Field Artillery

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Contents

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Purpose

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

Cover

The Director of Resources Integration for the Deputy Chief of Staff, G-9, spent the day with Soldiers of the 2nd Battalion, 2nd Field Artillery, in October. The Basic Officer Leader Course (BOLC) students demonstrated firing the weapon systems, including the M109 Paladin mobile howitzer. *(U.S. Army photo by Judith Oman)*

BG Shane P. Morgan
Chief of the Field Artillery

Who We Are and Where We are Heading

By BG Shane P. Morgan

TEAM: Greetings from Blockhouse Signal Mountain and the United States Field Artillery School, Fort Sill, Oklahoma. There has never been a more exciting nor more relevant time to be a REDLEG!

Now is the time to capitalize on the Field Artillery's decisive role in Large Scale Ground Combat Operations and the crucial role we play in defending this great nation. As Secretary of the Army Wormuth stated, "Fiscal year 23 will be the year of long range precision fires- we'll see the first Battery of the new long-range hypersonic weapon that we've developed with the Navy, as well as PrSM, our Mid-Range Capability, and the prototype of extended range cannon artillery." One needs to look no further than the transformation happening at JBLM, our new Multi-Domain Task Forces, or the persistent growth across our branch to realize fiscal year 24 will be just as transformative.

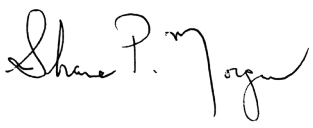
Our number one priority remains fielding the Artillery Force for the Army of 2030 and the cornerstone of that success lies in the men and women who make up that force. We must continue to recruit, train, and retain the best talent to maintain our title as the King of Battle. Our troops embody the spirit of determination, resilience, and discipline, which has been the hallmark of the Field Artillery for centuries. By investing in their professional development, providing them with state-of-the-art equipment, and fostering a culture of innovation, we will continue to dominate the battlefield and secure victory for our nation.

Just like in our Army Targeting process, D3A, we are top down planning and need your bottom up refinement. In an effort to stimulate intellectual debate within our chosen profession we are asking for your input for articles to publish in our journals. In the previous four journals, 50% of the articles came from Captains and Majors. While we want the same audience to continue sending their nominations, we encourage our Warrant Officer and NCO populations to continue writing. I ask Brigade and Battalion Command Teams to challenge their formations to consider writing on topics such as: what are you doing to establish a warfighting culture; how are you building and sustaining Field Artillery Readiness; what are your impediments to achieving your METL? Iron sharpens iron and your articles forge the drive which stimulates the necessary change we need to embrace. We exist to support the operational force and your input drives our initiatives.

We proudly maintain our title as the King of Battle. There's never been a more exciting nor more relevant time to be a REDLEG!

Zero Mils!

King of Battle!



CSM Paul I. Fluharty
Command Sergeant Major
of the Field Artillery

Redlegs–

First and foremost, I want to thank all the Redlegs for your continued efforts to ensure we are the most disciplined and lethal branch in the Army.

My number 1 priority as the Command Sergeant Major of the Field Artillery is to ensure the growth of our force and manning the force 2030. To maintain our rightful status as King of Battle, we must persistently strive to recruit, train, and retain the most exceptional talent among us. By investing in their professional development, providing them with state-of-the-art equipment, and nurturing a culture of innovation, we shall continue to dominate the battlefield. This is reinforced by our primary role in large-scale combat operations and multi-domain operations. BLUF—we need our Redlegs trained and focused on the fundamentals, lethal and ready for the nation's call.

The evolving nature of modern warfare compels us to adapt and modernize continuously. To outmaneuver and outmatch our adversaries, we must wholeheartedly embrace cutting-edge technologies, seamlessly integrate advanced fire control systems, and harness the power of data analytics. The future battlefield will be marked by interconnectivity, demanding our readiness to employ integrated systems and engage in network-centric operations. Our unwavering commitment to modernization shall ensure that our forces retain their agility, lethality, and unwavering ability to deliver decisive effects in any operational environment.

While the towed howitzer remains an invaluable asset, our relentless pursuit of modernization shall propel us to unprecedented heights of success. Through the unwavering dedication and unmatched skill of the men and women who form the backbone of our Artillery Force, we will proudly preserve our esteemed title as the King of Battle.

CW5 Rolando G. Rios
Chief Warrant Officer
of the Field Artillery

Greetings Lethal Redlegs.

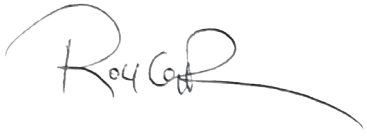
The U.S. Army is pulling every lever possible to solve its recruiting challenges. So too are Army Senior Leaders looking at innovatively accessing younger talent to mitigate the Warrant Officer retention problems. Current challenges in retaining career Warrant Officers have forced Army Senior Leaders to develop near-term programs aimed at addressing structural Warrant Officer retention issues. This convergence of efforts adds a new dimension to the way proponents access Warrant Officer talent.

In this unprecedented "war for talent", the U.S. Army Combined Arms Center is piloting a program that expands the pool of qualified Warrant Officer applicants by targeting younger soldiers in the lower enlisted grades. By Fiscal Year 2024, every branch is charged with identifying four potential applicants in the Private First Class or Specialist ranks who have the desired talent and demonstrate the potential to be successfully accessed into the Warrant Officer cohort. To improve Army readiness, address forecasted strength gaps, and take advantage of the depth of talent across the Army, there is a short-term need to reevaluate the Warrant Officer accession criteria.

To meet the personnel demands of Army 2030 and beyond, the philosophy for Warrant Officer accessions will temporarily be expanded from eligibility criteria based on time-in-service and rank to eligibility criteria based on talent, skills, and potential. To that point, I will be reaching out to the Senior 131As at the installations to begin dialogue for identifying four potential candidates.

King of Battle!

Becoming scholars of our profession!



(Photo by Edward Muñiz, Fort Sill Public Affairs Office)

Before World War I, Field Artillery batteries generally fired directly at visible targets measured in distances of meters and yards. Today, modern field batteries measure targets in kilometers and miles, often not engaging the enemy with observed direct fire.

The Battle of Fort Ridgely:
Artillery Saves the Fort, and Minnesota, for the Union in August 1862

Part 2: Dakota Strategy and the Emergence of Field Artillerymen as Ft. Ridgley's Main Defenders

By Dr. John Grenier, Field Artillery Branch Historian

Ordnance Sergeant John Jones. This image shows Jones in his officer's uniform. After the Battle of Ft. Ridgely, he accepted a commission as the captain of the Third Battery, Minnesota Volunteer Artillery, and he served in the 1863–1864 Northwestern Indian Expedition, designed to punish the Dakotas for the 1862 uprising. This image is courtesy of the Minnesota History Center.

