

SPECIAL SPOTLIGHT

Massed Fires, Not Organic Formations: The Case for Returning Field Artillery Battalions to the DivArty





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Brigadier General(P) Stephen G. Smi Commandant of the Field Artillery School Chief of the Field Artillery



COL Eric Johnson





From left to right :: LTC(P) Rick Johnson, JRTC LTC Elliot Harris, JMRC LTC(P) Tom Caldwell, NTC



Enlisted Branch School Chiefs SCF Dunn (13.1), SCF Davis (13M), SFC Cippriano (13R) SFC Davis (13F), SFC McCoach (13B), SFC Rodriguez (13B)



CSM Kevin King



COL C. A. Tavuchis Commanding Officer U.S. Marine Artillery Detatchment, Fort Sill

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On the cover: 115TH Field Artillery Brigade and 4-133rd Field Artillery Regiment Participate in Bilateral Exercises with UAE Courtesy Photo Task Force Spartan





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YOUR SUPPORT MATTERS!

The United States Field Artillery Association was founded in 1910 by Major John E. McMahon, Captain William Snow and Captain W.S. McNair, to promote the efficiency of the Field Artillery by maintaining its best traditions. Over 100 years later, the Association stands strong as the only professional organization that serves the Field Artillery branch of the military. Help continue the Field Artillery legacy by keeping your membership current, connecting with your local chapter and encouraging other Redlegs and Marines to join and stay active.

> UNITED STATES FIELD ARTILLERY ASSOCIATION PO Box 33027 Fort Sill OK, 73503 www.fieldartillery.org

From the Commandant's Desk



BG(P) Stephen Smith Field Artillery School Commandant

It's been an honor to serve as the 53rd Commandant of the United States Field Artillery School and the Chief of the Field Artillery. The talent across our Field Artillery (FA) force...Marines and Army... is inspirational, and all of us are privileged to serve at such an exciting time for our branch.

Through incredible teamwork and support from leaders throughout the Army and Marine Corps, our branch has made great strides over the last five years. We've updated our capstone doctrine, focused our professional military education and leader development programs towards large-scale combat operations, improved rigor across all training domains, increased and strengthened FA organizations, initiated unprecedented modernization efforts to achieve parity and eventual overmatch against our most likely adversaries, and increased the amount of FA positions in many formations. We've also begun to realign our training efforts with our professional Marine Corps Artillery Detachment here at Fort Sill. Finally, we reestablished the Field Artillery Bulletin as our professional publication designed to promote dialogue and growth within our community. In this light, I would like to thank the Field Artillery Association for being an outstanding partner and advocate for the branch. I would

Farewell from the 53rd Field Artillery Commandant

like to invite everyone to continue to leverage that far-reaching capability. Even with all of these advancements, we are not nearly ready to "spike the ball." We have much work ahead of us!

Our Joint force fights and wins predominantly through lethal fires in support of our maneuver commanders. Each one of us must continue to assertively maintain our momentum and act with a sense of urgency by assuming that we WILL fight a peer threat on our watch. Use our refreshed doctrine to plan, prepare, execute and assess tough training across all domains (institutional, organizational and self-development) to drive us toward large-scale combat and away from counterinsurgency. As leaders and Soldiers, continue the dialogue with Fort Sill. Provide feedback on emerging doctrine, write articles for publication in the Field Artillery Bulletin, provide feedback on recent arrivals to your formation from the school house and provide input on modernization efforts and FA personnel initiatives.

As we continue this momentum, we are excited to welcome COL (P) Phil Brooks as the 54th Commandant of the U.S. Field Artillery School and Chief of the Field Artillery. He is a great Artilleryman who also served as brigade combat team commander and as the deputy commanding general (Maneuver) for the 1st Infantry Division. COL (P) Phil Brooks will undoubtedly keep our branch on the correct azimuth of fire as we continue to rapidly modernize and shift to fire support for large-scale ground combat operations.

I'd like to close by thanking our 13th Command Sergeant Major of the Field Artillery, CSM Kevin King, and congratulate him on his next assignment as command sergeant major for 1st Army Division West. While here, he relentlessly continued position improvement by increasing the number of airborne Artillery volunteers coming out of basic training, obtaining additional uniforms and personal equipment for our Soldiers and instructor cadre at Fort Sill, motivating officers in Basic Officer Leaders Course during physical training, improving rigor across our Regional Training Institutes, updating our live-fire certification/qualification procedures, improving Advanced Leaders Course, Senior Leaders Course and functional course experiences, and much more. Each of these improvements are a living and persevering reminder of CSM King's positive influence on the entire Branch. We're excited that he was selected for continuted service at higher levels.

May Saint Barbara continue to watch out for the best branch in our military! As always...keep your powder dry, keep up the fire and *KING OF BATTLE!*



Colonel C. A. Tavuchis Commanding Officer US Marine Corps Artillery Detachment, Fort Sill, OK

It is hard to remain focused on the exciting developments in the Marine Corps and the artillery and fire support community as we adapt social distancing and work to keep everyone healthy. Regardless of the circumthe Marine Detachment stances. (MarDet) continues to ensure the health and safety of our Marines and their families while we provide the Fleet Marine Force (FMF) with the steady stream of superbly trained Marines it requires to maintain combat readiness. Our Army brothers and sisters-in-arms are working equally hard; and, as always, we are proud to be part of the team that stands ready in defense of our Nation.

As I wrote in the introduction to FD: the first edition of the Field Artillery Journal (FAJ) in 2020, Marine artillery 2019 is on the cusp of momentous and, more framing. to the point, epochal change following the publication of "The 38th CMC's Planning Guidance" (CPG). In March 2020, as a testament to the Marine Corps' progress, the CMC published "Force Design 2030" (FD 2030). The memorandum describes in more detail the sweeping changes required to meet the principal challenges facing the Nation and the Marine Corps, and the massive modernization effort envisioned by the Commandant.

From the Home of Marine Artillery

Marine Artillery Support to 38th Commandant's of the Marine Corps (CMC) Force Design Efforts



Force Design 2030

March 2020

The report trumpets the CMC's drastic the rationale for change, USMC's force design (FD) methodology and organization, his personal assessment of the work done to date, and the steps the Corps is taking to move FD into the next phase of deliberate analysis.

Perhaps most importantly, the our report updates us and describes the Force outcomes of the first two phases of and FD: form

• Phase I – began during June 2019 and focused on problem framing. It centered on a small operational planning team (OPT) working directly with the CMC to establish an initial visualization of the future force as well as aim points for follow-on phases.

• Phase II – included a series of deliberate war games providing an initial analysis of the Phase I effort and guidance to inform subsequent efforts. The results of Phase II also drew on the results of a wider body of Marine Corps and Naval

Service wargaming and analysis conducted before the OPT's work began. The significant budgetary implication aside, perhaps the most important outcome of the first two FD phases was the identification of the "Objective Force" envisioned in the new FD. This new force concept is planned to roll out over the current and future Fiscal Year Defense Plans.

In no uncertain terms, the Objective Force envisioned by the Commandant and outlined in FD 2030 is a significant departure from our traditional force and includes a number of sweeping divestments and investments in doctrine, structure, manpower, organization, materiel, operational concepts and perhaps most importantly - our mindset. Specific to our community, the new Objective Force lays out the following reductions additions to our artillery formations:

• Phase I – began during June • Divestment of 16 cannon batteries 019 and focused on problem (with 5 cannon artillery batteries raming. It centered on a small remaining);

• Increasing 14 rocket artillery batteries over the current force (to 21 rocket batteries in total).

In support of the evolving Phase III efforts, the Marine artillery and fire support community is strongly advocating and working in harmony with our counterparts at Headquarters, Marine Corps (HQMC) to assess the doctrine, organization, training, materiel, logistics, personnel, and facilities (DOTMLPF) implications of the new Objective Force. Led by the Deputy Commandant (DC) for Combat Development and Integration, LtGen Eric Smith and closely supported by the DC, Plans, Policy, and Operations, LtGen George Smith, and the other HQMC DCs and departments, the DOTMLPF Working Group will examine and ensure the supportability of the new FD and provide the necessary oversight to ensure full implementation of this profound shift in the force.

With the increased clarity of previous phases revealed and а basic comprehension of the emerging organization and role of the new Marine Littoral Regiments achieved, the implications of this massive shift are no less profound to the MarDet, Fort Sill than the FMF. As such, the artillery and fire support community is leaning into sorting out the emerging changes that will be required not only to our training methods but also, quite literally, how we fight.

The transformation of our formations and how we educate and train our Marines is of the utmost importance. The need for rapid innovation, and to aggressively seek and implement new ideas is clearly outlined in the CMC's FD 2030 message. The effort necessary to adapt current batteries, battalions, regiments, headquarters, fire support coordination centers and fire direction centers will take hard work, patience, a understanding thorough of the concepts of support and, perhaps most critically, the application of the detailed technical aspects of our profession.

The MarDet Fort Sill, OK - the Home of Marine Artillery - is not only actively working toward the CMC's vision, we are keen to modernize training through our Learning Modernization Cell, but also to refine learning and teaching modes as we evolve from a traditional or "industrial" age model of learning to an "information" age

model. The MarDet is keen on enhancing teaching and learning through the adaptation of technology and new techniques. While we work with the FMF and supporting establishment to move towards the CMC's vision of a new FD, we have much work to do in our own house.

For the Marine artillery and fire support team – at Fort Sill, in the FMF, and the Supporting Establishment – the future is exciting and one that is rich with opportunity, innovation, exploration, experimentation, and teamwork. We are also embracing our naval heritage and rekindling traditions that are deep in our warfighting DNA. There is no better time to be a member of the Marine artillery and fire support community.

"While the Future Force we are developing is different in terms of structure and capabilities, it is consistent with our historical roots as Fleet Marine Forces and directly supports our Title 10 responsibility to seize and defend advanced naval bases, and perform all such duties as directed by the President. It is also important to note that methods and concepts such as Expeditionary Advanced Base Operations are not the sum total of our contribution to the joint force. We will continue to serve as the nation's premiere crisis response around the globe and contribute to the deterrence and warfighting needs of all combatant commands."

Gen D.H. Berger CMC



Semper Fidelis



5 HH9 BH=CB'57 H=J9'5 B8'5 FB; '6 B'7 CA A 5 B8 9 FG

Submissions are desired for Each FA BN and higher formation in the ARNG and Active Component. NLT 1 July, 2020. Please submit information to director@fieldartillery.org and deputydirector@fieldartillery.org

The intent of the Red Book is to provide the Field Artillery Community an annual reference for networking amongst Field Artillery professionals. This is a change from previous red books. The red book is no longer consolidated and prepared by FCOE.

It would be preferred to have unit's redbook submissions made by FA Brigades or DIVARTYs to account for all associated units. Photos can also accompany submissions but are not required.

Unit Name/Supported Unit/Motto/FA Association Chapter Affiliation Mailing address Current CDR and CSM with projected COC and COR dates Phone Number to Unit Email address of CDR and CSM

Facebook URL

No more than 250 words, describing mission and activities over the past year

Example below:

2-8 Field Artillery Regiment Automatic!/ ISBCT, 251D USARAK/2ID DIV ARTY/
Northernmost Chapter
3717 Neely Road
Fort Wainwright, AK 99703
907-353-1509
Facebook 2nd Battalion, 8th Field Artillery @2.8Automatic
LTC Stephen Thibodeau projected CoC June 2020
Stephen. p.thibodeau.mil@mail.mil
CSM Lloyd Rhoades projected CoR August 2021
Lloyd.a.rhoades.mil@mail.mil
The Automatic Soldiers of the 2nd Battalion, 8th Field Artillery Regiment
supported the Arctic Wolves of the 1st Stryker Brigade through a full training

supported the Arctic Wolves of the 1st Stryker Brigade through a full training cycle in preparation for an upcoming combat training center rotation. Determined to gain and maintain Arctic proficiency at the platoon level, the battalion spent January to March executing platoon operations in temperatures ranging from -30 to 15 degrees. The quarter culminated in a week of platoon level artillery raids supported by 1st Battalion, 52nd General Support Aviation Regiment, executed under snowy arctic conditions. A Battery supported a key joint exercise, Operation Arctic Edge, with 3rd Battalion, 21st Infantry Regiment augmented by a company of Marines, validating US Army Alaska's ability to project combat power across Alaska. The battalion and brigade fires cell synchronized and massed joint Fires during Red Flag 18-02, hosted at Eielson Air Force Base. The battalion also executed precision guidance kit fielding and gualified through Artillery Gunnery Table XV in preparation to Arctic Avalanche- the brigade's combined arms maneuver live-fire exercise-throughout August and September. The year cuhninated with the brigade force on force exercise, Arctic Anvil. Anvil ended with a 2nd Infantry Division Artillery supported Artillery Gunnery Table XVIII. The Automatic Battalion remains poised to provide massed, lethal, joint Fires in support of the Arctic Wolves under any conditions across the Globe. Open Sheaf. .. Never Miss ... Repeat!



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Massed Fires, Not Organic Formations The Case for Returning Field Artillery Battalions to the DivArty

by Colonel David E. Johnson, USA, Ret. and Lieutenant General David D. Halverson, USA, Ret.

An Association of the United States Army Study Spotlight 20-1, April 2020

With artillery, war is made. –Napoleon

ISSUE

To prevail in large-scale combat operations against competent adversaries, U.S. Army divisional field artillery battalions should be controlled by a division artillery (DivArty) headquarters, rather than by brigade combat teams (BCT).

SCOPE

- Traces the evolution of U.S. field artillery since its inception.
- Describes the impact of modularity, driven by the demands of extended counterinsurgency operations, on the U.S. Army's ability to train for and fight peer adversaries.

KEY POINTS/IMPLICATIONS

- The issue with keeping field artillery battalions in BCTs is that it violates one of the fundamentals of fire support: never keep artillery in reserve.
- The artillery's sine qua non is its ability to mass fires.
- The advantage of the DivArty is that it ensures that all the fires that can range the fight are available to support maneuver commanders across an extended battlefield.

The U.S. Army needs to realize that in large-scale combat operations (LSCO) against competent adversaries, its divisional field artillery battalions should be controlled by a division artillery (DivArty) headquarters rather than by brigade combat teams (BCTs). To make the case for this change, this essay will trace the history of how U.S. field artillery has evolved since its inception; making the case requires understanding why field artillery battalions became organic to BCTs in the first place.

This essay is not a call to return to the past—rather, it is a call to prepare for the future. If the joint force is to mass fires against a peer adversary, centralized control will be important, just as it was in World War II. Now, with the need to converge fires and effects across multiple domains, it is even more essential. In such an environment, the DivArty will be the "go to" headquarters for Multi-Domain Operations (MDO) at the division level.

An Evolving Artillery Capability: from the American Revolution through World War I

The roles, missions and organization of American field artillery are a direct reflection of evolutions in technology, procedures, wartime missions and the types of adversaries that the U.S. Army has faced since its founding. These factors determined the location of field artillery in the U.S. Army. An additional factor is the understandable desire of maneuver commanders to own what they need for success in their brigade battle, coupled with keeping what they have.

Revolutionary War.

The role of artillery-and its location in U.S. formations-has been evolving ever since Henry Knox hauled heavy cannons, captured from the British at Fort Ticonderoga, General to Washington in 1776. Knox's cannons were direct-fire weapons with modest range (1,000-1,200 yards) and fired solid shot, explosive-filled cannon balls, large diameter grapeshot, smaller diameter cannister shot, various shrapnel shells and chain shot. These guns tipped the scale in the siege of Boston (April 1776). 1775–March They were emplaced on a commanding position on the forti-fied Dorchester Heights above the city and harbor, threatening the ability of the British to supply their garrison and the loyalists in Boston. In the face of this artillery threat, British General William Howe withdrew his forces to Halifax, Novia Scotia.

