Field Artillery

Professional Bulletin

2020, Issue 1

Approved for public release; distribution is unlimited. Headquarters, Department of the Army. PB 6-20-1

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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: *3rd Battalion, 25th Aviation Regiment, 25th Combat Aviation Brigade "Hillclimbers" and 2nd Battalion, 11th Field Artillery Regiment, 2nd Infantry Brigade Combat Team, 25th Infantry Division, worked together to train on alternate sling load operations to transport AN/TPQ-50 counterforce radars with CH-47 Chinook helicopters. (SGT Sarah Sangster/U.S. Army)*

Correction: In the September-October 2019 United States Army Field Artillery Branch's Professional Publication for Redlegs, CW4 William Carter with the 5th Battlefield Coordination Detachment at Joint Base Pearl Harbor-Hickam, Hawaii, was not given proper credit for his article entitled, "Maximizing Joint Targeting Synergy within the USINDOPACOM AOR: How to gain and maintain proficiency in leveraging joint capabilities during Multi-Domain Operations (MDO) in order to win against a near-peer adversary in preparation for tomorrow's conflict."

Greetings from the land of Block House Signal Mountain!

Happy New Year! 2020 will be an exciting year for the Field Artillery Branch!

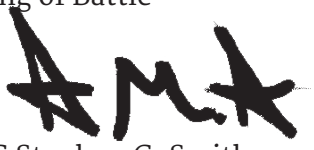
First and foremost, our capstone doctrine, FM 3-09 Fire Support and Field Artillery Operations, is in its final stages of revision. This doctrine is large-scale ground combat operations (LSGCO) focused and will drive our fire support (FS) and Field Artillery (FA) training, education and leader development for years to come. What's new or changed? This doctrine reinforces our culture of being Fire Supporters first. It restores the mission of the Field Artillery to "suppress, neutralize and destroy." It re-establishes the basic functions of fire support, and the importance of empowering the fire support coordinator at all echelons of command through theater level to best support the maneuver commander. It re-establishes the importance of the five requirements for accurate predicted fire and incorporates considerations for degraded operations. It establishes and defines the characteristics of fire support to violently apply lethal fires IAW the Law of War, always operate in the spirit of the offense and always operate as a single entity. It transitions the memory aide AWIFM-N (adequate fire support for committed units, weight to the main effort, immediately available fire support for the commander to influence the operation, facilitate future operations, maximum feasible centralized control) from a tool solely used to develop FA organization for combat to an acronym describing the Principles of FS execution. You may have noticed that we added a sixth letter …N, which stands for NEVER LEAVE ARTILLERY IN RESERVE! The publication of FM 3-09 is set for April 1, 2020.

In addition to multiple CTC and WFXs this year, our branch will participate in theater-level exercises in the United States Army Pacific and United States Army Europe which will undoubtedly provide lessons learned for the field, and also inform emerging operational and strategic FS concepts and doctrine. 2020 will also be a year of evolution for the Field Artillery branch as we implement Chief of Staff of the Army GEN James C. McConville's talent management initiatives. As Chief of the Field Artillery and the personnel proponent for our branch, I will enforce the CSA's number one priority – our people – we will get the right person in the right job at the right time resulting in a Field Artillery branch that is more committed than ever. We will perform better, our professionals will stay longer, and we will make our Army stronger.

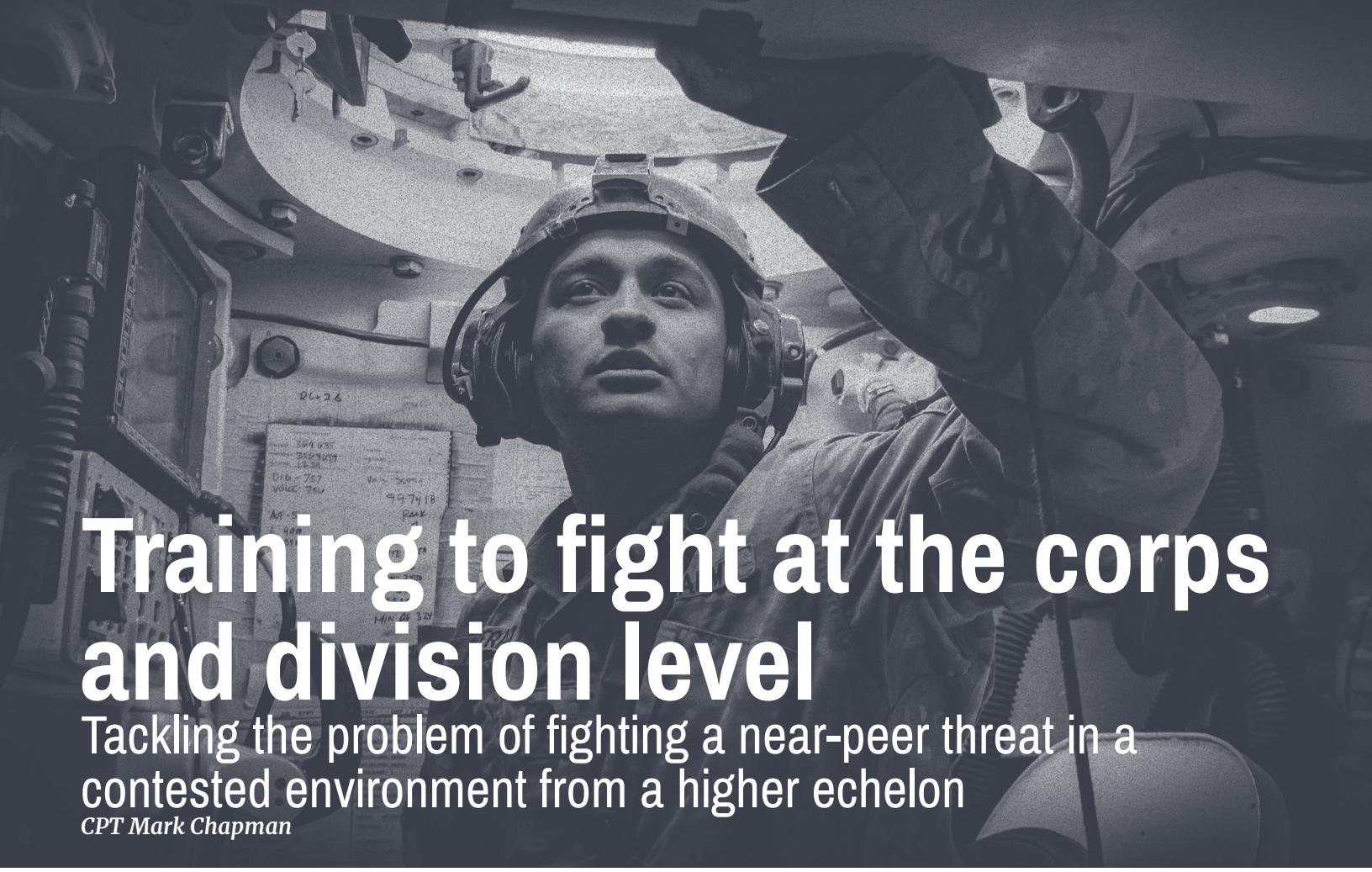
And as always, our deployed Artillerymen will continue to execute devastating fires against our enemies in support of maneuver commanders' tactical through strategic operations across the globe.

Lastly, thank you for the continued dialogue on all levels. Two-way dialogue is essential going forward, as we consolidate our gains and exploit our recent successes.

Keep Up the Fire!
King of Battle



BG Stephen G. Smith



Training to fight at the corps and division level

Tackling the problem of fighting a near-peer threat in a contested environment from a higher echelon

CPT Mark Chapman

SSG Jorge Almeraz, an M109A6 Paladin tank commander, prepares to receive a fire mission called by a U.S. Air Force F35 fighter pilot from the 59th Test and Evaluation Squadron during the Joint Strike Fighter Integration exercise, Nov. 7, at the Dona Ana Training Facility in New Mexico. (SSG Brandon Banzhaf, 24th Theater Public Affairs Support Element)

For the last 18 years, the United States and its allies have been embroiled in the Global War on Terror. A near-boundless war that has primarily taken the shape of counter insurgency operations (COIN) in the Middle East and Central Asia. Now, as the United States Department of Defense moves away from COIN and into a new era of Multi-Domain Operations, America and its partners must move away from training only up to the brigade level. In order to win a large-scale war in a multi-domain battlefield, America must be able to fight at the division or corps level, must be rapidly expeditionary, capable of fighting both jointly and as part of a coalition, and must have a robust logistical force capable of sustaining a prolonged fight. The need to train for this impending fight goes beyond the directives of the FM 3.0 Operations, and this article will highlight why it is critical to train for and win that fight. It will also articulate a solution for training to win that looming fight.

From Capitol Hill and combatant commanders to brigade and battalion commanders, there is a lot of talk about methods to tackle the new problems of the next fight. There is, however, little more than talk. This paper goes beyond a list of problems and offers as a solution, one way to address all four of these challenges. Mastering these four challenges will allow America and its allies to be successful in a multi-domain battlefield.

Russia's invasion of Ukraine in 2014 shocked many Western leaders. Their integration of both lethal and non-lethal Fires contributed significantly to their success. As such, it has been and continues to be studied with great vigor by the U.S. and its NATO partners because of the threat Russia poses. Caught blindsided by a renewed Russian threat, multiple Ukrainian brigades were destroyed. Perhaps more concerning was Russia's incursion into the Syrian civil war as this action showed two key things: Russia's ability to be expeditionary at the strategic level and their ability to set up a formable air defense system. The latter has driven the significant sales of surface-to-air missile platforms in that region and has become very concerning to Western leaders.

Russia's power projection along its borders and in the Middle East prove that they have not been idle in the past 18 years while NATO has been entangled in COIN operations. They have been quite the opposite, developing new technology and reversing the drastic cuts made by Boris Yeltsin in the 1990s. Vladimir Putin has made and continues to make great ef-

fort to modernize and bolster the strength of the Russian military.

Additionally, in the far East, there is another looming threat: China. It continues to improve its military across a broad spectrum including building multiple carrier groups for the navy, constructing new advanced land-based surface-to-surface and surface-to-ship missiles as well as increasing both its jamming and hacking capabilities. All of these pose a clear threat to both the regional and global status quo and emphasize President Xi's goal of making the People's Liberation Army a world-class fighting force by 2050.

Additionally, operating quietly, almost in the shadows of the world stage, China is buying, or negotiating for the use of ports around the globe. While its economic importance for the establishment of a Chinese trade route is paramount, the military aspect of this cannot be overlooked. Each port that China controls provides a logistical base of support for its military in a time of war.

It could be and perhaps should be argued that while over the past 18 years that the U.S.'s foreign policy has been focused on counter insurgency and global terrorism, Russia and China have moved from the status of a near-peer competitor to that of a peer adversary. Both continue to actively flex their military muscle in the forms of large training exercises, weapon sales and outright military incursions. While Russia seems to be focused on military actions, the importance of China's actions perpetrating their long-term strategic goals cannot be overlooked. The time for passive soft diplomacy has passed. America and its allies now must actively deter these potential peer adversaries from upsetting the status quo.

American military leaders at all levels are still fighting with some semblance of a COIN mentality, and in order to be successful in the next big fight, they must break away from their COIN hangover now. They must immediately transition their focus from a COIN environment to one against a major power peer threat. This starts with reading, understanding and internalizing, the Army's new FM 3.0. However, merely reading and discussing is not good enough. The American Army must implement the FM 3.0 into all levels of training. Now.

A method to accomplish this for the Army is by training to fight from the corps and division levels, training to be rapidly expeditionary, training joint integration or as part of a coalition, and straining the logistical capabilities of its forces.

During the 2019 Fires Conference at Fort Sill, senior leaders continuously harped on the point that the next substantial conflict would most likely start in an area where the United States and its allies were not expecting it to happen. This highlights two essential items: first, the U.S. military will be reactionary; and second, it must be expeditionary on a large scale. In order to win a large-scale conflict across multiple domains, the United States Army must build up its capacity to fight over vast tracts of land, sea and air, and be able to manage that fight from the division or corps level. In order to train this, the headquarters elements must train to be expeditionary and to fight a sustained fight. If America and her allies go to war with a peer competitor, they will not be able to win the fight at the brigade level. It will require a corps or division headquarters to manage the battlespace and to direct units. In order for America to dominate in the next conflict, the corps and division headquarter elements must be actively involved in training and preparing for this next fight.

This must go beyond the warfighter exercises that are currently being done. It is not enough to post corps and division staffs in air-conditioned buildings for 12-hour shifts while they move pieces around on a map or on a virtual battlefield. Exercises must bind the corps and division staffs to the field for extended periods and must be done in a variety of environments to include a chemical, biological, nuclear and radiological (CBRN) contested environment. If American forces are to be prepared for a large-scale armed confrontation, commanders and staffs at every echelon must get used to fighting, living and making decisions in an environment outside of forward operating bases, without tactical internet and with little sleep or information. There is no way to replicate the conditions of an austere or contested environment, without being in that environment. And as America looks to the next fight, it must train for the conditions that it will most likely find itself in.

This can be done in a variety of ways rotating the entire corps or division to combat training centers (CTCs) like the National Training Center or the Joint Readiness Training Center and fighting at a division level or by sending a corps to fight at the White Sands Missile Range against another corps can accomplish this. This idea is nothing new, the Louisiana Maneuvers of 1941, were designed to test the Army's ability to fight over a large area from a higher headquarters in preparation for a war in Europe or the Pacific.