Little Crow grasped intuitively that time was against him and the Dakotas, and they therefore must focus on the Army's sole outpost in the Minnesota River Valley. With Ft. Ridgely and its cannon in their hands, the Dakotas could impede any Army offensives up the valley, and more importantly, they could use the fort as a bargaining chip in the peace talks that President Abraham Lincoln was sure to call for. Little Crow knew from conversations with his many friends among the whites that the last thing Lincoln needed was an Indian war on the Northern frontier, especially since the Union Army had yet to beat a Confederate army in the East. Yet, other Dakotas ignored his sage advice and instead chose to unleash a campaign of terror on Southwest Minnesota's dispersed farms and towns: in the first week of the five-week uprising, they murdered over 600 settlers, torched hundreds of homesteads, and took upwards of 300 white and *métis* women and children as captives.[1] Nearly 40,000 whites abandoned their homes and fled in panic to the state capital at St. Paul and into Wisconsin. The horrors that the soldiers' lodge perpetrated sealed all the Dakotas' fate in Minnesota: white survivors demanded that the Army send them troops and matériel to extirpate (preferably) the Dakotas, or expel them forever (an alternate, but no less draconian option) from Minnesota. The gun crews who helped save Ft. Ridley for the Army therefore produced profound strategic implications for both the war and American history far beyond the immediate and desperate fight in which they found themselves on the third and fifth days of the uprising.

On 18 AUG, at sunrise, Dakota warriors fell on whites and *métis* (the multi-racial children of marriages between Native American and French-Canadian fur traders) who resided at the Lower Agency and nearby farms. A wholescale slaughter ensued, and by 10 a.m., hundreds of settlers staggered into Ft. Ridgely. The post commandant, CPT John Marsh, marched half the garrison toward Redwood to investigate the refugees' panicked claims of an unfolding massacre. He left nineteen-year-old LT Thomas Gere and twenty-two able-bodied Soldiers to hold the fort until he returned. At the ferry east of Redwood, Dakotas under Mankato (M-ak'-to) ambushed March and his command: they killed twenty-four Soldiers, and less than half a dozen wounded men made it back to the fort. Near 8 p.m., Gere penned dispatches advising of the disaster at Redwood Falls and sent them to the commander at Fort Snelling (near St. Paul, 125 miles distant) and LT Timothy Sheehan, who had marched that morning with one of Ft. Ridgely's infantry companies to meet and escort the BIA teamsters who were finally bringing the Dakotas their late annuity. The most immediate question became whether Sheehan or anyone else could reach Ft. Ridgely before the Dakotas overran it.

While he organized Soldiers and refugees

This is the second part in our four-part series on the Battle of Ft. Ridgley. We used the first part of this series in the previous edition of the FAPB to set the stage for the battle, and focus your attention on the Dakota leader, Little Crow. This part explains the strategy that Little Crow developed to capture Ft. Ridgley, and the emergence of SGT John Jones and a handful of artillerymen as the most important defenders of the fort.

1 *Métis* were the "mixed-blood" offspring of Indian-European unions.

to withstand the expected Dakota onslaught, Gere turned to SGT John Jones of the Ordnance Branch to position Ft. Ridgely's cannons for its defense.[2] Ordnance Sergeants were much like today's Warrant Officers, and Gere recognized Jones as the garrison's artillery expert. Jones also had seen combat and had been wounded as a Redleg fifteen years before in the Mexican-American War, so the young lieutenant, already deathly ill from mumps, may have instinctually turned to the older NCO to lead at the guns during the fighting. Jones recently had worked with SGT James McGrew at Fort Ridgely to train some of the Minnesota Volunteer Infantry in operating the post's cannons, and he asked McGrew for his assistance. Two civilians, John Whipple (like Jones, he had fought in the Mexican-American War) and Dennis O'Shea, said that they too had been artilleryman, and they could help at the howitzers. Still, there were not enough trained men to safely and effectively man all the fort's cannons on 18 AUG.

Jones concluded that the Dakotas' most likely course of action involved them rushing the parade ground through the opening between the officers' quarters and the surgeon's quarters at the fort's southwest corner. A ravine in that quadrant could conceal them for all but the last 150 yards on their approach. Jones therefore placed O'Shea with the 6-pound field gun there. He was confident that if he joined it to offer direct supervision, O'Shea's gun crew of three civilians and four infantrymen could work the howitzer fast enough to repel any Dakotas who charged from that direction. A squad of Soldiers stood nearby to provide covering fire. Jones gave SGT McGrew and Mr. Whipple command of 12-pound mountain howitzers. They should, he directed, pay particular attention to the ravine and tree line at the fort's northeast corner, where perhaps the Dakotas might approach under the cover of the heavy woods, and the northwest corner that faced the powder and ammunition magazines, whose contents promised to draw the Dakotas' attention. The relatively immobile—it was best moved with teams of horses or mules—24-pound field gun sat unused in the middle of the parade field throughout most of the battle that followed. Jones placed the third, unmanned 12-pound mountain howitzer at the fort's southeast corner to guard the prairie on which the Dakotas could find no cover if they tried to assemble for an attack. All the while, more refugees flowed into the fort. LT Gere placed the women and children in the stone barracks on the north side of the parade grounds, and garrison's physician prepared a room on the bottom floor to serve as a field hospital. Everyone expected hard business that night or the next morning.

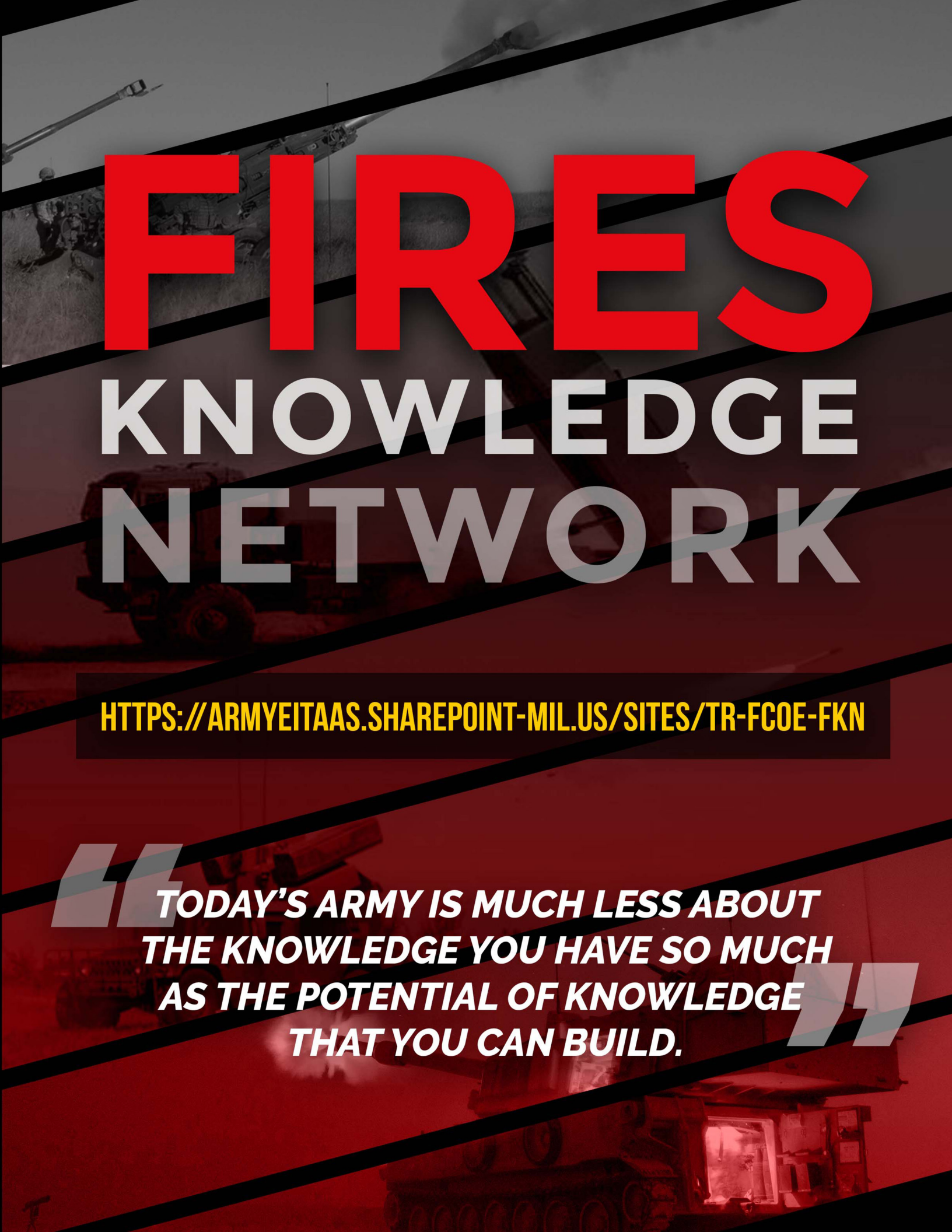
Sergeants were much like today's Warrant Officers, and Gere recognized Jones as the garrison's artillery expert...

