from the no later than (NLT) defend time to the actual distribution of the RADAR deployment order. An example is Unit A will defend NLT at H+10, the WLR needs to be in position ready to observe at location NV123456 by H+9; it will take two minutes to march order the system and five minutes to emplace. The section must travel X kilometers from position A to position B. It will take X amount of time for the WLR to travel from position A to position B. Once WLR has arrived to position B, a refined reconnaissance is required to ensure WLR is at an optimal location or position ready to observe. This process could take a significant amount of time due to time available, terrain, training, and experience. The planning and execution of WLR employment and understanding all considerations associated is vital and may be the difference in the overarching success of fire support operations.

Target acquisition in support of defensive tasks

The WLR is a critical part of the counterfire fight. An effective counterfire fight allows for freedom of maneuver and force protection by destroying or neutralizing enemy indirect fire weapons systems. The primary mission of a WLR is to track hostile fire weapon systems. The primary role in the defense is to provide priority counterfire mission processing through the use of target data collection. This is achieved through the use of site considerations, RADAR positioning with engineer support, and zone management during planning.

RADAR positioning is central to defensive operations in part that tunneling and screening crest should be utilized for survivability considerations. This can be accomplished through the use of en-

gineer support. Engineer support assets can be used to improve on the current site and/or they can construct a means to increase the survivability of the WLR. Target acquisition planners must also consider transitions to offensive tasks such as counter-attacks.

The first consideration is the use of the RADAR's zone capabilities to provide coverage for critical units or installations using a critical friendly zone (CFZs). CFZ's are an indication of assets that are deemed as essential to mission accomplishment. If the brigade commander does not identify these assets, the FSCOORD or FSO must query the commander for the necessary guidance. Once the guidance is obtained, the information is passed to the fires cell for implementation. Another consideration is the development of call-for-fire zones (CFFZs). CFFZs indicate a possible enemy indirect fire system and therefore the intent is to suppress, neutralize, or destroy those weapon systems. Lastly, artillery target intelligence zones assist in the uncertainty of hostile weapon systems and to help the development of the situation.

Conclusion

In conclusion, this paper provides key lessons learned for FA battalions executing defensive operations. The FA battalion staff and S3 have a large role in ensuring battery commanders have the necessary information, FATs or fighting products available to conduct TLPs, identify friction and ultimately ensure they have a firing solution for all primary and alternate targets assigned on the TLWS. Additionally, battery commanders must understand what is next. What is expected of the battery during the next phase? Am I ready to execute defensive operations and transition to subsequent phases? The FSC must also maintain communication with the FA battalion staff, S3 and battery commanders to ensure the battalion is postured to support the current defense and beyond. Lastly, successful RADAR employment is critical to providing necessary counterfire-locating capability during defensive operations to allow maneuver to hold their battle positions.

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Leadership of the brigade combat team Joint Fires Enterprise

COL Thomas A. Caldwell

One can confidently assume that all organizational leaders at some point, especially during a Combined Arms Training Center (CTC) rotation, have experienced and observed the frustrations of deliberate or undeliberate selective compliance on noncompliance of actions and orders by individuals or groups. Numerous times at National Training Center (NTC) I have witnessed organizational leaders, specifically the brigade combat team (BCT) fire support coordinator (FSCOORD), in frustration state, *"I told them to do that; we discussed or talked about that; I don't understand why it didn't happen; why didn't they report that; or, I don't understand why that happened, AGAIN!"*

The purpose of this article is to provide a fire support leader's testament to the application of the tenets of mission command (competence, mutual trust, shared understanding, commander's intent, disciplined initiative, risk acceptance) within a brigade combat team's Joint Fires Enterprise. The content is themed on circumstantial employment of the principles of mission command, and elements of command (authority, responsibility, decision making, leadership) and control (direction, feedback, information, communication) at echelon to achieve or exceed the commander's intent. As a former direct support Field Artillery battalion commander/Armor brigade combat team fire support coordinator (DS FA BN CDR)/ ABCT FSCOORD), and NTC senior fire support trainer (Wolf 07), I have experienced and observed the fires community's challenges of leaders at echelons ability to understand how to appropriately communicate capabilities, limitations, constraints, and achievable options with their formations within their respective areas of operation and collective BCT operational environments.

FSCOORD RETROSPECTIONS

In retrospection, my season as a DS FA BN CDR and ABCT FSCOORD brings to mind my unique relationship with my maneuver brigade commander.

I distinctly remember his guidance during my initial counseling just "one" week after I assumed battalion command and approximately "ten" days before us deploying to our decisive action NTC rotation. He completely understood that I had only a week in command nor did I have the context of my organization from their home station training to transition to our NTC rotation. With a basic mutual understanding of my reality and the mission at hand he simply ended my counseling with the following statement, *"You are my FSCOORD and fires is a hard and complicated endeavor that I do not completely understand, but I know it is your job to make it work and I trust you to do your job to meet my intent."* In retrospect, that is all I needed to hear from my BCT commander. Him saying the word "trust" both charged and empowered me to control the BCT Joint Fires Enterprise narrative and employment with confidence. I was empowered to generate relevant dialogue with him and fellow commanders in the proper employment of fires at echelon (organic mortars to FA cannon to echelon above brigade {EAB} rockets) to meet the commander's desired end state.

To summarize my time as the NTC senior fire support trainer, I have written down the following problem statement that identifies effective fires as holistic, brigade combat team problems.

"How do brigade combat teams establish, maintain and transition a 'permissive joint fires environment' at echelon within a decisive action training environment in support to shape the BCT deep fight and mass effects in the close fights in support of tactical and operational objectives?"

"The role of the Field Artillery is to suppress, neutralize, or destroy the enemy by cannon, rocket, and missile fire and to integrate and synchronize all fire support assets into operations."

FM 3-09, Fire Support and Field Artillery Operations

LEADERS' APPROACH "THE SCIENCE AND ART OF FIRE SUPPORT?"

One of the first principals that a fire supporter is taught at the Fires Center of Excellence at Fort Sill, Oklahoma, is the aforementioned role or mission of the Field Artillery. The fundamental principles of achieving our role is executed through the science and art of fire support. The delivery of indirect fires via cannon, rocket, and missile fire in accordance with the Five Requirements for Accurate Predicted Fires (5RAPF) equates to the "science." Fire support in the aspects of fires planning, targeting process (decide, detect, deliver, assess, or D3A), observer post planning and sensor integration/employment at echelon is considered the "art." I have a level of confidence gained by observing more than 20 NTC force-on-force under live-fire conditions, both active duty and National Guard rotations that our ability to consistently accomplish the science of fire support is fundamentally assured. This assurance comes through the disciplined execution of crew drills and mandated regimen of section, platoon, battery and battalion gunnery table certifications. The "art" of fire support and discipline required to accomplish the "science" is paired with a leader's ability to effectively lead and influence their organizations at echelon.

OBSERVED EXPECTATIONS OF FIRE SUPPORT BY THOSE WITHIN THE BCT:

Since the inception of modularization, the Field Artillery battalion has become a direct support asset to the BCT with the expectations of:

- Responsive preplanned and dynamic fire support within the BCT area of operations with effects beyond the coordinated fire line, specifically in support of the Calvary squadron's reconnaissance objectives and designated unit with priority of fires.
- Processing of fire missions sensor to shooter via digital fires network (frequency modulation and/or upper tactical internet).
- Provide timely and accurate delivery of conventional killer munitions (high explosive and dual-purpose improved conventional munition) in accordance with the defined high payoff target list.
- Provide responsive organic and EAB counterfires.
- Provide timely and accurate delivery of special munition fires (obscuration, screening smoke, family of scatterable mines).
- Provide timely and accurate delivery of precision-guided munitions.
- Suppression of enemy Air Defense systems.
- Maintain the 5RAPF.

"The speed, accuracy and devastating power of American Artillery won confidence and admiration from the troops it supported and inspired fear and respect in their enemy."

General Dwight D. Eisenhower, Supreme Allied Commander WWII

THE CHALLENGE OF THE FSCOORD:

The challenge I faced as the BCT's defined "chief of fires" was how do I, as an organizational leader, accomplish the aforementioned joint fires problem statement via the science and art of fire support, achieve the above expectations for fires and convey that same trusting sentiment I received throughout the BCT Joint Fires Enterprise based on my defined span of control?

SPAN OF CONTROL:

I had to balance and maintain my two roles as the BCT direct support Field Artillery battalion commander and BCT fire support coordinator. These two roles found me with a defined and necessitated span of control of "~27 leaders" who are networked and woven in the BCT, with some easily assessable and others not so assessable due to extended lines of communications. *Note the number of leaders had the potential to increase based on points of and levels of competency.

In my role as the BCT direct support Field Artillery battalion commander, I defined my minimal span of control as the following eight x leaders:

1. battalion command sergeants major
2. battalion executive officer
3. battalion operations officer S3
4. headquarters and headquarters battery commander
5. alpha battery commander
6. bravo battery commander
7. charlie battery commander
8. forward support company commander

In my role as the BCT fire support coordinator I defined my minimal span of control as the following 12 x leaders:

1. BCT fire support officer
2. brigade Aviation officer "BAO"
3. brigade Air Defense officer "ADAM Cell"
4. brigade Aviation liaison officer "ALO"
5. BCT lethal targeting officer
6. BCT non-lethal targeting officer
7. Field Artillery intelligence officer
8. Cavalry squadron fire support officer
9. Maneuver task force#1 fire support officer
10. Maneuver task force #2 fire support officer
11. Maneuver task force #3 fire support officer
12. Combat Aviation battalion fire support officer

As the BCT fire support coordinator, I also had a responsibility to influence the BCT staff fundamentally due to the required attendees to the BCT targeting working group made up of the following seven x leaders:

1. BCT executive officer "BCT chief of staff"
2. BCT operations officer S3
3. BCT intelligence officer S2
4. BCT information collection manager
5. BCT electronic warfare officer
6. BCT Staff Judge Advocate "lawyer"
7. BCT Signal officer S6 "SIGO"

Doctrine dictates that a lower headquarters should know and understand the mission of the higher headquarters two levels up, but I deemed it important to consistently maintain access, dialogue and shared understanding at least two levels down.

ORGANIZATIONAL LEADERSHIP:

For every fire support related Soldier to react appropriately, I demanded that my subordinate

Organizational leaders exercise leadership through subordinate leaders responsible for leading the various organizations that make up the larger organization. Organizational leaders establish a climate that supports their subordinate leaders.

Subordinate units and organizations do not depend on daily guidance from their higher-level leaders to be successful. Organizational leaders, particularly commanders, are responsible for communicating intent two echelons down and understanding intent two echelons up. Organizational leaders operate within commanders' intent and communicate that intent to subordinates as a means of providing room for subordinate initiative and decreasing the number of decisions they must personally make to keep the organization operating effectively. Organizational leadership includes responsibility over multiple functions, such as leading and synchronizing combined arms operations.

Organizational leaders regularly and personally interact with their subordinates. They make time to verify that reports and briefings match their own perceptions of the organization's progress toward mission accomplishment. Organizational leaders use personal observation and visits by designated personnel to assess how well subordinates understand the commander's intent and to determine if they need to reinforce or reassess the organization's priorities.

-ADP 6-22 Army Leadership and the Profession 31 July 2019 paragraph 1-128-29

commanders and leaders do the same.

I expected all of the aforementioned 27 leaders along with their NCO counterparts, FA BN staff to include special staff, platoon leaders, and platoon sergeants to fully understand my intent as well as the BCT commander's. I authored my commander's intent for every mission and demanded that it be translated into a direct leadership scope with "task and purpose for every section chief and 10-level Soldier. When out conducting battlefield circulation, I would engage leaders and 10-level Soldiers and gauge their understanding of my intent and the mission at hand. Any complete ignorance, lack of understanding, or situational awareness immediately triggered me to engage their supervisors.

DIRECT LEADERSHIP:

If I had to offer one takeaway from this article it would be the "culture" of your organization matters and culture starts with those at the top. By understanding this, leaders need to collectively create a culture that reflects a relentless "GIVE A DAMN FACTOR" in each Field Artillery battalion and BCT Joint Fires Enterprise. It's this culture that's going to gain us the success we desire as a team. I strongly believe that stakeholders joined together in a mutual goal through the empowerment of knowledge of how each team member plays a part in the big picture dictates our successes and failures.

The simple failure of 10-Level tasks not being performed, or performed to standard, can bring a BCT to a halt or commit it to undesired actions in response.

My desire was that identification, accountability, critical thinking, problem-solving, and achievable options are generated at the lowest level at the point(s) of friction. I wanted every Soldier to feel a sense of disappointment when they were not able to perform their defined task and purpose with quantifiable results and

1-124. Direct leadership is face-to-face or first-line leadership that generally occurs in organizations where subordinates see their leaders all the time such as teams, squads, sections, platoons, departments, companies, batteries, and troops. The direct leader's span of influence may range from a few to dozens of people. The leader's day-to-day involvement is important for successful unit performance. Direct level leadership covers the same type of functions, such as those performed by an infantry squad or a graves registration unit.

1-125. Direct leaders develop others through coaching, counseling, mentoring, and setting the example. For instance, company grade officers and NCOs are close enough to Soldiers to exert direct influence when observing training or interacting with subordinates during other functions.

1-126. Direct leaders generally experience more certainty and less complexity than organizational and strategic leaders because of their close physical proximity to their subordinates. They direct actions, assign tasks, teach, coach, encourage, give guidance, and ensure successful completion of tasks or missions. They must be close enough to the action to determine or address problems. Examples of direct leadership tasks are vehicle maintenance, supervision of creating of fighting positions, and performance counseling.

1-127. Direct leaders understand the mission of their higher headquarters two levels up and when applicable the tasks assigned one level down. This provides them with the context in which they perform their duties.

feedback to improve. I also wanted leaders who took their example from myself, understanding that:

- You have to earn respect and confidence every day you wear the uniform and fulfill your assigned duties.
- The privilege to rest in any capacity is earned.
- Decisions are informed and not made based on your emotional state, convenience, or comfort. There is no fault given for making informed decisions within your scope.
- Make the BCT's problems your problems or the HHQ's problems your problems.
- Don't walk away from a problem or situation if you can offer "any" assistance or be held accountable.
- Don't be afraid to act, speak, and report honestly due to the threat of displeasing others.
- Soldiers at all levels will respect you in the end for pushing them to do better and fulfill their potential.
- EVERYBODY matters and does each teammate know that?

GETTING AFTER IT!

In the fires community (sensor to shooter) we are challenged in our abilities to operationalize the following requirements at echelon to maintain a stance that is factual or advisory, to be properly employed by the HHQs-

- The Targeting Process: D3A
- Trigger, location, observer, delivery system, attack guidance, communication
- 5RAPF:
  1. Target location
  2. Firing unit location
  3. Ammunition data
  4. Metrological data
  5. Computational procedures

I found myself challenged as a DS FA BN CDR and FSCOORD in my ability to provide real-time options to the BCT CDR. Options that equate to decisions outside of the prescribed decision support matrix that could capitalize on a permissive tempo that gives the enemy multiple dilemmas and exploit advantages. I approached this challenge from a "science" stance with the belief that there are not many real-time options that a FA battalion can provide to a BCT commander that are outside of an expected stance of being in the right place, at the right time, with the right ammunition, with the right optics, and being able to talk FM voice and digital. I wanted to ensure that we maintained the best deliberate stance upon the line of departure and transition to another deliberate stance when triggers were met.

In pursuit of this stance, my teammates and I had to answer the following questions about our organization's culture to influence the realms of executing the art of fire support and the discipline (organizational and direct leadership) required to accomplish the science. * The answers to these questions constantly changed in accordance with METT-TC (mission, enemy, terrain and weather, troops and support available, time available, and civil considerations) at a minimum.