By war's end, there was an artillery company assigned to each infantry brigade for tactical control and a larger number of pieces in the artillery park that supported the Army. The parent artillery regiments that provided cannon the infantry also maintained to administrative control over them. On occasion, however, artillery was pulled from the brigades and its combined fires massed to great effect, as during the Battle of Monmouth in June 1778.¹

Mexican War.

The U.S. Army took better artillery into the Mexican War of 1848 than it had during the Revolution. Bronze began replacing the heavier iron cannons. and stronger single-trail gun mounts replaced twin trails. This made the cannons sturdier, lighter and more ma-Nevertheless. neuverable. artillerv remained a direct-fire weapon with two-gun detachments assigned to brigades. The artillery park was abandoned; instead, guns not with the operated independently, brigades responding to threats as needed.²

A pivotal event-the May 1846 Battle of Palo Alto-changed how Ameri-cans viewed artillery. Brevet Brigadier General Zachary Taylor, a great be-liever in the primacy of infantry, was convinced by his artillerists to mass his cannons in the same way Napoleon had, albeit on a smaller scale. This massed fire of cannons online decimated Mexican infantry. Taylor later recalled that his artillery "was the arm chiefly engaged, and to the excellent manner in which it was maneuvered and served is our success mainly due."3 As historian Janice McKinney wrote, Palo Alto "foreshadowed the import-ant role artillery and massed fire was to play in the Civil War."4

Civil War.

During the Civil War, cannon technology progressed marginally in terms of range and it remained a directfire weapon. Nevertheless, the tendency toward centralizing the field artillery took hold in both the Union and Confederate armies. Field artillery units were increasingly assigned to divisions and corps, rather than to brigades, where their massed fires could be



exploited.5 Confederate inaugurated, so soon, a battalion and isolated and attached to infantry brigades. So, they fought singly, and in such small units artillery can do little."6

World War I.

World War I saw incredible increases in the diversity, range and lethality of cannons, ranging from 75mm field guns to 12-inch railway guns. New means of executing accurate indirect fire. observation (airplanes and balloons) and targeting (sound and flash) complemented these developments.7 Centralized field artillery units at division, corps and Army levels provided either unobserved or observed fire against priority targets and fired rolling barrages in front of infantry formations to support their advance. Despite these advances, observed fire in close support of maneuver-where the gun crews could not sight directly on the target-was dependent both on reliable communications between the observer and the artillery unit and on the mobility in difficult terrain of

Colonel mostly horse-drawn field pieces. As Edward Porter Alexander wrote about McKenney notes: "What both sides the rationale for this move in his post- lacked during the war was a means of war memoirs: "It would have been a directing artillery fire efficiently. Teledecided step in advance had we phone wires were cut, runners took time messages were sometimes organization of several batteries. We insufficient."8 This reality made close came to it in about a year, but support of the infantry tenuous and, as meanwhile our batteries had been historian Boyd Dastrup wrote, the unreliability of indirect fire systems of the day "caused the infantry to adopt accompanying artillery as a means of hav-ing quick, accurate support . . . solving the communication problem

- Janice E. McKenney, The Organizational History of Field Artillery: 1775–2003 (Wash-ington, DC: United States Army Center of Military History, 2007), 3-16.
- McKinney, The Organizational History of Field Artillery, 41–46; Boyd L. Dastrup, King of Battle: A Branch History of the U.S. Army's Field Artillery (Fort Monroe, VA: Office of the Command Historian, United States Army Training and Doctrine Command, 1993), 71-81.
- Quoted in McKinney, The Organizational History of Field Artillery, 41.
- ⁴ McKinney, The Organizational History of Field Artillery, 41.
- ⁵ McKinney, The Organizational History of Field Artillery, 55-59.
- ⁶ Edward P. Alexander, *Military Memoirs of* a Confederate: A Critical Narrative, ed. T. Harry Williams (1907; repr., Bloomington, Indiana: University of Indiana Press, 1962), 14; quoted in McKinney, The Organizational History of Field Artillery, 63
- Dastrup, King of Battle, 167.
- McKinney, The Organizational History of Field Artillery, 121.



and developing field artillerymen were imperative before indirect fire could be truly exploited."⁹

Massed U.S. Field Artillery Dominates the World War II Battlefield

During the period between the two World Wars, the advent of tactical radios, motorization and mechanization solved the communication and mobility challenges that had plagued reliable close support of maneuver units in World War I. Mobility was provided by truck, tractor and selfpropelled gun mounts-as compared to the German army, which still relied largely on horses to move its artillery. Most important, however, is that field artillery officers American developed the technical means to mass the fires of multiple battalions accurately-and rapidly-using telephone and radio networks. With this crucial innovation, the fires of all artillery tubes within range of a target could engage it simultaneously. This enabled American commanders to place devastating amounts of fire on their adversaries.¹⁰ Author Frank Comparato notes that a good example of this volume of fire was in Patton's

Third Army, which eventually had 1,464 field pieces. The Third Army fired some 6 million rounds and converted Patton to indirect fire, although he did not fully understand how the artillery units managed, noting it must be "by methods known only to God and the Artillery . . . fire was placed on target."11 At the end of the war, Patton stated: "I do not have to tell you who won the war. You know our artillery did."12 Particularly effective was the time on target (TOT) mission, whereby the fires across corps artillery and DivArty massed their guns on a single targetoften 10 or more battalions-with all shells arriving nearly simultaneously on target.¹³ This was devastating, as Comparato writes, because "the TOT mission often denied to the enemy the bare 10-second's time to jump into a foxhole-and often Allied troops were able to walk in 'without a scratch."¹⁴ At the end of the war, General R. O. Barton, commanding the 4th Division, reminisced that: The Artillery was my strongest tool. . . . I repeatedly said that it was more a matter of the infantry supporting the artillery than the artillery supporting the infantry.

With this crucial innovation [advent of tactical radios and motorization and mechanization], the fires of all artillery tubes within range of a target could engage it simultaneously.

This was an overstatement, but not too much of one. . . . I wish I knew the countless times that positions were taken or held due solely to TOT's. I also wish I knew the innumer-able times . . . when counterattacks were smeared by the artillery.¹⁵

The massing of fires, while a technical feat, also relied on artillery commanders exercising tactical control of field artillery firing units. Through careful positioning, the maximum number of guns would be available to support maneuver forma-tions. execute counterfire and hit other high-priority targets.¹⁶ Furthermore, as General Courtney H. Hodges, commander of the First Army recalled, Of the principal arms that could be brought to bear directly on the enemy, infantry, armor, and air were seriously handicapped by the weather and terrain. Through all, however-day and night, good weather and bad-the flexibility and power of our modern artillery were applied unceasingly.17

- ¹¹ Frank E. Comparato, Age of Great Guns: Cannon Kings and Cannoneers Who forged the Firepower of Artillery (Harrisburg, PA Stackpole, 1965), 252.
- 12 McKinney, The Organizational History of Field Artillery, 187.
- ¹³ Comparato, Age of Great Guns, 254.
- ¹⁴ Comparato, Age of Great Guns, 254.
- ¹⁵ Comparato, Age of Great Guns, 254–255.
 ¹⁶ McKinney, The Organizational History of Field Artillery, 186.
- 17 General Courtney H. Hodges, quoted in Joseph R. Reeves, "Artillery in the Ardennes," *Field Artillery Journal, (March 1946):* 138; *quoted in McKinney, The Organizational History of Field Artillery,* 186.

⁹ Dastrup, King of Battle, 176.

¹⁰ McKinney, *The Organizational History of Field Artillery*, 150.

Post-World War II.

digitization, automation. guidance, global positioning systems, within never in reserve.

howitzer batteries with armored cav- Army.19 alry regiments), were provided tactical formations and missions

Modularity to Meet the Demands of **Persistent Conflict.**

Schoomaker reorganized the Army to instead demanded precision to prevent be based on BCTs rather than divisions. Schoomaker believed that the central flaw in the division-based system was that "tailoring and taskorganizing our current force structure for such operations renders an ad hoc

deployed force and a non-deployed civilian casualties and collateral damage. these brigades—and sine qua non remained the ability to more standardized brigades, enabling telling

that intelligence, signal, etc.) determined their priority of fires.18 decomposed and assigned to BCTs. reduced]. In the aftermath of Operation Iraqi time-counterinsurgencies (COIN) in FCX

> [The Artillery's] sine qua non remained the ability to mass fires across the force.



The World War II methods for residue of partially disassembled Skills across the artillery community tactical and technical control of field units, diminishing the effectiveness of diminished, as documented in a 2008 artillery were the seminal experience both." He was also concerned that white paper for the Army Chief of Staff for U.S. field artillery for the "right now, all these brigades are by three former BCT commanders (cogenerations that followed. Although different—the number of helicopters in authored by one of this essay's precision them, the number of units, sub-units contributors), titled "The King and I: The it's Impending Crisis in Field Artillery's improved radars and other innovations extraordinarily inefficient." He believed ability to provide Fire Support to advanced the ability of field artillery that modularity would be a more Maneuver Commanders." This was a units to support maneuver forces, its efficient way of organizing a force with mere five years into modularity. Most was their conclusion: mass fires across the force. The branch direct interchangeability when it is "Modularization places responsibility for had one imperative: field artillery is necessary to re-place a unit." This fire support training on maneuver would "increase the number of BCTs commanders who are neither trained nor Consequently, artillery units, rather available through improved force resourced to perform these tasks."20 than being assigned to maneuver bri- management" and create more time Furthermore, they lamented: There is no gades (with a few exceptions, e.g., the between deployments for a stretched competent higher FA [field artillery] headquarters to coordinate resources and Because of modularity, divisional enforce standards. [There are no more control by their parent field artillery non-maneuver battalions (e.g., military Corps Arty or Div Arty HQs and the were number of FA Brigades has been leaves This battalion This also happened with the DivArty, commanders to handle ammunition whose battalions were made organic to management, doctrinal review, new the BCT. This was appropriate for the equipment training, TACP integration, wars that the United States was in at the JAAT Training, MORTEP support, and coordination, among other Freedom, the Army has faced two pro- Afghanistan and Iraq. Indeed, the need responsibilities. . . . Units are seriously tracted insurgencies in Afghanistan and for fires in these wars was greatly challenged conducting Combined Arms Iraq. In 2003, Army Chief of Staff Pete diminished from earlier conflicts; they Live Fire [sic] Exercises in support of maneuver due to poor level of FO training, fire direction, and gunnery skills.²¹

> Much of this degradation in skills was unavoidable, given the combat tasks facing BCTs in Iraq. Nevertheless, artillery skills waned, and field artillery Soldiers were employed-absent a fire support mission-as ground holders, convoy escorts and in service to other missions that had to be accomplished by BCTs with the Soldier resources at hand. The white paper also warned: "The once mighty 'King of Battle' has been described by one of its own officers as a 'dead branch walking.""22

- ¹⁸ McKinney, The Organizational History of Field Artillery, 190–195. ¹⁹ Stewart E. Johnson et al., A Review of the Army's Modular
- Force Structure (Santa Monica: RAND Corporation, 2012), 11.
- Sean MacFarland, Michael Shields and Jeffrey Snow, "The King and I: The Impending Crisis in Field Artillery's ability to provide Fire Support to Maneuver Commanders," white paper, 2008, 2, https://www.npr.org/documents/2008/may artillerywhitepaper. pdf.
- 21 MacFarland, Shields and Snow, "The King and I," 2.
- ²² MacFarland, Shields and Snow, "The King and I," 1.

"Modularization places responsibility for fire support training on maneuver commanders who are neither trained nor resourced to perform these tasks."

The King and I: The Impending Crisis in Field Artillery's ability to provide Fire Support to Maneuver Commanders, 2008.

The extent of this was also captured in a 2017 Fires Center of Excellence briefing that noted several challenges to the branch, specifically that "fires core competencies have atrophied."²³

"All Available" Is Important for Maneuver Commanders

While appropriate for the nature of the COIN conflicts the U.S. was in, the fundamental problem with placing field artillery battalions in BCTs is that it violates one of the fundamentals of fire support: never keep artillery in reserve. In high-intensity combat of fire and maneuver envisioned in LSCO, this will not work. Armored and infantry brigades are positioned based on terrain considerations and time/distance calculations to enable them to mass at the decisive point against the enemy. In certain circumstances, it may make sense to keep one or more of them in reserve-out of range of enemy fires and ISR (intelligence, surveillance and re-connaissance) assets. In contrast, artillery assets are positioned based on survivability considerations and their ability to range targets across the battlespace. Thus, the artillery available to the DivArty also includes that of field artillery brigades external to the division and coordinated through tactical missions, i.e., direct support, general support reinforcing, reinforcing and general support. This big difference between positioning considerations often leads to putting artillery far from its habitually supported maneuver unit to achieve coverage and the ability to mass fires across the battlespace.24



The imperative to mass fires will become even more pronounced as the Army fields new cannons, rockets and missiles with greater ranges and more lethal munitions. In the near future, even more fires will be available to maneuver commanders across an extended battlefield. This is the clear advantage of the DivArty-it ensures that all the fires that can range the fight are available. The DivArty (and other force artillery headquarters) also fuses information-which targeting will become ever more sophisticated as future Army programs deliver new capabilities to find the enemy.²⁵

A BCT commander lacks the means and the situational awareness to integrate his organic field artillery battalion's fires outside of his area of operation (AO) with other units' fires. This is in addition to requirements to integrate Army and Air Force aviation, targeting intelligence, electronic warfare and air and missile defense. The division is the first echelon at which a commander can do this.²⁶

Some may be concerned about fire support for the BCTs if DivArtys are reformed in full. They should not be. This arrangement would benefit maneuver units most of all. In addition to freeing the BCT staff from worrying about the unique requirements of an artillery battalion, the BCT would enjoy better fire support when it matters most.²⁷

Bring Back the DivArty

The ability to rapidly shift reinforcing fires and integrate other effects, accepting risk in one AO to achieve success in another, is how a division commander contributes to a BCT's fight. It is how to change divisions "from headquarters to formations," improve the synergy between echelons and win on future battlefields.28 Institutional learning restore field efforts to artillery competence are being addressed at the Field Artillery School at Fort Sill. But schoolhouse learning is not enough to reinvigorate the fire support system if direct support field artillery battalions remain organic to BCTs. More important than the training and administrative burdens placed on the BCTs is the erosion of the principal skill on which the U.S. field artillery prided itself and with which it dominated its enemies in conventional combat: timely massed fires. Without a DivArty headquarters,

²⁵ MacFarland, "DivArty Paper."

²⁸ MacFarland, "DivArty Paper."

²³ Briefing in authors' possession.

²⁴ Lieutenant General Sean MacFarland, USA, Ret., "DivArty Paper," email to authors, 8–13 January 2020.

²⁶ MacFarland, "DivArty Paper."

²⁷ MacFarland, "DivArty Paper."

it will be difficult for maneuver commanders to exercise the required skills with its subordinate and battalions. As was the case in World War II—the last time the Army confronted a competent peer adversary in LSCO—the massed fires coordinated bv DivArty and fire brigade headquarters are crucial to winning the fight. Again, as Colonel Alexander realized during the Civil War, keeping artillery battalions in BCTs will have a deleterious effect, because, "in such small units artillery can do little."29

Most important, however-the world has changed since the Army adopted modularity. The potential adversaries detailed in the National Defense Strategy (China, Russia, Iran and North Korea) demand Army proficiency in LSCO and in MDO.³⁰ These are not operations where BCTs control an AO against irregular adversaries. These are offensive and defensive operations against increasingly capable adversaries that will require unity of effort across an extended battlespace.³¹ Just as the Army adapted to the threats and operational realities that demanded modularityincluding making field artillery battalions organic to BCTs, it must again adapt to changing strategic conditions. The future requires new solutions to:

• assure responsive fires across the theater of operations;

• improve fire support coordination at the division and above echelons and for the joint force;

• maximize the fires available to maneuver formations;

• ensure no artillery is ever in reserve; and

• restore the competencies the field artillery has always been renowned for in the past through better training.