Renewing this training will give America's senior leaders the repetitions that will build experience and ultimately allow them to be successful in a multi-domain operation against a peer competitor. In a fight where it is expected that America will lose entire battalions in sustained operations, it is not enough to simply certify its brigade combat teams. It must actively train its divisions and corps to continue to fight even with that type of loss. Logistically, this may mean cutting the number of rotations to the CTCs but making them longer and bigger. Instead of doing 10 brigade-level rotations to NTC per year, the Army could conduct six division-level exercises at White Sands Missile Range or training from NTC in the south to Twentynine Palms in the north. These exercises, though mainly

focused on training division staffs, could also act to certify the brigades.

Additionally, emergency deployment readiness exercises (EDREs) are another excellent way for the corps and division levels to prepare for this large-scale conflict. This is something that America has been doing at the brigade level and must now begin to flex its muscle through its division-level headquarters. Though it is a step in the right direction, brigade-level EDREs as part of Operation Atlantic Resolve or "surprise" rotations to the CTCs are not enough if we are to truly prepare for a conflict with a peer competitor.

EDREs accomplish two tasks; they test the readiness of a large unit to be deployed rapidly while also acting as a threat deterrence in whatever theater they deploy to. Deterrence is yet another reason that the United States must conduct EDRES at the division level as stated above, the next conflict will not be one which is fought or won at the brigade level. In order for it to indeed be a preventative measure, a potential adversary must see that the United States has the capability to rapidly mobilize its forces for conflict. By deploying an entire corps or divisions on an EDRE the United States sends a clear message that our forces at every echelon stand ready to deploy, something that will become paramount when the next conflict begins.

When the next conflict begins, it will stretch over vast tracts of land, sea and air. In order to maintain momentum in that environment, the American military must have a robust sustainment plan and forces that are trained and ready to exercise it. The only way to train this is to actively action it. This means deploying divisions by rail to CTC and or port, and training to sustain them in the field for extended periods. The first few times will be a significantly painful event. However, it is the only way to develop the muscle memory from the officer in charge at the port or railhead on up to the division commander that will allow us to rapidly project and sustain our power in a contested area.

The U.S. military as a whole must move away from their COIN hangover where dining facilities and USO lounges are par for the course. The military must train to feed, fuel and equip its fighting forces in austere environments, and it needs to happen now. The next fight, if it is a peer fight, will not be one with forward operating bases (FOBs) rather it will be a one with staggered front lines where corps and divisions need to be sustained and massive logistical packages must be pushed forward to the lines to sustain them. Because our potential adversaries have invested heavily in their anti-aircraft systems resupply will most likely be done via ground. This may mean a greater emphasis on prestaged sustainment packages that are rapidly accessible to the maneuver elements or a greater reliance on logistical trains keeping pace with maneuver elements. Victory in the next conflict may very well be decided by which force can sustain the fight the longest. America must now begin to focus its sustainers on being able to sustain multiple echelons simultaneously, moving away from the COIN hangover and the FOB mentality.

Much like the corps headquarters elements, a way to train sustainers and test or stress their ability is to practice at the CTCs or in the form of EDREs. Similar to the corps and division headquarters, no warfighter exercise will actively stress the capabilities of America's sustainment forces. By actively practicing the massive logistical movement that deploying and sustaining a corps or division requires and capturing the lessons learned, America's military will be able to train to a standard where they will be ready to sustain a protracted conflict over a vast landscape. It is something that must be done now, and something that must be practiced over a variety of different environments.

There is continuing talk at both the tactical and strategic level about fighting jointly and as part of a coalition against an adversary. However, outside of Europe and Korea, there has been little emphasis placed on fighting with our partners as part of a coalition. Additionally, there has been little to no partnership between the U.S. Army and other branches of our military, specifically the National Guard. This must change, and rapidly, in order for America to prepare for the next large-scale conflict. This is a problem that very many officers seem willing to address, yet we have seen very little action.

The American military is good at conducting training with like-minded countries. For the most part, NATO shares like systems, similar doctrine and a similar way of war. In order for America to prepare for a coalition fight, it needs to actively train to fight as part of the large multinational team. This must go beyond the scope of NATO. America must look at building partnerships with militaries that think differently or are in likely areas of potential conflict. For example, the Kuwaiti military is much smaller than the United States and is postured for defense only. Could the United States Army learn something from deploying a corps headquarters there to conduct a three-week training exercise with the Kuwaiti equivalent of a corps headquarters? In addition to a great training event, what message would it send to the rest of the world (particularly China) if the American Army deployed a divisional headquarters to the Socialist Republic of Vietnam for a training exercise? The American military must shift its focus from thinking that countries who do things differently are wrong and find ways to capitalize on their strengths and forge new partnerships in areas we have neglected in the past in order to prepare for the next fight.

The proposed multinational training must go beyond the tac-

tical level. To prepare for a conflict with a near-peer competitor, the United States military must focus on the operational and strategic levels of multinational training. In a near-peer fight, America may have the most significant percentage of ground forces. However, that does not mean that the other forces can be overlooked or discounted. The time to train with them is now. The time to conduct a large-scale exercise with the Japanese, the Australians and the Vietnamese is now, not when a conflict with China is imminent.

The importance of coalition training cannot be overlooked; it projects a powerful statement; one which says that America does not stand alone in its resolve. It is paramount for leaders at all levels to understand the importance of this; for a potential adversary, it is understood that if a conflict is started, it will be between multiple nations and much harder to fight. More importantly, it allows the United States to foster relationships in areas that we have perhaps overlooked in the past. The time to build and foster these relationships is now -- not in the face of impending conflict.

In addition to forging partnerships with forces abroad we must continue to build our interservice partnerships here at home. We must train our forces to fight jointly now. This is a point that is harped upon with robust rhetoric but is very rarely actioned. As a military, we must quit talking about it and actually action it. This starts with interservice integration at the tactical level and builds to the operational and strategic level. Training to fight jointly can be as simple as augmenting an Army light infantry battalion with a company of U.S. Marines who have light assault vehicles. For the infantry, they will be able to conduct training with a 25 mm chain gun, which is a powerful force multiplier, but the Marines will be able to showcase their capabilities for their Army brethren. Often at the CTCs, there are simulated aircraft that are shot down due to contested airspace. However, there are no Pararescuemen who are allocated to search for them. In a large near-peer conflict, the United States Army is not going to be able to flex a company to secure the crash site or pilot. We must train for that environment now, and that may look like sending an element or flight of Air Force personnel to train at the CTC with their Army counterparts.

Additionally, the active duty component of the Army must get better at incorporating National Guard and Reserve units during field problems at home stations and rotating them into training at the CTCs. By training together in simulated combat situations, the military as a whole will function better as cohesive understanding and trust between multiple echelons are built. It could be pointed out that while the training would benefit the units at the tactical level, the functions of different units would allow the commanders at the operational levels to think outside the box providing everyone with a valuable training event.

National Guard Soldiers bring to the table a wealth of skill sets from the civilian side, which are not usually found in an active duty military unit. These skill sets range from mechanical to medical and from carpentry to information technology. By integrating these skill sets into its forces during training, America stands to build a better force at the tactical level. These skills cannot be overlooked and must be fully leveraged if America is to be successful in their next war.

Currently, there is an overwhelming emphasis on the new concept of multi-domain operations. From the Joint Chiefs of Staff all the way down to the battalion level, units are preparing for the next large-scale confrontation between Russia or China. As of now, there has been much talk about the proposed problem sets. However, the problem set needs to be framed and solutions must be presented. This paper presents a solution. Now it must be understood that there are a lot of different ways to solve these problems and that there is a large pool of very highly intelligent Soldiers and civilians looking into ways to fix these problem sets. However, the fact that this paper formulates solutions for tackling these problems is what separates it from the rhetoric. This paper provides a way to tackle four vital aspects of a large complex multi- domain fight in which America will have to fight from the corps and division level with partners while sustaining that fight for an extended period. This paper provides a solution for the integration of U.S. forces both as part of interservice training and coalition training. The intent of this paper is not to undercut those who are working on these and similar problem sets, instead it serves to formulate discussion and stimulate thought on the problem sets listed above as we continue to train to fight a peer competitor.

One thing remains certain: China and Russia are continuing to make large bounds forward as peer adversaries, and rogue nations like Iran and North Korea are quickly trying to close the gap that stands between them and the West. With all that, it must be understood that the time for passive diplomacy is over, America and its allies must now actively deter this war from happening. In order to be preventive and to counter this aggression America must actively train its forces to fight from a corps or division-level headquarters, to fight jointly, and to be sustained as a means to prepare for potential conflict but also as a means to send a clear message to its potential enemies that the United States and its allies stand ready to rapidly deploy at every echelon.

CPT Mark Chapman recently graduated from the Field Artillery Captain's Career Course at Fort Sill, Okla. He is currently serving as the battalion fire direction officer with 5th Battalion, 25th Field Artillery at Fort Polk, La.

A Commander's Assessment

MG (retired) Richard Longo and LTC Jeff Schmidt

The decide, detect, deliver and assess (D3A) targeting methodology has served our joint force well since it became part of our doctrine, culture and lexicon. This framework is fundamental to ensuring the engagement of the right target with the right asset at the right time and has proved useful at every echelon of our military. The end result of the targeting process is a description of a target destroyed, a capability taken away, or a non-lethal effect that supports the maneuver commander's plan.

Having observed division and brigade targeting processes over the last five years during warfighter exercises, we can assure you that our commanders and staffs have progressed to a mastery level in targeting in the context of large-scale combat operations. There are small ways that units can continue to improve and that is what we would like to offer in this article.

According to our current doctrine, D3A consists of four functions: decide which targets to engage, detect the targets, deliver the appropriate effects and assess the effect of those engagements (ATP 3-60, Joint Targeting, para 2-5.) Assessment is focused on the intended outcome of an engagement and how it compares to the commander's vision and intent. These assessments should lead to a decision on the commander's part of whether to make an adjustment or continue with the current plan.

It is time to take a deeper look at assessment. Assessment should no longer be focused solely on the results of our engagements, but should also provide a reflective look at each stage of the process to give us a more informed view on the "why not" when we do not achieve the commander's intent. We suggest that the process should evolve into a decide-assess, detect-assess, deliver-assess, and non-intuitively, assessing our assessment.

When we do not achieve the desired result, we usually default to searching for a problem within the detect or deliver processes. It is more likely that the problem resides in the decide phase. If we make the right decisions during the decide phase, then detect, deliver and assess become execution battle drills - the decisions have already been made.

The first decision we must make is to determine which targets to attack. Doctrinally, we define these high payoff targets (HPTs) as enemy capabilities whose loss will significantly contribute to the success of the friendly course of action. Obviously this is tied to the maneuver scheme and these targets are best derived by full participation in the course of action development and analysis (wargame) phases of the military decision-making process.

This point warrants emphasis. The "decide" phase of the targeting process is not limited to the activity that takes place in the targeting working group or the target decision board. The decisions made must be completely nested with the decisions made in the military or rapid decision-making processes. The allocation of resources and targeting objectives must be embedded in the much larger scheme of maneuver and fires.

After determination of the HPTs and their assembly into a prioritized "list" (HPTL), we must decide our criteria for designation of a particular activity as a target. We call this our target selection standards

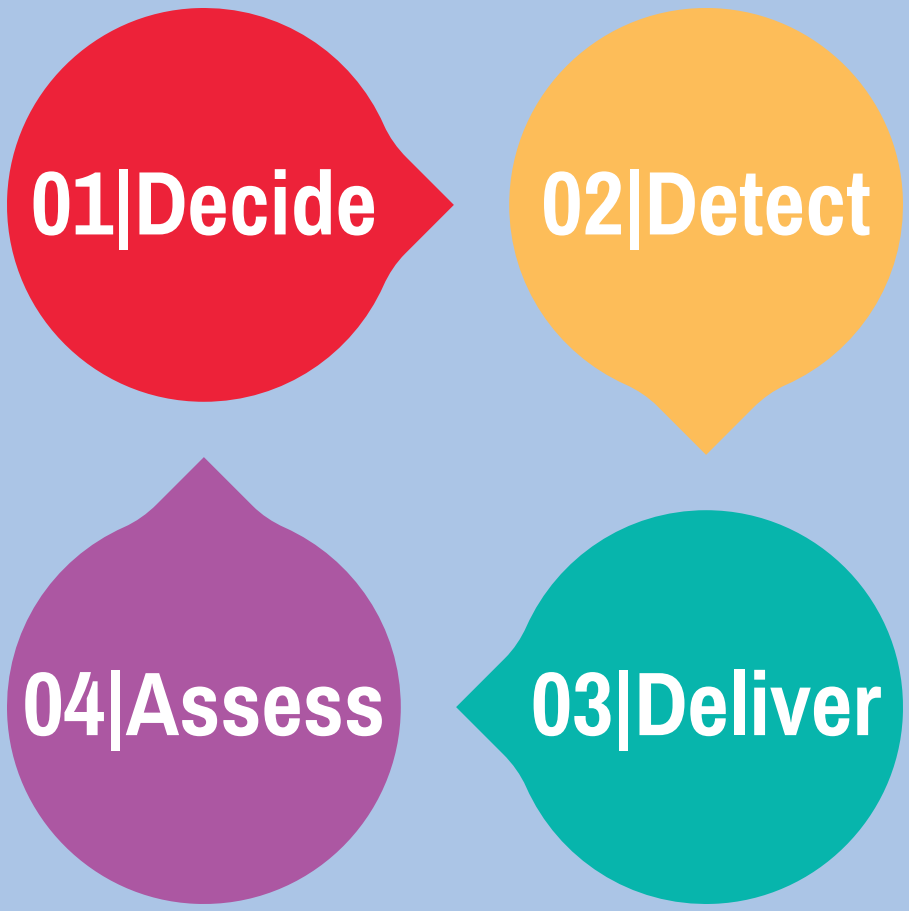


Figure 1. The decide, detect, deliver, and assess (D3A) methodology is used by the U.S. Army to enhance targeting capabilities. D3A is a methodology which optimizes the integration and synchronization of maneuver, fire support, intelligence, mission command, and information-related capabilities from task force to corps level operations. (Rick Paape/Information from ATP 3-60)

(TSS). Our targets must meet some accuracy and timeliness standard in order to qualify for attack.