1. When and where does the FSCOORD place himself on the battlefield to influence fires?
2. Where and when do task force (TF), company, and troop FSOs place themselves on the battlefield?
3. How is each respective fires support element incorporated into the BCT and TF tactical operations center (TOCs) and tactical air commands (TACs)?
4. How are the joint terminal attack controllers incorporated into the BCT and TF TOC and TACs?
5. Who facilitates the fires/intelligence collection rehearsal, fires technical rehearsals, and targeting working groups?
6. Who attends the fires/intelligence collection rehearsal, why, and are they invested in the process and see it as a complement to the military decision-making process and six TOC functions?
7. Does our organization set conditions to ensure that every rehearsal and working group is one of "quality?"
8. How does our organization define "quality" and who ensures it?
9. Who has release authority for precision strikes and re-tasking of EAB assets?
10. How germane is the traffic on the fires voice network; how do we gauge the quality of collaboration; how often do the TF FSOs have dialogue with the FSCOORD?
11. Do TF, company, and troop FSOs have a good rapport with their maneuver CDRs and field grades? Do they feel empowered to communicate any issues to the FSCOORD that deal with unachievable expectations or opportunities?
12. How do fire direction officers, platoon leaders, battery, and company commanders make decisions, and do they provide options to the higher echelon leaders?
13. Has our organization defined pacing items at echelon with the Joint Fires Enterprise beyond Howitzers and BFIST, i.e. radios, AFATDS, TacLinks, antennas, optics, data cables?
14. Does our team fundamentally understand reporting expectations of designated or unidentified commander's critical information requirements,

specifically friendly force information requirements (FFIR)? That FFIR, when not properly processed through the six TOC functions, cannot be effectively incorporated into deliberate or situational decision making in accordance with command and control of warfighting functions. This FFIR should be expanded to our ability to maintain the aforementioned "Observed Expectations of Fire Support by those within the BCT" specifically a seamless Fires network PACE plan for digital and voice (an order of precedence list based on primary, alternate, contingency, and emergency communications) and the 5RAPF.

THINGS ONLY THE DS FA BN CDR/BCT FSCOORD CAN AND MUST DO:

1. Advise the BCT commander on their intent for fires. The BCT commander's intent for fires sets the tone, sets expectations and enables the entire BCT Joint Fires Enterprise.
2. Speak candidly and advise the BCT commander and fellow TF commanders on the capabilities, limitations, and constraints of the BCT Joint Fires Enterprise to include the employment of TF-level sensors and deliver systems (mortars).
3. Write "your own" commander's intent. Define what risk(s) you are willing to assume and not assume.
4. Adamantly define the decision that only you can and want to make.
5. Force your staff, battery/company commanders, and TF FSO to provide you with options.
6. Ensure every rehearsal fires/intelligence community, fires technical, and FA tactical are of "quality." Examples: All attendees are presently prepared with the proper fighting products, the rehearsals begin and end on time, and provide relevant injects that identify and fill plan gaps.
7. Empower the BCT FSO to be credible and respected by the BCT staff (current and future operations). Also to ensure the fires plan is fought to expectations in accordance with the high payoff target list, target selection standards, and attack guidance matrix.
8. Instill confidence in the BCT Joint Fires Enterprise community by owning and engaging every fires venue at least two levels down.
9. In-person inspections of fires in support of defensive operations engagement area (EA) development. Visit each EA and have the respective TF FSO brief their fire support plan to you.
10. Define and enforce mandated rehearsals, pre-combat checks and inspections, and based on previous shortcomings, define risk to force and mission.

CONCLUSION

The word "enterprise" is defined as *a project or undertaking, typically one that is difficult or requires effort.* The BCT Joint Fires "Enterprise" is no exception to this definition and the level of shared understanding of how to accomplish a deliberate lethal stance must be properly communicated for the appropriate application, constantly. Necessary tasks within the Joint Fires Enterprise do not solely happen because we have identified, planned, tasked, and ordered accordingly. The BCT Joint Fires Enterprise must establish and maintain the confidence of the BCT. Confidence is easily lost if we cannot perform the expected functions of fires and if we create a perception that every lack of capability is rooted in excuses, inability to properly manage expectations, and complement opportunities. A culture must be established and fostered throughout the enterprise at the top-to-lowest echelons. The DS FA BN CDR/BCT FSCOORD sets the tone. He or she is responsible for visualizing, describing, and directing the efforts required to achieve success in the difficult and meticulous pursuit of fires. They are the steward of the "GIVE A DAMN FACTOR!" Perfection in any endeavor of warfighting is unachievable, instead the desire should be an organization that is uniformly self-aware and purposeful.

References

FM 3-09, Fire Support and Field Artillery Operations
ADP 6-0, Mission Command: Command and Control of Army Forces
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COL Thomas "Tom" A. Caldwell served as "Wolf 07" the senior fire support trainer at the National Training Center, Fort Irwin, California, from May 2018 to June 2020. He previously served as the commander of the 4th Battalion, 1st Field Artillery, 3rd Armored Brigade Combat Team, 1st Armored Division, Fort Bliss, Texas, from March 2016 to April 2018. COL Caldwell has deployed in support of the Kosovo Defense Campaign, Operation Iraqi Freedom, Operation Enduring Freedom, Operation Spartan Shield, and Operation Inherent Resolve.

NTC FSCOORD Reflections

Dear fellow Redlegs,

As I open this article, I want to first take the opportunity to thank our nation, Army, branch, and senior leaders for the remarkable opportunity and honor afforded me to serve as your representative for the last two years as Wolf 07, the senior fire support trainer at the National Training Center (NTC). My final message to our beloved Field Artillery (FA) branch is that we remain relevant and very necessary because the hallmark of the combined arms fight in support of large-scale combat operation is and will always remain "fire support." As I prepare to depart this post, I also want to convey to our community that the stance of our branch is one of self-awareness, purpose, ingenuity and ability to answer the call of every organization, formation and team in which we are so ingrained. We are maintaining the trust and confidence of our maneuver brethren through an appreciation that they are a responsible stakeholder in our success.

Over the past two years, before, during and after each rotation, I committed to introspection and retrospection in collaboration with the numerous fire support leaders who came through the NTC on how we continue to improve our branch at every skill level at every echelon.

This article is composed of post-rotation statements from every FA battalion (BN) commander (CDR) whom I had the pleasure of observing and coaching during my tour of duty. I felt it important for them to tell our community in their own words what they experienced, felt, and learned in their efforts to accomplish the complex mission of providing joint fires in support of their respective brigade combat teams. I hope these statements inspire, motivate, enlighten, and provide confidence to our fellow Redlegs. In turn, they can metaphorically be used to achieve our cultural and doctrinal requirements for accurate predictive fires. My hope is that we account for all probable errors in shared understanding to provide irreversible, comprehensive, timely, and accurate institutional knowledge to the force. Thank you to all of the commanders who contributed to this article. Let us begin this calibration of knowledge with me firing the first rounds with my rotational statement, ***"Train the force and King of Battle!"***

NTC Rotation 16-05 (Paladin M109A6)

COL Thomas "Tom" A. Caldwell, commander, 4th Battalion, 1st Field Artillery, 3rd Armored Brigade Combat Team, 1st Armored Division 2016 - 2018

"As the fire support coordinator (FSCOORD) I learned the importance of personally driving each fire support applicable rehearsal and working group to a high level of quality, to gain a shared understanding and define a point of friction that determined my placement on the battlefield. These venues served as essential touchpoints to hold accountable those in my specified and implied span of influence, which easily exceeded the doctrinal three-to-five personnel. I learned that I had to control the fire support narrative and actively anticipate requirements to ensure a deliberate stance to support opportunities based on the success or challenges of the maneuver plan. Finally, I learned that a salient home station fire support team (FIST) certification is necessary and needs equal prioritization as our FA tables."

NTC Rotation 18-06 (M777A2 Towed)

LTC Timothy "Tim" D. Gatlin, commander, 1st Battalion, 37th Field Artillery Regiment, 1st Stryker Brigade Combat Team, 7th Infantry Division 2017 – 2019

"My biggest lesson learned came in the form of Class V resupply. In hindsight, it was a good problem to have because it reflects positively on the ability of the battalion to keep all 18 guns in the fight. That said, the ability of the battalion and brigade to keep pace with the volume of fire was tested. The brigade and battalion-level sustainment rehearsals and the proper integration and synchronization of the 13th Combat Sustainment Support Battalion were critical to this effort. At the battalion level, the fire direction officer, S3, XO, S4, and forward support company (FSC) CDR needed to have a thorough understanding of the FA support plan to anticipate where ammunition expenditure might peak. To mitigate this factor, I placed experienced personnel from the FSC and the battalion staff (this included a senior 13B40) in the field trains command post to ensure 155 mm ammunition throughput was efficient. This paid off for us as we went deeper into the rotation."

NTC Rotation 18-08 (Paladin M109A6)

LTC Jason C. Carter, commander, 4th Battalion, 1st Field Artillery, 3rd Armored Brigade Combat Team, 1st Armored Division 2018 – 2020

"As the 3/1st AD FSCOORD during Rotation 18-08, I learned that the effective integration of fires is truly a team effort that cannot rest solely on the shoulders of Artillerymen. The brigade engineering battalion has a role in our survivability, the base support battalion in our sustainment, and all maneuver battalions in our synchronization with and integration into their plans. As such, the FSCOORD must closely manage 13A talent across his or her formation to optimize the collective understanding of each leader's role in synchronizing and integrating effective fires. At each echelon, the fire support officer serves not only as the FSCOORD's ambassador but as the ambassador for the branch. He or she must possess the maturity, competence, and confidence to articulate fires-related requirements as they relate to time, space, and resources to their supported commander (even when they don't ask for it). Then, they must be able to deliver on their sale with effective fires enabled through quality rehearsals. Anything less will result in the King becoming a spectator to an ugly brawl in which he should have played a part."

NTC Rotation 18-09 (M777A2 Towed)

LTC(R) Darryl W. Bertani, commander, 1st Battalion, 108th Field Artillery, 56th Stryker Brigade Combat Team, 28th Infantry Division, Pennsylvania Army National Guard

"As FSCOORD, I learned the importance of ensuring all the players understand the scheme of fires as well as the FA support plan, not just for those wearing cannons. This includes looking each maneuver battalion commander in the eye and ensuring they understand it as well. While we hammered the execution of targets, we glossed over moving to and from positions and did not deconflict movement in coordination with maneuver units. This led to delays in occupying of position areas for artillery or the inability to deliver fires altogether."

NTC Rotation 18-10 (Paladin PIM M109A7)

LTC Iven T. Sugai, commander, 1st Battalion, 5th Field Artillery, 1st Armored Brigade Combat Team, 1st Infantry Division 2018 – 2020

"As the FSCOORD for America's oldest armor brigade combat team, I learned that for our brigade combat team (BCT) everything revolved around the targeting process — the targeting process is our system and we need to understand that like most systems, it comprises systems of systems. Our BCT, under the leadership of COL Armstrong, placed heavy emphasis on the targeting process, our targeting working group (TWG) and targeting board, or what he coined the "kill board." We realized quickly how the BCT commander making this battle rhythm event a priority makes a huge difference in the inputs we received going into the working group and board, which in turn, developed quality outputs from the "kill board" (decisions). What we learned during this rotation is that while command emphasis is a multiplier in getting a great targeting process in motion, in hindsight, our train-up to our rotation should have made the targeting process as an end-state condition, with all efforts centered on the targeting process. This would have better informed our training glide-path. We found that during our rotation, while our targeting process was fine, we could have benefitted from more informed and timely inputs into the process as well as more violent execution of targets as a result of the "kill board." This simply means that we could have focused our training, from sensor to shooter, on staff and FIST/fire support element (FSE) contributions to the targeting process (creates effective inputs to the working group), and how to better violently execute missions/targets that derive from the "kill board." Since our NTC rotation, "Hamilton's Own" has since executed the aforementioned targeting-process-centric training glide-path towards its Joint Readiness Training Center (Combined Resolve XII) rotation to great success, allowing the BCT freedom of maneuver, and an unfair fight for the enemy."

NTC Rotation 19-01 (M777A2 Towed)

LTC William "Jason" Tolbert, commander, 2nd Battalion, 3rd Field Artillery, 1st Stryker Brigade Combat Team, 1st Armored Division 2017 – 2019

"Understand where your touchpoints should be as the FSCOORD to provide input and influence the Fires Enterprise (brigade {BDE} fires and FA BN), both planning and synchronization efforts while conducting current operations. Your time is limited so each interaction has to count. These touchpoints should be informed from home station training exercise after-action reviews, experience level of fires key leaders, and BCT CDR participation and priorities. They will vary between FSCOORDs, but routine touchpoints that worked for me at a minimum were the BDE TWG, BDE courses of action brief, BDE information collection/fires rehearsal, BDE combined arms rehearsal (CAR). These touchpoints enabled me as the FSCOORD to understand and influence the fires planning efforts before the 11th hour in the planning process."

NTC Rotation 19-02 (Paladin M109A6)

LTC Victor "Vic" H. Scharstein, commander, 3rd Battalion, 29th Field Artillery, 3rd Armored Brigade Combat Team, 4th Infantry Division 2017 – 2019

"As the FSCOORD for NTC Rotation 19-02, I learned that a successful rotation is determined long before you arrive at the rotational unit bivouac area for reception, staging, onward movement and integration. The ability to communicate seamlessly over multiple communications systems is the key to any unit's success. The development and implementation of a long-term training plan that incorporates the entire Fires Enterprise, from individual sections to the brigade, is paramount. A deliberate and disciplined approach to home station digital/analog fire support sustainment training that brings the brigade's entire fires kill chain together must be a brigade battle rhythm event. Doing so will allow you to work through friction points at echelon to include clearance of fire procedures, working through multiple communications networks simultaneously, and database management."

NTC Rotation 19-03 (Paladin M109A6)

LTC Sherman C. Watson, commander, 2nd Battalion, 82nd Field Artillery, 3rd Armored Combat Team, 1st Calvary Division 2017 – 2019

"I learned many valuable points but will highlight what I deem the two most important takeaways from the rotation as the FSCOORD.

1. Do not assume maneuver commanders have the resident knowledge and experience regarding integrating fires, both Army and joint to enable their operations. Need to have fires specific leader professional development training during home-station train up and put mechanisms in place to provide commanders at echelon feedback during platoon/company/battalion situational training exercises.
2. Evolve the brigade/battalion targeting process so it is flexible and adaptive (get beyond the process). During the rotation, we had ample resources to accomplish requirements but struggled to dynamically re-task or prioritize assets to achieve mass or desired effects for the commander. Establish, rehearse, and codify battle drill in current operations between the Fires Enterprise, operations cell, and intelligence cell to anticipate decisions (friendly and enemy), reallocate assets and provide the commander options on time."

NTC Rotation 19-04 (M777A2 Towed)

LTC Stephen P. Thibodeau, commander, 2nd Battalion, 8th Field Artillery Regiment, 1st Stryker Brigade, 25th Infantry Division 2018 – present

"The most important lesson I learned as the FSCOORD, is that large degrees of Howitzer dispersion, coupled with the daily synchronization of echelons above brigade enablers through the ground liaison officer, allows the brigade combat team to achieve periods of overmatch by identifying and striking enemy assets with close air support while the battalion masses in support of maneuver."