It is time to return the BCT field artillery battalions to the DivArty.

Senior Maneuver Commander Perspective

To ensure that this essay did not reflect only the views of field artillery officers, the authors provided drafts to several distinguished retired maneuver generals. These included Lieutenant General Sean MacFarland (former commander of III Corps); and General James D. Thurman (former commander of U.S. Forces Korea and U.S. Forces Command). Each provided useful comments and agree with the conclusion that field artillery battalions should be removed from BCTs and put back in DivArtys.

About the Authors

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U.S. Army soldiers assigned to Alpha Battery, 3rd Battalion, 29th Field Artillery Regiment, 4th Infantry Division, fire a M109A6 Paladin in support of the joint training exercise Eager Lion '19 at Training Area 1, Jordan, Aug. 27, 2019. Eager Lion, U.S. Central Command's largest and most complex exercise, is an opportunity to integrate forces in a multilateral environment, operate in realistic terrain, and strengthen military-to-military relationships. Photo by: SPC Andrew Garcia

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Improving brigade combat team intelligence collection operations for large-scale combat operations

Observations and best practices from the Joint

Multinational Readiness Center

MAJ William Denn, MAJ Jason Turner and CPT Adam Wojciechowski

After detailed mission analysis, the brigade staff was confident they knew where and when the enemy would attack. Over the next two days the engineers dug extensive battle positions, platoons rehearsed their plan, scouts seeded observation posts and intelligence analysts watched their drone feeds to give advanced warning. When the enemy did arrive, they attacked with such speed and audacity so before the brigade knew it, the enemy had penetrated their defenses and was heading straight for their command post. Every echelon was surprised: from the intelligence analysts, to the scouts forward, to the platoons in their defensive positions — there was little advance warning. While this is a hypothetical vignette, unfortunately this scenario occurs far too often at the U.S. Army's combat training centers (CTC).

The U.S. Army is undergoing a dramatic shift in training competencies to fight in large-scale combat operations (LSCO) versus the counterinsurgency (COIN) and advisory missions of the past 17 years in Iraq and Afghanistan. Brigades are learning that LSCO requires fundamentally different skill sets and competencies than the COIN fight of the past. Because of how quickly the battlefield moves — at the speed of mechanized forces attacking over large distances — the above vignette is an illustration of how brigades fail to layer their intelligence collection over large areas to give friendly forces enough warning and certainty of enemy intentions to adequately prepare for combat.

Over the course of observing multiple brigades encounter similar challenges in the last year, we, the authors at the U.S. Army Joint Multinational Training Center (JMRC) identify several challenges that brigades must address:

- 1. Manning and training an intelligence collection management team at the brigade level that is able to adequately plan and synchronize an effective collection strategy.
- 2. Scoping the brigade's deep fight adequately to give the brigade enough advance notification to prepare for contact with the enemy.

3. Adequately layering intelligence, surveillance and reconnaissance (ISR) assets to increase chances of detection, planning intelligence handover to coordinate between these ISR assets (and units) and ultimately enable targeting of the enemy throughout the depth of the battlespace.

Manning and training collection management cells

The role of the brigade collection manager (CM) is essential for planning an effective collection strategy to satisfy the commander's intelligence gaps, synchronizing all of the brigade's ISR assets (to include the cavalry squadron and radars), and integrating higher, joint, theater and national-level ISR assets. The struggle for brigades, however, is that there is no formalized collection manager position. Units choose a collection manager from existing personnel, often in a part-time capacity, and usually filled by a lieutenant or junior captain. This CM (often untrained), then attempts to manage the difficult task of planning and managing the entire ISR enterprise for the brigade. Even when the CM is trained (at the United States Army Intelligence Center of Excellence {USAICoE} or Defense Intelligence Agency courses), CMs are unprepared to effectively synchronize and integrate units such as the cavalry squadron, participate in brigade battle rhythm events like military decision-making process (MDMP) wargaming, intelligence collection/fires (IC/fires) rehearsals and contribute to targeting working groups.

Collection management is a complex enough task that requires a team to manage all of the CM requirements. Successful brigades dedicate at least four to six intelligence analysts to aid the CM in planning, ISR current operations management, assessments and targeting — especially in support of 24/7 operations.

Successful brigades will effectively utilize subordinate liaisons, especially from their cavalry squadron, to integrate into collection management working groups to plan and task assets and units for collection. This allows subordinates to help aid in refinement based on their knowledge of their own capabilities. This input is essential to refine the IC synchronization matrix (ICSM) that is included in daily fragmentary orders (FRAGOs) with what specific indicators and source of reporting their assets and teams must answer.

Today's ISR capabilities are also increasingly complex and rapidly changing with technology. There is little expectation that a junior captain can be a subject matter expert in what these ISR assets can or cannot collect. Noting such, it is important that the brigade's warrant officers are integrated into collection management planning. The brigade's 352N Signals Intelligence Technician, 351M Human Intelligence Technician and 131A Field Artillery Targeting Technician are especially critical. For example, unused by most brigades is the ability for the Q50/53 counterfire radar to be used as an ISR asset by reporting line-of-bearings whenever enemy counterfire radar transmissions are detected. Without input from these warrant officers, these non-conventional ISR assets will not be included in a brigade's ICSM.

The brigade's ad hoc collection management team must not fight for the first time at a CTC or in combat. They require practice and training as a team in order to understand what outputs they must produce and how they integrate into a brigade staff within planning (MDMP) and execution (current operations). USAICoE's standardization of military intelligence training through the military intelligence training strategy (MITS) framework is an important first step in identifying the need to train and certify collection management crews. Rarely, however, are brigade combat teams (BCTs) arriving at JMRC with a certified CM crew that has trained together in a previous MITS exercise. Nor are they using established CM standard operating procedures to structure how they operate. BCT commanders and S2s must place more emphasis on establishing and training their CM teams prior to CTC rotations. Successful BCTs operationalize their CM cells to operate year-round even in garrison rather than on an ad hoc basis during brigade collective training events.

Finally, while school options exist for CMs, we are not yet observing school-trained CMs successfully operating at the BCT level. We encourage USAICOE to improve their collection management program of instruction focusing on: managing and leading a collection team, joint asset capabilities and integrating CM into BCT rehearsals, MDMP (course of action development and wargaming) and the targeting process.

Scoping the "Deep Fight"

Within the COIN-era the BCT often lacked a "deep fight," instead focusing on the needs of platoons and companies in a close tactical fight. Within a LSCO environment, a BCT's deep fight is essential to mission success. FM 3-0, Operations defines the deep area as, "the portion of the commander's area of operations that is not assigned to subordinate units. Operations in the deep area involve efforts to prevent uncommitted or out-of-contact enemy maneuver forces from being committed in a coherent manner or preventing enabling capabilities [...] from creating effects in the close area. [...] The purpose of operations in the deep area is to set the condition for success in the close area or to set the conditions for future operations."

Brigades often struggle with where they should define the deep

fight. Brigades typically arrive to a CTC with their maps limited to the geographic training area boundaries or the area of operations (AO) boundaries dictated to them by their higher headquarters. Especially for a CTC like JMRC, which has a relatively small training area (10km x 20km), this decision on the scope of their maps is their first lost opportunity and requires coaching. From an intelligence collection perspective, the brigade's deep fight extends much farther outside the dictated AO.

U.S. Army doctrine provides us with assistance to help understand a brigade's deep fight utilizing the concept of area of influence (AoI). ATP 2-01.3 *Intelligence Preparation* of the Battlefield defines AoI as "a geographical area wherein a commander is directly capable of influencing operations by maneuver or fire support systems normally under the commander's command or control. The area of influence includes terrain inside and outside the AO and is determined by both the G2/S2 and G3/S3."

During mission analysis, brigades typically show their AO or area of interest, but do not refer to their AoI. AoI as a concept provides additional space that the brigade can not only see the enemy with ISR assets, but also gives the brigade space to shape the enemy through the use of their indirect fires, maneuver or aviation assets. When the AoI extends outside the AO, this requires coordination with their higher headquarters or adjacent units, but to ignore it shrinks the brigade's focus and increases the likelihood of tactical surprise by the enemy. Moreover, just because the higher headquarters plans for an intelligence handover line does not mean they will focus collection on the near side of it.

Our recommendation is for brigades to consider the full extent of their AoI and to conduct appropriate mission analysis (terrain, enemy and friendly capabilities) to maximize the brigade's ability to target and shape within the AoI



Asset and/or resource availability and capability factors. (Courtesy illustration)

prior to the enemy entering the brigade's AO.

Layering ISR to maximize detection and targeting

If a brigade can properly man and train their collection management cell, give them enough geographic and temporal space to plan for during mission analysis, then the final key to success is to plan and layer ISR appropriately to find the enemy.

As part of mission analysis, a BCT S2 and CM must first consider their overall approach to collection management. Joint Publication 2-01 Joint and National Intelligence Support to Military Operations, advises "When developing a collection plan, collection managers should consider to maximize efficiency by dispersing collection assets across the widest geographic area in order to maximize collection, or place them in nearby or the same geographic areas to overlap their sensor ranges for synergistic effects, thus providing more opportunities for

dynamic tipping and cueing, asset mix and/or asset redundancy." This concept of asset convergence or dispersion is determined based on whether the enemy course of action is clear versus unknown. For CTC rotations, typically the brigade understands where and when the enemy is expected to approach from and we subsequently recommend that the brigade attempt to maximize asset convergence.

Reliance on one type of collection asset severely restricts the level of certainty and dramatically increases mission risk of misiden-

tifying a target. CMs must analyze what the best assets to answer the commander's intelligence needs are, but should attempt to layer (or mix) complementary ISR assets to further increase likelihood of observation. JP 2-01.1 Joint Tactics, Techniques and Procedures for Intelligence Support to *Targeting*, Figure III-10, illustrates some of these planning factors; however, we recommend CMs study the new ATP 3-55.3 ISR Optimization Multi-Service Tactics, Techniques and Procedures for Intelligence Surveillance and Reconnaissance Optimization, published September 2019, which provides more detailed guidance on ISR employment for specific mission requirements based on capabilities.

Once assets are determined appropriate or not, brigades typically fail to consider layering ISR assets in order to mass their effects. Layering ISR begins with theater collection, like the Joint Surveillance and Target Attack Radar System (JSTARS), which provides important ground-moving target indicator intelligence as the enemy moves in the brigades' deep areas. Brigades understand the concept of cueing when it comes to JSTARS onto a full-motion video (FMV) asset, but they then over-rely on their aerial FMV ISR (Division MQ-1C Gray Eagle or Brigade RQ-7B Shadow).

Most brigades fail to task their cavalry formations, infantry/armor battalions or fire support teams (FIST) to observe multiple named areas of interest to confirm or deny enemy courses of action in conjunction with their aerial ISR to enable targeting. Battalions also arrive unprepared to leverage their own organic battalion-level ISR assets like small unmanned aircraft system or their own scout platoons. Moreover, brigades struggle to actually publish an ICSM daily with their FRAGOs to inform or direct ISR assets like their cavalry squadron. When weather turns poor, or division assets redirect to higher priority missions, brigades are left unprepared because they have

not adequately layered all-weather redundant ISR assets like their cavalry squadron.

Brigades also do not conduct effective intelligence handover between these assets and units. To avoid surprise, brigades must plan and conduct deliberate intelligence handovers with ISR assets. It starts with initial notification of enemy movement with theater deep assets in the division AO and an assessment on the brigade's current operations (CUOPS) floor on what routes and time horizons the enemy is expected to take. Brigade aerial ISR then should acquire the enemy to enable further advance warning and enable brigade indirect fire shaping. The brigade's CUOPS section should prepare to tip and pass these targets to their reconnaissance squadron in their series of observation posts or scout sections in depth. Once these targets are handed over, the brigade should be free to return their aerial ISR to focus back into the brigade's deep areas. Finally, the reconnaissance squadron conducts a deliberate handover of these targets into the infantry/armor battalions' close fight where the remnants of the enemy are eventually destroyed.

Intelligence handover of targets is a difficult and deliberate process that requires planning, graphic control measures and rehearsals. Brigades currently are not conducting effective IC technical rehearsals, IC/fires rehearsals and combined arms rehearsals to synchronize the handover of the enemy from the brigade's deep areas into the battalions' close fight. While outside the scope of this article, we recommend brigades spend effort to at least understand what is necessary to rehearse in the IC/fires rehearsal to shape the deep fight and conduct effective intelligence handover.

Conclusion

Evolution of our fundamental skillsets while linking ISR to targeting across the BCT will continue to utilize much that the BCT has to offer. To allow BCTs to capitalize on the myriad of collection assets and increase their lethality, we focused on three areas. First, ensuring a CM team exists and trains together year-round to plan and synchronize the BCTs collection strategy. Second, conducting analysis of the AoI to understand and plan for the BCTs deep fight. By doing so, a BCT can instead conduct a systematic attrition of their enemy instead of simply reacting to contact. To guarantee success in identifying the enemy, the BCT must maximize the utilization and layering of their ISR assets, to include their reconnaissance squadron and non-standard ISR like their counterfire radars. Lastly, conducting an effective IC and fires rehearsal is key for all operators to understand the sensor-to-shooter plan. As the U.S. Army continues training BCTs for large-scale war, we must relearn many of these fundamentals of LSCO so that we can maximize capabilities to successfully defeat our nation's emerging threats. Inclusion of these recommendations will likely, in time, reverse several of the negative trends of IC management and synchronization of IC and fires identified over multiple multinational brigade-level exercises at the CTCs.

The authors are all currently serving as intelligence and fires observer, coach/trainers at the Joint Multinational Center in Hohenfels, Germany.

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Soldiers assigned to the 1st Battalion, 37th Field Artillery Regiment, 1st Stryker Brigade Combat Team, 2nd Infantry Division, from Joint Base Lewis-McChord, Wa., fire an artillery round from an M777 Howitzer while conducting calibration during Decisive Action Rotation 20-05 at the National Training Center in Fort Irwin, Calif, March 5, 2020. Decisive Action rotations at the National Training Center ensure Army brigade combat teams remain versatile, responsive and consistently available for current and future contingencies. (SPC Kamryn Guthrie, Operations Group/National Training Center.)

Delivering timely Field Artillery fires

A review of existing doctrine, articles, white papers and earlier Center for Army Lessons Learned (CALL) publications offer detailed references to topics discussed in this article. ATP 3-09.50, *The Field Artillery Cannon Battery*, dated May 2019, defines the hot, warm and cold platoon status. FM 6-50, *Tactics, Techniques and Procedures for the Field Artillery Cannon Battery*, superseded by ATP 3-09.50, de-

MAJ James Thomasson

fined a hot section as a cannon section designated to maintain full crews at their posts for instant reaction to a fire mission. This technique minimizes reaction time to calls for fire and allows the other sections to accomplish various tasks that must be done during position improvement. This definition provides more direction and expectations than currently found in ATP 3-09.50. Furthermore, the imperative to mass fire support assets in the combined arms fight is discussed in the article "Hunting with Fires: One Armored Brigade Combat Team's Approach to Killing the Enemy." FM 3-09, Field Artillery Operations and Fire Support, dated April 2014, also discusses the necessity to mass fires as well as when to mass fires.

TC 3-09.8, Fire Support and Field Artillery Certification and Qualifi-



Note: Chart data is for battalion and below and does not include brigade fires cell. Average time for M119A3 is 7:10, which is 5:30 over the 1:40 standard for battalion FDC, platoon FDC and howitzer sections allocated by TC 3-09.08. Average time for M777A2 is 8:33, which is 6:23 over the 2:10 standard for battalion FDC, platoon FDC and howitzer sections allocated by TC 3-09.08.