Another key output of the decide phase is the attack guidance matrix (AGM). This is the process of determining how each target should be engaged in terms of desired effects from the available engagement options.

The final key output of the decide phase is the collection plan which ensures we have the right assets looking in the right places at the right time for both the detection and assessment of effects. This plan will ensure prioritized intelligence requirements are defined and tasked to the appropriate collection entity.

Assessment of decide

Assuming our overall assessment is that we did not achieve our desired effects, the first place we must look is at our decide phase. We can do this by asking a series of questions. Did we get the HPTL right? Are we trying to kill the things that are killing us? Are the entities on the HPTL detectable by resources available to us and "effect-able" by means at our disposal? Was our HPTL so all-encompassing that it did not provide useful prioritization guidance? Were our target selection standards sufficiently accurate and our timeliness standards, often described with dwell times, of appropriate length? Did our attack guidance matrix assign the right weapon system and adequate volume of fire to achieve the desired effect? Lethality is always a function of accuracy, timeliness and volume of fire. Did we meet those requirements?

It would seem sophomoric to have a discussion of assessment without at least discussing measures of performance (MOP) and measures of effectiveness (MOE). As we look at each element of D3A, we should deliberately consider the MOP that we need to achieve the effects, and then consider the MOE associated with the MOP. Often times, we see MOPs and MOEs developed independently of each other, when in reality, they should be considered as related and should be presented together to understand the relation between a means and the effect it will achieve.

To begin, especially in the decide phase, it is probably most important to start with the MOE. The MOE should be directly related to what we want the system we are attacking to do as a result of our attack. Do not confuse a MOE with battle damage assessment. A common target of divisions is the enemy integrat-

ed fires system. While destroying enemy gun tubes is admirable, the true effect trying to be achieved may be the reduction of the enemy's ability to engage friendly forces with their fire support capability at a critical time. While destroying enemy tubes achieves that effect, there are other means to achieve the same effect.

A good MOP at the division or higher level (where assets beyond organic surface fires are a significant contributor to the overall scheme of fires) might include the number of air interdiction missions, close air support missions, or other delivery means (to include cyber, electronic warfare, or other non-kinetic effects) and then tying those to the MOE we intend to achieve. By conducting this correlation, we can quickly identify which means are achieving the effects we want or need, and we can prioritize those methods appropriately.

Assessment of detect

The plan for the detection of an HPT should be produced during the decide phase. We must determine what we need to find, where and when we need to look and what redundant systems must be leveraged. What we frequently see during division warfighter exercises is the collection team executes the same plan day after day, but does not find the HPT. Unfortunately, by not conducting an analysis of our efforts, we will fail to learn what we need to do differently.

We should try to answer the following questions. Were we looking in the right place? Did the intelligence analysis narrow the search area to the right location? Did we execute our collection plan? Did we execute the collection that was within our control? Did we leverage the collection capability of resources that were not under our direct control? Did we assign collection assets that were capable of finding what we were searching for? Did we consider the impact of weather in our collection plan and build in the necessary redundancy?

We can once again use a MOP and MOE correlation to identify some of the answers to these questions and provide valuable analysis to the commander as he or she decides what assets to allocate to detecting targets. MOP for detection might include number of hours of airborne surveillance or reconnaissance, while MOE might include the number of HPTs acquired within certain named areas of interest, or by certain collection platforms.

Assessment of delivery

Again, when we do not achieve our desired effects, the next place to look is at the delivery phase of the targeting process. Our plan for delivery was also determined during the decide phase, mostly with the development of the HPTL, AGM and TSS. The following questions will enable our attempt to see ourselves. First, did we execute our plan? Did we follow the AGM? Did we get the AGM right? Did we assign the right weapon system or munition to an effect? Did we leverage joint fires and were they made available? Did we have a redundant engagement plan to account for degradation in our own ability based on weather or attrition? A frequent reason for ineffectiveness is inadequate volumes of fire. In a constrained ammunition environment, we often sacrifice volume of fire on a specific fire mission to enable more missions over time. This degradation of volume invariably leads to inadequate effects. Our own calculus says it is better to destroy an HPT you find today, then save ammunition for targets you may not find tomorrow.

Assessment of assess

It may appear redundant and "nonsensical" to assess an assessment, but what we are describing here is taking a look at our process. When we determine that we did not achieve the commander's desired effects, we must also take a look at our assessment process. During most warfighter exercises, the training audience does achieve the desired effect but does not realize it, thus squandering both resources and opportunities.

This assessment plan is developed during the decide phase and executed either concurrently with delivery or some time afterward. By taking a similar approach to assessing the detect step of D3A, we should analyze through MOPs and MOEs the effectiveness of the assets we dedicated or allocated to the post-strike assessment effort. There are several questions that need to be asked when reflecting on our assessment process. Did we execute our assessment plan? Were we looking in the right place for the right indicators? Often, assessment resources are diverted to a "more" pressing collection requirement. Who has the authority to approve diversion of collection assets and under what conditions? If we did execute our plan, did we leverage the right collectors to conduct our assessment? Did we streamline the intra-command post process for collection and analysis of effects? Did we define one agency within our headquarters as responsible for collection and analysis? Did we trust predictive analysis provided by our force Field Artillery headquarters that is generally reliable? Did we take advantage of resources that we do not own, for example, pilot reports available from the air operations centers?

Conclusion

The decide-detect-deliver-assess targeting methodology is a proven and battle tested construct for aligning resources with targets in all operational environments and echelons of command. In order for it to continue to serve us in large-scale operations against peer and near-peer enemies, we must make small refinements. It is time for us to expand our understanding of assessment to go beyond "Did

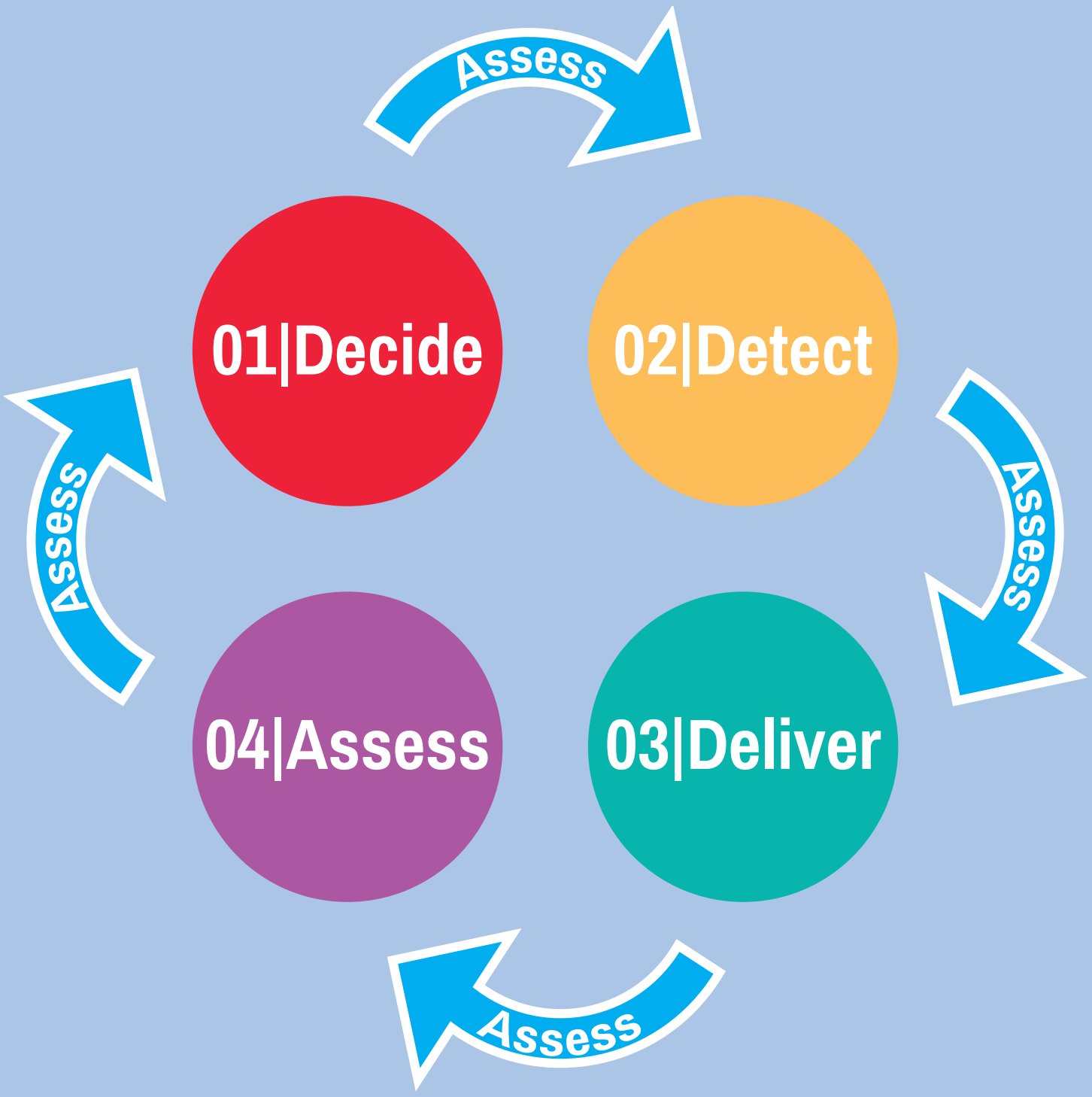


Figure 2. The modified decide, detect, deliver, and assess (D3A) methodology cycle which adds an assessment between each phase of the cycle. (Rick Paape/Courtesy information)

we achieve the desired effects?" and use it to help us understand the "why" when we don't achieve those effects. By using the ideas and suggested questions in this article, and adding more as we learn more, we can make in-stride corrections and dynamic adjustments that will contribute to improved targeting support to maneuver operations.

MG (retired) Richard Longo currently serves in the Mission Command Training Program as the division fires and division artillery senior mentor. His conclusions are his own but are informed by multiple discussions with fellow senior mentors, MCTP observer-coach-trainers and division artillery commanders throughout the force.

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The new 8 and you

LTC Aaron D. Bright

In the latest update to the TC 3-09.8, Fire Support and Field Artillery Certification and Qualification, battalions must execute Artillery Tables (AT) I-XVIII once a year in any order that makes sense for them, with the exception of AT VI being semiannually. Though the number of iterations has nearly halved, the total number of rounds for the year has not changed, allowing units to double the volume of their individual fire missions. What follows is the explanation into the thinking behind this shift in how we train, certify and qualify at echelon.

Imagine, if you will, you're the battalion executive officer of an American artillery battalion in the not-too-distant future, heading East between Minsk and Orsha, Belarus, when you hear the familiar voice of your battalion commander (who's with the brigade commander) come over the radio. He tells you that one of the Infantry battalions has a large enemy formation approaching one of its forward companies, about 10ks out from its position. Your brothers in arms have no choice but to stand their ground and the situation is further complicated by the fact that anything that flies lately, doesn't stay in the air for long. Your commander relays a grid to you

(SSG Elizabeth Tarr/U.S. Army Europe)

and tells you he needs a "Battalion 30, open sheaf on it in exactly five minutes." Could your battalion do it? How do you know?

Up front I feel have to tell you, the reader, that I am currently at the helm of the Operational Training Division within DOTD here in Fort Sill as its chief. For those that are unaware of what that is, fear not, neither did I before assuming this role following battalion command. The part of my job that concerns this article is that I oversee the changes made to TC 3-09.8, the manual we use in gunnery to tell us what the artillery tables are, what they do, and what makes someone certified or qualified on their given artillery platform and/or skill set. I also have a good deal to do with Standards in Training Commission (STRAC), which I'll get into later.

A few months ago I sent out an email to several recently former and current Field Artillery battalion commanders from all walks -- MLRS, HIMARS, Paladin, M119, M777, mixed, and our brothers training in 1st Army. I was looking for several things, but mainly I wanted to hear their opinions as to why they thought the tables were important, or for that matter, even necessary. I got replies over the course of a week from 20 of them; 18 stated (in one way or another) that all tables need to remain, one was on the fence, and one said that we don't need the tables anymore. Admittedly, there was a bit more to the email than what I've stated above, but this is enough for our purpose here.

Going back to the scenario under the intro, professionals in the field of indirect fire have stood witness to this problem and several similar to it hundreds of thousands of times across nations, wars and decades. Most of us can remember our social studies teachers telling us that "history repeats itself," but that phrase fails to convey the truth, which is actually that "history rhymes," an important distinction in this. The events and experiences that occur over time can indeed be very similar, but never exactly the same. The situation I described will most likely happen again, just in a different place, against a different enemy, with different weapons, and in a different climate with different minds to direct its violence. In this, I think we as a community are all saying the same thing. We need to know how to do "the old stuff" while not losing sight of, and applying what we've learned along the way. If you want a new idea, open an old book.