...everyone expected hard business that night or the next morning.

To be continued...

Dr. John Grenier is the FA Branch/USAFAS historian at Fort Sill, Oklahoma.

2 The Army did not create a warrant officer corps until 1918. Each Ordnance Sergeant claimed at least eight years of service in the regular Army (vice a state militia), including four as an NCO, and passed a series of examinations in mathematics and writing—at a time when many Soldiers were barely literate—before the Army placed them in the Ordnance Branch.



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"TODAY'S ARMY IS MUCH LESS ABOUT THE KNOWLEDGE YOU HAVE SO MUCH AS THE POTENTIAL OF KNOWLEDGE THAT YOU CAN BUILD."

BDA in Targeting Working Groups

By CW3 David Brown

Introduction

Targeting, conducted via the steps of Decide, Detect, Deliver, and Assess (D3A), is the Army's process for translating commander's guidance into a plan of attack. As such, commanders should be intimately interested in the outputs of that process, which focuses on achieving their specified end-state. After all, targeting determines what objects a unit must attack, when to attack them, how to attack them, and how to assess those attacks. The last step, assess, is the most abstract in the process but instrumental for keeping commanders informed as to whether or not their plans progress as intended. Crucially, assessments keep the targeting process focused and valuable enough for a unit to conduct during its precious battle rhythm time during operations.

As an Observer, Coach, and Trainer (OC/T) at the National Training Center (NTC), I've noted that the bulk of analysis conducted during Targeting Working Groups (TWGs) occurs in the form of S2's Battle Damage Assessments (BDA). A trend I wish to highlight is that the best BDA rollups prioritize the narrative over numerical. Specifically, units that dedicate themselves to providing all doctrinal elements of BDA and making recommendations based off those assessments during the assess portion of Target Working Group (TWG) tend to have far more success in achieving their commander's intent and enabling subordinate success than those that do not.

Assess is the first practical performance step in D3A

Decide, Detect, Deliver, and Assess (D3A) are the four functions of the Army's targeting process. Decide occurs first in planning but assess occurs first in practice, despite occurring last linguistically in the D3A mnemonic acronym. Assessments begin, or should begin, every TWG.[1]

High performing units hold themselves accountable by performing assessments at the start of every TWG. They do justice to their commanders' intent by specifically formulating what they are assessing — High Payoff Targets (HPTs) detected/prosecuted; Fire Support Tasks (FSTs) achieved; Priority Intelligence Requirements (PIRs) answered, for example — describing what their assessments mean in operational or shaping terms and make recommendations for command approval when adjustment decisions are necessary, or their plans miss the mark.

Elements of Battle Damage Assessments (BDA)

Specified desired effects determined during decide, and often expressed as attrition goals against enemy formations and functions, allow us to measure our effectiveness towards targeting task accomplishment. As an example, specifying that you want to neutralize 70% of the 801st BTG's 2S19s in the support zone by D Day plus four (D+4) or before a battalion's seizure of an objective is a clear, precise, and intelligible goal defined by time and space whose progress you can measure daily through kill charts listing the enemy order of battle.

Yet, numeric tallies or kill counts of enemy systems is only one part of BDA reporting, Physical Damage Assessments to be precise. Describing what the kill count means in terms of enemy target mission capabilities and the target category function writ large comprise the totality of BDA.

ATO AA SAT 13 MAR	ATO AB SUN 14 MAR	ATO AC MON 15 MAR	ATO AD TUES 16 MAR	ATO AE WED 17 MAR	ATO AF THURS 18 MAR
Assess Last 24	Execute CURRENT	Review +24	Validate +48	Approve +72	Guidance +96