Average counterfire mission processing times based on data provided by the battalion fire direction center. (Rick Paape/Courtesy information)

cation, dated February 2019, Table D-15, provides current counterfire mission processing time standards. The White Paper, "Fire Support Planning for the Brigade and Below," published Sept. 16, 1998, describes the necessity for wargaming to provide refinements, validate capabilities and synchronize the fires warfighting function. Additional emphasis is placed on understanding munition loads and characteristics. CPT Judith Morgan's article, "Tactical Field Artillery Munition Management," discusses planning efforts with the sustainment warfighting function to ensure ammunition resupply is forecasted and delivered in time to support brigade combat team (BCT) operations. CALL Handbook 16-12, Musicians of Mars II, dated April 2016, specifies the need for a detailed PACE plan (an order of precedence list based on primary, alternate, contingency and emergency communication) that is rehearsed to ensure lines of communication are maintained.

While the Field Artillery has made great progress over the last several years to integrate fires into the combined arms fight, Field Artillery battalions continue to struggle to deliver timely fire in support of Infantry BCTs operations at the Joint Readiness Training Center (JRTC). The purpose of this article is to share observations and trends during FY18, focused at the Field Artillery battalion and below, to better understand the issues resulting in a high average for fire mission processing time. Specifically, this article will discuss the average counterfire mission processing times, friction points and recommendations based on best practices observed during 10 rotations at the JRTC.

During FY18, the JRTC focused on counterfire mission processing time data to identify the friction points and where the friction points occur to provide solutions based on observed best practices and observer, coach/trainer experience to reduce fire mission processing time. The figure above depicts the average counterfire mission processing times, from receipt at the battalion fire direction center (FDC) to firing of the first round of a fire mission.

This data is the collation from nine decisive-action rotations executed by active component Army and National Guard BCTs at the JRTC. However, the Field Artillery battalions' ability to deliver timely Field Artillery fires varies widely; some battalions take an average of 14 minutes or longer to process counterfire missions, while others process counterfire missions at an average of eight minutes or less. What immediately stands out from this data is that a great deal of the total fire mission processing time is consumed at the battalion and platoon FDCs.

Why so much time at the FDC?

The three most commonly observed trends that waste time at the battalion FDC are no predetermined fire orders, the battalion FDC not knowing which firing unit is ready to receive the fire mission (hot and cold platoon schedule) and lack of communication between battalion and the firing unit. First, developing a standard fire order based on the Attack Guidance Matrix (AGM) and the JRTC adjudication tables (in accordance with the Joint Munitions Effectiveness Manuals) reduces the total amount of time fire missions stay at battalion FDC before being sent to a firing unit. Outputs from the targeting process, specifically the Targeting Synchronization Matrix, is a clear indicator for how many firing units are required to be in a hot status or when the battalion must mass fires. The battalion S2 and fire direction officer (FDO) must develop a solid understanding of the enemy threat during mission analysis to determine what type of munitions and the quantity needed to achieve desired effects on the enemy. Furthermore, course of action analysis (COA) should not only focus on what enemy combat power remains on the battlefield during each phase of the operation, but also define ammunition resupply triggers. The transition from conceptual to detailed planning is evident once all movements are synchronized in time and space between the forward support company (FSC), the firing units and ammunition consumption rates. Second, a battalion FDC continues to consume more time during fire missions if it does not maintain a good system of which firing units are in a hot status, in position ready to fire, and not moving to another firing position. Battalions consistently struggle to develop and maintain "hot and cold" platoon schedules. While some battalions do not plan for "hot and cold" platoons, oth-

ers develop unrealistic schedules. I would contend that FDCs and firing units can maintain hot status for no more than four hours. Units that plan a hot status for longer times are destined to exceed fire mission processing time standards. Third, communications that might be relatively easy to maintain in simulation center or in the field during home station training are very difficult to maintain in the complex terrain and competitive environment of the JRTC. At any given time during a rotation, some Advanced Field Artillery Tactical Data System (AFATDS) are communicating over the secret internet protocol router network, some are communicating over frequency modulation radio and some are not communicating at all.

A few additional notes are in order about "hot and cold" platoon schedules. First, we must define what the hot status truly means. During FY18, units reported that they made TC 3-09.08 time standards on approximately 80 percent of the fire missions during Table VI certifications. Moreover, those missions not meeting the time standard are on average less than one minute over the time standard. This is significant because the unit can clearly process fire missions much faster than the average times collected at the JRTC. This is not due to a lack of ability or competency. Field Artillery battalions have already trained to standard and certified that FDCs and howitzer sections can achieve mission processing time fire standards prior to arriving at the JRTC. The FDCs and howitzer sections are in the "three-point stance" during Table VI certification and ready to receive the fire mission.

Second, battalion FDCs fail to develop a detailed schedule for hot and cold units, nor is there a formal process to bring a cold unit to hot status and vice versa. A formal checklist and process that notifies units when they are in a hot status, or relieved of hot status and now in cold status, alleviates confusion among subordinate elements. More importantly, the battalion FDC controls this process and understands which unit to send fire missions to at any given time.

Third, the battalion must consider the maneuver plan and when the battalion is expected to mass fires or prosecute preplanned targets. There will be times when everyone needs to be in a hot status. Understanding these times is crucial to developing the hot and cold schedule. FM 3-09 states that massed fires seek to maximize the effectiveness of the initial volley on the intended target. Massing all available fires enables the maneuver commander to maximize the effect of fires on a target or targets. Massing fires must occur to disrupt enemy formations, support friendly penetration of enemy positions, destroy hasty defenses and prevent massing during counter attacks. Moreover, synchronized and intense fires can cause enemy personnel to lose the will to continue to fight. The friendly scheme of maneuver identifies these decisive points in which Field Artillery battalions are expected to mass fires. Additionally, battalions must determine if there will be a dedicated counterfire battery and how this effects the rotation of hot and cold platoons.

Recent trends observed at the JRTC

Issue 1

Units arrive at the JRTC without a defined system for hot and cold platoons or demonstrate an inability to adhere to the defined system. There is no common understanding of what "HOT" actually means. For example, are personnel expected to be at the ready like Table VI qualification (radiotelephone operator with hand mic to ear, computer operator with fingertips on AFATDS keyboard, section personnel at the howitzer, etc.)? Soldiers are doing good things (security, maintenance, rest, training and other priorities of work), but are not truly in a hot posture ready for a fire mission.

Recommendation 1

Units can benefit by defining hot and cold platoon status with expectations of each status. Units must develop and track a schedule of planned hot and cold transitions with personnel assigned to manage the plan. Synchronize the schedule during COA analysis in conjunction with survivability moves and alternate position area artillery occupations. Units must maximize time during home station training to refine tactics, techniques and procedures (TTPs) and practice hot and cold TTPs.

Issue 2

Units do not develop a checklist to execute formal transfers from hot to cold status. As a result, battalion FDCs are not tracking who is hot and waste time determining who receives the fire mission. Units have been in a hot status for extended periods of time, resulting in personnel asleep or not at their assigned positions for a fire mission.

Recommendation 2

Develop a hot/cold standard operating procedures (SOPs) to include change over briefs to mitigate confusion and track the prescribed schedule. Units must define a formal process to bring cold units to the hot status, then relieve hot units to the cold status. Additionally, units must nest transitions from hot to cold status with the tempo of BCT operations to reduce section-level friction while ensuring required assets are available during critical battle periods. Some items to consider include: develop a realistic hot/cold schedule that is sustainable, intelligence reports and friendly scheme of maneuver can depict times to accept risk in the schedule and standardized reporting criteria to ensure the battalion FDC is able to accurately track weapon statuses for howitzers and radars.

Issue 3

Units at the JRTC struggle to forecast ammunition expenditure and deliver ammunition in time to support BCT operations. The concept of sustainment lacks detailed planning and is not discussed during COA analysis to develop a feasible plan.

Recommendation: Units must know the required number and type of munitions required to achieve the desired effect against the entirety of the enemy formation. Units should know the haul capacity of the FSC and utilize other vehicles and trailers to support resupply operations. Ammunition management cannot be the sole responsibility for either the battalion FDO or the battalion S4. The battalion S₃ must supervise ammunition requirements while the battalion XO coordinates with the support operations officer and brigade support area to ensure ammunition is delivered.

Best Practices

The Fire Support Division at the JRTC has observed several best practices during FY18. Some units not only improve the delivery of indirect fires, but other warfighting functions as well. For example, units that train on the Global Broadcast System (GBS) at home station are better prepared to use the system at the JRTC. While GBS is used to obtain meteorological data, the S2 can also connect the Distributed Common Ground System-Army to the GBS.

Another best practice observed at the JRTC is maintaining digital communications from battalion to the firing elements. Digital is always faster than shooting degraded and reduces the risk of receiving wrong firing data or having to repeat voice commands. Units with SOPs that define specific standards for maintaining digital communications, with triggers to transfer technical control to another element if battalion does not meet those standards, succeed in avoiding degraded fire missions. Additionally, units that force the target description into the AF-ATDS reduce the total fire mission processing time, as well as maintain fire missions in accordance with the AGM.

Finally, technical rehearsals that integrate sensor-to-shooter establish a solid foundation for ensuring the timely delivery of indirect fires. Battalions that ensure sufficient time is allocated for the technical rehearsal, while integrating all observers, are better prepared for the upcoming operation by validating the fires plan.

Conclusion

The Field Artillery Training Strategy guidance prepares units for combat and rotations at a combat training center. The struggle is identifying how best to replicate the same posture as home station training, when executing Field Artillery Tables during live fire and operations in a decisive-action scenario at the JRTC. Field Artillery battalions that create extended periods of time for units in a hot status are more likely to exceed the standard fire mission processing times. Consider these two questions, 1) What is a reasonable amount of time for a unit to truly stay in a hot status? 2) How long can a lineman stay in the threepoint stance before false starting (football analogy)? Developing a thorough and disciplined schedule to maintain hot and cold units for extended periods of combat operations is crucial to delivering timely fires.

MAJ James Thomasson served as the Field Artillery battalion S3 and XO observer, controller/trainer at the Joint Readiness Training Center at Fort Polk, La. Prior to this assignment he served as deputy commander of the 101st Division Artillery and battalion S3 of 2nd Battalion, 32nd Field Artillery Regiment at Fort Campbell, Ky. Soldiers assigned to the Field Artillery Squadron, 2nd Cavalry Regiment prepare to fire M777 towed 155 mm howitzers during exercise Dragoon Ready 20. Dragoon Ready is a 7th Army Training Command led exercise designed to ensure readiness and certify the 2nd Cavalry Regiment in NATO combat readiness and unified land operations at the 7th Army Training Command's Grafenwoehr Training Area, Germany, Oct. 28, 2019. (Matthias Fruth/U.S. Army)

If you are in a fair fight, division did something wrong

DIVARTY's role in the division targeting process and predictive fires

MAJ Matthew Boudro, MAJ Benjamin Griffin and MAJ Duane Clark

Throughout September and October 2019, 1st Infantry Division (1st ID) and 1st Infantry Division Artillery (1st ID DIVARTY) excelled while providing deep fires in support of two exercises, Operations Saber Junction 19 and Dragoon Ready 20. Both were blended, multinational exercises with live-force training at Hohenfels Training Area (HTA). During the exercises, 1st ID DIVARTY served as both the counterfire headquarters (CFHQ) and the force field artillery headquarters (FFAHQ). The division won the counterfire fight and shaped enemy maneuver forces, which created conditions for the brigade combat teams' (BCTs) successful close fight. Firing nearly 10,000 constructive rounds over the two, 10-day exercises, 1st ID effectively shaped the deep fight by targeting enemy artillery, air defense and maneuver formations. The critical elements of the division's success included a simple and repeatable targeting process, DIVARTY's input to that targeting process and the use of predictive fires to deny enemy position areas for artillery (PAAs).

ATP 3-09.90, Division Artillery Operations and Fire Support for the Division, establishes the DI-VARTY's roles and responsibilities as the CFHO and the FFAHO for the division. During these exercises, the DIVARTY headquarters experienced little friction filling both roles. DIVARTY controlled the division counter fight by positioning all AN/TPQ-53 (Q-53) counterfire target acquisition radars thus ensuring maximum coverage at all times and supporting the requirements of the CFHQs. DIVARTY also utilized general support artillery to conduct counterfire missions long of the coordinated line fire, while directing BCTs to engage counterfire targets in their area of operation using direct support artillery battalions. By serving as the FFAHQ and the counterfire headquarters the fire control officer (FCO) has multiple options to engage enemy artillery formations. The fire control element attempted to use a dedicated counterfire shooter, however that was not always feasible due to range and airspace deconfliction. The option to use varied delivery systems increased responsiveness. DIVARTY serving as the FFAHQ and CFHQ, provides significant flexibility in the planning and execution of both deliberate and dynamic targets.

targeting methodology The in 1st ID is a simple, repeatable process that yields an easily executable plan. This ensures the effective integration of each staff section into a well synchronized targeting process and that all participants understand their required inputs. Its nature also ensures the process endures through staff turnover. A different command post led the process during each exercise. During Saber Junction, the division main served as higher control from Fort Riley, Kan. First ID forward played the same role during Dragoon Ready from HTA. The ability to repeat the process with two largely independent staffs proves the functionality of the system.

To keep the process simple, 1st ID uses the decide, detect, deliver and assess model organized by air tasking order (ATO) to develop targets in accordance with the commanding general's (CG) guidance. Further reinforcing the simplicity and the iterative nature of targeting, the agendas for the targeting working group (TWG) and target decision board (TDB) are identical. Following a review of the rules of engagement, the 1st ID targeting team first assesses effects from the previous ATO. It then reviews and validates planned targets for the next two ATOs. The process concludes when the CG approves targets for 72 hours out and issues guidance for the ATO that is 96 hours out. Each ATO, except for the assessment, follows the same briefing format: weather effects, higher and adjacent unit targeting, active fire support coordination measures and fire support tasks, enemy and friendly task and purpose by brigade and review of planned targets. For each planned target the targeting team briefs the formation, location, desired effect, time window to achieve effects and the assets used to detect, deliver non-lethal or lethal effects, assess battle damage assessment and integrate surface-to-surface and air-to-surface fires.

This process is effective because all members of the 1st ID targeting team come to both the TWG and TDB prepared to brief and give input, which keeps the runtime of both meetings to under one hour. First ID DIVARTY provides the key personnel to the targeting process. First, the DIVARTY commander, as fire support coordinator (FSCO-ORD), drove the process, and in the absence of the CG, approved the targeting plan. The DIVARTY lethal effects coordinator planned artillery targets and positioning and the DIVARTY S2 provided counterfire and battle damage assessments that helped determine priority targets.

Throughout both exercises, 1st ID drove its targeting process by focusing on specific formations. During TWGs, collaboration between personnel from DIVARTY, G2, G3 and division fires produced a list of three to five priority formations for the day. These were typically identified at the battalion level, though occasionally an individual company or battery made the list. The process utilized the high payoff target list and enemy order of battle to identify specific units to target and an event template for the ATO to provide locations as start points for collection assets in the detect phase. However, during execution, it was rare for 1st ID assets to engage a targeted unit within a planned named area of interest or target area of interest (TAI). Intelligence community assets often identified formations sooner than anticipated, allowing DIVARTY to engage and destroy the formations deeper than initially planned. Ground Moving Target Indicator radar was particularly helpful in shaping this. As the targeting process rarely called for a formation's destruction at a particular location, the division generally engaged high payoff targets as identified rather than waiting for the designated window. If a situation did require action at a specific time and location, it is then possible to maintain collection until conditions are set.

During past exercises, both the DIVARTY S3 and FCO participated in the division targeting process. During Saber Junction and Dragoon Ready, the lethal effects coordinator assumed sole responsibility for contributing to the TWG and TDB. Transitioning the targeting responsibilities to another 13 series major allows the DIVARTY S3 to focus on the overall operations of the DIVARTY and keeps the FCO involved in the current fight. For each target that had planned surface-to-surface effects, the lethal effects coordinator would determine the fire order and brief gun target line and maximum ordinate (MAXORD), which determined how the division would request or deconflict airspace.