NTC Rotation 19-05 (Paladin M109A6)

LTC Reginald "Reggie" D. White, commander, 1st Battalion, 7th Field Artillery, 2nd Armored Brigade Combat Team, 1st Infantry Division 2018 – 2020

"The epitome of mission command is the ability of the battalion to operate without you guiding every single action and decision. As the FSCOORD you cannot be present for every step of military decision-making process due to the TWG BCT planning timelines, or simply where the BCT commander wants you to be on the battlefield. Therefore, I placed my emphasis on providing the commander's intent either in person, over secure voice over Internet protocol, or joint capability release. From there I focused on two areas: courses of action development and the FA tactical rehearsal. A tactics focused, trigger-based rehearsal done at least twice, led by the current operations team, proved to me in execution that my team knew where and when to place main communication nodes, sustainment, and Paladins to meet the BCT commander's and my intent for fires. This gave me the confidence that my field grades, battalion fire direction officer and battle captains can run the battalion, allowing me to stay focused on the discipline of our BCT targeting process."

NTC Rotation 19-06 (Paladin M109A6)

LTC Derek R. Baird, commander, 3rd Battalion, 16th Field Artillery, 2nd Armored Brigade Combat Team, 1st Calvary Division 2018 - present

"Develop well thought out training objectives, across the BDE Fires Enterprise, before NTC, preferably before the home station BDE exercise evaluation, train ruthlessly, evaluate, and update as required. Stay on track during the NTC rotation, regardless of the shiny object, through prescribed touchpoints across the BDE Fires Enterprise. These training objectives focus the Fires Enterprise on what's important for the brigade, fire support to maneuver units, and the FA BN."

NTC Rotation 19-07 (Paladin M109A6)

LTC Thomas "Ted" Putnam, commander, 1st Battalion, 9th Field Artillery, 2nd Armored Brigade Combat Team, 3rd Infantry Division 2018-2020

"As the FSCOORD, rotation 19-07 reinforced the importance of incorporating as many reps as possible, with maneuver elements, of Artillery Table XVIII during the training progression to enable joint fires. The first time we executed a true sensor-to-shooter system as an armored brigade combat team (ABCT), was NTC. As the newest ABCT with little experience in mechanized operations, a majority of my focus was on FA battalion operations. NTC created a realization across the enterprise that sensor-to-shooter nodes need to understand the capabilities and limitations of systems to better plan, integrate, and achieve results in execution. Following NTC, I focused a lot more of my time with the maneuver commanders to integrate joint fires integration into their training. This training ranged from staff training to incorporation in their platoon-level certifications to give practice reps. Additionally, the BCT commander allowed me to use his company commander leader professional development and staff training to facilitate their understanding of planning and integration requirements. These initial steps at baseline integration training will facilitate collective training, and incorporation of maneuver elements into fire support artillery tables through Artillery Table XV."

NTC Rotation 19-09 (Paladin M109A6)

LTC Jonathan P. Hearn, commander, 1st Battalion, 113th Field Artillery, 30th Armored Brigade Combat Team, North Carolina Army National Guard 2018 - present

"As the FSCOORD I learned the importance of ensuring there is a shared understanding across the brigade of the capabilities and role of the FA through rehearsals and detailed planning as the deep fight option for the ABCT commander. I learned the importance of integrating all elements of the brigade into the fires plan to achieve the shared understanding of utilizing fires to enable the maneuver elements. Brigade-level rehearsals are instrumental in synchronizing the plans to achieve success on the multi-domain battlefield and give the maneuver commanders the information they need to succeed at their mission. The shared understanding of the role and abilities of the Bradley fire support team must be established to utilize this as a tool for the brigade commander and not just another Bradley in the formation."

NTC Rotation 19-10 (M777A2 Towed)

LTC Daniel "Dan" J. Von Benken, commander, 2nd Battalion, 17th Field Artillery, 2nd Stryker Brigade Combat Team, 2nd Infantry Division 2019 – present

"As the FSCOORD I learned how critical sequencing of training is and the effects it can have on the collective whole. For example, if you don't conduct a live-fire support coordination exercise before a large-scale combat operations exercise, fire supporters at echelon have difficulty visualizing their responsibilities in the collective fight. It is possible to compensate with leader presence at points of friction, but that incurs a subsequent risk. No training glide path is perfect; identify the holes in your swing early and mitigate to the best of your ability."

NTC Rotation 20-01 (Paladin M109A6)

LTC David "Dave" K. Smith, commander, 4th Battalion, 27th Field Artillery, 2nd Armored Brigade Combat Team, 1st Armored Division 2018 – 2020

"As the FSCOORD for rotation 20-01, I learned the importance of placing your strongest major in the brigade fire support officer (FSO) position and putting as much talent in the BDE FSE as possible. Based on feedback from several of my peers before their NTC rotations, they stated that they had pushed talent down to the BN FSE level to support maneuver at the expense of the BDE FSE. What they quickly realized was that NTC is a brigade-level fight and they suffered for the lack of horsepower in the BDE FSE. Based on this feedback, I placed my strongest field grade as the FSO and consolidated as much talent as possible at the BDE level, accepting risk in the battalions. The results were readily apparent as we had the bandwidth to run daily targeting, plan fires for future operations, and fight the brigade deep fight effectively. The FSE prosecuted an exceptional deep fight, removing high payoff targets and limiting the enemy's ability to impact the close fight. Additionally, having a highly qualified major at brigade allowed me as the FSCOORD to spend less time with the brigade staff and more time forward with the commander or conducting battlefield circulation."

NTC Rotation 20-02 (M777A2 Towed)

LTC Tyler R. Donnell, commander, Field Artillery Squadron, 3rd Calvary Regiment 2019 – present

"As the FSCOORD for 3rd Cavalry Regiment during NTC Rotation 20-02, I learned three valuable lessons to facilitate a permissive joint fires environment. First, the positioning of the FSCOORD must be a conscious decision rooted on where the FSCOORD can best influence the deep fight, manage the transition to the close fight while maintaining the pulse of the commander's intent for fires. During NTC 20-02, I found success from the regimental command post with regular touchpoints to the commander on high frequency and utilizing standardized fighting products. Secondly, a relevant and concise TWG facilitates the integration of the Fires Enterprise, enabling a synchronized deep fight setting conditions for maneuver squadrons to WIN at the decisive point. Do not take your eye off managing transition periods for the brigade – there is always a counterattack! Third, digital fires are more than a FA problem, maneuver command post/tactical air control jumps must be a deliberate discussion at the CAR and fires rehearsal. These are periods that force the fires network lower on our warfighting function (WfF) PACE plan, influencing responsiveness, and must not interfere with critical points where the brigade commander requires massing in the deep fight. Enjoy every minute."

NTC Rotation 20-04 (Paladin M109A6)

LTC Jeffrey "Jeff" R. Fuller, commander, 1st Battalion, 41st Field Artillery, 1st Armored Brigade Combat Team, 3rd Infantry Division 2019 - present

"As the FSCOORD, I learned the importance of providing clear guidance and intent across the BDE's Fires WfF. My ability to be at all points of friction at any given point in time was limited, but I was able to mitigate that through clear communication of priorities with battery commanders, the BN S3 and XO, and the BDE and BN FSOs before the beginning of the fight in the box. Additionally, through regular dialogues and touchpoints with each of the key stakeholders during rehearsals and in between major events, I was able to provide feedback from my perspective at the BDE tactical operations center and to also receive feedback and either re-emphasize or modify my earlier guidance as necessary. This facilitated the building and maintaining of a shared understanding throughout the rotation. The rotation also served to emphasize the absolute necessity for a high level of proficiency on basic, 10-level Soldier tasks. All areas of friction during the rotation directly correlated to areas where we lacked emphasis on a Soldier-level task during our train-up for a rotation and helped clarify a need for a more deliberate post-NTC training progression at home station."

NTC Rotation 20-05 (M777A2 Towed)

LTC Gregory "Greg" M. Tomlin, commander, 1st Battalion, 37th Field Artillery Regiment, 1st Stryker Brigade Combat Team, 7th Infantry Division 2019 - present

"Our experience during NTC rotation 20-05 reinforced the critical need for every brigade to include digital sustainment training (DST) in its garrison battle rhythm. Although my battalion schedules DST every Monday afternoon, competing priorities often limit involvement which prevents a true test of digital and voice systems essential to executing joint fires. Our brigade FSE serves as the nexus for DST, ensuring that observers, battalion FSEs, the battalion fire direction center (FDC), platoon FDCs, and the gun line perform their unique function in fire mission processing. However, the involvement of radars, maneuver and cavalry mortars, brigade air defense and attack aviation computers, and the Air Force in weekly DST would vastly improve the brigade's ability to support the close and deep fights.

Empower your brigade FSO to manage weekly DST, but the FSCOORD needs to emphasize its importance to his maneuver and cavalry peers and the brigade commander to gain their support for involving mortars and air-domain systems in the DST. Sending a digital fire mission or fire command in the motor pool is not the end state of DST but only the foundational step. Once digital systems work, require observers, FDCs, and Howitzers to displace from the motor pool to validate that digital and voice communications work at a distance. Involve the battalion and brigade's retransmission systems. Exercise the PACE plan for communications as well, particularly through the use of a tactical scenario that forces DST participants to upload graphics in AFTATDS, transfer air corridors from the Tactical Airspace Integration System, manage fire support coordination measures, share RADAR acquisitions with battalion mortars, and practice special munitions and time-on-target fire missions. Identifying the friction points in DST will allow you to identify maintenance issues, parts shortages, and manning shortages that can be addressed before deployment.

Investing in DST as a brigade-level event on a weekly basis may be the most critical effort for a FSCOORD to partake in to prioritize equipment maintenance and section qualifications prior to executing a decisive-action CTC rotation."

Successful Fire Support at NTC "The Stance, Balance and Process"

"How do Brigade Combat Teams (BCT) establish, maintain, and transition a "Permissive Joint Fires Environment" at echelon within a Decisive Action Training Environment (DATE) to shape the BCT Deep fight and mass effects in the Close Fights in support of tactical and operational objectives?" This is the problem statement posed to every Fire Support Coordinator (FSCOORD), Field Artillery Battalion and Brigade Combat Team (BCT) Staff that has conducted a DATE rotation at NTC during Fiscal Years 19 and 20. Represented in the table below is a cross section of the BCTs that have performed well during that time. The metrics below do not ***"obviously"*** paint a constructive picture of a positive measure of performance, based on the inconsistent ratio Fully Mission Capable (FMC) guns, Bradley Fire Support Teams (BFISTs), Fire Support Vehicles (FSVs), missions fired, counterfire, and employment of Echelon Above Brigade (EAB) assets. The primary takeaway is the means in which the pool of organic and EAB assets were employed to meet the BCT's CDR's desired effect for the close and deep fights. The overall success was enabled by the level of rigor the BCT CDR applies toward building organic Fires combat power, and integrating necessitated EAB assets to mass at decisive points. What is not represented in the table below is the highly effective BCT CDR and FSCOORD command relationship which allowed the FSCOORD to be at defined points of friction in order to drive the Joint Fires Enterprise. Notably, each BCT CDR attended and gave relevant guidance at each BCT Information Collection and Fire Support rehearsal that reinforced a culture of discipline to the Focus of Fires, High Payoff Target List (HPTL), Priority of Fires (PoF), Attack Guidance Matrix (ATGM), and Target Selection Standards (TSS). The same emphasis was demonstrated in disciplined quality execution of the Fires Technical Rehearsals and management of Fire Support Coordination Measures. These efforts ensured that conditions were consistently met sensor to shooter prior to any mission. Realistically, perfect conditions will never be met organically and leaders must understand that.

		M109A6		M777A2		M109A6		M109A6	
		FORCE ON FORCE	LIVE FIRE	FORCE ON FORCE	LIVE FIRE	FORCE ON FORCE	LIVE FIRE	FORCE ON FORCE	LIVE FIRE
ORGANIC ASSETS	# of FMC Cannons	8/18	9/18	13/17	15/17	16/18	17/18	17/18	18/18
	# of FMC FSVs	10/13 BFIST	11/13 BFIST	11/13 FSV	9/13 FSV	11/13 BFIST	12/13 BFIST	7/11 BFIST	5/11 BFIST
	# of FA BN FMs	157	28	125	26	649	32	474	29
	# of Missions Planned/Fired	19/9	22/9	22/8	26/9	52/0	27/11	14/0	32/16
	Dynamic FA BN Missions	130	0	105	15	586	15	454	12
	# Counterfire Missions Fired/ATF Time	18/ 31 MIN	19/ 42 MIN	12/ 21 MIN	2/ 36 MIN	63/ 21 MIN	1/ 44 MIN	20/ 25 MIN	1/ 27 MIN
EAB ASSETS	# of EAB Missions Shots	152	24	53	26	78	19	90	21
	CAS (Used/ Available = Percent)	47/47 100%	4/4 100%	33/33 100%	0/0 -	52/56 93%	0/0 -	49/51 96%	2/2 100%

TRENDS

Positive: Both M109A6 and M777A2 units set conditions to arrive to NTC with a effective Operational Readiness (OR) rate of guns equating to 2/3 rds combat power or +/- 5 x firing platoons. These units demonstrated a good maintenance acumen at echelon to fix equipment forward while maintaining tempo with the maneuver Forward Line of Troops (FLOT) and providing effects beyond the Coordinated Fire Line (CFL). These units also did a good job of managing their Shop Supply List (SSL) and tactical positioning of the Unit Maintenance Collection Point (UMCP) through consistent maintenance meetings.

Negative: Units were challenged to maintain their OR rates to represent a stance of 2/3rd combat power of gun strength . This challenge is indicative of units that transition immediately from home station training to NTC. Load out plans must support the FA BN's ability to immediately begin Reception, Staging, Onward Movement, and Integration (RSOI) to complete calibration and ensure their SSLs and Authorized Stock Lists (ASLs) enable their ability to fix forward while maintaining their operational reach IAW the FLOT and CFL.

Positive: The OR rates of BFIST and FSV employment, especially in support of the Calvary Squadron and Main Effort's Observer Post Plan is essential to the focus and volume of Fires. The operability of the Fire Support systems (FS3, SCU, FOS, LFED) are key in the mitigation of latency and target location accuracy of Fire Mission Processing. The BFIST and FSV maintenance to include the subsystems were always addressed as a community responsibility that surged resources and manpower from both the supported maneuver task force and Field Artillery Battalion. Each respective BDE FSNCO kept track of each FIST platoons equipment and was able to pool, reapportion, or reallocate equipment based on the unit with priority of fires and weighing of the main effort.

Negative: Units failed to properly account for the necessary sensor platforms and subsystems to fight the BCT's Fire Support Plan. Units tended to assume that each respective FIST platoon was able to achieve all requirements IAW with a fundamental TTLODAC construct. This is a consistent assumption that can be properly informed through proper staff estimates and Task Force FSO and FSNCO dialogue with the BCT FSNCO, FSO, and FSCOORD.

Positive: Disciplined and mass fires IAW the Fire Support Execution Matrix (FSEM), Focus of Fires, High Payoff Target List (HPTL), Priority of Fires (PoF), Attack Guidance Matrix (ATGM), and Target Selection Standards (TSS) has a far better effect. Effective fires are also achieved through the proper cross cueing / target handoff of a salient Information Collection Plan to include RADAR employment.

Negative: The volume of Fire Missions is one aspect of the BCT's measure of effectiveness. The other aspect is proper weaponeering and adherence to the unit's defined ATGM and TSS. Units that abandon the prescribed Advanced Field Artillery Tactical Data System's (AFATDS) firing solution and fires plan create internal friction such as Paladin Position Area and Class V management that desynchronizes the entire plan. The BCT Current Operations (CUOPS) must understand the Fire Support Plan and not re-allocate fire support resources without informing the FSCOORD or properly linking such a decision to a prescribed Decision Support Matrix (DSM) validated during the regimen of rehearsals.