Figure 1. Example TWG Timeline in conjunction with an example ATO cycle

1 MG Richard Longo and LTC Jeff Schmidt, "Fires Solutions for the Division Targeting Board," *Fires*, 2018, 39.

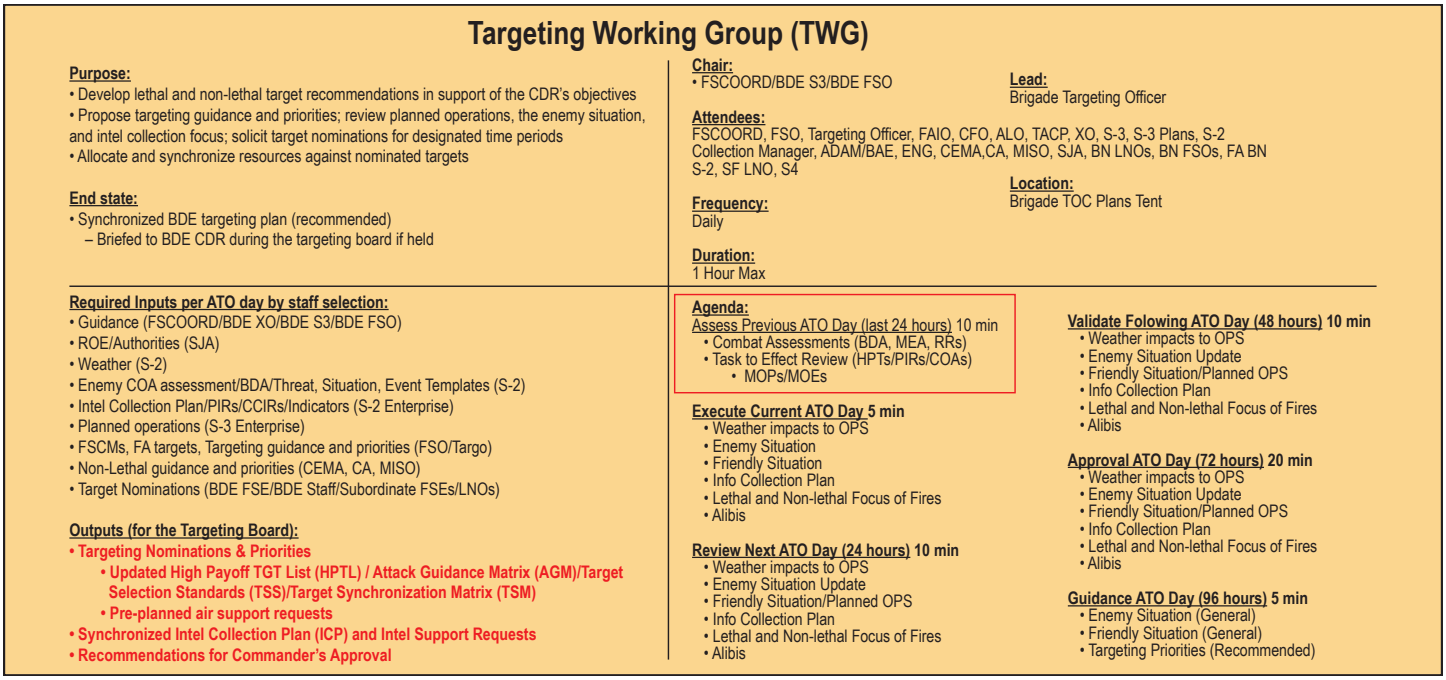

Figure 2. Example TWG Agenda Quad Chart

As a doctrinal reminder, three components comprise BDA per ATP 3-60 page 2-15:

Physical Damage Assessments:

These are observed or interpreted estimates of quantitative damage against a target or target elements. These are closely tied to Measures of Performance: things we wish to do and the way in which we wish to do them.

Example: 20x 2S19s destroyed in vicinity of Strawberry Fields. We engaged all within 6 minutes of detection.

Functional Damage Assessments:

These are estimates in terms of target mission and estimated enemy recuperation time. These are closely tied to Measures of Effectiveness: results we wish to achieve.

Example: The 20x 2S19s destroyed IVO Strawberry Fields means the 801st BTG cannot mass fires on Ujen (OBJ RED SOX, in this example). However, the 80th DTG can reposition a 9A51 Battery (6 launchers) ivo Echo Valley within 24 hours to range OBJ RED SOX.

Target System Assessments:

These are broad estimates of the remaining effectiveness of the targeted enemy category considering the cumulative effects of friendly action and the Commander's intent.

Example: "Sir, we have reduced the enemy artillery's ability to impact our seizure of OBJ RED SOX by destroying 70 percent of his self-propelled artillery; the 801st BTG cannot mass fires on friendly forces. We are confident that with the CAS we have allocated today and requested for tomorrow, we will be able to meet your intent and prevent reinforcing fires of the 80th DTG maneuvering from Echo Valley into Drinkwater Valley from affecting OBJ RED SOX.

Providing all three elements of BDA for every HPT turns data into usable information that enables commander decision making. In layman's terms, it is the equivalent of giving the commander "the what," "so what," and "which means" at the beginning of the meeting. Providing the BDA bottom line up front without omitting any of its component elements increases shared understanding of the remaining tactical problem sets amongst the staff and helps the commander refine his battlefield visualization. TWGs where S2s provided assessments with an explanation of how the prosecution of HPTs contributed to the friendly course of action and affected enemy decisions had more success in meeting their commander's intent for fires.

Assessments are a shared responsibility

BDA is an intelligence responsibility but requires operational input. FM 5-0 demands that the Intelligence and Fires Warfighting Functions communicate and cooperate with each other in this endeavor by charging the S2 to provide a BDA Tab to Annex D. Ideally, this tab describes the frequency, format, transmission medium, and recipients of unit BDA reporting, as well as the conduct of any BDA working groups. Targeting officers influence this process by specifying which targets require BDA on their High Payoff Target List (HPTL), Attack Guidance Matrix (AGM) or Target Sync Matrix (TSM). Know, however, that collection which focuses on BDA diverts collection from active target development, situation development, or answering other PIRs.

ANNEX D-FIRES (Chief of Fires or Fires Support Officer)
Appendix 1–Fire Support Overlay
Appendix 2–Fire Support Execution Matrix
Appendix 3–Targeting
Tab A–Target Selection Standards
Tab B-Target Synchronization Matrix
Tab C–Attack Guidance Matrix
Tab D–Target List Worksheet
Tab E–Battle Damage Assessment (G-2 or S-2)
Appendix 4–Field Artillery Support
Appendix 5–Air Support (Air Liason Officer or S-3)
Appendix 6–Naval Surface Fire Support
Appendix 7–Air and MIssile Defense (Air and Missile Defense Officer)
Tab A–Enemy Air Avenues of Approach
Tab B–Enemy Air Order of Battle
Tab C–Enemy Theater Ballistic Missile Overlay
Tab D–Air and Missile Defense Protection Overlay
Tab E–Critical Asset List/Defended Asset List

Figure 3. Annex D IAW FM 5-0

Accordingly, it is imperative that targeting officers familiarize themselves with their S2's BDA process. If your S2 doesn't provide you all elements of BDA during the TWG, especially for targets that you've designated as requiring BDA (maybe the BDA required target supports an Essential Fire Support Task or its successful engagement is the trigger for a tactical action), then you need to extract it. Talented targeting teams pull all elements of BDA from subordinate and higher echelons, extract relevant information, express that information in operational terms, and share that information with those with a need to know.

In LargeScale Combat Operations (LSCO), it is more likely that the enemy will not do what we expect, especially at a 72-hour time horizon,[2] necessitating comprehensive and collated BDA that accounts for decoys, discrepancies, over-reporting, incorrect reporting, enemy reconstitutions, and reinforcements.[3] Providing all elements of BDA for designated HPTs gives the commander enough information to adjust his plan should the need occur.

Re-Attack Recommendations

High performing targeting teams recognize when that need occurs; they recognize when they did not achieve intended effects during TWGs. They then use assessments to make recommendations to the plan and allow the commander to make dynamic decisions, which, operationally, usually boil down to one of three options when we fail to meet our targeting goal for a particular targeting cycle:

- Reallocate/divert today's or future air tasking order (ATO) days' resources towards the unmet goal (what we wanted to but didn't kill yesterday.)

- Change the plan (re-prioritize the HPTL, delay movement, alter the scheme of maneuver or collection plan, adjust the target method of engagement or weapon target pairings, request task organization or command relationship change, etc.)

- Accept risk, bypass, and continue mission.[4]

2 Ibid. 39.
3 MAJ Jared Cohen and CW3 Joshua Ryker, "Fusing Data into a Battle Damage Assessment for the Commander," *CALL*, 2022, 3.
4 Ibid. 39.

Re-Attack Recommendations respond to emerging requirements and are one of the most impactful ways deliberate targeting translates, ties, and transitions to dynamic targeting.