For DIVARTY, the final output from the TWG and TDB is the field artillery support plan (FASP). DI-



The targeting framework for the 1st Infantry Division. (Courtesy illustration)

VARTY published the FASP, including the target list worksheet (TLWS) daily, providing guidance for the next three ATO days. The internal DIVARTY battle rhythm included a fire synchronization meeting following the target working group. Led by the effects coordinator, attendees to the fire synchronization meeting included the DIVARTY S2, S4, air defense airspace management/brigade aviation element (ADAM/BAE) and FCO. For each planned target the effects coordinator reviewed the fire order, positioning guidance and coordinating measures. Each section validated that every target was properly resourced. This meeting allowed the ADAM/BAE cell to submit airspace control measures (ACMs) and enabled the S4 to forecast ammunition expenditures 72 hours in advance. Following the synchronization meeting, the lethal effects coordinator,

with assistance from the targeting cell, drafted the FASP and TLWS. After approval in the TDB, the DI-VARTY headquarters published the FASP for execution.

Planning for airspace during the targeting process enabled the rapid execution of preplanned fire missions. When a MAXORD exceeded the coordinating altitude of 20,000 feet mean sea level, the lethal effects coordinator identified the need for an ACM. This prompted the division airspace manager to create an ACM and request approval from corps. After the TWG, the DIVARTY ADAM/BAE cell built the ACM in Tactical Airspace Integration System and sent it to the division joint air ground integration cell for inclusion as a preplanned measure in the ATO. This relationship between the division and DIVARTY air cells ensured fixed and rotary wing air operations did not shut down surface-to-surface fires.

Throughout operations Dragoon Ready and Saber Junction, 1st ID DIVARTY shaped the battle through predictive fires that denied enemy PAAs. Firing unobserved fires on likely PAAs, without an intelligence, surveillance and reconnaissance (ISR) trigger, significantly disrupted enemy fires formations and led to the destruction of numerous enemy batteries. Successfully planning these fires began intelligence preparation of the battlefield (IPB) and completion of the military decision-making process (MDMP), requiring a strong understanding of the enemy's position relative to space and time throughout the operations. DIVARTY's predictive fires were more TAI dependent than the targeting process, though still guided by the need to target a specific formation. As these fires often

occurred unobserved and with a minimum of indicators, terrain analysis often led to the identification of likely areas for enemy artillery to fire from.

During step two of IPB, "Describe the Environmental Effects on Operations," analysts in the DIVARTY S2 shop worked closely with the FCO for terrain analysis. This analysis produced in-depth examinations of feasible PAAs throughout the battle space which could be used by either friendly or enemy fires assets. The identification of these PAAs facilitated both friendly fires planning and development of enemy courses of action (COAs).

Creation of an accurate threat template proved essential for conducting effective PAA denial fires. Analysts needed to capture how enemy forces use fires assets to support maneuver. This included the enemy's doctrinally preferred distance from supported elements and the volume and type of fires the enemy preferred to use. An accurate threat template allowed analysts to provide rapid assessments on the location of enemy fires assets based on the identification of any enemy formation. Understanding the volume and type of fires used by the enemy to support their formations enabled accurate assessments of when and how the enemy would employ fires.

The information gleaned from fires-focused analysis during steps two and three, contributed to step four, "Determine Threat Courses of Action." Here DIVARTY analysts again worked with the FCO to use the PAAs from step two to identify the most likely ones for the enemy to utilize. These then became preplanned fire zones for use during operations. Development of a fires-centric event template that depicted location by battery, of enemy formations at critical points furthered understanding of the fight and set conditions for predictive fires.

Terrain analysis of PAAs, the threat template, and event template provided the tools for the DIVARTY S2 shop to recommend execution of predictive fires. They provided the ability to understand how the fight was developing in space and time. Once friendly assets identified an enemy formation, analysts used event templates to identify the echelon of the force and the fires assets supporting it. The threat template provided the base information for analysts to understand the geographic relationship between the identified formation and its supporting fires, and the terrain analysis showed the PAA that best fits enemy doctrine. Analysts then provided recommendations to the FCO on where to shoot and on the composition of enemy forces in the targeted area. The entire process of initial identification of an enemy formation to templating its supporting fires took under one minute, allowing for the rapid creation of a fire mission and delivery of timely and lethal fires.

It is also possible to plan predictive fires based off time analysis of enemy COAs. Using expected rates of movement, analysts can support targeting by identifying windows where enemy fires assets are likely to be occupying PAAs to support maneuver elements. Even if ISR is unavailable, a commander then has the option to shape the battlefield by denying important terrain at a key moment. Predictive fires should also become more effective through each phase of the operation. As the battle unfolded, the DIVARTY S2 shop gained greater understanding of how the enemy commander was utilizing fires based on pattern analysis of enemy fire missions, ISR providing fuller understanding of the enemy order of battle, and confirmation of enemy COAs. These sources of information led to further refinement of the predictive fires plan creating the opportunity for these fires to be at their most effective at the decisive point of the battle.

Executing predictive fires in this way greatly helped DIVARTY shape the deep fight. It seized initiative in the fires warfighting function and enabled operations in environments with scarce ISR. There is risk in exposing friendly assets and unobserved fires also carry a heightened risk of harming non-combatants. The significance of these risks means it is essential to begin planning terrain denial fires from the very beginning of MDMP. Deliberate planning of predictive fires paired with an opportunistic DIVARTY staff can greatly impact the ability of a division to shape the battlefield.

Overall, 1st ID sustained success during the previous two exercises by executing a simple and repeatable targeting cycle, integrating DIVARTY into the targeting process, and by executing predictive fires. The effects of division deep fires included the destruction of over 70 percent of enemy artillery. Additionally, deep fires set conditions for aviation and ground operations. During both Saber Junction 19 and Dragoon Ready 20, these tactics, techniques and procedures served as best practices that should be repeated during future command post exercises and warfighters. They offer a way for divisions to create unfair fights and isolate enemy formations, allowing BCTs to destroy enemy forces and rapidly transition operations.

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Flexibility in the Fires enterprise

LTC Derek Baird

A brigade's *Fire*s enterprise must deliver organic, and joint fires rapidly through flexible, deliberate fires plans, executed dynamically, to enable the brigade's success during a rapidly changing, high OPTEMPO environment. This seemingly Herculean effort takes understanding and training, initiated during home station training events.

Over the past several years, the Army shifted focus from counterinsurgency operations to a more dynamic, and lethal focus on decisive action operations through combined arms maneuver. This paradigm shift provided the Field Artillery community a great platform to train and execute fire support flexibility during high operational tempo (OPTEMPO) missions. Over the past year, the 3rd Battalion, 16th Field Artillery Regiment, trained its fires enterprise to conduct deliberate fires planning, executed under dynamic and fluid conditions during high **OPTEMPO.** The National Training Center (NTC) provided a fantastic training opportunity to validate, and actualize lessons learned from our yearlong training strategy. The NTC shifted from a planning period, battle period, planning period rotational framework to create an open phasing construct enabling the opposing force, and the rotational unit to execute extremely flexible, and dynamic operations against each other. During the NTC rotation 19-06, the 2nd Armored Brigade Combat Team, 1st Cavalry Division, Black Jack, published a single operations order (OPORD) for the entirety of the mission, and then published several short fragmentary orders (FRAGOs) during the operation to adjust the brigade's tasks as required. This open phasing construct, and single OPORD enabled the fires enterprise to use the brigade and Field Artillery (FA) commander's visualization and intent to deliberately plan targets through the military decision-making process and targeting. Due to the fluid nature of these operations, the fires enterprise had to be flexible enough to provide massed fires at the decisive point and shift priorities based off the dynamic environment. The fluid operations provided distinct lessons learned. The fires enterprise had to understand when to prioritize massing effects, take advantage of success and opportunities through dynamic execution of deliberate fires plans, and ensure fires assets remained flexible



LTC Derek Baird provides an information briefing during an intelligence and communications Fires rehearsal. (Courtesy photo)

to respond to the rapidly changing operational environment.

Prior to the NTC 19-06, the 2nd ABCT published an extensive OPORD covering the entirety of the 2nd ABCT's mission. This OPORD provided solid commander's intent that was conveyed through multiple commander-to-commander dialogues, rehearsals and back briefs. The 2nd ABCT commander, COL Jeremy Wilson, used the commanders' process to provide his understanding, visualization and direction to depict how he intended to fight the brigade, and where he wanted to mass joint fires in support of maneuver operations. This enabled me, as the brigade fire support coordinator, to understand his thought process, and allowed me to nest my visualization and intent to the fires enterprise. The brigade focused targeting efforts on deliberate fires planning, flexible enough to adjust quickly to the fluid environment inherent in our operations. One of the biggest challenges we faced was to dynamically re-task assets, or quickly coordinate resources we requested 72 hours out, due to the rapidly evolving operational environment. At the fires battalion, the 3-16th FAR focused planning efforts using a 72-hour construct, focusing heavily on course of action (COA) development and analysis using my intent to ensure we were in place ready to fire at the right time, with the right ammunition and classes of supply to support this fluid environment. The 72-hour planning cycle also allowed the 3-16th FAR to

rehearse operations using maps, and terrain sketches, at echelon, to synchronize our operations. The 72-hour targeting and planning construct came with its own risk, mitigated through understanding the decisive point, and priorities of fires to enable the brigade to mass joint fires at the appropriate time, and space.

The brigade targeting team focused on the 72-hour targeting cycle, coordinating joint resources to mass at the appropriate time, and space through deliberate planning efforts. However, we quickly realized our deliberate planning efforts were not flexible enough to adjust to the rapidly changing operational environment. This was due to maneuver forces taking advantage of success, and continuing to expand areas of operations. Operations we anticipated supporting 72 hours in the future, tended to occur in a more rapid manner. This dynamic execution oftentimes meant we had to dynamically re-task resources to support maneuver operations, or deny requests, based off of priorities of fire. This ensured that appropriate assets were available at the brigade's decisive point.

At the brigade level, the fires team used products such as the attack guidance matrix, commander's intent, decision support matrix and commander-to-commander dialogue to ensure we provided the appropriate effects in time and space. The fire support rehearsal is another key event that assisted in refining and synchronizing fire support in an ev-



LTC Derek Baird provides a briefing of the commander's intent during training at National Training Center, Fort Irwin, Calif. (Courtesy photo)

er-evolving environment. One of our major lessons learned was to ensure the fire support rehearsal not only synchronized all joint fires assets, but helped visualize potential changes to fires plans based off maneuver actions during a dynamic, high OPTEMPO environment. This is not an exact science, and in the early stages of our rotation, we tended to "play whack-a-mole" with minimal success. However, as the brigade progressed through its NTC rotation, the fires enterprise was able to better prioritize joint fires to provide more lethal effects in support of the Black Jack Brigade. This was especially true when planning for organic fires through the 3-16th FAR. Organic fires assets are more responsive to the dynamic nature of a high OPTEMPO environment. For more flexible organic fires response, the Field Artillery battalion shifted to a 72hour planning process to ensure organic assets were available to provide timely, and accurate fires for the Black Jack Brigade.

As operations became more fluid, the 3-16th FAR had to quickly adjust its planning method to meet the fluid operational environment. The dynamic nature of our brigade's operations meant that we had to provide flexibility in our combat configured loads (CCL), and resupply operations to provide organic fire support to the brigade. Our biggest challenge was to forecast when, and where to best provide the correct package based off the high OPTEMPO nature of our operations. The 3-16th FAR standard operating procedure was

a great starting point, enabling the staff to account for CCL flexibility by ensuring our Palletized Loading System trucks, and Carrier Ammo Tracks were configured to provide appropriate effects at the right time and place. For example, we needed to provide primary and alternate battery shooters for constant suppression and obscuration to enable rapid maneuver across the open desert, a high explosive package for the counter-battery, and family of scatterable mines to support blocking operations. However, my staff initially struggled with appropriately forecasting when, where, and how to resupply the battalion to support current, and future operations. I shifted the staff's focus to a daily planning battle rhythm, focused on a 72-hour planning cycle, aligned with the brigade's targeting efforts, to enable the staff to provide more flexibility in a high OPTEMPO environment. The brigade's single OPORD enabled my planning staff to initially conduct a detailed mission analysis for the entire operation (rapidly updated throughout our operations), allowing the staff to focus more on COA development, and analysis using my commander's intent, and decision points to ensure we were flexible enough to provide timely and accurate fires for the Black Jack Brigade. The 72-hour planning cycle allowed the staff to better anticipate fuel, ammunition, medical and maintenance requirements to support our operations. Batteries increased efficiency by understanding the nature of the brigade's fluid environment, using my commander's intent, participating in multiple brigade and battalion rehearsals and through commander-to-commander dialogue. The combination of our 72-hour planning cycle, and the batteries' operations, allowed the battalion as a whole to provide effective organic fires in a rapidly evolving brigade area of operations.

A brigade's fires enterprise must deliver organic, and joint fires rapidly through flexible, deliberate fires plans, executed dynamically, to enable the brigade's success during a rapidly changing, high OPTEMPO environment. This seemingly Herculean effort takes understanding and training, initiated during home station training events. The 2nd Brigade Armored Combat Team, 1st Cavalry Division, spent tremendous energy ensuring that its fires enterprise could rapidly respond to a fluid operational environment using a single OPORD, multiple short FRAGOs, and commander's intent to guide effective, timely and accurate joint fires during the NTC Rotation 19-06. Throughout the NTC rotation, the 2nd ABCT fires enterprise gathered lessons learned and put them into action. The brigade, and the 3-16th FAR focused on a 72-hour planning cycle to maintain flexible joint fires operations to support the 2nd ABCTs dynamic operations, prioritized massing effects during decisive operations and took advantage of maneuver success through the dynamic execution of deliberate fires plans. Home station training and combined training center exercises provide the Field Artillery community a way to prepare for flexible field artillery support during high OPTEMPO operations.

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THE MULTI DOMAIN TASK FORCE FROM A DIVISION ARTILLERY HEADQUARTERS

MAJ Branton Irby and CPT Austen Boroff

THE MULTI DOMAIN TASK FORCE PILOT PROGRAM

America's 1st Corps is facilitating phase two of the Multi Domain Task Force Pilot Program (MDTF-PP) with 2nd Infantry Division Artillery (DIVARTY) as its headquarters through fiscal year 2020 until 1st **MDTF** reaches initial operating capability $(IOC).^{1}$ Second ID DIVARTY has maintained the progression of the MDTF since April 2019 when the mission was reassigned to employ both 17th Field Artillery Brigade (17th FAB) and 2nd ID DIVARTY as the **MDTF** headquarters.² Second ID DIVARTY was assigned exercises Pacific Sentry (PS19) and Talisman Sabre (TS19), and later established as the sole MDTF headquarters in support of MDTF-PP.³ This article provides recommendations for 1st MDTF that will enable its through IOC progress to full operational capability utilizing 2nd ID DIVARTY's experience during PS19, TS19 and FY20 Pacific Pathways exercises.

PACIFIC PATHWAYS EXERCISES REFLECT POTENTIAL SCENARIOS THAT COULD EMPLOY THE MDTF IN ORDER TO GAIN A FOOTHOLD IN A COMBINED JOINT TASK FORCE'S (CJTF) OPERATIONS

The Pacific Pathways model centers on an adversary's incursion on a sovereign nation in the United States Indo-Pacific Command (INDOPA-COM) area of responsibility (AOR). The scenario often establishes the CJTF on a portion of the sovereign nation but necessitates the seizure of the remainder of the joint operational area (JOA), and restoration of the legitimate government. The MDTF's mission is to provide shaping operations, then isolate the deep area of the battlefield through lethal and nonlethal effects. Second ID DIVARTY achieved these objectives utilizing the information. intelligence, cyber. electronic warfare, and space battalion (I2CEWS) and the Light High Mobility Artillery Rocket System (HIMARS) Package (LHP) or HIMARS battalion (exercise dependent) attached to 2nd

ID DIVARTY. The LHP consisted of two HIMARS (High Mobility Automated Rocket System), one Fire Direction Center, a two-person liaison team, and a small amount of maintainers from 5-3FA, 17th FAB.