Positive: Units that properly integrate organic RADAR into the BCT Information Collection Plan are able to properly identify and respond to enemy indirect fires (IDF) within a timely manner that equates to enemy's ability to displace their IDF systems (~6-8 minutes). Unit's also coordinated for EAB support to fill RADAR coverage gaps that occur due to maintenance windows and RADAR Displacement Orders (RDOs). They also request EAB delivery systems support to effect targets / acquisitions beyond the range of their organic IDF systems beyond the established CFL.

Negative: Units experience friction planning for maintenance, cueing schedules, and survivability moves. Units often struggle with identifying the Counter Fire (CF) Headquarters, and the CF Battle Drill is seldom rehearsed and understood from senor to shooter (to include the BCT Staff). Units often do not integrate their Target Acquisition Platoon Leader (TAPL) into FA BN S2 operations to assist with enemy acquisition pattern analysis. (ATP 3-09.12)

Positive: Successful units understand their Fire Support capabilities gaps (#of FMC guns, Range, Enemy Situation, available Information Collection platforms) through proper fires planning, Targeting Working Groups, and rehearsals. This clear understanding creates a relevant demand that can be used to justify the need for EAB assets or solutions to problems the division must help the BCT solve to accomplish its assigned task. When EAB assets are allocated the BCT must properly integrated the assets into their scheme of maneuver and fires. Units also find success in nesting their HPTL with the higher headquarters and are able to receive preplanned and on-call EAB support.

Negative: Units wait to the last minute and do not anticipate requirements within the higher headquarters targeting cycle. Some BCTs tend to forget they are not the only effort in a LSCO fight and that EAB assets are finite and apportioned/ allocated IAW the unit priority.

Positive: Successful units properly integrate and employ their Joint Terminal Attack Controllers (JTACs) IAW their observer plan. Proper employment results in the full utilization of the Close Air Support (CAS) in support of both preplanned and targets of opportunity. Deliberate employment of CAS ensures proper synchronization for Suppression of Enemy Air Defense (SEAD) and cross cueing of both organic and EAB information collection platforms.

Negative: Units that do not properly employ CAS find aircraft returning with unutilized munitions that equates to a trend that empowers divisional denial of DD 1972s unless the BCT is defined as the Main Effort of Decisive Operation.

(Rick Paape/Courtesy information)

2nd Infantry Division, United States/Republic of Korea Combined Division Howitzers operationalizing the counterfire imperatives

COL Jonathan M. Velishka and CW2 Alexis R. Delapaz

The United States Army Field Artillery School has developed a framework to approach counterfire operations in support of the maneuver commander's (CDR's) combined arms plan. The 2nd Infantry Division, United States/Republic of Korea (U.S./ROK) Combined Division operates in an environment that enables our team to operationalize 10 counterfire imperatives and routinely exercises them as part of the ROK, Ground Operations Command (GOC), and Counterfire Task Force (CFTF). The Warrior Division's counterfire effort includes the Division Artillery (DIVARTY), the division (DIV) fire support element, and in a direct support (DS) role, the 210th Field Artillery (FA) Brigade (BDE).

The 210th FA BDE is a U.S./ROK staffed combined force including 10 Republic of Korean Army (ROKA) staff members, Korean augmentees to the U.S. Army (KATUSAs), and tactically aligned U.S. Cavalry, U.S. Aviation and ROK Mechanized Security Forces. The 210th FA BDE's counterfire mission has unique requirements that provide capabilities as part of the U.S./ROK Counterfire Task Force. Foundational requirements specific to the counterfire imperatives are clarity in the CDR's guidance and intent, common battlefield framework, and the interoperability of digital systems in this multinational environment. The discussion below illustrates how the 2nd Infantry Division, U.S./ROK Combined Division operationalizes the counterfire imperatives to win the counterfire fight on the Korean Peninsula.

Here are the 10 counterfire imperatives:

1. **Understanding the CDR's guidance and intent enables detailed synchronization of maneuver, intelligence, and fires (fire support task/Field Artillery task/attack guidance matrix {AGM}/high payoff target list {HPTL}).**

The CDR's guidance and intent and the command support relationships that support the intent are critical elements to gaining fire superiority and the tactical advantage in counterfire on the Korean Peninsula. The CDR's intent is clear; reduce long-range artillery's ability to affect the greater Seoul metropolitan area. The command support relationship of DS to the DIV and CFTF is specified in the CDR's intent. This framework aligns the efforts of all warfighting functions against the counterfire fight. With this guidance, the combined U.S. and ROK counterfire effort uses a detailed battlefield framework, fire support, and maneuver geometries to support permissive attack guidance and assigned ar-

The ten counterfire imperatives. (Rick Paape/Courtesy information)

eas for collection and delivery of fires.

Enabling this effort is the integration of liaison officers (LNO) throughout multiple echelons of both U.S. and ROK formations. This ensures understanding of higher headquarters intent between both forces while allowing each to keep pace with the tempo of the counterfire fight and adjust the focus of fires in real-time. LNO's enhance interoperability by ensuring common graphics, communications connectivity and the integration of essential fire support tasks (EFST), essential Field Artillery tasks (EFAT), AGM, and HPTL within the common operating picture (COP). The inclusion of the ROKA target acquisition (TA) and delivery assets (and capabilities) into the COP enables the rapid identification and neutralization of enemy long-range artillery. LNO operations are not without friction and require dedicated resources and a minimum of two personnel to provide 24-hour coverage. The combined efforts on the peninsula are to neutralize and destroy the enemy's long-range capability; this is the DIV's and FA BDE's number one mission.

2. **Develop and execute an intelligence collection plan that supports the targeting and counterfire fight.**

Drawing directly from the CDR's guidance and intent, the collection plan and how we distribute the outputs from the collection into the targeting and real-time counterfire fight is mutually supportive through the targeting process, systems interoperability, and our sensor-to-shooter linkages across the counterfire task force. Developing an intelligence collection plan with assigned collection assets and integration with the higher headquarters (HQ) collection plan ensures the effective alignment of resources with clear tasks and purpose. Within the U.S./ROK intelligence collection plan, the collection focus areas are established by each echelon and integrated into higher headquarters COP and targeting process to support the CFTF. As the U.S. and the ROKA employ organic assets such as the Shadow, Herron, Grey Eagle, and Artillery RADAR to provide observation throughout their perspective areas of responsibility, there is a feedback loop that enables adjustment of collection to focus both counterfire and targeting.

The efficient distribution of targeting data in the form of acquisitions and live feed from or to aerial platforms is essential to the CFTF. The DIV, BDE, and ROKA employs the Joint Fire Operating System – Korea (JFOS-K) and the Joint Automated Deep Operation Coordination System (JADOCS). These two systems interconnect and provide both forces the ability to share intelligence and acquisitions that build a shared understanding of the COP. Additionally, this DIV has incorporated the Fires Digital Operations Integration Network-Korea hardware that provides the Tactical Radio Application Extension to link the RADAR acquisitions to the aircraft on station. With the combined COP, targeting officers from both nations work together throughout the targeting process in support of the CDR's intent, execute TA tasks, conduct and adjust effective surveillance, and deliver the desired effects on specific targets. The analysis, assessments, and recommendations that enable routine refinement and guidance in the allocation of assets and focus of collection to the commander are essential in this effort instead of simply having the collection plan in support of the counterfire fight.

3. **Develop a permissive battlefield design that shortens the counterfire "kill chain" [geometries, fire support coordination measures (FSCMs), RADAR zones].**

The DIV, U.S Forces Korea, and ROKA have established a templated threat position area artillery (PAA), which provides a common understanding of the area known as rocket target (RT) boxes, a non-doctrinal term used between U.S. and ROK forces.

Although RT box is a non-doctrinal in joint terminology, it is essentially a large cluster of RADAR call-for-fire zones with the highest priority. The RT boxes, along with friendly locations identified as necessary to our host nation, have enabled the establishment of sensor-to-shooter alignments across our area of operations.

The 210th FA BDE construct is made up of an array of sensor-to-shooter linkages, RADARs and associated firing battalions, providing each unit with a specific RT box of responsibility. The sensor-to-shooter linkage also allows for the sensor to be within FM: digital/voice range which shortens the kill chain and facilitates redundant communications options. Simultaneously, the upper tactical internet is the critical link to painting the broader collection and counterfire picture up through DIV to the CFTF. The DIV's and brigade's ROKA staff and both U.S. and ROK LNO's play an essential role in the current operations fight as they provide real-time updates and facilitate real-time adjustments and targeting recommendations. LNO's ensure the digital COP, as well as the analog COP, are current with an appropriate forward line of troops locations and the current established forward edge of the battle area (FEBA), which is an established set of obstacles as a line of defense.

The collective effort uses the battlefield framework and understanding of the counterfire geometries to quickly share assessments and make recommendations to the DIV and CFTF. This enables the refinement of all collection and acquisition priorities and the subsequent AGM's. As a result, unanticipated targets that are acquired outside of the defined counterfire geometries can be rapidly de-conflicted within the defined priorities. This increases the effectiveness of the CFTF's dynamic targeting by reducing reaction time and will contribute to overall mission success.

4. **Plan/manage terrain and distribute common graphics that allow for optimal PAAs and RADAR position areas (RPAs) which include primary, alternate and tertiary locations.**

The combination of a defined battlefield framework and common graphics is essential in our employment of artillery and RADAR systems. The 210th FA BDE is in DS to 2ID, and 2ID is DS to GOC, and our frameworks are nested four levels higher as we are prepared to occupy assigned PAA's with established contingency options. Like our sharing of our collection efforts, our COP is maintained both digitally and analog. It is passed digitally through the interoperability of the U.S. JADOCS and the ROKA JFOS-K that provides updated friendly forces locations. In the BDE's AO, we also share host nation established PAA's, U.S and ROK maneuver security force (SECFOR) capabilities, and FEBA. 210th FA BDE uses its geospatial-intelligence section in conjunction with the operations and counterfire cells to create and distribute analog "fight maps" throughout the BDE and its higher HQ. Utilizing personalized fight maps provides CDR's and staff a way to visualize pertinent information in time and space and is another tool that facilitates shared understanding.

5. **Plan airspace that allows for responsive counterfire (airspace coordination measures {ACMs}/airspace control authorities).**

In addition to the ground operations framework, the air component is also permissive where we employ a Joint Fire Area-Korea (JFA-K). The JFA-K is a three-dimensional FSCM used to facilitate targets in various forms of fires. A JFA-K is usually established south of the fire support coordination line and utilized in conjunction with the Grid Azimuth Reference System (GARS). The GARS box (cell, quadrant, or keypad provides the two-dimensional surface space {area}, while the JFA-K adds the third-dimensional air space restriction {altitude} requiring coordination between the ground component commander {GCC}/land component commander and air component commander {ACC}). JFA-K allows for counterfire operations to execute the Surface-to-Surface Missile System (SSMS) operations while simultaneously providing a minimum altitude for aircraft to fly and conduct air-to-surface fires. 210th FA BDE provides bottom-up refinement by providing current patterns to continuously adjust the JFA-K through systems such as the AFATDS, JADOCS, and Tactical Air Integration System which allows for more responsive counterfire.

The JFA-K is a combination of FSCM and ACM. Working in a joint (multi-service) and combined (multi-national) environment has created a process that works with U.S. and ROK training, systems, and understanding. In essence, the JFA-K allows a localized coordinating altitude given a specific GARS quadrant. Though not typical in a U.S./joint fight, JFA-Ks allows the ROK to lead GCC shaping requirements to integrate joint/combined fires with the U.S.-led ACC assets. An entire JFA-K/GARS quadrant change may not be necessary. In some cases, a discreet fire mission (example: 1x ATACM for a time-sensitive target {TST}) does not necessitate a change of airspace coordination or the size of an entire JFA-K/GARS box. In this case, a "goal post" concept can be employed with rapid airspace deconfliction for a very finite missile flight path and time of flight.

6. **Understand the counterfire HQs (role/manning/location) (FFA HQ role verses counterfire HQs role).**

In the case of 210th FA BDE and 2ID DIVARTY, 2ID DIVARTY serves as the force Field Artillery HQ, and 210th FA BDE serves as the counterfire HQs as designated by 2ID. 210th FA BDE manages its organic TA sensors and provides 2ID DIVARTY with the location, cueing intervals, zones, and movement orders of its assets. Unique to the 210th FA BDE and DIV is the deployment of two TA platoons with nine RADAR systems and is mutually supported by the maneuver BDE fire support assets. 210th FA BDE provides RADAR coverage and delivers fires in support of CFTF while 2ID DIVARTY conducts fire support planning and targeting in DS of GOC's U.S. and ROK counterfire fight. With augmentation, they integrate all forms of Army, joint, and multinational fires through the fires cell within GOC directorate at both DIV HQs, division tactical air control, and GOC Counterfire Task Force. 210th FA BDE, 2ID DIVARTY, and ROKA, fire support elements, synchronize assets to ensure coverage in support of the CDR's guidance, avoid duplication, and ensure proper routing of targeting data to minimize threats to friendly operations.

7. **Develop a sustainment and protection plan for all TA and attack/delivery capabilities.**

Many discussions have taken place over the best command or support relationship 210th FA BDE should have with the GCC CFTF. Based on the intent for CFTF, unique requirements in a U.S./ROK combined force, and sustainment considerations for a U.S. FA BDE, the best relationship was DS. This facilitated the required effects in support of the CFTF while enabling U.S. leadership to have the requisite control which facilitates the sustainment and logistical requirements of each firing element. Sustainment and protection are greatly enhanced in the CFTF. The brigade's task organization expands significantly as we move toward contingency operations. Sustainment and protection enablers are the bulk of this growth. The essential piece and difference here on the peninsula is the support and interoperability with our dedicated U.S. SECFOR and ROKA security partners. This is evident in our planning, training, and resourcing. The formations' dedicated cavalry squadron, aviation assets, air defense artillery (ADA), engineer, and sustain-

External security is a critical requirement and a priority for maneuver commanders to maintain the counterfire RADAR capability.

ment support are critical to the survivability of delivery and TA systems. The protection plan ensures the addition of BDE assets to the critical asset list and the defended asset list for integration into the ADA's plan and allows engineer blade teams to berm the RADAR position areas and other areas as prioritized. In a sustainment point of view, the required supply rate is determined through collective effort between the staff during the operations process and is based on the enemy threat and GOC's desired effects. Once an approved controlled supply rate has been determined, 210th FA BDE continues to find solutions through the targeting process on thresholds that support resupply triggers based on the CDR's guidance.

Additionally, the ROKA supports the U.S. TA plan by providing a security package known as the Republic of Korea SECFOR. They provide the RADAR and artillery units a security element during movements and during the occupation of RPAs, PAA's, logistical nodes, and high-speed avenues of approach to increase our survivability. External security is a critical requirement and a priority for maneuver commanders to maintain the counterfire RADAR capability. Clear security tasks are specified within the higher headquarters operations order and include the task organization of required SECFORs.

8. **Communicate at distance using a primary, alternate, contingency and emergency (PACE) plan, digital architecture, AFATDS database management.**

The terrain on the Korean peninsula is extremely restrictive and requires that the planning, establishment, and maintenance of our communications systems is viewed as a critical requirement. The 2ID systemically conducts digital sustainment training (DST), which facilitates the synchronization of the AFATDS database. Additionally, combined joint fires element (CJFE) led DST with 2ID DIVARTY and battlefield coordination detachment (BCD) has also been extremely beneficial to iron out common communication issues at a distance. A vital approach leveraged in the Korean Theater of Operations is weekly DSTs with every echelon of the kill chain (210th FA BDE FCE, 2ID, 8A Fires, 3BCD, CJFE). This is a significant weekly event that, not only validates connectivity but validates common understanding of processes. The communication configuration is then consistently tested during daily rehearsal and multiple field exercises across the BDE. During the planning and preparation phase, tools such as the systems planning, engineering, and evaluation device (SPEED) are used to model and analyze FM: digital/voice and jammer effects in a defined electromagnetic spectrum environment. The SPEED tool allows us to understand better where communications degradation or interoperability issues may occur, therefore mitigating them with proper employment of RETRANS sites. Continued sustainment training can include local RF Link-16 training between the ADAM/BAE and Air Operation Center Joint Interface Control Officer and Joint Information Coordination Center Watch Officer.