What we saw clearly in the course of this update is the need to value our (the branch's) inability to mass fire over our perceived inability to shoot Tables XII-XVIII. I write this because there has been a prevailing belief that getting through the collective artillery tables in many circumstances can be highly improbable, if not impossible. Most active units I've communicated with since getting my feet under this desk tell me that they actually can and do get themselves to AT XVIII, though twice can be a struggle, hence my earlier use of the word "perceived." Many, in fact, are calling for more ammunition. We believe that what the schoolhouse should be doing is helping those that can't get there, but not through allowing units to ascribe their own standard in a completely hands-off approach. By placing our attention into those areas where we can "help them help themselves," we found a better balance.

The easiest way for me to convey much of why we did what we did is to put your mind's eye in a place where you can see the rationale happening for yourself. These, of course are not the only reasons, just ones I plucked from my imagination to help describe each main aspect from the introductory paragraph a little better. So if you'll indulge me:

You "must" shoot all the tables

Pretend you command a Paladin battalion. If you were to read in the .8 that you "should" shoot this or that, you would surmise we've just given you a wider left and right limit to get done what you think should be done for your battalion and situation. After all, you surely know both of them best. However, the fallout comes (out of view from you) when every other branch within your brigade combat team (BCT) has a gunnery manual that reads "must" where yours says "should." Now imagine yourself as a BCT staff officer that's working with division on priorities for who gets what for training. Does the unit that "must" get it done go to the top of the list, or does the one that "should?" If you're a BCT commander and when you have to make sacrifices in training here or there, do you find it in the unit that has a requirement that "must" be met, or in the one that "should" be met? More than likely, that BCT commander is not an artilleryman, and like it or not, will lean toward what's familiar. Words matter, and this word doesn't restrain you, it gives you power. Much like a fire support coordination line, you only think it's restrictive, when it's actually permissive.

Double the rounds for fire missions

Imagine you're a gun chief, watching your rather skinny, 18-year old, number one man do his job. You've witnessed him almost drop the near 100 pound round during loading on more than one occasion, but he's always able to get the job done with the one-to-five-round fire missions you routinely fire. Annoyingly, you're almost always last to be "rounds complete," but he's working on it with your help. You've always wondered how he would do with a 10-round mission or higher, but the way things are, you'd really never know. You also have concerns on how well your gun would hold up under the stress of such a higher-volume mission. You question whether you, yourself, could remember what changes

with your procedures when your tube temp gets to a degree you, (or it) really haven't seen in a long time; maybe ever. You shrug it off and figure that you'll just have a look in the book later (which never happens) or you figure that you'll just wait to do things like that in combat. No need in practicing it now, there's more important work to do. Train as you fight and fight as you trained. I think we can all agree that war is not the ideal place to become self-aware and recognize you don't actually know how to do your job properly. Is it, for instance, important to know at what temperature the high explosives (HEs) starts to melt and exude its way out through the fuze threads, and into your gun tube after a short amount of time loaded? Can you guess what happens to your tube when you fire that round with enough melted HE in front of it? Hint: it's not good.

No need to shoot the tables in order

You're the S3 of an MLRS battalion, about to go into a Table XV live fire, but there's a problem. One of the platoons (let's just say for an unforeseen reason) suddenly now has a new platoon leader and platoon sergeant, officially making that platoon unqualified to shoot a battery AT XV. Now, you have to expend precious rockets you didn't account for having to shoot. Like a good S3 you'll find some way to get more reduced range practice rockets (RRPRs), but there will be a consequence somewhere down the road. You say to yourself, "if only the .8 would allow us to shoot in whatever order we needed to, and allowed us to underwrite such a simple risk. We could actually qualify the platoon with the same rockets they fire for AT XV." The tables are no longer "gates" through which one must pass in order to enter the next. If you need to skip from one to another, for whatever reason, and you're comfortable with it, someone may stop you, but it will not be the .8.

These three scenarios convey the heart of our thinking. One thing you may still be asking yourself is, "Why did we halve the number of times that you get to undertake AT VII-XVIII annually, in order to double the rounds?" Why not just tell the Army we need to double the rounds and keep all the iterations? Contrary to popular belief, artillery training ammunition is not at the top of the Pentagon's spending priorities. That would be modernization, and something has to pay for that. It's a hefty bill, and coincidently, so is artillery training ammunition. You can probably guess what looks like the proverbial low-hanging fruit to the budgeteers, and why we start on the back foot in any such argument. When we go to the big ammo meeting in the sky (actually called the Army Munitions Requirements Council of Colonels) each branch has to convince a very tough panel of colonels, and headquarters DA civilians, all informed by their respective general officers, on why their branch needs more or less rounds for training. (Less is easy, more is not!) If you want more, invariably the first question that arises is, "how much did your units shoot last year?" If the answer is anything shy of 100 percent of what you asked for the last time you were in front of that panel, you have some explaining to do. Imagine if you received a task that required 10 Soldiers so you sent 10. They come back and tell you only five did anything. Next week you get that very same tasking but this time it's for 20 Soldiers. The reaction is the same. It's not easy to explain why they should grant you more if you can't even shoot what you asked for last time. It's a fair question. Maybe we had units deployed, or units on an extended red cycle, those situations are rather easy to explain (but not always easy to excuse, believe it or not.) But do not worry, that's not really the problem. I know that a lot of units do, in fact, shoot over 100 percent of their STRAC and some come close, but for a myriad of reasons just cannot get there. Yet again, that doesn't matter either. The part that actually matters is whether any given shooting unit put their expenditures in the Total Ammunition Management Information System (TAMIS), or not. That panel does not care what you show or what proof you have that you shot all your rounds. Even if you did, if it is not reflected in the system of record that is TAMIS, then it didn't happen. That, my friends, is where the problem lies. I've recently read two white papers attesting to the need for a vast increase in training rounds. Both of them make fantastic arguments and neither of them matter because some of us are grossly deficient at reporting our expended rounds in TAMIS and that's bringing our overall percentage down. It really is just that simple. If you truly want to be part of the solution to getting more rounds in training, the first step is to stop being part of the problem.

When we were faced with the question of, on which echelon do we place the emphasis of training, there were good arguments for two directions. We could go with ensuring proficiency at "blocking and tackling" and concentrate on the section level, or we could help units find a way to get to a higher proficiency up to, and at the battalion level. For the former, we went so far as to consider stripping the .8 of everything above AT VI, but opted instead to go in the latter direction for several reasons. Above all, what we sought to avoid was portraying a confused narrative on what it is we want. If we proclaim in all our latest professional publications that we desire more rigor, than we need to give units the opportunity to do so. That same narrative preaches the need to prepare for large-scale combat operations (LSCO) and to get back to fighting as battalions, not as sections on patrol bases. It implores us to once again be experts in massing fires before the impending war scenario of facing a near-peer, or dare I say a superior force, arrives. There is already enough confusion in our ranks

with people talking about getting back to basics. Yes, we must get back to the basics, but firing a cannon is only one "basic" task when it comes to the role we fulfill on the battlefield. A platoon leader conducting a reconnaissance, a battery occupying a tactical area, a battalion conducting a rehearsal, and setting up a battery operations center are all basic fundamentals as well, and all are beyond AT VI. I think anyone would have a great deal of trouble arguing that erasing AT VII-XVIII would make our battalions more lethal in LSCO given all the other "basics" to which we would not be holding our battalions accountable.

All that said, I really haven't answered the real question; that of what do we actually gain from shooting these higher tables? Is it not enough to assume that if our crews can shoot alone, they can also shoot together? No. It's not near enough. Barring a CTC rotation, executing tables XVII and XVIII, for instance, are the only opportunities the battalion staff and the brigade fire support element (FSE) (for BCT FA battalions) have to exercise planning and current ops, simultaneously. More to the point, it's arguably one of the best events for the battalion staff to do things like make recommendations to their commander, see gaps that only execution manifests, alter the plan, and learn how to reframe logistic needs on the fly.

You may not think that maintaining these essential tables was really that big of a question, but allow me to relate this story. A little more than a year ago, at a DA headquarters level meeting on STRAC, the representative of the Maneuver Center of Excellence asked the question to the artillery, "Why are you shooting anything over Table VI, we didn't ask you to do that and we don't need it?" By this point in the article, I hope you realize how ridiculous (and pretentious) that sounds. The problem is, that kind of logic seemed reasonable to most everyone else in the room except the artillerymen, and only served to further separate them from the group. We need to wake up to the fact that there are still several maneuverists out there in places of authority that see artillery units as training aids to their "real" units, and not as the historically biggest killers on the battlefield that we are. Our units are, in fact, a part of the training audience and some may need convincing on what we see as fairly common sense. If you want to stump them, ask your maneuver friends if they would rather go against an enemy whose artillery community live-fired only at the section level, or against one that fired up to the battalion level.

The newest .8 holds battalions to a standard for which they are accountable to their Soldiers for their training, and their bosses for the support they provide them in combat. It gives those same commanders a deadline to meet, which will be attainable in most cases and more realistic with wars of the near future versus the near past. It forces a dialogue between commanders to chart a path to qualification that is less dependent on personnel turnover and more on common sense. Our battalion commanders need the ability to show their BCT commanders that their unit is qualified to do its job.

There is arguably nothing more important to a brigade commander than knowing that his battalions, whatever their role, can do what they say they can do. Had we gone with section level as the ceiling, we would not be arming our FA commanders with a decent argument to train to a level that prepares their formation to fight across the Eurasian Steppe, or wherever else bad guys may bring them. We have a problem with an inability to mass fires in the U.S. Army Field Artillery from years of forward operating base life, and our answer to fix it should be geared towards having a battalion staff work as a team to get off a fire mission like the one mentioned under the intro. It will take the whole team, not just the gun or launcher sections, and to think otherwise is simply myopic.

Unfortunately, I'm quite sure there will be at least one maneuver officer that takes exception to the light in which I cast him. First off, to that individual, good on you for reading the "Field Artillery Professional Bulletin", you might be the only one. Second, you are correct in your assessment: I have indeed stated outright that some of your compatriots have grievously wounded the FA branch with their lack of understanding and/or thoughts outside of themselves. What I do not wish to do is imply that this is all-encompassing. I have been highly impressed with the vast majority of Infantry or Armor officers I've come in contact with in my career. What I do wish to imply (which I suppose I'm now specifying) is that I would like for you to prove me wrong, and be the maneuver commander that sees the importance of artillery in conflicts to come and then acts on it; placing a premium on indirect fire training. The King is there to keep the Queen safe. It's not a training distractor, it's meant to save your Soldiers' lives; all of them. I would ask you not deny them that.

Though our changes to the TC 3-09.8 are not exactly a revolution in military affairs, they are something concrete instead of just talk to help put our branch on a path to readying itself for LSCO. Though the training iterations are less, those that remain are more substantial, can be conducted more thoroughly, are aligned with future warfare, and will be more efficient at training those aspects of gunnery we have been without for far too long.

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Back to the Future?

Limiting Factors and Proposed Course of Action to Increase the Effectiveness of Field Artillery in Multi-Domain Operations

CPT Corey Hill

The 2nd Infantry Division Artillery recently conducted their first series of exercises as the Multi-Domain Task Force (MDTF) at Joint Base Lewis-McChord and in Australia. During these exercises, 2nd Infantry Division DIVARTY and the newly minted Intelligence, Information, Cyber, Electronic Warfare, and Space Detachment coordinated and executed lethal and non-lethal fires across multiple domains of a simulated joint operations area (JOA). During Pacific Sentry 19-3 (PS 19-3), a U.S. Army Pacific driven scenario based in the U.S. Indo-Pacific Command geographic area, several questions and concerns were brought up regarding the use and deconfliction of lethal and non-lethal fires. Exercise Talisman Saber 19 (TS19), a multinational exercise wherein the MDTF was operational control to the Australian 1st Division, which served as the Combined Joint Task Force (CJTF), prompted similar concerns. Of note, these exercises brought light to two distinct limiting factors currently affecting the MDTF; the first is a modified table of organization and equipment (MTOE) limitation of mission command equipment, while the second factor is an outdated institutional education system that is due for a revival to accommodate Multi-Domain Operations (MDO).

The first limiting factor, represented by the current MTOE allotted to a High Mobility Artillery Rocket System (HIMARS) battalion, lies in the inability for MDTF units to execute adequate distributed command and control (C2) with current equipment. Due to the geographic nature of the INDOPACOM region, typical schemes of maneuver involve "island-hopping" tactics, requiring the MDTF and subordinate HIMARS units to be able to maintain mission command across hundreds of kilometers. This limiting factor can be mitigated by exploring additional communication platform options that would facilitate expansion of the MDTFs mission command abilities.

During Pacific Sentry 19-3 (PS 19-3), a U.S. Army Pacific driven scenario based in the U.S. Indo-Pacific Command geographic area, several questions and concerns were brought up regarding the use and deconfliction of lethal and non-lethal fires.

Some of these options include platforms to allow access to Upper Tactical Internet as well as the proliferation of satellite communications/high frequency (SATCOM/HF) communications. The second limiting factor presented by PS 19-3 and TS19 was the lack of non-lethal planning and discussion currently taking place in Field Artillery institutional education. This limitation presented itself when the MDTF was tasked with conducting a strike against a simulated enemy Integrated Air Defense System (IADS) threat. This limiting factor can be mitigated through a renaissance-style revival in the material being taught during institutional education such as the Field Artillery Captains Career Course (FACCC). This revival primarily accounts for refining the aesthetics and use of such products as the Fire Support Execution Matrix (FSEM), Field Artillery Execution Matrix, and combined High Payoff Target List- Attack Guidance Matrix-Target Selection Standards to account for MDO.