Based on current guidance for task organization, see figure below, the MDTF will consist of an organic HIMARS battalion (BN), composite Air Defense Artillery (ADA) BN, brigade support battalion (BSB), headquarters and headquarters battery (HHB), and I2CEWS BN. An Aviation task force, security force, and Engineer company may be attached to the MDTF based on operational requirements. The task organization of the MDTF, a conglomerate of assigned and attached units, has proven sufficient through multiple training events



The Multi Domain Task Force campaign plan. (Courtesy illustration)

with regard to its ability to produce both lethal and non-lethal lavered effects during computer assisted exercises. The training events and experiences of 2nd ID DIVARTY in conjunction with the lessons learned during pilot program exercises are the foundation for how 1st MDTF should establish and train. Anticipated friction points during MDTF IOC will center on the necessity of equipped liaison packages and early establishment of command and support relationships (1), communication at echelon (2), and sustainment of the MDTF (3).



The Multi Domain Task Force task organization designated for validation. (Courtesv illustration)

LACK OF LIAISON PACKAGES AT ECHELON AND INSUFFICIENT COMMAND AND SUPPORT RELATIONSHIPS

DIVARTY and 1st MDTF will LHP from 17th FAB are poignant train and operate in assigned exercises as a composite MDTF until 1ST MDTF reaches FOC with all subordinate and assigned units established. Without organic, assigned units under the MDTF, DIVARTY and 1st MDTF will be required to receive attached units and integrate them into planning and multi-domain operations for the foreseeable future. Hence, the process and lessons learned by which DIVARTY as the MDTF has trained, deployed with, and integrated attached units is the baseline in standard operating procedures until FOC. Additionally, as the MDTF will be required to integrate with a newly formed CJTF, liaison packages from the MDTF, and potentially component commands, will be required within the operations or fires cells to adequately coordinate and synchronize multi-domain effects.

TS19 presented the DIVARTY with several cases highlighting the importance of command and support relationships between the MDTF headquarters (HQ) and attached units. attached The forward support company (FSC) from the 634th BSB, 33rd Infantry Brigade Combat Team, Illinois Army National Guard and the

examples of attached unit integration when coupled with an inadequate command and support relationship. The I Corps TS19 White Order did not establish command relationships between DIVARTY HO and the subordinate MDTF units until vessel outload for TS19 departure. While direct liaison authority was granted prior vessel departure, to the coordination was hampered hv additional training events in Pacific Pathways for both DIVARTY and 17th FAB. As a result, the planning efforts of **DIVARTY** to organize the HIMARS air insertion and live fire events were not fully disseminated to the LHP. Those examples speak to the larger challenge of incorporating a composite ADA BN and Aviation TF. With future MDTF events scheduled for DIVARTY before **MDTF** activation, the HQ's ability to receive subordinate units, plan and execute effectively correlates with early staff, and subordinate unit integration.

The unique positioning of a brigade-size headquarters element (with accompanying modification table of organization and equipment {MTOE}) at the CJTF echelon reinforces the challenges of the MDTF

at the convergence of the operational and tactical levels of war. The assignment of the MDTF comes with a price tag of liaison noncommissioned officers (LNOs). This includes LNOs from the MDTF up to the CJTF, as well from subordinate units into the MDTF HQ. Liaison teams must be integrated throughout the MDTF's higher and lower echelon's early in the planning process to allow leaders to understand capabilities and gaps, allow for integration into the joint airground integration center. and establish reporting requirements. All subordinate units should have a LNO team within the MDTF in order to aid planners, describe capabilities, and execute combined battle drills. The significance of the MDTF LNO team at the CJTF speaks directly to the MDTF's operational and tactical convergence. Operating with future long range artillery capabilities, the MDTF is required to execute tactical actions to shape the deep area of the battlefield with operational. and potentially strategic effects and considerations. The MDTF LNO team ensures that tactical clearance of ground, sea, and air space occurs and those effects are integrated into the operational framework of the CJTF commander's intent.

COMMUNICATING AT ECHELON

FRICTION POINT 2/3

As stated, the MDTF resides at the changeover point between tactical and operational levels of war. Its unique positioning creates challenges for a brigade headquarters in its ability to communicate with organic units and joint task force level components. These challenges arose due to the lack available communications of equipment and accessible networks associated with a DIVARTY's MTOE. While 1st MDTF's MTOE will not replicate a DIVARTY's, the data points between a FAB and DIVARTY provide a baseline for understanding capability requirements in mission command and communication equipment needed at echelon's above brigade and units below. Until MDTF FOC, it exists solely in the aggregate. While communication is always a challenge, integration into the MDTF and its higher headquarters will require standardization for both supporting and supported commands. The aforementioned changeover point signals the demand for the MDTF HQ to pull a common operating picture across the JOA, not only for situational understanding but also for clearance of air, ground, and sea space for its

subordinate units. Future training must establish a baseline for a communications architecture that integrates attached units while rapidly assimilating the MDTF into its higher headquarters.

The INDOPACOM AOR dictates an environment hindered by a tyranny of distributed distance and communications across varving terrain interwoven with sea space. The expanse in which the MDTF and its units will operate requires robust and redundant communication packages and plans to include high frequency, satellite communications (SATCOM), and upper and lower tactical internet. Until the full task organization of the MDTF is established, attached units must be outfitted properly by parent units to ensure the communication requirements are fulfilled to connect with HQ over voice and digital. This was encountered during the MDTF's mobilization of an LHP to train distributed platoon operations in support of a Combined Joint Forcible Entry Operation during TS19. The LHP was improperly outfitted and thus hampered the ability of the MDTF to provide mission command outside of the brigade's

SATCOM link that spoke directly to Task Force Fires (1st Marine Division, which received and maintained tactical control of the LHP during distributed platoon operations). A robust primary, alternate, contingency and emergency plan solution includes possible assets such as Link-16 over Multifunctional Information Distribution System radio and the expansion of Warfighter Information Network-Tactical assets such as SATCOM radios for firing units echelon and lower packages.4 Likewise, the MDTF is not equipped to communicate with the higher echelons to which it is assigned. A modular communications array will be necessary to meet MDTF mission requirements considering the likelihood of geographically separate detachments each needing significant bandwidth across multiple communication transports. An immature communications architecture will be compounded with the additions of ADA and Combat Aviation brigade units and remains untested with tactical employment of I2CEWS capabilities.

SUSTAINING THE MDTF

The MDTF is a conglomerate of equipment and units that not only requires specialized maintainers, but also for leaders to be both specialists and generalists for a multitude of systems and platforms. DIVARTY required a significant capability infulfill its **MDTF** crease to requirements with emphasis in logistics and sustainment. Based on guidance from I Corps, DIVARTY received a FSC, however, the

geographic dislocation of the FSC and lack of direct command relationship early on degraded the benefits of having additional sustainment planners within the MDTF. The organic BSB within the FAB is capable of the required sustainment and logistical planning for the BDE due to proximity, staff capacity and established interoperability. Though the 1st MDTF will have an organic BSB based on projected task organization,

the MDTF must incorporate realistic sustainment operations into future training and be able to effectively integrate attached sustainment and maintenance support to ensure requirements are fulfilled.

The nature of 1st MDTF operations in the INDOPACOM AOR presents the challenges of sustainment across an archipelagic environment. Internal sustainment requires a concerted effort of the Aviation TF in addition to coordination and execution from fellow service components. While the organic BSB can alleviate mission command and planning challenges from an attached unit, an over taxed and un-specialized BSB supporting ammunition consumption for multiple "large bullet" units will encounter enormous logistical constraints that remain untested. The unit basic load for the MDTF is largely ill-defined and must be adjusted to give deference both rapid deployment and to operations. Extensive sustained foresight is needed to anticipate and request ammunition resupply which may potentially require sustainment

operations across a denied or contested environment.

While the MDTF exists in the aggregate, the integration of attached units carries with it a demand for their specialized sustainment and maintenance needs. During TS19. the **MDTF** faced challenges ordering parts for units not organic to the organization. Attached units must recognize requirement the for deployment with a bench stock of specialized parts and the maintainers to keep pacing items functional. Once established, the MDTF and its BSB must maintain a bench stock for subordinate

units, and priority within the Logistical Support Area for parts shipment. Whether deploying for training or realworld missions, the integration into the MDTF is an essential window to establish mission command and shared understanding between attached units and their higher headquarters. The assignment of attached units will necessitate а directed command support relationship early in the planning that is crucial to the successful establishment and deployment of a fully operational MDTF.

THE FUTURE OF THE MDTF

Until 1st MDTF reaches IOC, the headquarters and subordinate units will exist as a nonhomogeneous organization learning how to best achieve synergistic effects. While assigned units and task organization will change from the pilot program, the lessons learned over the past two vears will continue to be developed to make a more functional tactical and operational asset. The future MDTF, however, must consist of robust liaison teams consisting of technical experts that have established relationships prior to deployment. communications armed with packages, and integrated early with adjacent and higher units. It must train in a way that stresses not only the headquarters, but also subordinate units focusing in the realms of logistics, sustainment and clearance of assets.

The future MDTF communications architecture must be altered to facilitate communication "up" to echelons above brigade, and "down" to the tactical level. It must simultaneously provide additional communication nodes that empower liaison teams to help inform and drive decision making at their respective attached component commands or unit. The way we "conduct" exercises for the MDTF must be amended as to how capabilities are replicated in order to maintain realistic training а environment While the MDTF calculated its own probabilities of success for capabilities to enhance training value, this was not evaluated or replicated by external observers or the simulation itself. As the MDTF program transits into 2020, 2nd ID DIVARTY will continue its efforts in establishing best practices and standard operating procedures through joint and combined exercises to aid in the establishment and success of 1st MDTF.

AUTHORS

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¹ OPORD 097-20 (Multi Domain Task Force – Pilot Program FY20) 18NOV19.

⁻ Pilot Program F Y 20) 18NOV 19.

² FRAGORD 03 to OPORD 339-18 (Multi-Domain Task Force Pilot Program)

²⁹APR19.
3 OPORD 097-20 (Multi Domain Task Force – Pilot Program FY20) 18NOV19.
4 Fannelli and Allen, "HIMARS Over the Horizon Communications—The Way Forward at the HIMARS Battery and Below-."

Muzzle Velocity Management

CPT Andrew T. Patterson

The five requirements of accurate predicted fire is a holistic fire support framework, starting from a target acquisition system through a higher headquarters' (HHQs) meteorological message and tactical fire direction, and finally ending with the myriad of responsibilities within the position area of artillery (PAA) by both the gun line and platoon operations center (POC)/ battery operations center (BOC), resulting in the timely and accurate fires in support of maneuver forces.

TC 3-09.8, Fire Support and Field Artillery Certification and Qualification requires fire direction centers' (FDCs) fire mission processing times to be 35 seconds when digital and 45 seconds when degraded, with only a ten second buffer between the two operations. This crew drill within a cannon FDC moves the minimum personnel requirement from three to potentially seven, with necessary safe-

Table 1. The numbers utilized for EFC Factors and Cumulative EFC RDS fired for this cannon and on every gun card in the Army are calculated for fatigue, helping track the life of the tube and condemnation criteria. Fire Direction Centers cannot employ numbers for shooting these strength or muzzle velocity loss due to it not being derived from erosion. (Courtesy illustration)

ty checks in between. Condition setting for responsive degraded fires starts long before reconnaissance, selection, and occupation of the initial PAA and starts with the building of an efficient muzzle velocity logbook. Number three of the Big Three is imperative for accurate weapon and ammunition information, but accounting for predicted muzzle velocity variation (MVV) ahead of time will save the technical computation of fire direction seconds, even minutes.

Chapter 4, TC 3–09.81, Field Artillery Manual Cannon Gunnery provides a guideline for the building of a unit's MV Logbook, but stops there. The half a page dedicated to the building and utilization of an MV Logbook in the TC 3–09.81 and lack of implementation strategy outlined in ATP 3–09.23, Field Artillery Cannon Battalion or ATP 3–09.50, The Field Artillery Cannon Battery leave units to find their own way to succeed. The FA battalion FDC should create the FA battalion's standard operating procedure (SOP), implemented in each platoon FDC. Regardless of the potential of operating in a denied or degraded communications environment, cables and digital systems will break or fail. The necessity of gaining and maintaining firing capability is solidified by the maintaining of an analog MV logbook. A way to create the SOP is to segment the battalion logbook by reference material and each subsequent firing battery. The reference material portion should include the agenda, the entirety of Chapter 4 of TC 3-09.81, the MVCT-2, MACS propellant efficiency tables, Rock Island updates to changes in MV or specific lot issues, and any other needed reference material. Each individual firing battery (recommend by platoon for units that fight traditionally this way) should be segmented into three portions within the battery.

1. Tube 2. Cannon Type, Model or Serial 3. ORGANIZATION (UIC/UNIT) 376 M20/M20A1/M119A3 (Cannon, 105mm Howitzer WEQ2B0 (FA BN 02) BTY B 105T IB 5. End Item Identification 6. RDS/EFC SN: 220 (Howitzer, Light, Towed: 105mm, M119A3) 6. RDS/EFC 7. 8. Retubings 9. Rebushings EFC FACTORS 7. 8. Retubings 9. Rebushings 1-6 0 1-6 0.1 EFC 376 0 1-6 376 0.1 EFC 4. SPECIAL LIFE DATA 0.4 EFC Condemn the cannon tube, muzzle brake, and breech mechanism when 6500 EFC rounds have been fired.										
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The first element is each individual howitzer's updated gun card. The requirement to conduct a pullover gauge (POG) reading or borescope is outlined within TM 9-1000-202-14, Evaluation of Cannon Tubes, and must be done at either six months or within 500 equivalent full charges (EFCs). This POG reading which should be posted on the Tank and Automotive Command's Unique Logistics Support Application (TUL-SA) {strongly recommend FDOs have at least "view only" access to their unit identification code to print updated copies when needed} is accompanied by the rounds fired between the semi-annual POG and borescope. These rounds are accounted for as total EFCs by specific charge within this digital gun card, but by fatigue and not erosion. To accurately account for EFCs on top of the most recent POG, TULSA does not provide the final solution for an MVV. For example, Table 1, previous page, depicts 9.6 EFCs based off of fatigue, but 12.0 off of erosion. The difference, though seemingly minuscule (less than a tenth between the two numbers when converting it to a MV lost), can be exponentially different several months after a POG update and the firing of hundreds of rounds at the higher charges. A recommendation to TULSA is to

include EFCs by erosion on each gun card to ensure there is zero error when firing degraded, acknowledging that the reasoning for the M20A1 cannon tube on the M119A3 EFCs are only computed by erosion because condemnation criteria of the tube is calculated by erosion only. Units can find success by adding their total number of rounds fired by individual charge together and finding the MV lost by erosion.

The second portion of each unit's segment within the MV logbook should include predicted MVV by charge for each howitzer. Each tabular firing table demonstrates a significant change in MV based off of which charge is about to be fired. Table 2 illustrates the difference between Charge 1 and Charge 7 when it comes to MV lost. A way to be prepared to fire degraded is to have each zone calculated for each individual howitzer. For example, MV lost for a single M119A3 should have six separate predicted MVVs based off of charge zones (1/2/3, 4, 5, 6 and 7).