Operationalizing Assessments

Battle Damage Assessments are inherently difficult. The scarcity of time, unforgiving terrain, and contested communication environments units face at NTC don't help. Compounding the challenge, in many cases, junior or new S2 personnel do not know what information to communicate, how often, over what medium, and to whom. Hopefully, the abovementioned examples will assist aargeting officers and other information customers shape how intelligence professionals express BDA and turn it into useful and usable information during TWGs and other touchpoints.

To be clear, while the three elements of combat assessment, especially BDA, comprise the bulk of analysis given at the start of a TWG, they aren't the only topics of interest to the targeting team. As a reminder, the three combat assessment elements are:[5]

- BDA [S2]
  - Physical Damage Assessment
  - Functional Damage Assessment
  - Target System Assessment
- Munitions Effectiveness Assessment [ALO/FSO/Targeting Officer]
- Re-Attack Recommendations [Targeting Officer/S2/FSO]

But assessments could also include the following:

- Collection Assessment [Collection Manager]
- Counterfire Assessment [CFO]
- Operational Assessment [S3]
- Fire Support Task / Fire Mission Assessment [FSO / FA BN S3]
- Non-Lethal Assessment [Protection/CA/CEMA]
- Critical Supply Rate / Required Supply Rate Assessment [S4]

Including, excluding, or abbreviating any of these additional assessments depends on your targeting standard operating procedure (SOP) and your unit's level of targeting proficiency. I recommend including at least some version of these assessments to give your staff a fuller picture of your operational efforts, but, as with any best practice an OC/T recommends, the choice and manner of its implementation is up to you and your unit.

Regardless of the manner or exact topics of your assessments during the TWG, well considered BDA is supremely important. Assessments set the stage for the conduct of the rest of the working group and ill-defined assessments can cause the staff to lose focus on the commander's guidance. Providing all elements of BDA in operationally relevant terms will help your unit track targeting task accomplishment, allocate or reallocate resources, and accomplish your commander's intent according to the framework they envision.

CW3 David Brown serves as the Targeting Trainer for Operations Group Bronco Team at Fort Irwin, California. He is an Honors Graduate of American Military University and the Warrant Officer Basic and Advance courses. His previous assignments include Brigade Targeting Officer, Division Artillery Counterfire Officer, Field Artillery Brigade Lethal Effects Element Targeting Officer, Target Acquisition Platoon Leader, and Battalion Targeting Officer.

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MG (ret) Longo, Richard, and LTC Jeff Schmidt. "Fires Solutions for the Division Targeting Board." Fires, 2018, 38–42.

5 *ATP 3-60 Targeting* (Washington, D.C.: HQDA, 2015), page 2-14.

7th Infantry Division:
Revitalizing the Maneuver Fire Support Integration Program

By MAJ Joseph M. Brown (7ID AFSCOORD)

In his 2002 article 82d Airborne Division Maneuver and Fires Integration Program, MAJ John P. Drago addressed negative trends from the combat training centers (CTCs), specifically the integration of fire support with maneuver, by describing a training solution implemented by the 82nd ABN. Now, over 20 years later, many of his recommendations have found their way into doctrine. The integrated weapons training strategy (IWTS) and TC 3-09.8 taken together lay out nearly the same training glide path as described in the article. However, the negative trends he sought to address persist, causing us to ask why and what can be done to correct this issue.

"In planning, the importance of using indirect fires is seldom grasped. During rehearsals, calls-for-fire (CFFs) are seldom incorporated, or their purpose accurately explained. During execution, communications routinely fail, CFFs are not processed, or tactical patience is not practiced. Poor situational awareness causes slow clearance of fires in the company sector, and commonly, units become impatient and maneuver against the enemy without employing their indirect assets."[1]

These comments are as relevant today as they were in 2002 and for much the same reason. Our current training does not deliberately integrate fire support into maneuver training until late due to the "stove piped" nature of our maneuver and fire support training glide paths. This effect is further re-enforced by the physical separation of the fire support teams (FIST) from their maneuver commanders and the doctrinal separation between the IWTS and TC 3-09.8.

Without early integration and emphasis from their higher headquarters, maneuver commanders often choose to assume risk and skip critical training events such as the fire coordination exercises (FCX) to save time and resources for the platoon live fire exercise (PLT LFX) or the combined arms live fire exercises (CALFEX). Skipping the FCX robs commanders and fire support officers (FSO) of the opportunity to practice developing mutually supporting maneuver and fire support plans prior to the LFX. This results in poorly developed plans that often derail the maneuver plan and are subsequently discarded leaving companies to fight as individuals instead of the lethal combined arms teams they are designed to be.

In large-scale combat operations (LSCO), the need to address integration of fire support at the platoon and company level is paramount. Just as the 82d in 2002, the 7th Infantry Division has instituted the maneuver fire support integration program (MFSIP) to deliberately connect the IWTS and the TC 3-09.8 and eliminate the "stove pipes." This program takes a phased approach to integrate maneuver and fire support training starting at the individual level and culminating with the CALFEX. This enables units to train and certify the "maneuver fires team" so they understand how to fight as a combined arms team before they are evaluated during the CALFEX, tested at a CTC or forced to learn while in direct contact with the enemy.

Phase 1 focuses on the individual and squad level training. This includes the fire support certification program as outline in the TC 3-09.8 and the Table I, tactical exercise without troops (TEWT), from the IWTS. Additionally, battalion (BN) level fire support elements and company level FIST provide classes and leader professional development (LPDs) on fire support topics to

1 John Drago, "82d Airborne Division Maneuver and Fires integration Program" Field Artillery Journal, (January-February 2002): 26-29

their maneuver formations. These serve as the foundational academic education for maneuver leaders as they prepare for collective training and allows maneuver and fire support leaders to discuss how to fight as the combined arms team.

Phase 2 shifts the focus from academic to hands on training via the fire support planning exercise (FSPX). This exercise is essentially the Fire Support Table IV: Execute Fires, expanded to include the CO/TRP commander and the platoon leaders as part of the training audience, creating the "maneuver fires team." The FSPX breaks down into 4 parts: planning, brief, rehearse, and follow through.

During the planning portion commanders and their fire support officer (FSO) will receive the order from the BN. They create their maneuver and fire support plans, conduct any necessary coordination, and prepare a company fire support rehearsal. This portion can be done in a matter of hours or over several days, informed by how the BN wants to execute and what competing tasks they have. The most critical aspect of this phase is the company commander and FSO working together to integrate the fires and maneuver plan.