Within the digital architecture, the counterfire section provides the commander with a menu of sensor-to-shooter linkages that facilitate the counterfire task force array of responsibility due to the vast area of battle. Contingencies such as multiple echelons building all the RADARs into their AFATDS to serve as an alternate observer provide continuity if any step of the kill chain breaks down. The PACE plan also includes the utilization of high-frequency radios as well as joint capabilities release. Although the BDE prefers to function using direct FM: digital to facilitate the sensor-to-shooter linkage, the ability to direct all RADAR acquisitions directly to the BDE is always available.

9. **Conduct tactical fire direction: firing unit management (hot/cold).**

On the Korean peninsula, the 210th FA BDE maintains our "fight tonight" capability, which is established using the hot/cold firing unit approach that can rapidly provide counterfire and precision strikes to the AO. During planning, the military decision-making process phases systems such as the Joint Technical Coordination Group for Munitions Effectiveness Air-to-Surface (JMEM/AS Weaponeering guide) and Joint Weaponeering Software are used to facilitate the targeting process and is used to develop target selection standards and attack guidance matrices that are applied to the counterfire shooters and TST.

In the ROK theater, we array our forces and ammunition to support continuous operations and sustainment. During operations, designated firing units have dedicated areas of responsibility that are aligned with sensors to facilitate an expedited counterfire mission.

Tactical fire direction centers manage the hot/cold SSMS (MLRS) fight depending on the intended mission and the antic-

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ipated enemy volume of fires. The main priority is to return fire rapidly while using the hot/cold SSMS (MLRS) employment tactic which enables survivability, maintenance, and rest cycles to maintain readiness.

10. Maximize RADAR home station training (emplacement/ displacement, drills, DSST, counterfire battle drill, etc.)

In Korea, our home station is our area of operations. This provides a tactical advantage. We train as we fight and where we may fight while deterring aggression. Similarly to the MLRS, our RADAR platoons have primary and alternate ready RADARs, our anchor point for mission success. Essential in our RADAR training is the deliberate and repetitive conduct of our artillery tables to train for proficiency and integrate with our ROK partners. Our training includes integration of our KATUSA Soldiers and NCOs into the sections which has the added benefit of easing maneuver around the area of operations, increased acquisition training with ROK Army cannon unit live fires, and integrating digital systems with U.S./ROK combined staff elements.

The hardest part of what we do is the digital interoperability and routine maintenance of engagements with our ROK partners to optimize SECFOR and RADAR training. We have a combined battlefield framework, common graphics, and link collection to our sensors and shooters across the peninsula. Partnered training and routine integration with our ROK Security will continue to improve our ready force and overall counterfire success.

In conclusion, although the 210th FA BDE's counterfire mission is unique to the Korean Peninsula, the counterfire imperatives provide a framework that enables a common understanding. The key takeaway is that these imperatives are flexible enough to be applied to any unit's counterfire mission. Routinely reviewing the counterfire imperatives against a unit's counterfire mission will enable success. In our case the success of the brigade, DIV, and the GOC Counterfire Task Force relies on our ability to actively seek, incorporate, and adapt to new processes that apply to the Peninsula.

Tasks to operationalize counterfire imperatives

Synchronization of maneuver, intelligence and fires

- Ensure the EFST/EFAT/AGM/ HPTL is nested within the CDR's intent
- Integrate LNO's where communication + collaboration is critical for mission success
- Produce mission-specific "Fight Maps" to be able to collaborate on a COP

Intelligence collection

- Plan the placement of sensors that are mutually supportive of each other and the intelligence collection plan (build flexibility to adjust)
- Establish interoperability of digital/communications systems
- Build communication linkages between ground and air fire delivering platforms (this includes joint and host nation systems)

Permissive battlefield

- Establish pre-determined PAA's with primary/alternate/ tertiary locations
- Analyze and define a permissive COP (U.S./ROK ground and air)
- Recommend and plan airspace that allows for multiple platforms to function with minimal coordination
- Minimize the kill chain to decrease reaction times

Responsive counterfire

- Analyze operability of sensor-to-shooter linkage (have multiple options)
- Provide a clear understanding of mission, roles, responsibilities, and authorities to all echelons
- Execute continual training and refinement of battle drills/SOPs
- Maintain consistent digital sustainment training at echelon

Sustainment and protection

- Anticipate dedicated areas of responsibilities and organizational needs for future operations
- Integrate task organized and partner nation assets during training events
- Coordinate for SECFORs and engineer assets to increase survivability

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Artillery-delivered PGMs in LSCO

Insights from the battle for Mosul

COL Daniel C. Gibson, LTC (P) Scott Pence, CPT (P) Stoney Grimes

The Iraqi Security Forces' (ISF) offensive into western Mosul in the spring of 2017 demonstrated the utility of artillery-delivered precision guided munitions (PGMs) in large-scale combat operations (LSCO). Originally developed during the height of the counter-insurgency campaigns in Iraq and Afghanistan, PGMs provided ground commanders with low-collateral damage options for defeating insurgents and terrorists on the battlefield. Later, 2nd Battalion, 319th Airborne Field Artillery Regiment (2-319th AFAR) would employ PGMs in the 2017 Battle for western Mosul. 2-319th AFAR's employment of artillery-delivered PGMs offers insight into the efficacy of these munitions in LSCO against a determined enemy in dense urban terrain. This is relevant to future conflict for many reasons. Knowing that the United States follows jus in bello principles and always seeks to minimize collateral damage and civilian casualties, future adversaries will place their highest value assets in dense urban terrain. This article will describe the environment in which the operation took place, explain the battalion's best practices for PGM employment, and identify the

CPT Stoney Grimes, deployed in support of Combined Joint Task Force-Operation Inherent Resolve and assigned to 2nd Battalion, 319th Field Artillery Regiment, 2nd Brigade Combat Team, 82nd Airborne Division, works in the tactical operations center at Camp Swift, Iraq, June 3, 2017. Grimes, a third-generation Paratrooper and the battalion fire direction officer, assists Iraqi security forces with fires support to achieve the military defeat of ISIS. CJTF-OIR is the global Coalition to defeat ISIS in Iraq and Syria. (CPL Rachel Diehm/U.S. Army)

challenges inherent to employing artillery-delivered PGMs in dense urban terrain.

The battle for western Mosul lasted from January to July 2017. During this time, Task Force (TF) Falcon, the 2nd Brigade Combat Team, 82nd Airborne Division provided support to the Iraqi Security Forces' efforts to liberate the city of Mosul from the Islamic State of Iraq and Syria (ISIS). The ISF depended upon U.S. forces for integrated fires to provide the tactical overmatch essential for success. Despite their possession of indirect fire systems, the ISF could not employ them with the precision necessary to enable their operations. TF Falcon's direct support artillery battalion, 2-319th AFAR, provided many of these fires. To do so, the battalion employed its organic M777A2 battery, a reinforcing M109A6 Paladin platoon, a French general support-reinforcing 155 mm Caesar battery, and general support joint fires assets including an M142 HIMARS platoon.

In 2017, the densely packed urban environment within the city of Mosul consisted of structures varying from two to three-story residential and small business buildings to high-rise buildings over 10 stories tall. The city was organized in geometric patterns with buildings arranged in neat blocks bounded by generally wide straight roads. This changed dramatically as one approached the ancient Old Mosul district tucked against the west bank of the Tigris River. The medieval old city featured structures arranged seeming indiscriminately with archaic buildings packed on top of each other. Narrow alleyways, few roads, and a labyrinth of pedestrian thoroughfares weaved between walled courtyards. ISIS added complexity to this already complicated environment.

In preparation for the impending attack, ISIS integrated obstacles in support of a deliberate defense in depth. Using earth-moving equipment captured from the ISF or seized from civilian businesses, ISIS constructed berms and moved rubble to place deliberate obstacles along key avenues of approach into and within the city. The obstacles canalized ISF into deliberately constructed engagement areas overwatched by ISIS fighting positions in structures that were once homes, schools, hospitals, and mosques. Fighters barricaded themselves inside buildings, cutting holes into exterior walls to cover obstacles with fire and observation without being directly observed themselves from outside. Moreover, they cut holes into interior walls so that they could move between adjacent buildings within a block without being visible from either the air or the ground and protected from the effects of small arms fire. If ISF maneuvered without the support of TF Falcon, the defensive positions gave ISIS a clear relative advantage and the Iraqi's would sustain unacceptable combat losses.

TF Falcon sought to degrade the ISIS defensive positions to enable ISF freedom of maneuver. To do so and avoid unnecessary collateral damage, precision munitions, especially M982A1 Excalibur and the M1156 Precision Guidance Kit (PGK), were often the weapons of choice. The M982 Excalibur is a cannon-launched GPS guided precision munition with a circular error probable (CEP) of less than 3 meters.[1] The PGK is a GPS-enabled electronic fuze placed on a conventional M795 high explosive or M549A1 Rocket Assisted Projectile that turns it into a near-precision munition with an advertised CEP of less than 50 meters. The PGK can be set to point detonate (PD) or an airburst function known as variable time (VT).[2] 2-319th AFAR would use these capabilities with decisive effects throughout the fight for western Mosul.

On the morning of May 4, the 9th Iraqi Army Division — at the time, the Iraqi Army's only armored division — began its much-anticipated attack into northwest Mosul. 2-319th AFAR supported the assault with precision munitions — predominantly PGK and Guided Multiple Launch Rockets — allowing precisely placed fires to suppress ISIS fighting positions while minimizing damage to structures. In the dense urban terrain of western Mosul, a miss by as few as 20 meters meant having effects on the wrong side of a block of buildings or behind a wall or other piece of urban micro-terrain that resulted in no effects on the intended target. What's worse, tactically, such a miss would cause damage to structures that then became obstacles or fortifications that the ISF would later have to breach. Further, a 20 meter miss might damage infrastructure or cause civilian casualties that ISIS could exploit for strategic effect targeting the cohesion and will of the coalition. PGK was an ideal option for these fires because of its near-precision capability and its ability to be set to VT. Employing PGK in VT mode reduced the probability of damaging structures while suppressing enemy fighters on rooftops or dug-in positions. It often forced ISIS fighters to go to ground or displace altogether, allowing the ISF's advance.

2-319th AFAR used precision munitions both for preplanned and on-call targets. On-call targets were often in direct support of ISF at danger close distances where the precise nature of the munitions mitigated the risk to friendly forces. Almost daily, a typical vignette occurred in which Iraqi forces advanced through the city until they made contact with ISIS fighters. As ISIS fighters engaged from prepared positions inside buildings, Iraqi forces took cover, often directly across the street and as close as 12-15 meters from ISIS positions. This produced an urban World War I-like stalemate scenario where adver-

1 "Excalibur Projectile," Raytheon Missiles & Defense, accessed May 18, 2020, https://www.raytheon.com/capabilities/products/excalibur.
2 "Northrop Grumman Details Precision Guidance Kit," Monch Publishing Group, accessed May 18, 2020, https://www.monch.com/mpg/news/land/5238-ng-precision-guidance-kit.html.

saries were statically entrenched and engaging each other across an open "no-man's-land." Iraqi forces would then request fires, through their advisor network, to the 2-319th AFAR battalion fire direction center. The battalion's standard response was M795 high explosive fuzed with the M1156 Precision Guidance Kit. Despite the 50-meter advertised CEP of the PGK, the battalion routinely employed these munitions on rooftops or within courtyards with near pinpoint accuracy. As long as the Five Requirements for Accurate Predicted Fire were met, the technique achieved decisive effects. For small, thin-walled structures the battalion employed PGK in PD mode to suppress ISIS fighters in their prepared positions within buildings. These techniques provided the suppression necessary for Iraqi forces to cross one linear danger area after another, assault building after building, block after block.

This suppression was effective unless ISIS fighters were too deeply entrenched within their positions. In such cases, 2-319th AFAR employed Excalibur munitions in multiple precision-aimpoint mission (MPAM) firing multiple Excalibur rounds against different aimpoints on the same target to achieve a destructive effect. While the PGK could only be set to PD or VT, the Excalibur has a delay function that enables the munition to penetrate structures before detonating. An Excalibur MPAM became the mission of choice for engagements where ISIS was fighting from larger, heavier structures because of the munition's ability to penetrate and kill with blast, fragmentation, and overpressure while still leaving the structure standing.

When employing Excalibur, the battalion had to coordinate across multiple layers of command due to the extremely high trajectory, or maximum ordinate, of the Excalibur munition. The munition, fired high angle, followed a trajectory that typically crested over 30,000 feet above the ground. Without prior planning and coordination, this necessitated a lengthy process to clear the airspace of manned and unmanned aircraft routinely working over the city of Mosul. The battalion mitigated this challenge by designating a target area of interest (TAI) and kept the airspace between the firing unit and the TAI clear of friendly aircraft to minimize the time required to engage targets in the vicinity of the TAI. As an alternative, 2-319th AFAR often employed the PGK fuze in lieu of the Excalibur. The PGK was designed to be fired low angle and thus produced a significantly lower maximum ordinate that reduced the airspace clearance requirements.

Despite these best practices, the environment and ISIS's tactics challenged the battalion's organic capabilities and tactics. When ISIS fighters employed mortars and heavy weapons from firing positions in the middle and lower stories of multi-story buildings PGK and Excalibur were often ineffective because neither munition could penetrate deep enough to have effects on the target. Additionally, structures in the target area formed intervening crests that prevented low angle attacks from reaching the target. To overcome this challenge, the battalion coordinated for aerial platforms to employ forward-firing munitions such as the AGM-114 Hellfire missile to achieve the desired effects.

The battle for western Mosul demonstrated that precision artillery fires are not only useful in counter-insurgency operations where civilian casualties and collateral damage are an overriding concern, but also in LSCO scenarios in dense urban terrain. In the battle for western Mosul and the subsequent battle for Tal Afar later that summer, 2-319th AFAR fired more than 300 M982A1 Excalibur rounds and more than 1,000 M1156 Precision Guidance Kits. Artillery-delivered PGMs can be employed rapidly and effectively in close support of maneuver elements to increase the probability of effects with the first round, thus minimizing the number of rounds necessary. This enables maneuver commanders to employ artillery fires at extreme danger close distances with confidence and minimal risk. Further, the reduction in the number of rounds required to achieve effects will reduce the firing time and subsequent vulnerability time of firing units, increasing their survivability. Additionally, firing units can apply MPAM procedures to PGK missions to get a precisely placed area fire effect and mitigate the need for saturation fires or the massing of guns.

The tactics, techniques, and procedures for PGMs in dense urban terrain that 2-319th AFAR used in Mosul could be used in the future to support U.S. military efforts in LSCO. Near-peer competitor countries rely on large-scale volume of massed artillery fire to achieve their effects. However, lethal effects placed precisely can achieve the same outcome as a massive barrage if every round fired counts. The U.S. military can apply these lessons from operations in Mosul to achieve effects on future battlefields.

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The Army Concept of Fires

Laying the foundation for the future

By Andres Arreola, Lance Boothe and LTC Robert Reece

Why concepts? To put it simply, concepts are the start point. In recent years, the Army has made modernization a top priority and it uses concepts as the entry point to drive capability development and define how the Army will fight in the future. Fires is among the top modernization priorities for the Army, making the U.S. Army Concept for Fires a critical document for shaping the future of the Army. It is the starting point for modernization.