Recommendation for 105 mm units is to only utilize the shooting strength without propellant efficiency for predicted MVV. There is no baseline for ammunition efficiency for 105 mm units due to lack of useful/up-to-date propellant efficiencies. The platoon FDC should handle the calculations which should then be given to battalion with the updated gun card. Then the predicted MV can be easily plugged into a CENTAUR based off of which specific charge the FDC is about to fire. As the unit continues to fire, the difference will continue to increase between the Advanced Field Artillerv Tactical Data System (AFATDS) if operating in advanced mode and updates will be necessary, but this will provide an initial quick method. The third portion that could provide assistance is historical MVVs from previous lots of charges fired.

A shared and streamlined MV logbook across a battalion can potentially assist in transfer of control from one unit to another. The intent is not for each platoon FDC to have all 18 howitzers' gun cards or predictive MVVs, but for each platoon to have all six in the battery and for the battalion to have all 18. The battalion can then either transmit the necessary information to another BOC/ POC or control the technical fire direction themselves. A deliberate step must be built into the battalion and battery after operations maintenance process for updating gun cards after every live fire and predicted MVVs within the platoon and then battalion MV logbooks.

Table 2. A comparison between charge 1 and charge 7 in regard to change in muzzle velocity. (Courtesy illustration)

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The following tables may be used as a guide in estimating muzzle velocity departures from the firing table standard due to uniform wear in cannon: M20A1.

Ap	proximate	Losses	in Muzz	le Velocity*
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105mm Howitzer, Cannon: M20A1; Charges: 1, 2 and 3

Number of equivalent full service rounds (erosion)	Wear measurement (inches)**	Muzzle Velocity Loss (m/s)	
0	4.134	0.0	
1000	4.138	1.5	
2000	4.144	3.1	
3000	4.150	4.6	
4000	4.156	6.2	
5000	4.161	7.7	
6000	4.167	9.2	
7000	4.186	10.8	
7500	4 190	11.2	

Approximate Losses in Muzzle Velocity*

105mm Howitzer, Cannon: M20A1; Charge: 7

Number of equivalent full service rounds (erosion)	Wear measurement (inches)**	Muzzle Velocity Loss (m/s)	
0	4.134	0.0	
1000	4.138	2.3	
2000	4.144	4.6	
3000	4.150	7.0	
4000	4.156	9.3	
5000	4.161	11.6	
6000	4.167	13.9	
7000	4.186	16.2	
7500	4.190	16.8	

FT 105-AS-5



A listing of the circuit cad assembly and data cable in a virtual technical manual. (Courtesy photo)

Additionally, periodic digital sustainment training can verify that a unit's predicted MVVs are calculated appropriately and bump with other systems checks.

A couple other small things HHQs can do for subordinate units to ensure the third requirement is consistently met and streamlined is upgrading their borescope and investing in digital CENTAUR cables. The new digital borescope, NSN 6650-01-631-0369, will cost a unit roughly \$15,000. A forward support company equipped with a digital borescope has high resolution video and picture taking capability that drastically outperforms the old system. Questions into burrs or tube cleanliness can be answered more efficiently with this new system. This information should be shared with sister maneuver battalions as these would help their 91Fs (small arms/artillery repairman) with inspections of their mortar systems as well. Lastly, the digital capability of the CENTAUR enabled by the TEM data cable, NSN 5998-01-615-615-7167, and TAC-Link expansion module, P/N 717926, provide exceptional degraded capability (See photos above and right).

The 2nd Battalion, 15th Field Artillery Regiment tested this system during FY 19 with good, but limited results. The FDC chiefs within the battalion were able to get the CENTAUR to speak digitally between both an AFATDS and an M119A3 Howitzer. The CENTAUR

received metrological (MET) data, firing unit, and weapon/ammunition information. The digital CENTAUR transmitted a fire command to the fire control cell (FCC) of an M119A3 after Alpha Battery took it out to the field during a training exercise. The FCC did not, however, compute its own firing data and a secondary independent check was still needed. If a firing unit within the Army does eventually receive the digital CENTAUR cables, it is strongly recommended to use it to transmit data only from an AFATDS. At a bare minimum, it will save the FDC upwards of ten minutes by not having to input 20 lines of a MET message. In preparation of an air assault raid, this may enable the quick receipt of necessary information to each CENTAUR prior to going wheels up, but a secondary check (chart or another CENTAUR) must be brought along and bumped prior due to the inability of the gun to calculate its own data via this method.

The techniques, tactics and procedures within this article do not necessitate strict adherence, but a way to minimize mission processing times within technical fire direction centers through the management of muzzle velocity variation by battalions and with work from their subordinate units. Most issues between secondary and tertiary independent checks can be traced back to poor muzzle velocity management. Through a deliberate, streamlined process implemented by a battalion MV logbook SOP, testing and implementation during digital sustainment training, and having the right equipment on hand, the Field Artillery battalion's technical fire direction woes can be addressed before they occur.

CPT Andrew Patterson is currently the commander of Bravo Battery, 2nd Battalion, 15th Field Artillery, and has served as the battalion's FDO for one year previously planning and executing fires in support of platoon through division-level operations.

A circuit card assembly with data cable attached. (Courtesy photo)





As the character of war and conditions on the battlefield evolve over time, technological advances and the adaptive capabilities of our adversaries require us to innovate to maintain an advantage. Amidst all of this change, the nature of war remains constant, and it is critical that we remain centered on a philosophy of preparation to ensure our success. Through experience observing artillery units in both active and reserve/ national guard components in the Marine Corps and U.S Army, I submit that there is more that we can and must do now to improve how we prepare for war. Most units focus on the training and welfare of their personnel. Fewer, however, demonstrate a true mastery of our craft and optimally prepare for war.

The Marine artillery community is experiencing one of its greatest periods of revolutionary change since the transition from direct fire cannons to predicted As the Commandant's indirect fire. Planning Guidance directs significant force design assessments, the artillery community is on the precipice of monumental changes in how we are organized and employed in combat. Irrespective of the theater or weapon system employed, we must remain focused on developing leaders who can think, "decide, communicate, and act in the fog of war." Leaders who will make a difference on the battlefield.

In order to position ourselves for success, improvements can be made in; developing technically and tactically proficient leaders at all levels; a combat mindset with healthy habits of thought and action, rooted in discipline and mastery of the basics; and cultivating the intangible elements of esprit, trust, cohesion, and love into the identity of the unit. Though basic, these characteristics can be challenging to achieve when placed against numerous other competing requirements, and they are arguably not the status quo across our community.

Technical and Tactical proficiency

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

Artillery instills fear in the gut of the enemy and confidence in the hearts of the maneuver brethren we support...or at least it should. Due to a lack of requisite artillery expertise, many units are consumed with the technical requirements of artillery Artillery operations are operations. technical in nature, which necessitates synchronized efforts across several functions to deliver desired effects on specific targets at specific times. When units lack the necessary expertise and mastery of our craft, they often relegate themselves to deploying to a training area, establishing a firing capability, and subsequently measuring success by the number of rounds fired safely into an impact area; we see Guys Doing Artillery instead of Artillerists performing artillery operations. We have all observed units who fix all resources on meeting the five requirements for accurate [predicted] fire, or validating the database for a High Mobility Artillery Rocket System fire control panel, while neglecting the basic requirements for developing tactically proficient leaders, capable of evaluating a situation, mission requirements, and risk to make decisions. To address the lack of technical expertise, we must prioritize gunline, fire direction center (FDC), and forward observer/fire support coordination center rehearsals. Artillery units need to

shoot, move, and communicate to specified conditions and standards with equal proficiency; deliberate weekly rehearsals are essential. Leadership that is focused on the perfection of technical artillery skills and fire support coordination must be the standard as it is essential to our preparation for combat.

"Dictated or "canned" scenarios eliminate the element of independent, opposing wills that is the essence of war..."

Units must design training that requires leaders to make decisions based on a tactical scenario with a dynamic enemy threat. Imagine what we see all too often; a standard movement order issued by the battalion operations center, directing a battery to occupy a specific gun position (GP) or artillery firing area (AFA). The batterv commander executes reconnaissance, selection, and occupation of position (RSOP) with minimal decisions made beyond how the position will be set Consider instead, a battery up. commander executing RSOP of four or more GPs/AFAs to select the most appropriate positions based on multiple considerations. This requires evaluation of the enemy situation, defense of the position, survivability (rapid emplacement/ displacement), immediate and intermediate masking terrain, range to anticipated target sets and ammunition available (vertical or nominal angles of fall for rocket and missile fires, or preferred charges/probable errors of cannon artillery), communications suitability, and other considerations.

Decisions made by commanders based on their evaluation of the environment – rather than by an operations officer attempting to fit X number of firing units in the training area – provide an opportunity to develop tactical proficiency in our leaders. Battery and platoon commanders should be required to debrief higher echelon commanders on their thought process behind tactical decisions. Adding these elements to a training exercise can eclipse the overall training value achieved by simply deploying to the field and executing scenarios that ignore the essence of war.

Combat Mindset

"We will prepare for war in everything we do. If it's comfortable or if it's easy, something's not right"

Individual and small unit combat skills are critically important to an artillery unit's ability to execute combat operations. The practical application of these skills - beyond the Artillery Training & Readiness Manual and Artillery Tables of Fire - should be infused in a unit's training and not executed as isolated training events. with feedback Realistic training mechanisms to support unit and leader development is essential. Tough, realistic training has long been the intent of service leadership. The spirit of that intent, however, is often lost among competing requirements. Several years ago, the Marine Corps identified an atrophy of basic combat skills and implemented a revised battle skills test program. The revised program's intent is "to ensure all Marines sustain proficiency in...common skills taught during entry level training," while affording commanders flexibility in their approach to unit training and evaluation. Leaders need to both capitalize on and embrace that flexibility.

Implementing tough, realistic training requires the synchronization of leadership, commitment, discipline, creativity, and will. The resources to design, prepare, and execute training that builds skills, evaluates performance, and fosters a combat mindset are at our fingertips but often underutilized. Below are a few recommendations to maximize training value:

• Prepare and deliver operations and fragmentary orders for all training exercises with the aid of terrain models, just as a leader would in combat.

• Utilize a comprehensive scenario developed by the S-2 with injects to provide valuable context to training and present

decision points for leaders. The behavior of unit leadership, starting with the commander, will determine the credibility of the scenario and the level of buy-in from subordinate leaders.

• Employ an opposition force (OPFOR) capable of challenging friendly tactics, techniques and procedures. The potential of being attacked by OPFOR while on the move or in a firing position, day or night, by ground, air, or electromagnetic threats will force leaders to consider other variables in making decisions. OPFOR doesn't require many resources but certainly requires creativity.

• Eliminate the concept of a "roving fire-watch for security" and the announcement of "reveille" in the field. Both indicate that a unit is not postured to defend itself at all times, nor is it organized to conduct 24/7 sustained operations. Instead, adjust the security posture based on the enemy's most likely and dangerous courses of action and a current threat assessment.

• Execute casualty evacuation training from the point-of-injury to a specific role of care instead of only "reviving" the casualty after triage. Effective casualty care training inspires confidence and morale at all levels and will result in a more confident unit.

Every training event represents an opportunity to develop skills that contribute to a combat mindset. Training is about learning, and feedback is a critical component. Applied rigor and sustained evaluation mechanisms are required to produce tangible feedback and maximize learning objectives. If we fail to habituate evaluation, we squander the opportunity to maximum learning value from our training.

These suggestions are not an exclusive blueprint to developing a unit's combat mindset. Rather, they represent items to consider as we prepare for war. Leadership is the differentiating factor in a unit's ability to capitalize on all available resources while breeding a combat mindset. The will of a leader and their focus on instilling a combat mindset are essential to developing the habits of thought and action in a well prepared unit.

The Key Ingredient: Swing

"In war, the chief incalculable is the human will." -B. H. Liddell Hart

Brown also illustrates that "what mattered more than how hard a man rowed, was how well everything he did in the boat harmonized with what the other fellows were doing. And a man couldn't harmonize with his crewmates unless he opened his heart to them. He had to care about his crew." Units who achieve such a level of esprit, trust, cohesion, and love rarely do so by accident. It is achieved when the actions of individual Marines and Soldiers are guided, not by fear of consequences, but rather by a refusal to let one another down. These elements are especially critical to the execution of artillery operations where synchronized efforts across several functions are required to deliver desired effects. Achieving swing requires greater commitment, discipline, creativity, and will than simply developing tactical and technical proficiency and a combat mindset. I have been fortunate to observe teams that have possessed swing; here were a few of the major contributing factors:



• Mission and intent were clear and communicated at every turn; there was no ambiguity about where the team was headed.

• Shared hardship and rigor; leaders maximized opportunities for shared hardship to lead from the front and build trust.

• Focus on development and growth; coaching was prioritized over "instructing," mistakes were expected and used as learning opportunities.

• Feedback was relevant and continuous; there was no false praise or weak feedback given.

• There was a commitment to exceed standards, and a relentless pursuit of perfection.

• Leaders inspired the best in their men and women and led by example and with an iron will.

There is no simple formula for how to achieve swing in a unit, as several intangible factors are at play. However, when achieved, it can be sensed; as you walk into a room, a FDC, across a gun-line, or onto an observation post. It is the difference maker.

The Test

As the character of war evolves and the speed of change accelerates, we must continually ask ourselves, are our artillery units prepared for war? Are you, reading this, prepared for war? When the nation calls, our formations will deploy and execute the mission with leaders genuinely focused on the mission and welfare of those in their charge. However, the units that master our artillery craft and prepare for war using the key ingredients of esprit, trust, cohesion, and love to develop both tactical and technical proficiency, and the habits of thought and action of a combat mindset will set themselves apart. These units, with leaders who can think, decide, communicate, and act in the fog of war will make the difference on the battlefield.

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¹ United State Marine Corps, The Basic School, TBS focuses on five horizontal themes of leadership: 1.a man/woman of exemplary character, 2.devoted to leading Marines 24/7, 3.able to decide, communicate, and act in the fog of war, 4.a Warfighter who embraces the Corps' warrior ethos, and 5.mentally strong and physically tough.

² United States Field Artillery Association (USFAA) King of Battle Podcast, Episode 2, Mike Grice ³ The Five Requirements for Accurate Fire (known as the The Five Requirements for Accurate Predicted Fire prior to the publishing of TC3-09.81); 1. Accurate Target Location and Size; 2. Accurate Firing Unit Location; 3. Accurate Weapon and Ammunition Information; 4 Accurate Meteorological Information;

5. Accurate Computational procedures.
⁴ Command post exercises should enable repetitions in executing the basics of targeting, mission processing, and gun-line/ launcher procedures, not just an effort to establish a and validate a digital network. Rehearsals should include troubleshooting and injects with updates to non-standard conditions
⁵ MCDP1 Warfighting Pg 61

⁶ Quote by the Author, December 2015 following a unit physical training cohesion event

⁷ The NAVMC 3500.7B Artillery T&R Manual, April 2015 defines mission essential tasks and task, conditions, and standards for individual and collective training event.

⁸ Artillery Tables of Fire, explained in TC
 3-09.8 Fire Support and Field Artillery
 ⁹ Marine Administrative Message (MARADMIN),
 IMPLEMENTATION OF THE REVISED BATTLE
 SKILLS TEST PROGRAM, Number: 693/17, Date
 Signed: 12/21/2017

¹⁰ Evaluate EVERYTHING from the efficiency of daily formation, effectiveness of information sharing, delivery of 'hip-pocket' classes, to artillery rehearsals. It is not what we do but how we do it that contributes maximum value to developing a combat mindset.

¹¹ Daniel J. Brown, Boys in the Boat: Nine Americans and Their Epic Quest for Gold at the 1936 Berlin Olympics, (New York, 2014), Pg 134

¹² Col Joseph J. Russo, remarks as guest of honor at Marine Artillery unit's mess night, June 2016

¹³ Shared hardship and rigor achieved via physically and mentally challenging unit events designed to build cohesion. In addition to designing rigor into artillery training exercises, consider incorporating elements of the Marine Corps Martial Arts Program or the eight lines of effort for the USMC Force Fitness Instructor program into regular unit physical training events. This will promote a purpose-built, and assessed/evaluated physical training regimen.