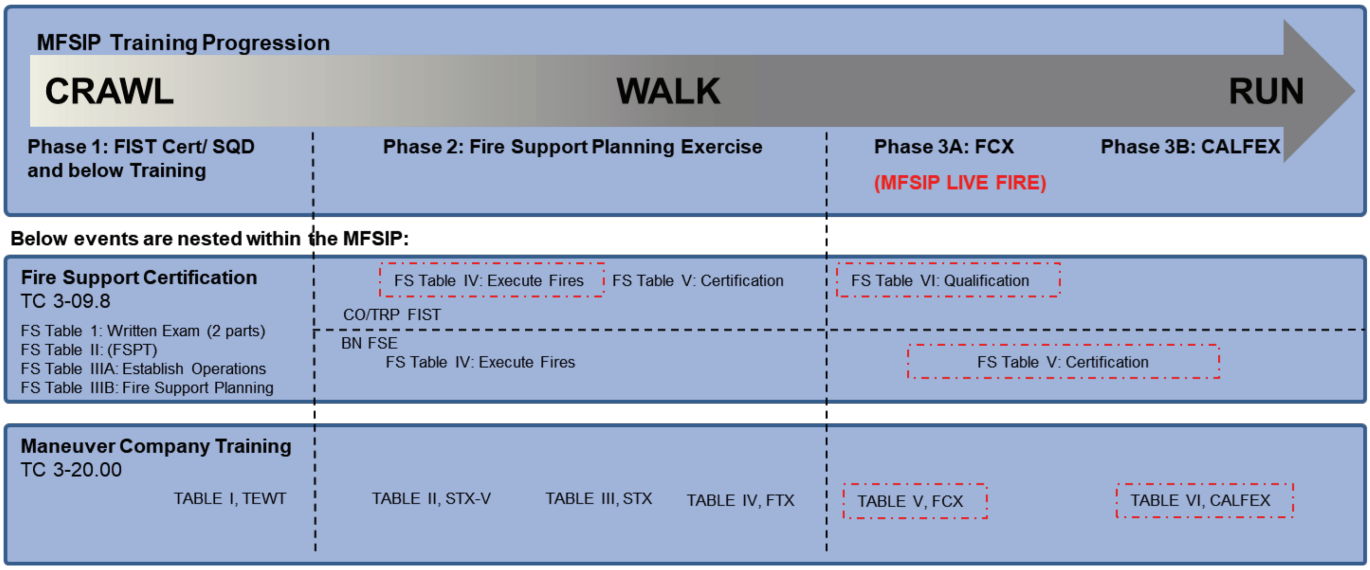
During the briefing portion, the company commander and FSO will brief their plan to the maneuver BN commander and FA BN commander. This allows both commanders to provide feedback on the plan and coach the company "maneuver fires team." It is critical that both commanders participate so that both plans received adequate attention and to communicate the importance of synchronizing the maneuver and fires plans. After the brief, the commander and FSO make any directed adjustments to the plan and prepare to execute.

Once the briefing is complete, the company rehearses the plan. Depending on the resources available, this can be completed as a dry fire on

Maneuver Fire Support Integration Program

Mission: 7th ID establishes the Maneuver Fire Support Integration Program (MFSIP) NLT FY 23 to enhance Company/Troop commander's integration of fire support within their maneuver plan by expanding existing 7th ID certification and training requirements.

Concept: The MFSIP builds fire support proficiency at the CO/PLT level. This is a three phase program that serves as the connecting point between company maneuver training and the company fire support team (FIST) certification process prior to CO/TRP CALFEX.



In order to integrate into the IWTS live fire home station proficiency training, Fire Supporters must ensure they are qualified at providing safe and accurate fire support into the maneuver plan. They must validate their ability to support IWTS live fire events through their qualification events in the Fire Support Tables. For example, a FIST Team will participate in an Infantry Company combined arms live fire exercise only after they have successfully qualified through an evaluation of the tasks required in Fire Support Table VI

- TC 3-09.8, Ch 6, Section IV, Par 6-27

"Trust in Me" **CAO 03 MAR 2022** *7th Infantry Division-"BAYONET"*

the terrain, in a digital environment, and/or on a terrain model/map board. Representatives from the firing elements and the maneuver BN C2 node replicate the fire mission processing chain and the higher HQs. BN CDRs and/or S3/BN FSO attend the rehearsal and provide feedback to the company. After the company completes the rehearsal, they apply lessons learned, update their tactical standard operating procedure (TACSOP) and prepare to execute their plan live during the FCX. In total, this portion of the program should take one day of training to complete for a company.

Phase 3 is the transition from training to live fire evaluation, consisting of the FCX and the CALFEX.

The FCX is a live fire event focused on echeloning fires while conducting a deliberate company attack and hasty defense. The FCX allows the company leadership to focus on the integration of fire support and the transition from indirect fire suppression to direct fire suppression. Executing live highlights any friction points and the importance of tactical patience; any shortfalls are corrected before they derail the maneuver plan during the CALFEX.

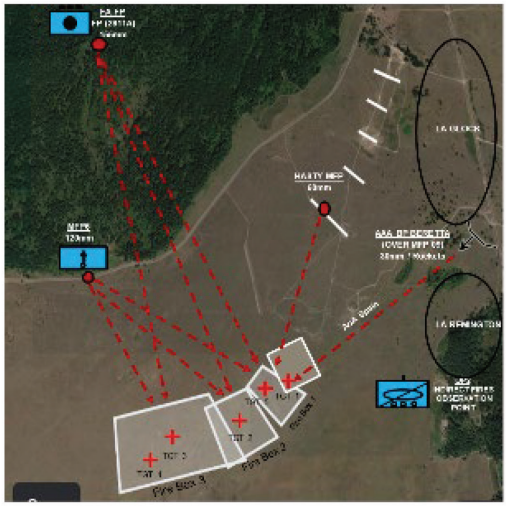
The culminating exercise for the program is the CALFEX. This is where the maneuver plan and the fire support plan come together in full force to qualify the combined arms team.

The goal of the MFSIP is to build lethal combined arms teams capable of employing all available assets. As a force, we must eliminate the "stove pipes" that prevent us from achieving this level of integration or our companies will learn these lessons while in direct contact with the enemy at the cost of Soldier's lives. The Maneuver Fire Support Integration Program is not a new concept, but it is a necessary one. We must link our maneuver and fire support training plans and programs down to the platoon level so that we create company level leaders that understand how to fight with the full force of the combined arms team.

Major Joseph Brown is the 7th Infantry Division Assistant Fire Support Coordinator (AFSCOORD). Previous assignments include Battery Fire Direction Officer, Troop Fire Support Officer and Platoon Leader in 2-321 Field Artillery Regiment(ABN), 4th Brigade, 82nd ABN DIV. He commanded B Battery, 1-5 Field Artillery, 1st Armored Brigade Combat Team, 1st Infantry Division. While at 1st ID, he also served as the BN Fire Direction Officer for 1-5FA and the Brigade Assistant Fire Support Officer for 1st Combat Aviation Brigade. Following command, he served as the Battalion Fire Support OC/T for Task Force 3 at the Joint Readiness Training Center (JRTC). After completing the Command and General Staff Officer Course, he was assigned to the 7th Infantry Division at Joint Base Lewis McChord.

Maneuver Fire Support Integration Program

1-37 FA provides suppression with 155mm HE during the MFSIP Validation exercise at Joint Base Lewis McChord, WA.



1-37 FA provides suppression with 155mm HE during the MFSIP Validation exercise at Joint Base Lewis McChord, WA.

"How May I be of Service?"

CW5 (R) John A. Robinson in Memoriam

By: CW5 Rolando G. Rios, 5th Chief Warrant Officer of the Field Artillery

In May 2023, the Field Artillery lost a titan with the passing of CW5 (R) John A. Robinson, the third Chief Warrant Officer of the Branch and a scholar in education.