The Army Concept for Fires (AC-Fires) is part of the Army Conceptual Framework. The purpose of that framework is to provide "a foundation for developing future capabilities and help Army leaders think clearly about future armed conflict, learn about the future through the Army's campaign of learning, analyze future capability gaps and identify opportunities, and implement interim solutions to improve current and future force combat effectiveness," according to the former director, of the Army Capabilities Integration Center (now the Future Capabilities Center), LTG(ret) H. R. McMaster. Thinking, learning, analyzing, and implementing, indeed; the process by which the Army glimpses, if imperfectly, into a vague and uncertain future.

The Army Conceptual Framework, of which the AC-Fires is part, starts with a strategic vision from the National Defense Strategy and National Military Strategy of the United States of America, publications produced by the National Security Council. From the guidance provided in these publications, a joint operating concept is produced, which in turn informs the Army's operating concept. At present, a joint operating concept is under revision. The Army has recently published two seminal concepts: TRADOC Pam 525-3-1, The U.S. Army in Multi-Domain Operations 2028, and TRADOC Pam 525-3-8, U.S. Army Concept for Multi-Domain Combined Arms Operations at Echelons Above Brigade (EABC) 2025-2045. These concepts inform the AC-Fires. So as expected, the AC-Fires describes how fires formations and capabilities support and enable joint, interagency, intergovernmental, and multinational (JIIM) efforts, in support of Multi-Domain Operations (MDO) in the 2028 and beyond timeframe. Future warfare requires the Army to integrate and execute fires to conduct MDO against future peer threats. This integration and execution falls to the Army's Fires Warfighting Function.

(U.S. Army released)

Fires defined

Before a functional concept can be imagined, the object of the function needs definition. While concepts are not bound by doctrine, current and emerging doctrine may inform a concept to create shared understanding for terms and techniques as a start point upon which to expand innovative ideas, or conversely to scope new ideas. Accordingly, the AC-Fires refers to the term "fires" within the context of existing and emerging doctrinal definitions to clarify future fires actions and identify required fires capabilities. JP 3-0, Joint Operations defines fires as "the use of weapon systems to create specific lethal and nonlethal effects on a target." Additionally, joint fires is defined as "fires delivered during the employment of forces from two or more components in coordinated action to produce desired effects in support of a common objective." Army Doctrinal Publication (ADP) 3-19, Fires, dated July 31, 2019, defines the Fires Warfighting Function as "the related tasks and systems that create and converge effects in all domains against the threat to enable actions across the range of military operations." Under this broad definition, Army fires are understood to integrate and execute fires across the five domains of land, air, sea, space, and cyberspace as well as the electromagnetic spectrum and information environments to support JIIM operations.

To accomplish the tasks required to create and converge effects, Army fires employ or coordinate surface-to-surface fires, air-to-surface fires, surface-to-air fires, surface-to-space fires; integrates and synchronizes cyberspace operations and electronic warfare with ground-based fires; and integrates space operations, multinational fires, and special operations with joint fires to support MDO. Army Fires are integrated with JIIM operations through the targeting and operations processes; fire support planning; airspace planning and management; electromagnetic spectrum management; multinational integration, rehearsals; and air and missile defense planning and integration. To this end, the AC-Fires focuses on concepts for integrating fires at all echelons to penetrate and dis-integrate threat anti-access and area denial (A2/AD) capabilities and strategies, defend critical assets, and defeat threat fires to enable joint force freedom of action. The AC-Fires presents concepts for how the Army will conduct fire support, targeting, and air and missile defense in the future.

A central idea

Any multifaceted concept such as the employment of Army fires must spring from a central, overarching idea. The AC-Fires asserts that Army fires contributes to the joint force by enabling deterrence in competition, and in armed conflict integrates and employs fires at all echelons, throughout the depth of the MDO battlefield framework, to penetrate and dis-integrate A2/AD capabilities, defend critical assets, and defeat threat capabilities to enable joint force maneuver. During return to competition, Army fires contributes by posturing capabilities and reconstituting forces to preserve the favorable condition established during conflict.

This central idea for future Army fires leads, logically, to four components of the solution that are critical to success in MDO: echeloned fires capabilities; enhanced sensor-to-shooter linkages; multi-domain targeting; and leverage JIIM capabilities. These components form the essential role of fires in the future operational environment and support the key tenets and solutions described in the Army Operating Concept, TRADOC PAM 525-3-1, The U.S. Army in Multi-Domain Operations 2028. These components have been validated in recent experimentation and are rooted in Army success in large-scale combat operations against peer threats in the 20th century. Understanding the past provides a window into the future, because the nature of war is unchanging and immutable. Rooted in each solution are requirements to leverage emerging technologies that advance the role of fires, including artificial intelligence, robotics and autonomous solutions, advanced target recognition, and technologies that expand range, enhance lethality, and improve survivability.

Solution components

Echeloned capabilities. The Army fights in echelons, spanning across each level of war from tactical to strategic, each dependent upon the other for success. Fires formations at all echelons provide responsive fires to support strategic, operational and tactical operations to win through MDO. Army fires require structure and capabilities at all echelons in order to shape in depth and provide a layered defense. Echeloned capabilities give the Army the ability to fight extended campaigns, cover vast distances of physical terrain, and provide an array of fires capabilities, coupled with requisite authorities, to employ them. Echeloned capabilities are critical to the employment of effective fires in all domains in large-scale combat operations and help the Army set desired conditions at decisive points.

Enhanced sensor-to-shooter linkages. The Army must move toward any sensor, best shooter as a state-of-being. The temporary and ad hoc arrangements between sensors and shooters that have been the norm for decades will not be effective in future warfare where the scale, scope, and rapid decision cycle required to employ responsive, effective fires will determine success and failure. In the future, automated battle management tools must overcome human constraints to responsiveness and minimize human cognitive overload through a 'human on the loop' interface where sensors and shooters are rapidly converged from multiple networks across domains, monitored

through common data terminals and managed by exception, creating an "any sensor, best shooter" paradigm. Sourcing of data from sensors across domains and pairing that data with the best available shooter enables rapid target engagement regardless of domain. These enhanced linkages move the Army beyond simple kill-chains and help establish the creation of "joint kill-webs" that push and pull targeting data from a wide array of available sensors to the desired capability that can create the desired effect on the target. Building trust in this kind of system of systems requires rigorous joint and combined training to achieve confidence in the advanced automated tools, which will have the potential to employ fires without a human decision-maker directly in the loop.

Multi-domain targeting. MDO requires Army fires to support the commander's targeting priorities by leveraging existing and emerging technologies to stimulate, see, understand, and strike targets across domains with input from JIIM partners to create lethal and nonlethal effects. However, MDO does not drive a departure from the Army targeting process (decide, detect, deliver, assess) or the joint targeting process, but it does require a unified approach to targeting at echelon including the integration and synchronization of lethal and nonlethal effects in all domains to enable convergence. In order to effectively penetrate and disintegrate A2/AD capabilities, the Army cannot afford to wait until armed conflict to build accurate intelligence and determine effective targeting solutions against threat A2/AD capabilities. Therefore, the Army (along with joint and multi-national partners) must conduct thorough and continuous target development against threat high payoff targets before reaching the threshold of war. Greater flexibility in both deliberate and dynamic targeting procedures must be implemented to meet the time-sensitive demands of targeting in MDO.

Leverage JIIM capabilities. In all future operations, Army-only solutions will not be enough to address the problem. Current policy restrictions as well as limited network and platform interoperability hinder the Army's ability to share data, system capabilities, and even network connectivity, which constrains the ability to access and provide capabilities. To be successful in MDO, Army fires must be enabled by JIIM sensors and shooters to seamlessly integrate and converge fires into operations. This requires improved information sharing with JIIM partners to integrate the full range of capabilities available and enable seamless integration. Interoperable systems and the implementation of cross-domain solutions are required to optimize operations and facilitate real-time coordination of fires. Leveraging JIIM capability allows the Army to increase the magazine depth of multi-domain capabilities available to address the threat.

Embracing the future

Regardless of how imperfectly the Army divines the future, an analytical approach proves most viable for shaping the future force and how it will employ emerging technologies, making the future battlefield more lethal within an operations tempo, which will strain human endurance and ability to synthesize. The AC-Fires attempts to provide a foundation for understanding these challenges. The AC-Fires introduces new and innovative capabilities for testing and experimentation in the coming years, described in detail in its science and technology appendix.

The AC-Fires describes fires capabilities necessary to execute MDO within the context of a central idea, which provides the framework for the components of the solution presented – echeloned capabilities, enhance sensor-to-shooter linkages, multi-domain targeting and leveraging JIIM capabilities. Derived with data captured from experimentation, these components of the solution drive discussion and frame future assessments for leadership, industry, and capability developers. Army fires will continue to play a critical role in joint force operations. These operations in the future operating environment will occur in all domains, requiring the Army as part of the joint force to counter complex, advanced peer threats. For the Army to execute MDO throughout the expanded battlefield, fires must be delivered responsively, integrated at all echelons and across the joint force.

The Army Concept for Fires provides broad conceptual underpinnings to pursue future technologies, capabilities, and doctrine, organizations, training, materiel, leadership and education, personnel, facilities, and policy solutions to modernize and equip Army fires to support MDO. On track to be officially released this summer, the Army Concept for Fires is a must read for all leaders, especially those who play a role in the integration and employment of fires. Thinking about future warfare is a professional responsibility and an essential part of preparing for victory against emerging threats.

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The Cannon Field Artillery

Implementation of battery and platoon operation centers

SSG Adam Moreno and SSG Oly Magofna

The Fire Direction Center (FDC) is a salient entity within the Field Artillery battalion whether it is for rockets or cannons. Based on the way units choose to utilize the center, it can influence how the battlefield is shaped for maneuver commanders. General Dwight D. Eisenhower said, "The speed, accuracy and devastating power of American Artillery won confidence and admiration from the troops it supported and inspired fear and respect in their enemy." As Field Artillery professionals, we must ask ourselves, is that still true today?

Observer, coach, or trainers at the Joint Multinational Readiness Center in Hohenfels, Germany, observe numerous CONUS and OCONUS brigade combat teams executing rotational exercise at Grafenwoehr and Hohenfels Training Areas as part of a standard broadening assignment. As Fire Direction Specialists (13J military occupation specialty), we observe positive and negative trends that can provide a unique perspective and experience of what it takes to be successful in large-scale combat operations. In this article, we focus on the battery operations center (BOC) and platoon operations center (POC) within the cannon battalion and battery, and the necessity to master these operations before combat. Successful BOC/POC performance is a key part of developing and maintaining a lethal and fully capable Field Artillery battery. The operations centers' transition during sustained operations is a vital process enabling the battery to achieve timely, accurate fires, and ultimately the commander's desired effect.

Purpose and importance: What are BOCs and POCs?

Based on mission variables and commander's guidance, the battery FDC controls the Howitzers as a battery, platoon, paired, grouped, or as a single Howitzer. Traditionally the firing battery consists of two platoons, each with their respective organic FDC and Howitzer sections. Under a platoon-based unit, the POCs can operate independently. When dealing with extremely large firing points or

(U.S. Army photo released)

multiple firing points, operating as platoon-based units are ideal to maintain command and control. Operating in this fashion allows for the flexibility of the battery to facilitate multiple fire missions, as well as, support multiple units across the battlefield. This means that each platoon must provide its security as well as facilitate sustainment.

If the mission requires it or there is limited battlespace, the firing battery consolidates and operates as a battery-based unit. The battery commander designates one of the two POCs to assume control of all the Howitzers and assume the role of the battery's FDC while the other POC transitions to become the BOC. Operating as a battery-based unit allows for maximum security of the consolidated position as well as facilitates easier massing of fires. Despite maximizing security, battery operations can make for a larger target for the enemy. Once again, based on the commander's guidance and mission requirements, there are different risks and rewards for either method. (ATP 3-09.50, 2016)

Purpose of BOCs and POCs

As Field Artillery professionals we must understand doctrine and how to efficiently implement it. The fire direction officer, chief fire control sergeant, and battery commander must all understand the purpose of BOCs/POCs and why they are important. The FDC is the primary control node for the cannon battery and the employment methods affect the firing battery's delivery of fires. When a battery is operating out of one centralized location, the commander may designate the one FDC to be the POC and the other the BOC. This allows the POC to control the firing of the battery while maintaining the current tactical situation and responding to the supported unit(s) and higher headquarters. The purpose of the BOC and its commander is to facilitate control of the firing battery. This entails the BOC serving as the focal point for internal battery operations to include battery defense, sustainment coordination, and all operations normally performed by the headquarters element, and the backup FDC. In the Army, one needs a task and purpose to accomplish a mission. It is no different when conducting battery operations and implementing BOC/POC operations. (ATP 3-09.50, 2016)

Soldiers, assigned to 1st Battalion, 6th Field Artillery, fire a M270A1 Multiple Launch Rocket System (MLRS) at the 7th Army Training Command's Grafenwoehr Training Area in Grafenwoehr, Germany, Jan. 27, 2020. (Markus Rauchenberger/U.S. Army)

Importance of the BOCs/POCs

Cannon batteries and their employment greatly affect the agility and flexibility of the cannon battalion's ability to deliver accurate and responsive fires. A common trend identified when units lack the understanding of BOC/POC operations is to designate the FDC that is in control of the Howitzers as the "hot" center. The FDC that does not have control is considered "cold." In this situation, the trend is to operate in some type of shift schedule where the cold center ends up breaking down to minimum manning and implement a work/rest cycle, leaving them with little to no operational or situational awareness. Firing batteries that utilize hot/cold FDCs are highly inefficient. Having an effective BOC is where most fall short.

All FDCs, once certified, understand how to operate as a POC and facilitate fire missions. The BOC must be the focal point for battle tracking and decisions made by the commander. Therefore, the BOC must operate as a headquarters element. When the BOC fails, or the unit fails to implement them, it can result in commanders constraining their vehicle monitoring higher echelon platforms for guidance and situational awareness. In some cases, due to communication limitations, the commander is required to leave the position area for artillery. A recommendation is to have both platoon FDCs outfitted with multiple long-range antennas and multiple communication platforms to effectively coordinate with higher, subordinate, and adjacent units and facilitate efficient operations at the battery level.

In most cases, Field Artillery units establish and maintain two operational communication networks: a command net and a fires net. Utilizing a BOC/POC setup allows for active monitoring and communicating through both nets. Frustrations across unit echelons occur when no BOC exists to facilitate command and control. Communications from higher and adjacent units can delay or break without an operational BOC.

The most common trend in trying to solve this issue is either the battery commander and/or their driver try to monitor multiple nets. Another common insufficient trend is when the POC places an additional radio on the battalion command net and attempts to juggle processing fire missions and taking reports from higher. Both techniques have proven inadequate and increase the risk to mission in some situations. BOC/POC operations remain the preferred method when conducting battery operations (ATP 3-09.50, 2016). Based on the operations tempo and the commander's guidance, the BOC and the POC can alternate between the two FDC sections. Having two dedicated sections trained to give and take reports and prepared to assume control of Howitzers has proven to be an invaluable asset enabling command and control.

Roles and responsibilities

Based on the commander's guidance and FDCs employment it determines the roles and responsibilities in battery/platoon operations centers. As previously mentioned, one FDC establishes as the platoon and the other as the battery. When an FDC is operating as a POC, normal operations are as usual except now the POC is controlling all Howitzers within the battery. The FDC and chief maintain their normal roles and responsibilities outlined in ATP 3-09.50, ATP 3-09.70, and TC 3-09.81. When operating as a BOC, roles, and responsibilities depend on the commander's guidance, therefore the battery commander must be transparent with their BOC.