Discovering the first limiting factor was the result of a seemingly simple question, "How would we (the MDTF) talk to our subordinate HIMARS battalion?" A seemingly direct question at first glance, the PS 19-3 scenario offered additional challenges with the HIMARS battalion located hundreds of kilometers away from the MDTF headquarters (HQ) on a separate island. How-

ever, this situation is not unique to the PS 19-3 scenario as a similar style of fighting is prevalent throughout much of the INDOPACOM JOA. This scenario, coupled with the Electronic Warfare (EW) effects that near-peer adversaries would likely use, presented a rather unique problem set to such a simple question. Ultimately, the best option available to replicate a solution for the MDTF was to enable assets like retransmission Unmanned Aerial Vehicle and other EW assets available to the MDTF. Later, this problem set was given further credence when 2nd ID DIVARTY, as the MDTF HQ, was tasked with conducting a similar mission set as part of TS19. Despite the TS19 mission being relatively straightforward, the problem set of balancing C2 with our communications limiting factor made planning far more challenging again.

While highlighted during PS 19-3 and TS19, the problem set of such extreme distributed C2 is not exclusive to the INDOPACOM area. Due to the expanding reach of communication platforms, C2 is and will continue to grow extremely distributed to increase survivability. Current doctrine for HIMARS units in ATP 3-09.60 MLRS and HIMARS Operations explicitly states that the optimal method for MLRS/HIMARS to improve survivability is through distributed emplacement and "shoot-and-scoot" tactics to avoid enemy detection and counterfire threats. Despite the distributed nature of HIMARS operations, the MDTF still has a critical need to communicate to these subordinate units spread across a massive geographic area to be able to coordinate and mass lethal fires; this is particularly vital as the MDTF's targeting scope is quickly encompassing more sea-based targets that require multiple rounds per engagement to overcome future enemy defense capabilities. This combination of geographic separation, distributed C2 and survivability tactics, techniques and procedures necessitate a change in available equipment to enable the MDTF's ability to C2 subordinates.

While the current systems in use are generally lacking for HIMARS units, there are multiple options available to mitigate this limiting factor that are currently in use with Field Artillery units and across the Army.

The current communications plan for a standard HIMARS battalion currently revolves around the advanced system improvement program radio, generally 1523E/F variants with the only long-range system from battalion to battery level being limited to an AN/PRC-150C HF radio and/or the JCR platforms. In this, it is evident that the present beyond-line-of-sight (BLOS) communication PACE plan (an order of precedence list based on primary, alternate, contingency, and emergency communication) is severely lacking. The Harris HF capability currently relies heavily on having exceptional spectrum managers that can assign frequency's compatible with the atmospheric density at any given time to actually make HF operable. Additionally, the lack of emphasis in training cycles also generally require a time-intensive refresher to ensure operators understand how to set up and operate the equipment (an easy fix, but a point of friction nonetheless).

While the current systems in use are generally lacking for HIMARS units, there are multiple options available to mitigate this limiting factor that are currently in use with Field Artillery units and across the Army. Among these options are the Soldier Network Extension (SNE) system, the SIPR/NIPR Access Point (SNAP) terminals, and finally the AN/PRC-117F SATCOM radios. With these recommended options, the future PACE plan for the technical and tactical fire direction of an MDTF HQ to a HIMARS battalion would be- P: LAN, A: SATCOM, C: HF, and E: JCR (given proper equipment, it is reasonable to assume that the Operational Command Net information would ultimately share a similar PACE plan). Although a BLOS communication plan currently exists in a minimal fashion, a bolstered infrastructure is vital as it allows the MDTF units to build a comprehensive PACE plan to communicate through multiple channels. With these changes, the MDTF would no longer be solely reliant on radio communications but would be able to branch out into other realms of communication. It is important to note that currently, these changes would only apply to those HIMARS battalions being utilized as part of an assigned MDTF.

The first option is equipping battalion tactical operations centers (TOCs), battery

operations centers (BOCs), and platoon operations centers (POCs) with SNE platforms to facilitate SIPR and NIPR access in remote locations. The Army at large currently has this platform available and it is frequently used to facilitate mission command in distributed areas of operations. The benefit of using such a system is the ability to maintain mobile connectivity to SIPR and NIPR access, enabling systems such as Transverse/mIRC chat as well as voice over internet protocol (VoIP) phones. The disadvantage relies on enemy abilities to conduct targeting by using electromagnetic means. The SNE platform inevitably gives off a distinct signature that would likely be able to be targeted by enemy electronic surveillance assets. Given the propensity for leadership to maintain these systems, this capability has the potential for units to have their C2 nodes destroyed by enemy long-range artillery (LRA). This disadvantage is solely mitigated by ensuring the leadership can stay mobile or out of range of enemy LRA assets.

The second option is to equip all MDTF HIMARS echelons with SNAP terminals. The SNAP terminal generally consists of just a small tough box with a deployable satellite dish, akin to a personal sized Joint Network Node satellite. In addition to being small and easily deployable, these systems have shown great promise being used by HIMARS units in the CENTCOM area of responsibility over the past several years. In short, this system ultimately gives the same capabilities offered through the SNE system. With that, units would again be presented with an additional layer to incorporate into a PACE plan. However, one of the drawbacks to using this system is that it can only be employed in a stationary environment. This would make employment challenging for POCs and BOCs trying to remain mobile and avoid the counterfire threat. Conversely, due to the limited bandwidth the SNAP terminal is capable of supporting, it is really only feasible to use at a POC or BOC. Despite these difficulties, the benefits gained in the SNAP still outweigh the limitations presented by the system, especially when used in conjunction with MDTF electronic protection assets such as the Biometrics Automated Toolset System-12 platform. This would ultimately negate the concern of being targeted for counterfire in the cyber-electromagnetic activities (CEMA) realm.

The last viable option is for MDTF HIMARS units to be outfitted with AN/PRC-117F SATCOM radios at each echelon in addition to the Harris HF radios that are already in the HIMARS MTOE. While not providing as wide of a capability as the previous two options, the SATCOM radio would allow for BLOS fire mission processing and communication in a more efficient manner than HF radios currently allow. In short, HF only offers communication to be sent one way at a given time, whereas SATCOM can facilitate digital communication in both directions. Here, the SATCOM capability is generally considered more "user-friendly" insomuch as it does not rely as heavily on the band structure of HF to work with the air density in order to make BLOS communication possible. The primary disadvantage to this system, especially when compared to HF, is that it typically relies again on a stationary unit being able to set up the antenna correctly. Conversely, HF is technically capable of being used on the move, similar to standard FM radio use. However, much like the SNAP terminal, this option's limitations are capable of being mitigated through other MDTF capabilities such as electronic protection. Furthermore, a likely limitation is presented in the allocation of available nets; the general rule of thumb is that more available satellites correspond to more nets available for transmission. The limitation presented relies on understanding the overall situation, in that the MDO fight will likely be heavily reliant already on satellite communications. If this proves true, the expectation is that satellite allocation will be tight at best, limiting the overall effectiveness of the SATCOM transmission. These limitations highlight the SATCOMs position as an emergency option for C2.

A second limiting factor was identified when the MDTF was tasked in multiple exercises to "penetrate an enemy IADS bubble" within the JOA. Unfortunately, the MDTF could not execute this mission as a standard Suppression of Enemy Air Defense

This sync matrix was an easy product to read and digest as an artilleryman solely because it was nearly identical to a FSEM, a product that is taught and utilized at the U.S. Army Field Artillery School (USAFAS).

It is critical that students begin understanding how multiple uses of a particular non-lethal effect will ultimately degrade its effectiveness with consistent use.

mission because such missions do not account for an integrated anti-access/area denial system. This system accounts for a variety of other systems beyond the single system capable of attacking friendly aircraft; targeting an IADS network includes examining nodal vulnerabilities across CEMA and other non-lethal realms in addition to the familiar lethal fires aspects. It is these factors that effectively mutate an enemy air defense platform into an actual integrated system, making it vital to effectively target and strike.

After multiple planning sessions and product development, a visual tool was presented as a synchronization matrix coupled with an execution checklist, aligning fires and effects in time and space. This sync matrix was an easy product to read and digest as an artilleryman solely because it was nearly identical to a FSEM, a product that is taught and utilized at the U.S. Army Field Artillery School (USAFAS). The only difference in the product developed by the MDTF was that it accounted for joint component and non-lethal platforms and weapon systems to further facilitate engagement of the assigned target set. While the FSEM itself is capable of doing this task, it is generally underutilized simply because junior officers are not exposed to the level of detail required to incorporate non-lethal effects on the battlefield. This underutilization also implies that many junior officers have a limited understanding of how to effectively execute a battle using the FSEM based on knowledge and/or past experiences. Though serendipitous, this revelation also highlighted a limiting factor in the artillery community's institutional educational plan. While we as an artillery community are adept at teaching the nuances of lethal (particularly cannon) fires, the incorporation of non-lethal fires and effects is currently lacking.

Current FACCC memorandum of instruction (MOI) takes junior captains through a gamut of scenarios that allow them to execute the military decision making process (MDMP) from the perspective of maneuver and artillery units. However, the current curriculum fails to account for the integration of non-lethal effects to achieve desired end states. For the first repetitions, these scenarios are useful to get artillery leaders ready for battalion-level planning and to re-acquaint them with such products as a Field Artillery Support Plan and FSEM. As the scenarios develop and become more complicated, however, there is a noticeable lack in the discussion or integration of utilizing non-lethal effects outside of anything more than smoke screens. Moreover, these officers are not exposed to the various platforms and capabilities that could potentially be at their disposal with the implementation of the MDTF across other commands. This leaves artillery officers facing a steep learning curve once these assets become available to them in operational units, creating a distinct limiting factor as Fire Supporters. For the future artilleryman to continue to meet the commander's intent across all domains, it is imperative that students begin learning how to implement and synchronize both lethal and non-lethal effects in time and space.

It is imperative that USAFAS begin incorporating non-lethal fires and effects into MDMP scenarios for FACCC students to plan. Furthermore, as the MDO concept and access to electronic warfare assets expand, it would be equally wise to begin offering these options to Basic Officer Leader's Course students in their introductory scenarios as well. While the scenarios can be built for elementary applications and grow in time, the simple act of incorporating these effects into planning products and timelines will undoubtedly serve to broaden the mindset of budding and seasoned Fire Supporters alike. This incorporation will both revive the application of doctrinal products to facilitate greater synchronization and reinforce the utilization of products such as the FSEM to be used in more settings than just lethal fires planning. With the capabilities at their disposal, artillery officers need to begin understanding how non-lethal effects are both utilized and implemented in time and space. The cost to incorporate these options comes at the expense of schoolhouse timelines; in order to effectively teach synchronization techniques, instructors will have to take time to inform students of individual systems and capabilities. This would inherently either add time to already lengthy courses or require less detrimental subjects

to be dropped from the MOI. However, the opportunity to expand fire support capabilities certainly outweighs the associated costs.

While the individual knowledge of systems may be useful, this data is not accurately utilized or understood until artillery officers are forced to reconcile the synchronization of a MDO. Moreover, these planners need to also account for follow on latency or capability loss, much in the same manner that we account for survivability moves of artillery units. It is critical that students begin understanding how multiple uses of a particular non-lethal effect will ultimately degrade its effectiveness with consistent use. This is vital because degraded non-lethal effects in recent exercises have caused ripple effects to the attack guidance matrix that Fire Supporters are using (e.g. degraded non-lethal effects against an IADS node will require more munitions to meet the same tactical task). Being able to account for these factors will allow future Fire Supporters to more adequately provide supporting fires across all five domains of battle.

Finally, this change in institutional instruction is crucial to ensure future Fire Supporters are mentally agile in meeting a commander's intent. After reviewing several reports from the Center for Army Lessons Learned, a common theme was the recommendation for units to explore deceptive or deceiving operations. Some examples included sending false indirect fire "tracks" to the enemy to force them to queue radars, ultimately enabling the targeting process. To avoid establishing a pattern, an additional option included inconsistent or seemingly random jamming of enemy equipment (ensuring the enemy had no idea when a strike may or may not be occurring). The revival discussed earlier comes from this application; at best, such deception tactics have only marginally been used in the modern fight, and to date only in the scope of counter insurgency operations. Additionally, the renaissance of fires will develop with the renewed focus on synchronization of effects (not exclusively lethal fires). As stated previously, the fires community is generally lagging behind the combat power curve by only focusing on lethal capabilities. Having students accounting for non-lethal effects and revitalized tactics will undoubtedly cause a surge in the versatility, flexibility and lethality in fire support planning. Beginning to change the way we as Fire Supporters think and plan will ensure that Field Artillery officers can continue to support maneuver forces in support of large-scale combat operations.

After reviewing several reports from the Center for Army Lessons Learned, a common theme was the recommendation for units to explore deceptive or deceiving operations.