CW5 Robinson was an ideal role model who truly understood the United States Army Field Artillery School's motto *Cedat Fortuna Peritis* – Let Fortune Yield to Experience, or Skill is Better than Luck. He was always driven by his passion for scholarship and teaching others about the profession of arms and the history of the Warrant Officer. As a dedicated scholar, mentor, and student, CW5 Robinson approached life with an outlook described as, "How may I be of service?"

CW5 Robinson served with distinction during his 31-year career as a Fire Supporter, Aerial Observer, and Field Artillery Targeting Technician. His love and passion for the Field Artillery was always on display, leaving an indelible thumb print on the Field Artillery and Warrant Officer communities.

He built strong organizations and teams by developing relationships based on mutual respect and trust.

Even in retirement, CW5 Robinson continued to serve the Warrant Officer cohort as a member of the Board of Directors for the Warrant Officer Historical Foundation. To his credit, CW5 Robinson established a podcast and non-resident fellowship specifically for the Warrant Officers. In addition to being a lifelong member of the U.S. Army Warrant Officer Association, CW5 Robinson was also the Editor-in-Chief of "The Quiet Professional: A Centennial Tribute", which is a collection of works that details the History of the Warrant Officer.

CW5 Robinson leaves behind a legacy that will continue to reside in the 131A cohort. Our Army was fortunate to have walked alongside him. He stands as an inspiration to us all for his valor and humility. He will be missed. Our sincere condolences to his family.

Cellular Communications as a Fire Support System

By CPT de Leon, CPT Kerasotes, and CPT Spencer Persechino

Modern fire support systems for targeting and fire mission processing require significant coordination and time. An observer is left in the dark for sometimes as long as an hour while echelons above coordinate efforts to approve, modify, or deny calls for fire. Meanwhile, maneuver elements pay the price in tempo, audacity, and concentration. In order to have effective fires, they must be timely and accurate.

The dependency on cellular devices is not a challenge unique to United States armed forces. The weaponization of cell phone use and data collection can be the difference between victory and defeat. However, there are many benefits to effectively utilizing this phenomenon as a tool. Modern technology enables accurate location tracking within meters through mobile app location data and the triangulation of individual phone signals off cell towers. Something as simple as a "Snap Map", a device used to find and locate friends on Snapchat, can be used to accurately locate positions of forces on the battlefield. Opposing forces at the National Training Center discovered this as the single most lethal way to target rotational unit position areas for artillery and maneuver command posts. Soldiers who had most recently used mobile apps on their cellular devices were unknowingly sending time stamped location data across an unsecure network.

There are many possibilities for the use of encrypted cellular applications or tablets on the battlefield allowing for quicker communications and long-range messaging. Until now there was little to no real-world experience to learn from, only theories. With the recent war in Ukraine, encrypted cell phones may have a place in the modern battlefield. A presentation from the 41st Field Artillery Brigade (FAB) outlines some of the key takeaways of the Ukrainian Field Artillery (FA) communications architecture.

Prior to the 2022 invasion, Ukraine was encouraged by western powers to adopt and fund a "secure communications" architecture. However, when Russia invaded Ukraine the FA branch decided to mostly forgo the high-frequency (HF) systems they were outfitted with and primarily utilized handheld radios and Bbuetooth/Wi-Fi cell phones. While HF is resistant to jamming, its signature stands out on the battlefield. The Armed Forces of Ukraine (AFU) prioritized their approach to communications security (COMSEC). The first is to prevent an enemy sensor from picking up their emission. The second prevents an enemy from being able to fix on the location. The third prevents an enemy from being able to characterize the nature of unit activity. In this regard, cell phones worked better for the AFU over HF and traditional means of communication. The AFU was largely successful in being able to communicate without Russian electronic warfare (EW) assets ascertaining the location of friendly positions.

With FA equipment specifically, the AFU utilized Starlink satellite internet systems and pushed it down to the battery level. The Kropyvas systems at particular locations could connect to Wi-Fi routers and cell phones would be used in Wi-Fi mode for secure voice over internet protocol (SVOIP) and text. The satellite antenna is directional and would evade enemy EW assets from picking up AFU emissions. Another advantage for the Starlink system is user friendly and intuitive use, requiring minimum training.

The AFU also use methods of communication readily available to the public. As noted in the 41st FAB semi-annual training brief, "many AFU artillery officers attest to using encrypted apps, especially signal, to provide targeting data to the firing elements. The most common explanation is that they consider this method superior to using radios over long distances. Once at the firing element, this data is transmitted to howitzer crews using short range hand-held radios or with voice" (UKR Observations 2022). The AFU openly uses some methods of communications the US armed forces would consider unsecure and vulnerable to EW attacks. There are risks and benefits to utilizing encrypted cell phones as means of communications. The advantages are to evade jamming and protect the locations of friendly forces from enemy EW collection assets. The downside in utilizing cell phones is that the messages sent may become compromised by enemy decryption teams. However,

the AFU believed they could overcome the negatives of having their messages compromised. Operating in an environment where almost every person has a cell phone on them, the enemy must take time to differentiate civilian versus military signals. Even basic encryption requires a decryption team that is highly specialized and not available to most units. Finally, most messages sent contain tactical information that has a short decay time. By the time the Russians would have decrypted the AFU call for fire text over signal and routed the information to the units being targeted, the fire mission would have long been shot and the shooters would have already established new position areas for artillery (PAAs).

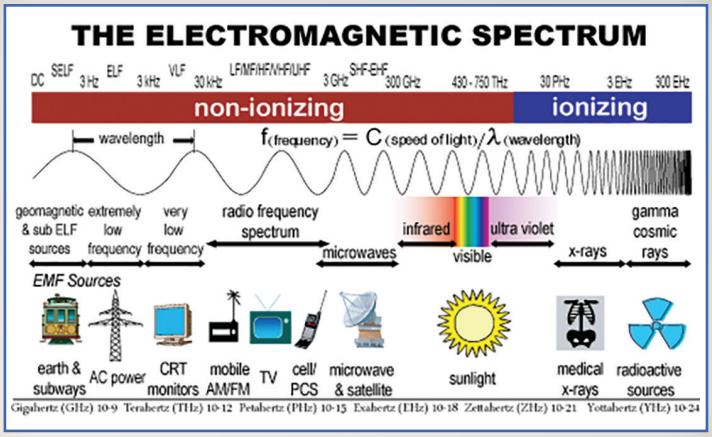


Figure 1. Electromagnetic Spectrum.