The roles of the fire direction officer and chief ensure the continuation of the Advanced Field Artillery Tactical Data System (AFATDS) database management in the event a transfer of control is required. Collecting intelligence reports from the battalion, including friendly and enemy situation reports, is another key task when functioning as a BOC (ATP 3-09.50). Intelligence reports facilitate a constant development of the common operating picture and provide a shared understanding of situational awareness across all echelons. This improves the battery's defensive posture and adjacent unit coordination. The commander's guidance influences the execution of BOC operations but fire direction officers and chiefs must provide the commander with recommendations to improve functionality.

Work/rest cycle with minimum and optimum manning

Often, units find themselves in the middle of a sustained operations or field training environment working on little to no sleep. How can units have an effective and efficient work-rest cycle when conducting 24-hour operations? Effective work and rest cycles must be as well balanced as possible and

(U.S. Army photo released)

based on the operations tempo, manning, and the commander's guidance of how they want to employ the battery. Training sections and the battery contribute to the success of the battery with rested Soldiers. Often batteries will brief BOCs/POCs to plan to conduct operations throughout the training event.

The common trend is that units fail to understand or have little experience in what BOC/POC operations entail. The trends are that the battery operates with hot/cold FDC with the cold center sleeping and the hot center is controlling the Howitzers and acting as the

BOC. This approach is not recommended as it degrades fire mission capability and mission processing times to include sending and receiving reports. The only time that approach would be feasible is during administrative shoots, though these are potential training opportunities.

Furthermore, units may not have a full personnel strength at the battery level, and therefore manning options are limited. The battery's numbers, in terms of personnel, determines how the commander implements the work/rest cycle. The battery command team must address any personnel concerns before training events to achieve effectiveness. When planning a work/rest cycle, the recommendation is two personnel operating the BOC at any given time. The fire direction officer and chief must not be on the same shift, as it may delay mission readiness if both are off shift and sleeping. Common trends are the fire direction officer and chief sleeping while conducting BOC operations, resulting in disruption of information flow and situational awareness. Work/rest cycles are based on the commander's guidance and recommendations from the FDC leaders.

Best practices

Communications with lower and higher echelons

Being able to shoot, move, and communicate is the basic skill sets all Soldiers must learn and be proficient, the same goes for the firing battery. Communications with lower and higher echelons are maintained to deliver accurate and responsive fires. FDC communication configuration is mission dependent but recommended that each section has four radios to facilitate effective communication with lower and higher echelons: Two radios for communicating with higher, one for voice and one for digital. When operating as the BOC, one radio for voice command net. When operating as a POC, one radio for voice fires net. The second radio for higher echelon communications is for AFATDS digital communication on the fires digital net.

Both the BOC and the POC need to maintain digital communications with the battalion FDC. The other two radios are for battery internal communications. Preferably one radio for voice on battery command or fires and one radio for digital fires net to the Howitzers and other platoon's FDCs. The AFATDS is an alternate or contingent

means of communication to the battalion and another platoon's FDCs. Ideally, each center should have an additional form of digital communication such as a Joint Battle Command Platform (JBCP) or Joint Capabilities Release. The more communication platforms the FDC can maintain, the more effective it becomes.

Battle tracking

Battle tracking is significant at all levels of operations. Trends indicate that many units occupy an area that is either already occupied by a friendly unit or sometimes enemy-held territory. Phase lines or objectives are commonly unknown by the batteries during their training events. This provides an indicator that the unit is failing to effectively battle track. Battle tracking is the ability to build and maintain a picture of the operational environment that is accurate, timely, and relevant (JP 3-09).

A BOC receives, processes, analyzes and monitors information that is transformed into a cohesive image that assists the commander in visualizing the current and future operations of both enemy and friendly. Doing this helps the battery commander make informed decisions and manage their resources decisively. Although the BOC is not controlling fires for the battery, they must track ammunition both on hand and fired, to meet resupply trigger point requirements. The BOC must be able to transition to control fires as the POC as fast as possible and an accurate ammunition count greatly facilitates this process.

There are two ways to battle track, analog and digital. Implement both as sometimes AFATDS, Command Post of the Future, JBCP or other mission command information systems fail, either due to lack of management, overuse, or electronic warfare threat. Battle tracking adds meaning to relevant information by transforming into a common operational picture and when successful, the battery can build and maintain situational understanding (ATP 6-0.5). Document battle tracking methods in the appropriate standard operating procedures (SOPs) and train, rehearse and fully understand down to the lowest level. Once a unit achieves successful battle tracking, all information should be transferred to the POC as they need the same information to be able to function as the BOC once the transfer of control happens. Each platoon FDC must be prepared to simultaneously control all the Howitzers of the battery or operate as the BOC and must develop effective ways to control the battery.

Transfer of control

Each FDC at echelon must be capable and prepared to assume control of the battery. The battery commander decides when they deem the POC must transfer control to the BOC and vice versa. Commanders should be transparent with their centers and platoon leadership when planning for the transfer of control. Units have been observed operating as a POC for 24-36 hours straight. Not only does this degrade battery effectiveness, but it also degrades the Soldiers' ability to complete common tasks such as erecting antennas or providing security. An ideal transfer of control is conducted every 12 hours, but at times, mission variables do not allow for such on-time changeovers. The commander still has the responsibility of ensuring their centers are transferring control to facilitate battery effectiveness in delivering fires.

Depending on if the unit is light, medium, or heavy determines the execution of the transfer of control. Information is transferred from the BOC to the POC right before "shift change" or transfer of control is ineffective. This has the potential to overload the network with the amount of data sent and can crash both AFATDS and result in being non-mission capable in the digital aspect. FDCs can still shoot off centaurs to centaurs or centaurs to chart if the commander assumes the risk. Both FDC chiefs and fire direction officers should sit down before any training event and begin the discussion of how the transfer of control should happen.

A best practice is the BOC and POC should transfer information to each other every two hours. At least an hour before the transfer of control, database comparison is a best practice to ensure all information and data matches. Doing this ensures both systems are identical and transfer of control can run smoothly. When the transfer of control happens, the best practice is to transfer by platoons. What this means is the POC should transfer control of a platoon to the BOC. The BOC gains control of the platoon and dry fire verify before taking control of the remaining Howitzers. Recommend that they take control of the gaining POC's organic Howitzers first. The POC should never transfer all six Howitzers at one time. Transferring a platoon at a time allows for the battery to maintain fire mission capability. Taking out an entire battery for a transfer of control can be detrimental to the overall mission.

Assuming control of the battalion

Communications and proper battle tracking with lower and higher echelons to include sister batteries is imperative in the event the battalion FDC is unable to control the tactical aspect of delivering fires across the battalion. Based on unit SOP, it is common for the batteries to be prepared to assume control of the battalion. The key to being prepared is a good digital SOP, database management across the brigade, and rehearsals. Ideally, all frequencies should be known for higher and lower echelons and digital addresses built into the AFATDS. Assuming the role of battalion FDC is a very deliberate process. Communicating to higher echelons should consist of the BOC changing a frequency, establishing voice communications, and activating a digital network to communicate digitally to the brigade or equivalent. The voice and digital platforms used to communicate for battery inter-

nal now communicate voice and digital with the subordinate firing batteries.

For the subordinate batteries, as outlined in a digital SOP, the AFATDS command and support relationships change to reflect the role name of the new FDC that assumed control. Similarly, the center that assumed control changes it to the brigade or supported unit's role name. Having these processes thoroughly rehearsed before the "fight" is extremely important. Trying to build units or networks at a moment's notice with no standard or guidance takes up valuable time. Battle tracking and maintaining a command observation post (COP) is imperative when transitioning to the role of battalion center. The location of the enemy, all subordinates, and adjacent units are critical for tactical fire direction. The BOC must consistently update the COP and continuously pull much-needed information to ensure readiness and awareness. Once again, training and rehearsals aid in developing this process.

Training and rehearsals

The Joint Multinational Readiness Center motto is "Readiness First, Train to Win!" and that is exactly what we do. Training readiness is essential to development no matter the profession. Units fail to improve proficiency unless they train. Units must capitalize on every opportunity to train, not only BOC/POC operations, but all battery, platoon, and section-level training. To achieve BOC/POC operation effectiveness, create SOPs, and conduct training regularly. Chiefs and fire direction officers must take the time to cross-train sections and duty positions. This results in a fully capable FDC where no one person is irreplaceable. A common concept to maintain throughout the progression of a Soldier's career is to understand the responsibilities of the leader one grade above and two below.

Rehearsals are equally important, even if only a walk-through rehearsal is conducted outlining FDC responsibilities and BOC/POC operations. Rehearsing before execution allows for Soldiers to become familiar with the operation and to translate a written or verbal plan into concrete actions. Rehearsals are a commander's tool to ensure the battery understands the intent and the concept of the operation. Conducting rehearsals allows for the commander and the battery to identify shortcomings or flaws not accounted for or recognized during the planning process. Battle drill or SOP rehearsals are the most common for rehearsals conducted at the battery level.

Rehearsals require adequate time that is based on the complexity of the mission. If time is available, conduct the rehearsal thoroughly to the lowest level possible. In limited conditions, focus on critical events that are determined by reverse planning. These critical events such as BOC/POC operations are based on the mission, battery or FDC readiness, and the commander's overall assessment. Consider the number of echelons to conduct rehearsals to make the rehearsal realistic. Incorporating the battalion FDC can help identify friction points during BOC/POC operations from reporting to transfer of controls. Incorporating the Howitzer sections allows for real-time occupations and displacements and the time it takes to report to who is taking control of the Howitzers. With the Howitzers participating in the rehearsals, identify the terrain needed to conduct the rehearsals. Once rehearsals are complete, each echelon must conduct an after-action review to enable leaders to incorporate lessons learned for subsequent rehearsals or existing plans or orders. (FM 6-0, 2015)

Conclusion

The impact of effective BOC and POC operations on the battlefield

Successful BOC/POC operations are essential to maintaining sustained lethal fires to effectively support and shape the battlefield for maneuver elements. Effective BOC/POC operations allow the battery to be as efficient and lethal as possible. A firing battery that is operating at an optimal level can service targets effectively and efficiently to achieve the desired effect on the enemy. Such a simple process can be the difference in timely and accurate fires as well as the situational awareness required for survivability. With the numerous variables artillery professionals must account for; we must not allow a dereliction at this level to be the reason for mission failure.

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Bridging today's dynamic target engagement battle drill with tomorrow's mission set

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In the last 18 years, the United States military has increased its number of persistent armed reconnaissance aircraft such as the United States Air Force's MQ-9 and the United States Army's MQ-1C to conduct various mission sets. In addition, the advancement of laser-guided munitions such as the Hellfire missile (AGM-114) and high-definition, full-motion video provides ground force commanders (GFC) with a host of dynamic engagement options from these aircraft. GFCs and their staff can effectively, expeditiously develop valid military targets and transition to a kinetic strike with a single or multi-ship aircraft solution. But how does that GFC and their staff train to take advantage of this capability?

Background

Currently, there is no doctrine or program of record to train battle staffs on kinetic strike execution. During combat operations, the lack of training is degrading the Army's ability to effectively conduct kinetic strikes against static and mobile targets to maximize weapons effects while significantly reducing collateral damage. In the joint and special operations community, the widely used term 'kinetic strike' is loosely defined as, "an offensive lethal action against a target that is not close to friendly forces and requires detailed planning during execution to mitigate collateral damage and civilian casualties."

The establishment of kinetic strike training into Army doctrine can significantly reduce collateral damage and civilian casualties on the battlefield. The need for a kinetic strike trained staff is critical wherever there is a mission involving persistent armed reconnaissance. Though the term kinetic strike is non-doctrinal, the dynamic target engagement methodology uniquely fills a role not currently filled by doctrinal mission sets such as strike coordination and reconnaissance (SCAR), air interdiction (AI), and close air support (CAS).

Per Chapter 4, paragraph 5. Subparagraphs. A-C, pg. JP 3-09, Joint Fire Support dated April 10, 2019:

SCAR. Missions flown in a specific geographic area and elements of command and control used to match weapons effects with targets per the supported commander's prioritized target list through proper real-time allocation of interdiction assets. A SCAR mission is designed to effectively and efficiently destroy targets and conduct associated battle damage assessments. SCAR interdiction assets include fixed-wing, rotary-wing, and surface-to-surface fires.

Airborne alert AI. An on-call air mission that pursues unplanned or unanticipated targets of opportunity in designated areas versus planned targets tasked on an air tasking order. Airborne alert AI is also used against planned targets that are detected during execution by the supported commander.

CAS. Air action by aircraft against hostile targets that are close to friendly forces and requires detailed integration of each air mission with the fire and movement of those forces.

Understanding the distinction from the doctrinal mission sets and the kinetic strike battle drill is key and requires commanders and their staff to understand their unique role in executing a non-doctrinal kinetic strike mission. Primarily, this mission begins with an armed intelligence, surveillance, and reconnaissance (ISR) asset conducting a mission in accordance with the commander's targeting priorities. During intelligence collection, potential targets are detected and validated using a combination of staff functions before transitioning to the fires team for delivery of effects. These actions are symbiotic within a staff and executed as a highly functional battle drill to allow the optimal delivery of weapons effects against static and mobile targets in any tactical environment with varying collateral concerns.

Unlike SCAR and AI, a kinetic strike evolves from a joint operations center (JOC) controlled intelligence collecting platform to a lethal effect producing platform with the same aircraft requiring immediate prosecution. Unlike CAS, the kinetic strike is executed as a JOC-controlled offense action far-forward of the movement and maneuver of friendly troops. We must also consider that the kinetic strike battle drill has been validated as the best practice against highly elusive targets within restrictive operating environments.

Notably, the kinetic strike battle drill is especially beneficial during JOC CAS scenarios. During JOC CAS it is often perceived to be a JTAC (Joint Terminal Attack Controller) function only, however, this battle drill serves to produce the most situation awareness, facilitates deconfliction at all echelons, and rules of engagement validation by employing all staff functions during a critical period when ground troops need CAS.

Recently, the Air Force Research Lab (AFRL) completed an MQ-9 after-action report study consisting of the content analysis of 346 MQ-9 AARs from Jan. 1, 2016 to Dec. 31, 2019.[1] The data concluded that 68 percent of missions were aligned with the non-doctrinal

1 Air Force Research Lab, "MQ-9 After Action Report (AAR) Study"; published 21 MAY 2020.

(Courtesy illustration/Air Force Research Labratory)

kinetic strike mission set while 29 percent were in support of the CAS mission set. Further, over 90 percent of the CAS was JOC-based with the remainder of CAS controlled by the ground force JTAC. The remaining supported mission sets during the assessed period were AI, direct action, and armed overwatch.

In addition, the data suggests there is a lack of MQ-9 training guidance towards training for kinetic strikes even with a considerable real-world demand for this mission set. The MQ-9 AAR study highlights the unrecognized demand for the kinetic strike mission set within the MQ-9 community and coupled with the lack of training for battle staff suggests that joint operations requiring this skill set may negatively impact mission success.

The problem

The continued growth of unmanned aircraft and the capabilities they provide to a conventional commander and staff present a challenge with employment given the lack of formalized training and doctrine available. Army units are continuously deployed at all echelons with the expectation of employing a kinetic strike against dynamic targets within their tactical or joint operations centers. Unfortunately, these commanders are not given the tools necessary to train their collective staff or provided an institutional venue to train the numerous complexities involved in executing kinetic strikes.