As commanders, concerns are generally discussed in the form of operational risk and opportunities. Given the current state of the Field Artillery, particularly in the realm of available equipment and institutional education, the risk to mission is in particular peril. It is imperative for the artillery community to re-examine the capabilities currently available to facilitate C2. Without this, the risk is exceptionally high that the MDTF, and by extension the CJTF, would lose a critical ability to affect a given JOA. Furthermore, institutional education is in dire need of re-examination to ensure the newest lieutenants and captains can incorporate multi-domain capabilities. At this singular point, Field Artillery officers will understand the full impact of these enabling non-lethal platforms. In doing so, the next generation of battery commanders can better prepare to fight and win our nation's wars in a contested, near-peer environment. If we fail to account for these limiting factors now, we as a Field Artillery community will ultimately be left in a position ill-suited to fully support the maneuver force. With training and the ability to synchronize fires across all five domains, Field Artillery officers will be in a drastically stronger position to meet the mission of the Field Artillery and continue our reign as King of Battle.

CPT Corey Hill is currently the battalion fire support officer for 2nd Battalion, 1st Infantry Regiment under 2nd Stryker Brigade Combat Team out of Joint Base Lewis-McChord, Wash. Previously, Hill served for 15 months as the fire control officer for 2nd ID Division Artillery, which participated in numerous exercises as both the Force Field Artillery Headquarters and the Pilot Program Multi-Domain Task Force. Hill has also been assigned as a lieutenant to the 3rd Battalion, 321st Field Artillery Regiment (HIMARS) from 2015-2018, and served on a deployment to the CENTCOM AOR with 3-321st FAR in 2016.

How we fight

Integrating traditional training with future virtual technology

MAJ Matthew DeWitt and LTC David Smith

As the Field Artillery continues to develop as a profession of arms, we are faced with the challenge of balancing the training requirements of Soldiers across multiple formations while also ensuring the success of supporting mission requirements from higher. When 4th Battalion, 27th Field Artillery Regiment redeployed from Operation Spartan Shield and Operation Inherent Resolve in 2018 the problem statement was rather familiar, "How does the Iron Thunder Battalion conduct Fire Support Tables III and IV in accordance with TC 3-09.8, *Fire Support and Field Artillery Certification and Qualification*, for both battalion and company/troop level Fire Supporters prior to attaching personnel to maneuver battalions, all while minimizing support from those maneuver units?"

Our solution

The solution to our problem wouldn't be found in a four-hour convoy to the vast training areas of Texas and New Mexico, but instead three miles away at the Fort Bliss Simulation (SIM) Center. The SIM center enabled us to run through hours of repetitions and scenarios to provide realistic training while drastically reducing the support, logistics, time, and cost requirements of a field training exercise. The training complex had all the requisites to run a live, virtual, and constructed integrated architecture validation and certification exercise (VALEX) to be conducted by each battalion (BN) fire support element (FSE) and their aligned company/troop fire support teams (CO/TRP FISTs). We had to design the exercise to build upon skills that were already tested by Fire Support Tables I and II, on-going digital sustainment training (DST), and institutional learning. With limited personnel experience, we relied heavily upon the resident expertise in the brigade FSE to integrate and provide training on digital systems, guide fire support plan development and execution, and mentor fire support rehearsals.

The concept was a five day construct that would take a BN FSE through receipt of mission to planning, rehearsals and execution. The Virtual Battle Simulation (VBS3) set at the National Training Center was the digital architecture. Maneuver forces and the opposing force would be constructive, controlled by SIM center personnel. This would allow the fire support teams to maneuver in support of their formations. Each CO/TRP FIST would fight their platform from a VBS3 work station replicating a M2A3 Bradley. The teams virtually fought their Bradley Fire Support team (BFIST), tactically maneuvering between observation posts (OPs) and executing their fires plan. Reports were sent fire mission (FM) to the BN FSE and missions were sent digital through the Lightweight Forward Entry Device (LFED). The environment and enemy actions forced the FIST teams to utilize alternate or establish new OPs, sometimes under contact. The battalion/squadron (BN/SQN) FSE occupied their M1068 command vehicle in the "live" environment just outside the SIM center. In addition, we placed a live AN/TP-Q50 radar for counter-fire replication and incorporated the maneuver battalion mortar fire direction center (FDC) to process digital missions on the Mortar Fire Control System.

How we did it

The BDE FSE partnered with the SIM center staff, to develop complete nested armored brigade combat team (ABCT), BN/SQDN, and company/troop operations orders, which we could tailor to each unit and commander's training objectives. On day one of each VALEX, these orders were briefed to the BN/SQN FSEs and FISTs providing each team the remainder of the day to conduct their initial planning while FIST Fire Support (FS) specialists and drivers conducted VBS3 training. On paper and in the VBS3 simulation, we designed a brigade attack in zone through the national training center (NTC) central corridor, with the BN or SQDN being trained designated as the main effort. Artillery, organic mortars, close air support (CAS), and a platoon of army attack aviation (AAA) were all replicated in the simulation. They faced an enemy combined arms mechanized infantry battalion situated with an armored reconnaissance company in the disruption zone comprised primarily of enemy tacked vehicles (BMPs), enemy wheeled vehicles, and anti-tank systems tied into the pass complexes and urban areas. In the main battle zone sat one armored company with T72s and two mechanized infantry companies with BMPs, supported by a battery of 2S19s and a platoon of SA6s.

On day two, the BN/SQN FSE executed a battalion fire support rehearsal utilizing a sand table provided by the SIM center. The BDE FSE role played the BN/SQDN commander and S3 to add realism, while the 4-27th FAR S2 added substantial subject matter expertise by injecting enemy reactions

to each operational phase. Following the BN rehearsal were CO/TRP FIST rehearsals with the BDE FSE role playing the supported CO/TRP commander. Each fire support rehearsal was followed with a hotwash. Once rehearsals were complete, the BN/SQDN FSE led a fire support technical rehearsal to ensure the digital distribution of targets and fire support coordinating measures while providing for final validation of the digital architecture. FSEs built and shared target list worksheets via Advanced Field Artillery Tactical Data Systems (AFATDS) as well as building air support lists with accompanying air support requests based on CAS allocation.

Days three and four consisted of three battle periods lasting approximately 3.5 to 4 hours. Each battle period was initiated by an FM voice intelligence summary (INTSUM) and updated commander's guidance. Simulated maneuver companies and enemy were driven by SIM center personnel from the exercise control. We found it essential to include these personnel in every phase to achieve the same operational understanding and maintain a tempo that allowed for the accomplishment of each FS Table IV task. During the battle periods, the BDE FSE injected friction by moving enemy elements into advantageous positions, issued orders and instructions for changes to CO/TRP schemes of maneuver, provided INTSUMs, and attacked maneuver and silhouetted observers with indirect fires. The BDE FSE role played AAA by checking on and receiving five-line target handovers from the FSE or delegated FIST and did the same for CAS by role playing the joint terminal attack controllers receiving CAS 9-Lines and executing Type 3 Control. In the fight, CO/TRP FISTs utilized the VBS3 to observe, move and fight from simulated BFISTs and communicated with each other and BN via FM voice and digital free text. Calls for fire (CFF) were manually input into the LFED and sent digitally to the BN FSE over FM digital. Because the AFATDS is not linked to the VBS3, the BDE FSE maintained centralized fire support execution to ensure requested effects were entered into the simulation.

After each battle period, the BDE FSE facilitated a hotwash to identify gaps in understanding and create "contracts" through which each element designated a specific action or task to improve upon in the next battle period. On day five, every participant attended the culminating AAR focused on the following: What was supposed to happen?, what did happen?, observations from asset integration; observations from observer planning and execution; observations from BN/SQDN planning and execution; and fire mission processing times.

What we learned

Planning and coordinating the VALEX was both personnel and time intensive, often conflicting with other planning and training events. Scheduling meetings and deadlines were critical to synchronizing the multiple entities and resources involved to ensure the exercise would be ready in time for execution. Identifying key tasks early and assigning specific responsibilities within the BDE FSE while leveraging the FA BN staff enabled mission success. Our use of an off-the-shelf brigade-level order from the SIM center provided us with a baseline from which we made significant modifications that were tailored to each unit and adjusted to fit the FS Table III and IV tasks. We worked closely with personnel from the Fort Bliss SIM Center to modify their work schedules within the training timelines, construct room layouts and build the simulation. Without their efforts, we would not have been able to replicate a similar training event outside of the mission training center with the same intensity, depth and realism the SIM center provided.

Integrating digital communications and systems while prohibiting FISTs from sending CFFs FM

voice greatly enhanced the technical and tactical proficiencies of all involved. In general, FISTs had very little experience operating the LFED, but training during DST and in Phase I of the VALEX improved their understanding of the system which grew during each battle period. We took advantage of the VALEX to incorporate the brigade counter fire cell, organic BN mortar FDCs, and Q50 sections providing each with an opportunity to improve and exercise digital system integration with BN/SQDN FSEs and the BDE FSE.

The VBS3 does not replicate the M3A3 BFIST. In order to acquire a target or observe the battlefield, Soldiers either dismounted their avatar or stood up in the turret using binoculars that provided capabilities similar in range and acquisition to the Lightweight Laser Designator Rangefinder. Additionally, we were unsuccessful in integrating LFEDs and AFATDS directly into the VBS3. Nonetheless, the VBS3 provided the FISTs with a realistic training platform through which they were still able to con-

An Artilleryman with 4th Battalion, 27th Field Artillery Regiment, 2nd Armored Brigade Combat Team, 1st Armored Division, mans the turret of an M109A6 Paladin howitzer self-propelled gun, maintaining constant vision over the range to support his team's situational awareness during a Table XVIII gunnery qualification, May 7, at Dona Ana Range Complex, New Mexico. Table XVIII is a battalion-level qualification event where a Field Artillery battalion conducts tasks including suppressive fire and time on target missions in order to ensure they remain an agile and lethal fighting force. (SPC Matthew J. Marcellus/U.S. Army)

duct the six phases of the FIST-V occupation and more: security, location, communication, targeting head, observation and position improvement, acquire targets, maneuver and provide situational updates to the FSE.

Due to external scheduling conflicts, we were unable to include Tactical Air Control Party (TAC-P) personnel aligned to 2nd Armored Brigade Combat Team, 1st Calvary Division. While we mitigated their absence internally through joint fires observer certified noncommissioned officers in charge, their contributions would have improved each FSE's understanding of techniques in air-to-ground integration. Additionally, role playing maneuver leadership and staff allowed us to develop and execute the VALEX internally, but it would have been beneficial to have maneuver commanders and staff review and edit products to provide orders from their perspective.

As a whole, the FSE VALEX resulted in a tremendous exercise during which all four FSEs and 13 FISTs certified FS Tables III and IV. We built upon skills learned at Field Artillery institutional schools and those gained through combat and training over time. We built trust and confidence in the use of digital fire support systems while gaining higher levels of individual and team competencies in both planning and execution. The 2-1st ABCT later used this certification model to ready the BDE FSE and staff prior to NTC 20-01, the result was a direct increase in system and planning proficiencies across the brigade's fires community. Utilizing the SIM center has proven itself to be an invaluable asset to the Iron Thunder Battalion and 2-1st ABCT, and we look forward to implementing more of these exercises to develop adaptive, proficient and lethal Artillerymen. King of Battle!

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LTC David Smith is the commander of 4th Battalion, 27th Field Artillery "Iron Thunder." His previous assignments include brigade operations officer for 3rd ABCT "Greywolf" in the 1st Cavalry Division, Battalion S3 for 2nd Battalion, 82nd Field Artillery, and Wolf 03 at the National Training Center.

Don't sleep on First Army's role

CPT Jacob Gatewood

As Forces Command's coordinating authority for implementation of the Army's Total Force Policy, First Army executes a diverse mission with the purpose of improving readiness of the Reserve Component. Serving in First Army allows post-key developmental captains and their NCO counterparts the opportunity to develop their professional expertise while utilizing their experience-honed Field Artillery knowledge to increase combat readiness of Army National Guard (ARNG) partners. First Army observers, controllers/trainers (OC/Ts) utilize tough, realistic training concepts that are tailored to the deployment mission of ARNG partner units at all levels from division down to battery. Buried within this challenging mission is the hidden gem of First Army: building relationships.

The foundational principle of building relationships is often mentioned within the Team of Teams concept. It is also an evaluated competency covered by officer and NCO evaluation reports under "leads." For a bit more clarity, ADP 6-22 Army Leadership defines, "extends influence beyond the chain of command," as influencing others when the leader does not have designated authority or while the leader's authority is not recognized by others, such as with unified action partners. (ADP 6-22, 2012) First Army OC/Ts obviously focus on the first half as it pertains to our own ARNG units and the command relationship with them.

Though it is becoming more prevalent within the junior officer world, most have neither seen nor read "The Iron Major Survival Guide," in which LTC David Dunphy shares his tips for field grade officers. LTC Dunphy's tips for building relationships include:

"Don't think that by sheer rank and intimidation that you will be able to bull your way through the 'Iron Jobs' to success. You need to solicit buy-in, loyalty and trust, from up, down, left and right, and beyond. Your influence in and outside of your unit will have a direct correlation to your success as an S3 or executive officer, and ultimately, the unit's." (Dunphy, 2011)

The challenge associated with "The Iron Major Survival Guide," is that junior officers do not focus on this vital skill until intermediate-level education, and NCOs may never see it at all. Sure, leaders utilize various methods to coach subordinates to make friends outside the organization, knowing that those relationships may bear fruit in the future. Unfortunately, the ability to extend influence does not necessarily come naturally to all, and is often overlooked. Just like an assignment to First Army. But in this First in Deed provides a clear path.