A High Mobility Artillery Rocket System with Battery Q, 3rd Battalion, 12th Marines, 3rd Marine Division, disembarks a landing craft, utility, from the dock landing ship USS Ashland (LSD 48) during an amphibious raid by Combat Rubber Raiding Craft at Kin Blue, Okinawa, Japan, Aug. 16, 2019. This operation of a HIMARS insert by LCU during a simulated amphibious raid demonstrated naval expeditionary combined-arms maneuver from amphibious shipping across Marine Air-Ground Task Force capabilities and warfare domains. (U.S. Marine Corps photo by Lance Cpl. Kyle P. Bunyi)pecialist 2nd Class Natalie M. Byers)





Field Artillery is the bread and butter of Fort Sill. Since 1917, Marines have walked this sacred ground arm-in-arm with our Army and Allied teammates. With the exact same mission, similar equipment, and a shared burning pride in our technical proficiency, we created and trained skilled and proficient artillery officers. It may come as a surprise to more senior officers that, until recently, the U.S. Army and the Marine officers (and our Allies) do not still train together. Combined officer training began 70 years ago when "Upon the request of the Commandant of the Marine Corps, on 26 October 1950, Office, Chief, Army Field Forces, allocated a quota of 55 Marine students to the Associate Field Artillery Battery Officer Courses 7, 8, 9, and 10. In return The Artillery School requested that 23 Marine Corps officers be detailed as instructors during the period that attended the Marine students the School" (Whitfield, p 42). This joint training continued for 66 years. That is no longer the case, as a divergence in training priorities Service and eventually separated the standards Army and Marine officer students. Currently, Army officers attend Field Artillerv Basic Officer Leaders Course B (FA BOLC-B) and Marine officers attend the Marine Artillery Officers Basic Course (MAOBC). With the exception of a select few live fire events, these two courses are taught separately. This article describes the devolution of training between the Army and Marine Corps artillery officer basic training that led to the separation and further seeks to inform and highlight efforts underway to realign the two courses to a combined syllabus for Army and Marine officers. During the summer of 2019 the Field Artillery Commandant's (FA CMDT) office reviewed the current Memorandum of Agreement (MOA) and directed a long-overdue examination and possible re-write to facilitate joint USMC-USA

training. The FA CMDT's office and the

Marine Detachment at Fort Sill (MARDET) established a working group envisioned to review the differences and similarities between FA BOLC-B and MOABC in an effort to determine if, when, and how, the two courses might be re-aligned (either presently or in the future), and examine the current of the support status agreements between the schools, commands, While and Services. there are significant structural and cultural challenges the Services must overcome to combine the two courses, what was discovered will assist in the future adaptation of each course and potential to recombine them. Additionally, the efforts have revealed a number of informal but long standing agreements that were not codified nor analyzed for the sake (and budget) of each Service. indicates situation The current significant work yet to do.

The course manager for FA BOLC-B was traditionally a Marine major. He oversaw the course as he had personal interest in it since his Marine students were attending. As outlined in the current MOA signed when the two courses diverged, the billet remained as a Marine requirement on the 1-30th Field Artillery (FA) Battalion Table of Distribution and Allowances (TDA) (similar to USMC Table of Organization and Equipment). This officer serves simultaneously as the Course Manager both the FA BOLC-B for and MAOBC. The story below explains the historical context of the divergence from the viewpoints of both the current FA BOLC-B and MAOBC staffs, those instructors and personnel that were on staff during the period when the decision was made to split the two courses, and other relevant historical data. Names of current instructors and leadership are intentionally omitted to remain focused on the problem rather than the people. Amplifying information is also provided in order to "translate" terms from Marine

by Maj Jonathan Bush

and Army terminology.

In order to understand the previously combined course, we must first understand the framework behind it. The bulk of this course and other interservice training arrangements are guided by a document known as the "Standard Memorandum of Agreement (MOA) Between the USA and USN and USAF and USMC and USCG." This document is an Interservice Training Review Organization (ITRO) and practically specifies requirements for consolidated and collocated training both for the host Service and participating Service tenants. The ITRO is a high-level document that largely is common sense; for consolidated programs of instruction (POIs) all services must agree jointly on substantive POI changes, provide instructors for a specified amount of time, and, where applicable, abide by the host's rules and regulations among other things. By necessity, the ITRO is intentionally written necessarily allvague and encompassing to facilitate and encourage more specificity in lower level and locally drafted agreements. From the ITRO spring other MOAs signed by various levels command specifying requirements agreed upon by both services to "keep the peace" and execute a course that aligns with the individual Services' training standards. requirements, resource allocation (ammunition, manpower, equipment, military etc.), and occupational specialty (MOS) production plans. Generally, these MOAs are honored by all parties. Occasionally, however, they deviate on varying scales, but generally this occurs with the knowledge and concurrence of both parties. In the case of FA BOLC-B prior to the split, there were deviations by both parties that were detrimental to artillery community writ large.

During 2015, the FA BOLC-B course consisted of four platoons of 40 students each. One platoon was traditionally designated as the "Marine Platoon," where approximately half the student body consisted of Marine students and was traditionally trained by Marine captains. With the exception of a few Army- specific classes, Marines and soldiers executed the POI, graduated, and became artillerymen together. However, changes were underway. At the time, the POI content was entirely under the purview of the U.S. Army Field Artillery School (USAFAS). Since it was not a multi-service course, the U.S. Army was well within their authority to change the POI without the approval of the USMC. As a result of changing priorities and Army policies specific to the school at the time, the USAFAS leadership did not seek concurrence from the USMC.

This emerging situation at Fort Sill and growing concern by Fleet Marine Forces (FMF) commanders drove the MARDET Commanding Officer (CO) to have the Officer Instruction Branch (OIB) staff assess the impact of the significant and rapidly changing POI with the Marine Corps Training and Readiness (T&R) Standards for an MOS 0802 Marine Artillery Officer as required by the Commanding General (CG, MajGen) of Training and Education Command (TECOM). (Note: 1000 level T&R Standards are the equivalent of U.S. Army's Individual Combat 641146 Task List Skill Level 1) The assessment revealed Marine lieutenants were instructed and evaluated on only 30% of the required T&R Standards that an 0802 must obtain prior to serving in the FMF as a result of the various changes to the FA BOLC-B POI. In addition, USAFAS removed the stand-alone Joint Fires Observer (JFO) course that was conducted at the conclusion of FA BOLC-B. The JFO material was reapplied with 40 instruction hours into FA BOLC-B in order to provide exposure to the material but unfortunately, no additional course length was added to the POI. This resulted in students that were not graduating with JFO certification. (Since such time, JFO has been added as a standalone course at the end of FA BOLC-B for a portion of students that will utilize the certification upon graduation.) The detailed assessment also revealed that fire support instruction was deficient by as much as 80% of the required T&R Standards, gunnery as much as 20% to 30% deficient, and battery

operations were not being taught at all. The MARDET received numerous complaints from FMF commanders that lieutenants were reporting to FMF units insufficiently trained which, in turn, was eroding readiness. Based on these findings, the MARDET CO directed the staff to identify viable courses of action (COAs) to remedy the problem.

The OIB staff began analyzing the details of the Service MOA that dictated the requirements for both the Army and Marine Corps at Ft. Sill. Essentially, the Marine Corps is required to provide officer instructors/ curriculum developers proportionate to a percent of the overall student throughput, while the Army provides the necessary facilities and the opportunity for Marines to attend instruction. When it was written, artillery programs between the two services were nearly identical; however, as a result of TRADOC driven inputs to the POI such as Common Core, emerging operational requirements (transition from counterinsurgency operations), and a reluctance from both Services to extend the course length, the two Services' missions and how they trained for them began to diverge. As a result of the 2015 analysis that identified that Marine Corps T&R standards were simply not being met, the MARDET stood up a MAOBC followon course to cover the differences. As Service requirements continued to drift further apart, MAOBC simply could not keep up. To further exacerbate matters, the Fires Center of Excellence (FCoE) was considering removing manual gunnery from enlisted and officer training in an effort to "modernize gunnery." At the same time, FCoE was developing a concept to combine Field Artillery (FA) with the Air Defense Artillery (ADA) as a single fires branch. This combination was attempted in the 1950s and 1960s without success. This concept further strained the ability to create subject matter experts in fire support and field artillery operations. (This is no longer an FCoE or USAFAS concept.)

As directed by the MARDET CO, the staff proposed three COAs to bring artillery officer entry-level training back into standard with the T&R and address the FMF commanders' concerns:

1. Keep Marine students in BOLC-B and grow MAOBC to cover all the differences in the POI. The COA would grow the course length and prohibitively impact the USMC training, transients, patients, and prisoners (T2P2) population.

2. Keep Marine students in some of BOLC-B instruction (primarily gunnery) while they attend MAOBC throughout the course to receive additional fire support and battery instruction. This COA was considered a "blended curriculum" and required inordinately complex scheduling and depended on FCoE acquiescence to Marine scheduling requirements.

3. Remove Marine students from BOLC-B altogether and they would receive training in fire support, gunnery, and battery operations at MAOBC.

The COAs were presented to TECOM with all the supporting details. Initial feedback was that the removal of manual gunnery was not acceptable. The MARDET CO made it clear that the Marine Corps would not remain part of artillery training at Ft. Sill if manual gunnery was eliminated. TECOM declined to approve lengthening MAOBC as it was cost prohibitive and must remain within the temporary duty under instruction (TEMINS) time limits (less than six months). Therefore, either of the two latter COAs were viable, as long as 0802s were sent to the FMF fully trained in 1000-level T&R tasks.

Given the direction handed down by the U.S. Army at the time, the FCoE disagreed with the position on gunnery when the MARDET relayed the directives from TECOM, but understood our dilemma and were willing to accept the decision so long as the MARDET continued to provide Marine instructors at BOLC-B.

The FCoE leadership also assessed that Marine students had a positive influence training with Army students (academically, socially, etc.) and wanted to maintain as many 'touch points' as possible. This view was shared by MARDET leadership. The reality, however, was that other than classroom instruction, the students did not spend much time together. After exhaustive deliberation, the staff was unable to develop a viable training schedule that facilitated a blended curriculum, so the MARDET leadership opted for the "break away" COA. The staff was directed to write the curriculum for a complete MAOBC program.



Field Artillery Basic Officer Leader Course students conduct a walkthrough of the impact zone during a fire support coordination exercise (FSCX) Jan. 17, 2019, at Fort Sill, Okla, The walk-through was a new addition to the exercise. The FSCX was one of the training events conducted during Red Leg War, which is the culminating event for the FA BOLC students. (Photo Credit: Daniel Malta, Fort Sill Public Affairs)

In early 2016, the instructors began writing the new curriculum. The course design was based entirely on T&R standards and followed a logical, concurrent, progression of increasing complexity in both fire support and gunnery instruction. Battery operations were taught throughout, and the staff began working with both the enlisted and Warrant Officer Basic instructor cadres to ensure the standard techniques were taught across the Marine artillery community. Also, based on demand from FMF commanders, the Marine Logistics Course was introduced to provide students with a basic understanding of artillery logistics. Finally, after completing the MAOBC POI, the students attended a contracted JFO course (not a graduation requirement). The first stand-alone MAOBC course began instruction in mid-2016 with MAOBC Class 7-16.

Since the first course in 2016, both FA BOLC-B and MAOBC POIs have undergone changes. Each course was adjusted and improved, and FA BOLC-B and MAOBC are currently teaching MAOBC 2.0 and FA BOLC-B 6.0 respectively. The MARDET provides two to four instructors (occasionally and temporarily surging past four) to the FA BOLC-B that work solely with the soldier instructors and students. FA BOLC-B typically runs eight classes annually with a throughput of roughly 1,100 lieutenants. MAOBC offers seven classes annually aligned with The Basic School (TBS) in Quantico class schedules with a throughput of roughly 125 lieutenants. The courses are similar in length and instruction MARDET and the FA CMDT's office remain committed to combining instruction of our officers by working closely mitigate hours (792 for the USMC hours versus 799 hours for the Army) but have varying requirements. Since Marine lieutenants attend TBS, they obtain basic knowledge of military skills required by a Marine officer to include but

not limited to rifle/pistol range, basic attend MAOBC to provide the student's infantry tactics, field craft, Marine Corps view of the course history and traditions, and Marine Corps Supervised by a Marine Major who is the design and capabilities and limitations of its Course Manager for both BOLC-B and units. This six months training at TBS MAOBC, four Marine captains remain as permits the students and instructors at Fort part of the instructional staff for FA BOLC-Sill to focus solely on artillery. In contrast, B to provide teaming, leadership and the FA BOLC-B receives lieutenants directly mentorship to the future generations of from their commissioning source. Regardless Army artillery officers. The MARDET CO of commissioning source - Officer Candidate and the Course Manager remain invested in School (OCS), Reserve Officer Training the success of both programs. Corps (ROTC), or West Point - newly commissioned officers arrive at FA BOLC-B uncertain, the MOA Working Group and must execute Common Core training continues its process to identify differences objectives that include but not limited to rifle in the two courses and work together to range, field craft, Army organization, and overcome them. Naturally, some of these many other classes also covered at Marine challenges lie beyond the scope and control TBS. FA BOLC-B also includes a Combined of the MARDET, FA CMDT, and FCoE and Arms Division (CAD) that instructs the will require concurrence and approval from lieutenants on the basics of maneuver and higher level commands such as USMC how to apply fires to support different types Training Command, Marine Corps Combat of units. Aside from these blocks of Development Command (MCCDC), USA instruction, the material in the Gunnery, Fire Training Support, and blocks are remarkably similar. Instructor to Military Training (USACIMT), and USA student ratio (ISR) also differs by course, Human Resources Command (USAHRC). with a ratio of 1:20 for USMC and 1:35 for The fact remains, however, that the goal of USA. While there are differences in the Fort Sill (USMC and USA) are the same: to number of hours taught due to extra produce the finest artillery officer possible requirements for FA BOLC- B and some for the good of our nation. This is a no fail differences in grading, the basic materials and skills are the same. This puts us to where we are today. The existing and emerging challenges. The MOA Working Group is taking a methodical and purposeful approach at a framework to combine the courses and define the necessary equitable inter-service support. Under the auspices of the G-3/5/7, the FCoE battery commander, Battery B, 1st Battalion, G-8 (Comptroller) is actively working with 12th Marine Regiment, 3rd Marine Division. Training Command (which is subordinate to *He is a graduate of Randolph-Macon College* TECOM) and TRADOC to draft the necessary Inter-Service Support Agreements (ISSA) to account for support provided and received by both parties under the existing ITRO. At the local level, the two courses are still taught separately; however, certain touch (USMC) points are in play to facilitate conditions to combine training where it is practical to do so. To that end, we continue to push forward with several initiatives designed to overcome some of the most basic challenges. One example is having MAOBC students routinely attend planned FA BOLC-B socials to mingle, share experiences, ideas, and culture between the two Services. Also, commencing in the spring 2020, as part of a pilot program to practically and fully assess bringing the two schools back to joint training, several soldiers will

differences.

So what is next? While the future is still and Doctrine Command Battery/Platoon Leader (USATRADOC), USA Center for Initial mission that we remain committed to.

> Maj Jonathan Bush is the Officer In Charge of the Officer Instruction Branch for FA BOLC-B and MAOBC. He previously served as the Marine Detachment, Fort Sill Operations Officer. His previous assignments include aide to Deputy Commander, Marine Forces Pacific, and and the USMC Expeditionary Warfare School.

> * With excerpts, review, and input from current and former USAFAS staff members and MARDET staff members to include Major Shawn Burkhart (USMC), Major Roy Miller (USMC), Major Ricardo Bitanga

¹ 1LT Whitfield, Robert W. History of the Field Artillery and Missile School Volume III. USFAS, 1957, pp. 42-51, History of the Field Artillery and Missile School Volume III





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