A SOF solution

In recent years, the 75th Ranger Regiment adopted a program to train on the kinetic strike battle drill called the networked integrated tactical exercise (NITE) developed through a joint effort consisting of COL Ryan Ayers, North Dakota Air National Guard, CW3 Herminio Rodriguez, 75th Ranger Regiment Targeting Officer, and Dr. Leah Rowe, the 711th Human Performance Wing at AFRL at Wright-Patterson Air Force Base located in Dayton, Ohio. NITE trains commanders, staff, and joint fires to solve time/speed/distance problems concerning collateral concerns adapting to varying terrain and conditions, and maximizing lethality using rapid weaponeering solutions against static and mobile targets.

AFRL facilitates unit-level training by providing a simulated/synthetic environment consisting of two fully functional JOCs and a host of Predator Research Integrated Networked Combat Environment (PRINCE) simulators. The PRINCE is an MQ-1/9 simulator suite that replicates a ground control station maximizing aircrew training. In addition, AFRL delivers state-of-the-art live, virtual, and constructive capabilities to include a comprehensive AAR system that utilizes research experts to analyze training and performance to recommend best practices to enhance mission success.

Critically, the exercise reinforces relationships within the Joint Fires Enterprise and maximizes exposure for first-time engagement aircrews and JTACs through face-to-face interaction. It further builds on the foundational relationships between the intelligence, staff judge advocate, maneuver, and fires sections within a staff. The exercise environment also facilitates Target Engagement Authority validation training. Lastly, the joint training includes

The staff for the 2nd Brigade Combat Team conduct a kinetic strike battle drill during AA STRIKEX 20-01 at the MTC, FBNC. (SGT Laine Hogue/U.S. Army)

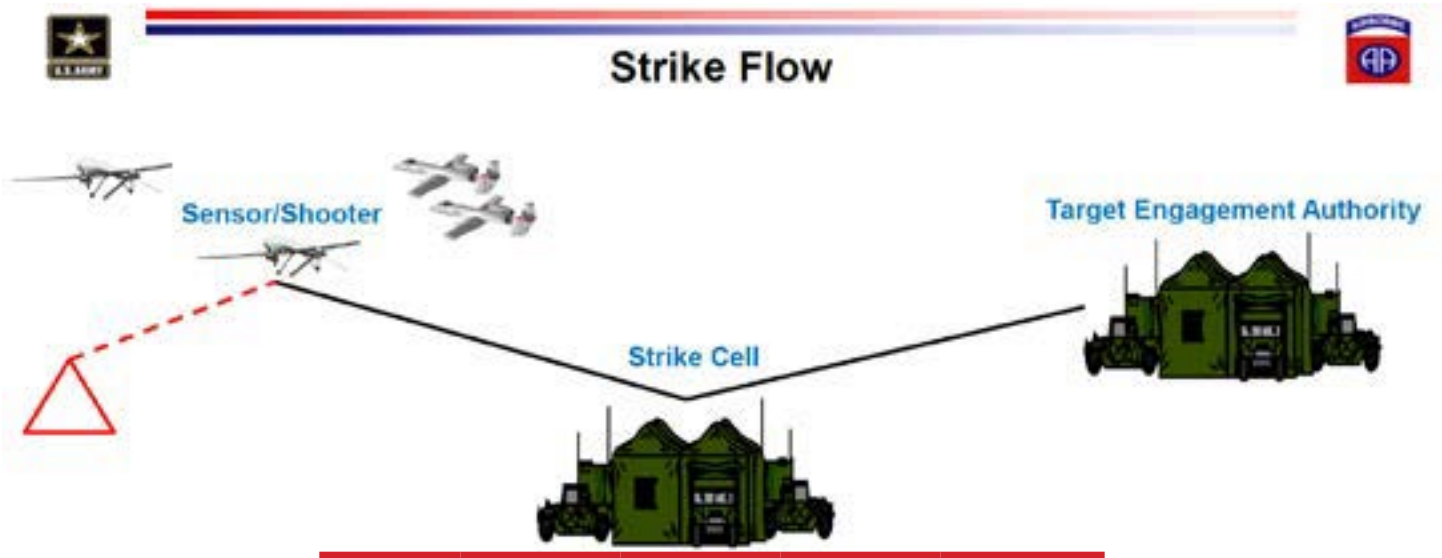
Air Force and Army aircrews to provide both realism but also serve to educate/inform the ground force on air-to-ground tactics, techniques, and procedures (TTPs) in face-to-face interaction.

Moreover, the training reinforces lessons learned from across the conventional, joint, and special operations community while also creating opportunities to validate new TTPs. Additionally, the exercise provides classroom instruction on numerous system capabilities and the latest best practices to prepare the training audience for execution in a synthetic/simulated environment that uses the crawl-walk-run training methodology. The academic portion allows all participants to receive a baseline understanding of recognized procedures and expectations that provides the entire joint team a foundation to build upon as the exercise unfolds.

Kinetic strike training and execution is founded by the codified practices developed by the 75th Ranger Regiment that provide commanders and their staff the necessary tools to conduct rapid lethal engagements. These training events have provided a foundation of conceptual knowledge on best practices and TTPs on the integration of persistent armed reconnaissance aircraft, joint attack aircraft, and surface-to-surface fires. These TTPs have reduced the overall strike execution timeline and collateral damage while increasing the situational awareness of all participants involved in the kinetic strike. Further, it builds a baseline approach that allows commanders to also execute non-lethal effects expediently in conjunction with lethal effects or independently based on mission requirements. Importantly, the TTPs aid in clarifying the supported commander's intent and decision-making process exponentially.

The all-American way

Recently, the 82nd Airborne Division executed two brigade-level exercises at the Fort Bragg, North Carolina, Mission Training Complex (MTC) based on the NITE program of instruction. Facilitated by Mr. Joshua Hutchison, the MTC provides robust and ever-evolving training support plus a facility that can produce a virtual environment for the execution of Kinetic Strike Cell training at no cost. The MTC provides a secure environment that facilitates academics, after-action reviews, and video conferencing. Additionally, the MTC houses a committed support staff that provides configurable training spaces capable of executing joint-level mission command



		EXECUTED SIMULTANEOUSLY						
SENSOR	ITC	INTEL	SJA	BTL CPT	FIRES/JTAC	CDE ANALYST	CDR/"STRIKE DIRECTOR"	SHOOTER
ID POSSIBLE TARGET	RELAYS TO STRIKE CELL	COLLECTS INTEL TO VALIDATE TGT	DETERMINES TGT MEETS ROE CRITERIA	DISSEMINATES/ DECONFLICTS WITH APPROPRIATE AGENCIES INTENT TO STRIKE	ESTABLISHES APPROPRIATE ACM/FSCM	DETERMINES CDR LEVEL	REQUESTS TEA APPROVAL, IF REQUIRED	RECEIVES GAMEPLAN FROM JTAC
RELAYS TO ITC			"REASONABLE CERTAINTY"		DEVELOPS GAMEPLAN	IDENTIFIES ENGAGEMENT TERRAIN	APPROVES JTAC TO PASS CLEARANCE	EXECUTES ON CLEARANCE FROM JTAC

training supported by live, virtual, constructive, and gaming capabilities.

The development and execution of the All-American Lethal Strike Exercise (AASTRIKEX) identified numerous training and doctrine shortfalls from the participating units concerning current combat operations. Moreover, it demonstrated that during large-scale combat operations training, some capabilities developed during the Global War on Terrorism and counterinsurgency operations were not being implemented effectively. The AASTRIKEX, however, did effectively implement the kinetic strike lessons learned to produce a more capable, competent battle staff for the 3rd Brigade Combat Team (3BCT).

3BCT's AASTRIKEX success was demonstrated during their deployment to Afghanistan from 2019 – 2020. 3BCT capably surpassed the previous unit's 10 kinetic strikes during their nine-month deployment. From June to November of 2019, 3BCT executed 82 successful kinetic strikes – nearly matching the pace of SOF's kinetic strikes within the same time period. The AASTRIKEX proved to be an indispensable combat multiplier in Afghanistan and lauded by deployed Army commanders at all echelons.

The feedback collected after two iterations and an operational deployment suggests that this highly desired training is not only effective but accurately represents what our operational forces are currently executing abroad. The inclusion of the entire battle staff, JTACs, and MQ-1C aircrews were critical to creating a training environment that truly trains the entire weapon system. Further, the use of the local MTC proved invaluable to support training at no cost to the unit while providing the latest in simulation technology. Of note, while the estimated cost to train was zero, the estimated simulated weapons expenditure and aircraft operating costs were $5.9 million for two exercises.

A way ahead

Implementation of a joint program capable of providing non-MOS specific instruction in kinetic strike battle drills would greatly enhance operational readiness across the formation at all echelons. The Army Joint Support Team (AJST) could play a vital role in educating and training staff on the battle drill in a similar fashion as it does the echelons above brigade airspace course (EABAC). EABAC educates and trains Joint Air Ground Integration Center personnel to perform those duties within their respective Army echelon staff. The AJST staff is uniquely suited to support collective kinetic strike battle drill training. Individual education and awareness would appropriately be applied to MOS specific courses such as the Joint Forward Observer Course and/or professional military education courses.

Combat Training Centers and warfighter exercises also present excellent opportunities to train the collective staff on the execution of dynamic lethal and non-lethal strikes under various operational conditions and environments. Leveraging these types of exercises to enhance a staff's ability to ex-

Aircrews from the 10th Mountain Division execute a kinetic strike battle drill during the AA STRIKEX 20-01. (SGT Laine Hogue/U.S. Army)

ecute dynamic strikes in support of a commander's targeting priorities during large-scale combat operations will produce significant opportunities to maximize battlefield effects. Most importantly, these exercises will better prepare the staff for today and tomorrow's unmanned and remotely piloted aircraft mission set.

Conclusion

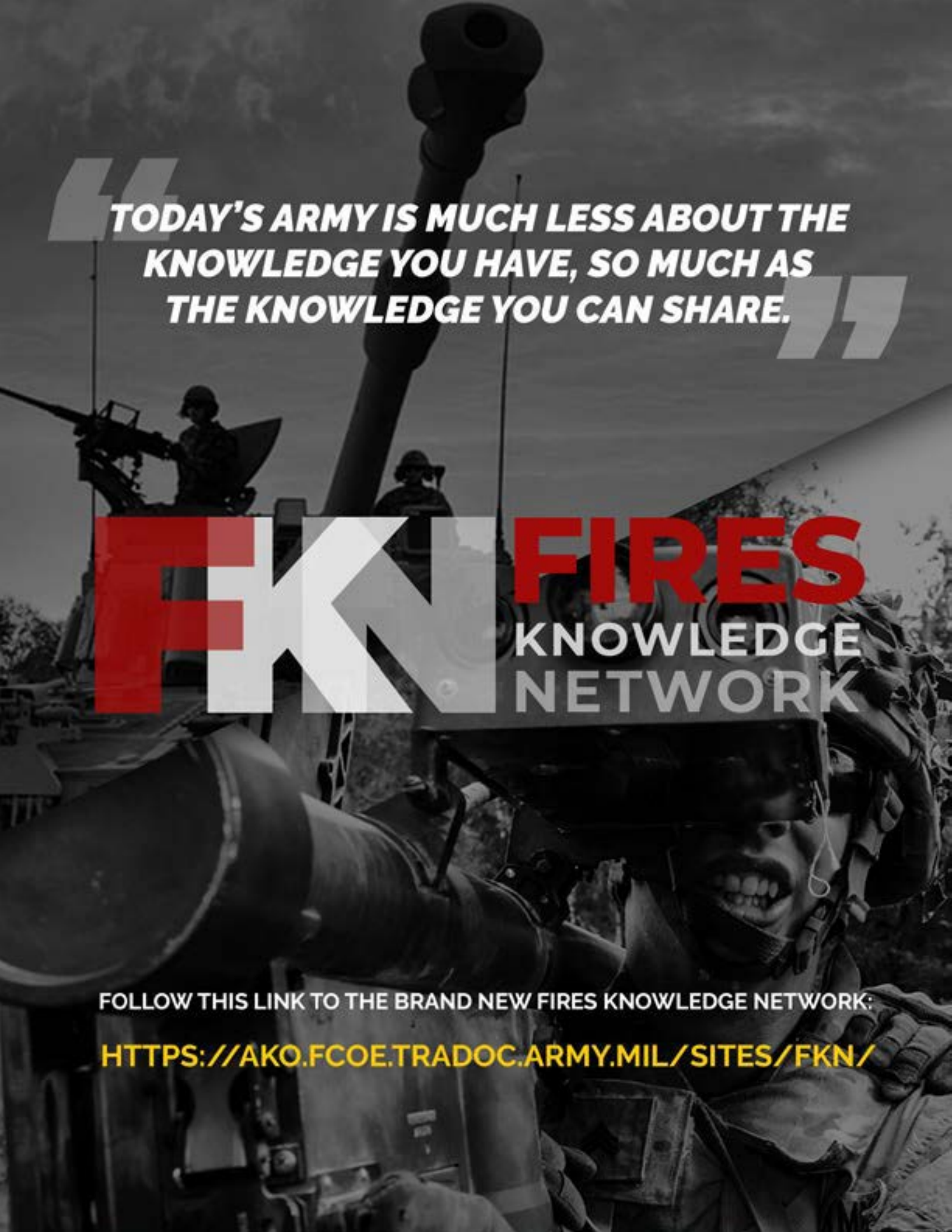
The human feedback and training data collected during various exercises confidently indicate there is a lack of joint cross-functional training, standardization, and doctrine in the employment of armed ISR aircraft. In addition, it highlights the need for pre-deployment training to better prepare Army battle staffs on the use of emerging capabilities such as armed ISR aircraft as a fire support weapon system. The lack of training doctrine further limits the acceptance of those emergent capabilities and best practices to enhance large-scale ground combat operations training.

Additionally, it illustrates a systemic lack of recognition for this existing requirement to develop highly capable joint strike cell teams capable of executing lethal and non-lethal effects in real-time in declared theaters of active armed conflict and those outside declared theaters. Ultimately, producing battle staffs capable of conducting rapid target engagement in today's ever-changing environment where unmanned aerial systems and remotely piloted aircraft will play a significant role in winning the fight anytime, anywhere.

CW3 Herminio Rodriguez Jr. is currently an 82nd Airborne Division Targeting Officer. He previously served as an O-6 level fire support officer, special operations terminal attack controller, and Kinetic Strike Primary Instructor for a Joint Special Operations Task Force during five out of eight combat deployments executing kinetic strikes. He is a General MacArthur Leadership Award recipient and is transitioning into the innovation, research, and development career field.

MSG (P) Bryan H. Valentine is currently enrolled as a student in the Sergeants Major Academy Class 70 and on orders to report to the 10th Mountain Division Headquarters. He has served all positions from a forward observer radio telephone operator to a Division Fires Operations Sergeant Major. He has held additional duties as the 75th Ranger Regiment Special Operations Terminal Attack Controller Senior Enlisted Evaluator. He has deployed for a Joint Special Operations Task Force for 16 deployments in support of Operation Freedom's Sentinel and Operation Iraqi Freedom.

MAJ (Ret) Jonathan Burgess (USMC) was an Artilleryman by trade and retired after over 20 years of service. His last tour of duty was as the Marine Exchange Officer for the 75th Ranger Regiment. He was previously an instructor at Marine Aviation Weapons and Tactics Squadron One and has deployed in support of a Joint Special Operations Task Force as a collateral damage analyst.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Submit your articles to:

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Paratroopers from the 17th Fires Brigade participate in a joint forcible entry operation into Donnelly Training Area, Alaska, joining more that 250 Soldiers from the 4th Brigade Combat Team, 25th Infantry Division. (PFC Colton Eller/25th ID)

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