In order to develop key partnerships, First Army OC/Ts must understand the operational environment of their ARNG partners. National Guard Soldiers have the unique challenge of maintaining readiness while simultaneously serving as members of the civilian workforce. They live complex lives compartmentalized between monthly drill, annual training exercises, civilian occupation requirements and community functions. The time they spend conducting Army Field Artillery training is extremely limited in comparison with their active duty peers, and yet the Enlisted Promotion System, managed at the state level, continues to churn through NCOs at roughly the same rate as regular Army (RA). Essentially, ARNG batteries are able to maintain crew stability on the same calendar timeline as RA batteries, but only get around a month of actual training together per year. Therefore, training time, whether inactive duty training, annual training, or eXportable combat training capability exercises (XCTC), must be effective. OC/Ts are vital at shaping the unit's training schedule to ensure partnered units achieve certification and qualification requirements in accordance with quarterly and annual training strategies while still adhering to this compressed schedule.

First Army OC/Ts assist their Field Artillery brethren to meet these training gates by offering their experience with training management in the regular Army. As former battery commanders and platoon sergeants, OC/Ts can communicate the friction they experienced during similar train-

ing events and provide lessons learned. They offer successful tactics, techniques and procedures that were effective during their operational time. Most importantly, they provide an external evaluation for their partners during every phase of training from individual to collective, home station to combat training center rotations. The after-action reviews (AARs) they provide are combined into a take-home package that the training unit keeps with them throughout the next phase of training. First Army OC/Ts engage with their partner units through every phase of their training progression, serving as resources for constant improvement.

Planning realistic training is a challenge for the National Guard given their reduced full-time staff and limited resources. As an organization that maintains an enduring relationship with each battalion, First Army OC/Ts utilize a coaching strategy to assist in planning. This technique is not at all dissimilar to our counterparts at combat training centers, the major difference being the ability to hone the unit planning process over time. This timeline doesn't stop after the exercise, unlike so many of our peers, but continues throughout the entirety of the partner unit's readiness and mobilization cycle.

As a vignette, during the 34th Infantry Brigade Combat Team XCTC in the summer of 2018, 1st Battalion, 120th Field Artillery (Wisconsin ARNG) and their First Army partners developed a 72-hour situational training exercise based on the direct action training environment approach used at the Joint Readiness Training Center (JRTC) at Fort Polk and the National Training Center (NTC) at Fort Irwin. First Army OC/Ts developed the exercise concept while working with the training unit's full-time staff to achieve their commander's intent. The relationship leveraged training resources that replicated an operational environment, forcing batteries to operate using multi-echelon procedures in both day and night conditions.

Fire support coordinators from the 120th Field Artillery conduct an after-action report meeting upon conclusion of their command post exercise. (Courtesy photo)

Before entering the training area, each battery received a battalion operations order complete with templated position areas of artillery, in-position-ready-to-fire times, and an enemy situation which prompted battery commanders to conduct troop leading procedures. OC/Ts were imbedded with battery leadership to provide external evaluation and coaching throughout the scenario. When batteries conducted movement, they encountered opposing forces that engaged them with small-arms fire, improvised explosive devices, and simulated electronic attack. The battalion tactical operations center requested routine reports and also provided daily operation and intelligence updates in accordance with the unit standard operating procedure. The scenario forced batteries to maintain constant firing capability in support of maneuver forces, prompting the need for an occasional emergency fire mission during movement. Simulating counterfire and assessing casualties provided an opportunity for batteries to train similar to how they'll fight against a peer threat.

Throughout the exercise, OC/Ts gathered data for the purpose of providing a formal AAR, facilitating an opportunity for battery leaders to discuss methods of improving performance over the next fiscal year. Lane training involved continuous operations over 72 hours; a method different from the standard training executed during previous training events. Batteries operated in both day and night conditions, reacting to injects such as emergency fire missions, regular fire missions, movement orders, survivability moves and dismounted attack. Soldiers were constantly shooting, moving, communicating, decontaminating, medicating, supplying and defending themselves in support of maneuver elements, resulting in confidently trained

First Army observers, controllers/trainers work alongside partner units. (Courtesy photo)

batteries capable of fighting and winning in a modern operational environment.

If this part of the job sounds just like every NTC or JRTC rotation, that is because it is. The XCTC package has similar capabilities for data tracking as are used at both Fort Irwin and Fort Polk. What is missed by the vignette is the work done before training ever really kicked off. First Army personnel established long-term relationships with their ARNG partners, assisted in planning, executing and evaluating training for years leading up to the XCTC. And continue to work with the unit afterward to implement sustains and improves identified during the AAR process. This is not a one-shot transaction, but a mission of steady mentorship and coaching a unit. If this sounds just like a battalion or brigade commander's vision for their unit, that's because it generally is.

Of course, other assignments exist that allow Army leaders to hone their skills of extending influence. The latest of these being the Security Force Assistance Brigade (SFAB), which executes a similar mission to First Army, though directed toward partner nations. To quote the Sergeant Major of the Army Daniel Dailey, "This [Security Force Assistance Brigade] is the number one priority for the Army's Chief of Staff." This is certainly true and our SFAB structure continues to be increased, but what the First Army mission allows captains above and beyond the SFAB are longer timelines for unit relationships and the ability to work with units deploying to multiple theaters. Soldiers from one First Army battalion mentored units mobilizing in support of Central Command, U.S. Army Europe and Africa Command in the space of just under two years.

To imply that the main benefit of serving as a First Army OC/T is teaching young captains the art of relationship building ignores the purpose associated with this task: to increase the readiness of the Total Force. First Army OC/Ts are the primary element in providing bottom-up feedback through FA doctrinal and command channels. The data captured during unit assessments drives the honest picture of artillery readiness across the Army that allows strategic leaders to make informed decisions.

None of the positive impacts associated with coaching and mentoring ARNG partners, like increased deployment and Total Force Readiness, are possible without first building the relationship. Establishing mutually beneficial partnerships is tantamount to extending influence beyond the chain of command. That influence allows First Army OC/Ts to engage partners with doctrinal-based coaching techniques and incorporate realism into their collective training. This process facilitates a noticeable and lasting impact on the readiness of the Total Army Force.

The ARNG partners are more lethal and adaptive, especially with the First Army team mentoring them. The Field Artillery Soldiers who come to this assignment have the opportunity to fine tune the craft of relationship building that is vitally important to successful performance as either majors or first sergeants. The natural outcome of quality key leaders within all artillery battalions is the successful achievement of the commander's vision. As Dunphy says, "When you take care of the boss, you take care of the unit." (Dunphy, 2011) As a premier enabler for helping the Total Force achieve readiness, First Army leads the way in leader development for the future.

CPT Jacob Gatewood is a 2009 graduate of Slippery Rock University. He has served as a fire support officer and deployed in support of Operation Enduring Freedom. He then served as an executive officer, acting as the commander in support of the Command Team SFAAT deployment to Afghanistan from 2012 to 2013. He completed the Air Assault Course, Pathfinder School and the Joint Firepower Control Course. Upon completion of the Maneuver Captain's Career Course, Gatewood served as the battalion adjutant. Gatewood is currently the commander of Alpha Battery, 2nd Battalion, 82nd Field Artillery.

Building the confidence of maneuver commanders

Improving timely fires through digital sensor-to-shooter

MAJ Kurt Knoedler

What is the purpose of a direct support Field Artillery battalion? I was taught "to place the maneuver commander in a position of overmatched advantage in order to defeat or destroy the enemy through decisive action." This is not an easy task given the brigade combat team's (BCT) potential operational environment of any regional large-scale combat operation (LSCO). The worst day of any fire supporter's career is when they hear a maneuver commander comment on significant delays in the sensor-to-shooter chain and a lack of desired effects on target. At this point, we have lost the confidence of the maneuver commander we support.

Unfortunately, this is not solely a Field Artillery battalion problem set, but a larger problem for the BCT. One solution to fixing this problem and building confidence in our maneuver brothers and sisters is through disciplined efficiency in the digital sensor-to-shooter chain.

To account for those who read this article and argue the importance of degraded and digitally degraded operations, this is not an argument against training degraded operations. Given the current threat, Field Artillery battalions must have a level of proficiency in degraded operations and operating in a digitally denied environment. Understanding that each division and or Division Artillery (DIVARTY) establishes training guidance for digital and degraded training, a historical guideline of 70/20/10 focused units on training 70 percent digital, 20 percent digital degraded and 10 percent analog. This article focuses on the critical training conducted using digital systems.

In order to achieve desired effects of surface-to-surface fires through targets of opportunity and counter-battery fire, the digital sensor-to-shooter link must process calls for fire and translate to fire missions efficiently. Many factors account for inefficiency and time lost, but one key observed factor includes the lack of trained operators on digital systems to include Forward Observer Software, the Tactical Airspace Integration System and the Advanced Field Artillery Tactical Data System (AFATDS). AFATDS is the most important system in the digital sensor-to-shooter link providing the BCT with tactical fire control, tactical fire direction and technical fire direction. Technical fire direction is the foundation of the digital sensor-to-shooter link.

Our most competent AFATDS operators are often the ones that execute technical fire direction — to be successful we need the same level of competence in our Fire Supporters. The 13Js own the foundation mentioned above due to their 63 plus hours of instruction during Advanced Individual Training and further experience operating the AFATDS once in a battery. Our 13Fs do not habitually gain AFATDS experience until they reach the maneuver battalion level. Additionally, 13Fs receive no training on the AFATDS based on the 2019 Advanced Individual Training Course Map and Period of Instruction (POI). By the time a 13F moves from the battalion to Brigade Fire Support Elements (FSE), their time in front of an AFATDS is four to five times less than their 13J counterpart in the FA battalion fire direction center (FDC). With no formal AFATDS POI for 13Fs, we are completely reliant on unit training to bring operators to an acceptable level of proficiency. Most brigades struggle with maintaining proficient 13F AFATDS operators in the maneuver battalions and Brigade Combat Team Fire Support Elements (BCT FSE).

The BCT FSE is the most important node as it communicates with all battalions and is the digital hub between sensor and shooter. The personnel selected to operate in the FSE current operations (CUOPS) section must have the highest level of proficiency in operating the FSE CUOPS AFATDS. Management of the entire fires enterprise of the BCT happens at this critical node. The FSE CUOPS section is relied on to build, load and manage all geometries, conduct iterative geometry scrubs, input and update commanders' guidance (attack guidance, high payoff target list, target selection standards, target list work sheets), and lead sensor-to-shooter technical rehearsals critical to timely and efficient fires. Bottom line, our Fire Supporters must gain increased proficiency in operating the AFATDS and be capa-

ble of managing the system. The BCT Fires Digital Master Gunner (DMG), along with battalion and brigade Fire Support NCOs are responsible for this training proficiency.

In addition to trained digital operators, BCTs must create a digital standard operating procedure (DIGSOP) to assist digital operators in the standards for the brigade's digital fires and airspace enterprise. The Fire Support Coordinator (FSCOORD), informed by division, DIVARTY and BCT training guidance, provides intent and oversight to the brigade fire support officer (FSO), fire support noncommissioned officer (FSNCO), brigade aviation officer, and DMG to create the brigade fire support DIGSOP. At a minimum the DIGSOP covers AFATDS database build; integration of BCT mission command systems to include the Tactical Air Space Integration System, the order of precedence list based on primary, alternate contingency and emergency communications (PACE) plan for digital fires (upper tactical internet, FM digital, high frequency digital, tactical satellite digital, etc.), standards for connecting and troubleshooting digital connections, target naming conventions, standard attack guidance, target workbooks, and technical rehearsal standards at echelon. A common understanding of these procedures and inputs to the AFATDS significantly affects the efficiency and timeliness of digital processing. Additionally, the standards and agenda for brigade technical rehearsals provide required emphasis on this often-neglected critical rehearsal. The brigade FSE, with the assistance of the DMG and Air Defense Airspace Management/Brigade Aviation Element, must own and manage the DIGSOP and technical rehearsals as the senior echelon and hub for digital fires at the BCT level.

To increase digital efficiency, FSCOORDs must establish guidance to include attack guidance, target selection standards and high payoff target list which the BCT fires cell manages through the targeting process and inputs into the AFATDS. Units correctly publish this guidance during the orders process and update through the targeting process, but habitually only disseminate through latent paper copies. This leads only those receiving the paper copies to update their database, which further leads to BCT mission command nodes at echelon operating with different expectations for fire support.

Building guidance correctly is critical given the 35-second standard at echelon for processing most types of fire mission in accordance with TC 3-09.8 Fire Support and Field Artillery Certification and Qualification. Without properly built, standardized guidance, units consistently struggle to meet these time standards. When the FSE does build guidance into digital systems, operators and leaders fail to manage appropriately or share across the entire fires enterprise. This causes digital errors at echelon, "red gumballs," requiring human input (recalculation of fire missions) and adds critical time to mission processing. Some leaders are opposed to building digital attack guidance and target selection standards in the AFATDS due to personal negative experiences. The issues normally experienced with digital guidance come from a lack of trained operators and a DIGSOP. If the BCT can correct these two deficiencies, we can then rely on the AFATDS to work efficiently and effectively in decreasing mission processing times.

Finally, it is imperative for brigades and battalions to plan and execute graduated digital sustainment training (DST) regularly as part of the BCT battle rhythm. The BCT S-3 needs to plan and enforce BCT DST starting with training at the user level and gradually increasing echelon connections. It is important for the BCT fires cell (FSCOORD, FSO, or FSNCO) and DMG to lead DST in order to achieve the desired outcome. During DST, the entire sensor-to-shooter link must be involved (battalion FSEs, Armored Knights, M7 Bradley Fire Support Team Vehicle, radar, battalion FDC, platoon FDCs, and howitzers) in order to train and effectively troubleshoot issues. The establishment of the DIGSOP assists units in establishing digital communications and to efficiently train crews throughout training. Additionally, units can create standard templates and scenarios in the DIGSOP to assist in efficiently focusing training to meet desired training objectives. It is imperative for DST not to degrade into a communications exercise or units won't realize positive results. The end state of this graduated DST is exercising the entire chain with all observers, FSEs, FDCs, radars and howitzers. Fire missions need to pass through each of the nodes at distributed sites. The BCT achieves training objectives when the enterprise routinely meets TC 3-09.8 time standards and the BCT fires chain executes to the desires of the BCT commander and his FSCOORD.

Once we have proficient operators, using published SOPs outlining digital standards, with standardized guidance built into the AFATDS, and practiced iteratively through DST, we are able to provide timely fires and effects for the maneuver commander. It is imperative for direct support Field Artillery battalions to reach this level of training readiness and proficiency, earning the confidence and trust of maneuver commanders, and the title "King of Battle."

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Intellectual Capital

Combating complacency with the country's oldest weapon

U.S. Army CPT Mark Chapman and U.S. Marine Corps MAJ Daniel Beck

The Armed Forces of the United States is the most diverse and educated fighting force that the world has known. Leaders at all levels recognize the importance of sustaining this trend and champion personal and professional education. Services are providing an expanding menu of educational opportunities: on-base and online partnerships with civilian universities; tuition assistance to allay costs; and, most recently, programs for Soldiers to obtain civilian certifications for MOS-specific skills. As we seek intellectual development outside of our organization, we are failing to capitalize on the most precious resource—our organic intellectual capital. The written word provides one of the most effective platforms for individuals to reflect deeply, develop coherent thoughts, and share ideas across the force. Taken further, written expression is fundamental to achieving greater collective understanding and, most importantly, organizational learning; nevertheless, the current professional military class remains all too lackadaisical about professional writing. A sampling of the professional literary landscape of recent further suggests that our services' cultures have accepted a largely disinterested attitude toward writing. Why is this? How do we change it?

Within the confines of this short article, we will first make our case for why the pen remains mighty and writing is a matter of survival. Next, we will highlight some of the major factors contributing to the poor station of professional written dialogue, namely complacency and a lack of options. Finally, we conclude by offering a simple starting point for remedying this collective shortcoming—reinvigorating the local, community-based publication.

Sharing ideas and capturing experiences has both personal meaning and deep organizational value. It enables the type of "reflective openness" that underlies organizational learning and encourages individual accountability. An organization that reflects meaningfully and engages in frank dialogue is one that adapts and changes with the environment.

From its very inception the German military was highly academic, analyzing and publishing lessons learned from their wars and the wars of their allies and adversaries up to the mid-20th Century. This allowed them to become one of the most effective maneuver forces in history. Their ability to dominate in both Fires and maneuver in large part began with a culture that encouraged blunt exchanges between leaders regardless of grade. In contemporary society, the proliferation of information makes identifying those messages of value increasingly difficult, and, by extension, increasingly important.

Like the European armies of the past that we owe much to, the U.S. military also harnessed a spirit of innovation and adaptation. The American ability to adapt on the battlefield and in doctrinal publications propelled it to success in the interwar period and on Guadalcanal, just as it did in the Cold War and Persian Gulf. Additionally, following Vietnam, the military established multiple large combat training centers where brigade-sized elements could fight a variety of adversaries in a diverse array of environments to better prepare themselves for combat. This spirit resulted in the most technologically advanced fighting force on the planet by the fall of the Soviet Union; however, that technological overmatch is about to reach its half-life. The sweat and blood of those that preceded us will not guarantee success against the peer threats of the future.

We, the ones who wear the uniform now, must take responsibility for re-invigorating the habits of adaptation that brought success to previous generations. We have run out of time, money and, frankly, patience to allow innovation to remain the sole responsibility of a bloated military-industrial complex or understaffed headquarters at the center of American military power. Soldiers, Sailors, Airmen and Marines of all ranks must take ownership of their responsibility to foster change in our organization.

Some innovation requires substantial financial and material investment; however, much does not. In fact, in the modern economy, the most valuable component of any high-tech gadget is not the screen or processor, but the idea—the intellectual proper-

ty. The change that we are talking about—the type of broad, continuing conversation that we seek among military professionals—is not just about innovating the next best weapons system, but also how we train, promote and develop talent within the enterprise. Nothing is off the table. Having the courage to express your thoughts and engage in dialogue has been the source of impactful ideas since the time of Socrates. Why are we not doing the same now?

Unfortunately, the principle answer to that question is complacency. Existential threat, surrender, military defeat, these terms have been non-existent in the American national security lexicon since at least 1991 and, arguably, even earlier. This country's "unipolar moment" has bred the type of complacency and intellectual lethargy that afflicted many European countries in 1913 and even the British Empire as it faded in the late-20th Century. Simply put, the malaise that exists within the Armed Forces is reflected in a general lack of interest in professional expression and dialectics. The point is not that service members are inherently lazy or uncommitted. The point is that the sense of urgency for meaningful change is unrealized. This sense of complacency is visible to those with the greatest perspective in our organizations, from the executive branch to the general officer leadership. It is time for the rest of us to take heed. We can start by initiating an active, inclusive dialogue; the kind that exposes "deep and potentially embarrassing information that can motivate learning and produce real change."

Part and parcel of the issue we face is a lack of forums for such exchange, or the perception thereof. Although professional discussions should be present in everyday interpersonal exchanges, learning on a broad scale requires promulgation of the resulting ideas; furthermore, dialogue must happen across geographic and unit boundaries. While units pride themselves in the professional development of their officers and NCOs, we must also develop and encourage the intellectual capabilities of all ranks. At present, would-be authors who are suppressed by billet responsibilities are generally left with two choices to share their professional reflections: peer-reviewed journals and books. For the most part, those who are courageous enough to expose their thoughts are confronted by prohibitively high barriers to such publication. Although the deterrent may be imagined in many cases, it is a deterrent nonetheless. Since desired outcomes should drive action, it is worthwhile to consider how to make written expression more convenient and accessible for all, particularly the most numerous among us. Local community publications are a good place to start.

Step one is for leaders at all levels—and with particular emphasis on commanders—to unequivocally state their expectations for subordinates to engage in written organizational dialogue. Whether through commitment or compliance, generating initial involvement is critical. Second, those same leaders must reinvigorate publication at the community or unit level. From more formal platforms like the Field Artillery Professional Bulletin and Field Artillery Journal to highly-localized unit bulletins and newsletters, commanders can take immediate action to provide platforms for frank and open written dialogue. This effort, at the unit level, does not need to become a bane. Editing may be minimized since these publications should reflect the genuine thoughts and concerns of their contributors; furthermore, a key component of written communication is holding individuals accountable for their expression. The creative use of social media platforms should also be explored. The Socratic Method achieves well-structured ideas because those ideas are opened to and refined through public scrutiny. The key is to provide access to a common forum with low barriers to entry. Over time, as the word spreads, stigmas surrounding writing will be reduced and excitement about the value of written expression will grow. And while content should be professionally relevant, topics do not have to narrowly focus on technical or tactical minutia. Leaders must be willing to allow subordinates creative license and push preconceived boundaries. Innovation will be sparked by genuine interests, wherever that may be.

In sum, a hallmark of the American military has been its adaptability; at all levels, from all ranks. This reliance on grit and innovation, however, has been slowly replaced by an addiction to technological superiority. Looking forward, maintaining its place as the world's premier fighting force will not be served by reinforcing the lessons learned from decades of counterinsurgency or relying on the convoluted Defense Acquisitions System. Fostering a culture of reflective openness and frank debate is required to achieve the type of organizational learning and innovation that is needed across the enterprise. Individual service-members of all ranks have a role in this effort and written composition is an important method. Encouraged by commanders and invited by the convenience of contributing to local publications, all of us must harness our role in shaping the organization we serve using the primary means at our disposal—our words. I recognize that the potential embarrassment of an unpopular idea or the discomfort of recording one's personal ideas are a concern; however, they pale in comparison to the consequences of failing to do my part to shake the straightjacket of complacency that ails our organization.

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DEPARTMENT OF HEALTH AND HUMAN SERVICES

HEALTHY ARTILLERY PERSONNEL NEEDED

If you have operational experience with *artillery* and are between 18 and 60 years old, we need your help to learn about effects from exposure to blast.

This research study investigates the effects of repeated exposure to low-level blasts in explosive breaching and in artillery operations. To do this, we need to compare experienced military and law enforcement breachers to *individuals with equivalent experience in artillery*.

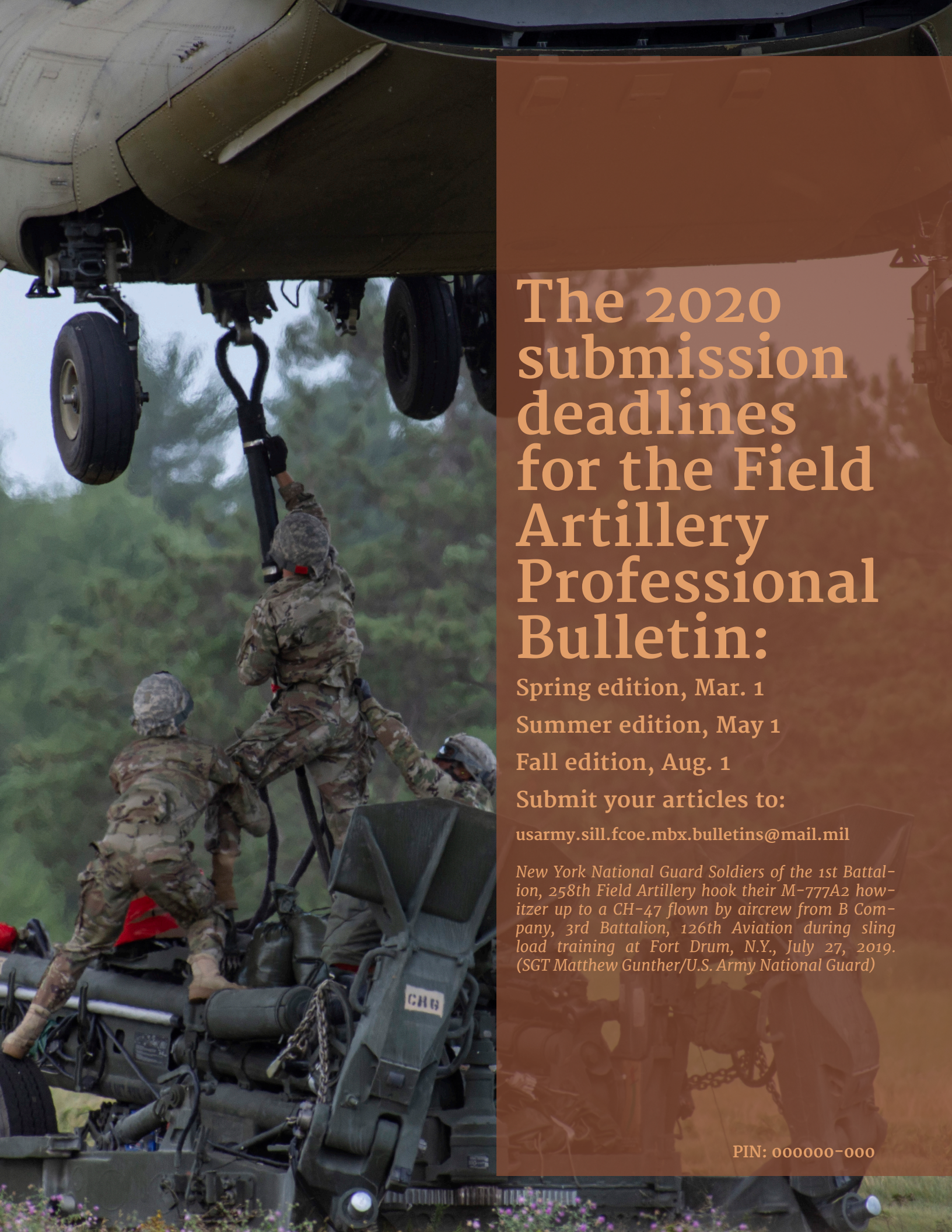
-You may qualify if you have at least 4 years of experience with artillery and minimal or no exposure to other blast.

- You may not qualify if you have history of moderate or more severe brain injury or if unable to have a MRI scan.

- **Study activities** involve tests of thinking, memory, and non-invasive brain scans. There are also hearing and balance tests and one blood draw.
- The time commitment for this study is **5 days, 6 hours each day**. There is no cost for participation or tests related to our study.
- Travel to Bethesda, Maryland and accommodations are provided for volunteers and a companion.
- Monetary compensation is provided.

People interested in this study should contact **Bobby Arnold** at **301-496-5829 or arnoldbj@ninds.nih.gov**, "Experienced Breacher Study," NINDS, study #12-N-0065.

This study is in conjunction with Naval Medical Research Center and Walter Reed Army Institute of Research.



The 2020 submission deadlines for the Field Artillery Professional Bulletin:

Spring edition, Mar. 1

Summer edition, May 1

Fall edition, Aug. 1

Submit your articles to:

usarmy.sill.fcoe.mbx.bulletins@mail.mil

New York National Guard Soldiers of the 1st Battalion, 258th Field Artillery hook their M-777A2 howitzer up to a CH-47 flown by aircrew from B Company, 3rd Battalion, 126th Aviation during sling load training at Fort Drum, N.Y., July 27, 2019. (SGT Matthew Gunther/U.S. Army National Guard)

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