While the use of cellular devices on the battlefield can expedite the sensor-to-shooter kill chain and allow more accurate and effective fires, it is not without risk. The modern, multi-domain battlefield is incredibly complex and saturated with threats. The electromagnetic spectrum is a foreign concept and largely intangible to the average Soldier. This lack of understanding presents openings for hazardous use of cell phones on the battlefield. Cell phones emit non-ionizing radiofrequency (RF), similar to microwaves, televisions, visible light, and heat. Just as one can see light and feel heat, cellular RF can be detected by specialized equipment. Volume and density of cellular RF can tip an enemy to the size and composition of a friendly unit. Additionally, cellular emissions can be triangulated using cell towers, thus revealing the location of the transmission. These problems exist for the radios the U.S. military currently employs; however, the risk is mitigated by extensive equipment training, standard operating procedures, and survivability criteria. The use of cellular devices as a tactical encryption and communications device is in its infancy and no doctrine or widespread training exists to dictate proper and safe application on the battlefield. Cell phone usage is a part of daily life, and this mentality can bleed into its use on the battlefield. Being able to delineate between a cell phone as a luxury of modern life and a lethal tool is imperative to its success in the world of fire support. As the U.S. military evolves and adapts to a modernized battlefield, emphasis must be placed on modern doctrine laying the foundation for risk mitigated use of the most readily available device for rapid, encrypted passage of critical information, the cellular phone.

Innovation is key to winning the next large-scale fight. As the world continues to modernize, the U.S. and its partners must continue to keep pace with adversaries. While traditional methods of communication work for unit internal coordination and planning, fire support requires multiple echelons of synchronization. The short decay time of dynamic targets on the battlefield dictate the need for a dynamic response to communications. Methods such as cell phones assume an acceptable level of risk in order to achieve rapid coordination at echelon. As evident by the study on Ukraine, the short decay time relative to the lengthy decryption time displays a clear advantage to cell phone use. Any material sent through this method would need to be obsolete by the time of decryption. By adding COMSEC keys to a tablet or cell phone, the sensitivity of information would not be an issue. As previously stated, the modern, multi-domain battlefield is complex and constantly evolving. If the battlefield is changing, the armed forces should do the same.

CPT Spencer Persechino served as a HIMARS platoon leader and executive officer in Bravo Battery, 5th Battalion, 3rd Field Artillery out of Joint Base Lewis-McChord. He participated in exercises in Japan and the Philippines that required distributed mission command and long-range communications infrastructure. He subsequently worked as the Executive Officer for Special Forces Operational Detachment-Bravo 1210 forward in Thailand and then as the Fire Support Officer for 2nd Battalion, 1st Special Forces Group (Airborne). A focus of the Fires enterprise at 2/1 SFG(A) was to develop a targeting cycle that facilitated the passage of data in a communications limited/denied environment. He currently serves as the Task Force Effects Coordinator at the 1st Multi-Domain Task Force.

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The Measure of Effectiveness

through Increased Cohesion between the Intelligence and Fires Warfighting Functions at NTC

By CPT Harrison B. Haines and CPT Zachary J. Schmidt

It is tempting for warfighting functions to work in isolation, focusing on their own tasks and capabilities, while ignoring the tasks and capabilities of the other cells within the main command post (Main CP). While at the National Training Center (NTC) a unit's actions are measured through its measure of performance (MOP) and its measure of effectiveness (MOE). A MOP is actions taken by a unit towards the enemy. MOPs display the aggressiveness of a unit in their engagement with the enemy. Although aggression is encouraged, the actions taken by a unit towards the enemy only matter if they are effective. MOEs display a more accurate picture of what takes place on the battlefield. A MOE is the efficacy of actions performed. MOP and MOE together explain whether a unit is taking the right action and whether that action is productive.

Within a squadron staff there are two warfighting functions that have a tangible impact on performance and effectiveness on the battlefield during a current fight: intelligence and fires. Both can achieve a high MOE on their own, but together, they help us understand and shape the battlefield. The purpose of these two wars fighting functions can be amplified and a greater lethality be achieved when intelligence and fires work cohesively.

The intelligence cell identifies enemy targets that are out of range of direct fire weapon systems, which are or may become part of the fight. The fires cell services those targets using squadron organic assets (120mm or 81mm mortars) or requested regimental assets (155m howitzers, anti-aircraft artillery, or combat air support). In isolation, both warfighting functions can achieve high MOPs – intelligence can identify and locate a great number of enemy targets and fires can execute a large number of fire missions. Intelligence and fires are cohesive when they are planning actions against observed or template enemies, servicing dynamic targets, communicating point of origin (POO) and point of impact (POI) of enemy indirect fire (IDF), and utilizing each other's direct connection with higher headquarters.

Dynamic targets are unplanned or unanticipated, because the enemy was not assessed at a given location and time, we do not have enough fires assets to cover every target at once, or because there is not enough time to plan for every possible target. Many targets a squadron shoots at NTC will be dynamic. In order to rapidly and effectively service these targets, intelligence and fires need to be in constant communication. The goal of this communication is to filter the vast amounts of information available down to targets that are practical and useful to shoot. The questions intelligence needs answered by fires are:

-Where are squadron and regimental fires assets located, and where can they shoot?

-What are they tasked to shoot based on the high-payoff target list (HPTL), commander's guidance, and planned missions? When?

-What will they not shoot based on survivability, commander's guidance, or time constraints?

The answers to these questions allow intelligence to filter incoming reports and determine which targets need to be shot or passed higher, and which targets will not or cannot be prosecuted. This filtering of information prevents wasted time and rounds from redundant or non-impactful missions being drawn up. Answering the first question will help the fires and intelligence cells note the range that the firing assets may fire.

Understanding the HPTL, commander's guidance, and planned missions will help filter the information by helping fires and intelligence understand the order of precedence rather than simply engaging targets as they are observed. Junior leaders on the ground might want to engage enemy infantry with fires, but the HPTL might place precedence on several other kinds of targets before enemy dismounts such as engineering assets or the enemy's artillery. The commander's guidance might be to use troop mortars on enemy dismounts and hold the squadron and regimental assets for the HPTL.

The answer to the final question is vital to the survival of our firing assets. Understanding what to shoot and when is just as important as understanding what not to shoot. Intelligence needs to accurately collect and share with fires what counterfire assets the enemy have in order for fires to adequately plan targets. At NTC and likely in large-scale combat operations (LSCO), the enemy have counterfire radars and their own long range IDF. Therefore, a friendly unit cannot unmask its mortars and artillery without good enough reason. After firing at NTC, a firing unit must move to a new PAA or mortar firing point (MFP) or it will receive counterfire. The fires and intelligence cells must plan for these risks during the targeting process.

To be timely and effective, fires must be aware of where collection is occurring and when. This allows fires to be prepared to prosecute targets as they inevitably appear. When fires and intelligence is on the same page concerning these questions, dynamic targeting is efficient and effective. A report comes to intelligence, it is immediately recognized as a target or non-target, the data is given to fires, and the mission is processed. Initial sighting to destruction is a matter of minutes.

Sighting to destruction time can be accelerated through the use of named areas of interest (NAI's) at the squadron level with the use of the squadron's organic MQ-11B (Raven). These named areas of interest (NAIs) can allow our unmanned aircraft system (UAS) assets to focus on specific areas in order to help drive the targeting process known as D3A (Decide, Detect, Deliver, Assess) at the intelligence and fires cells. Since the enemy at NTC knows the terrain and how a friendly unit might use it, they have home field advantage. This means that dynamic targeting is used more than deliberate targeting. This is why NAIs are needed to collect on and target the enemy before

they can engage us in order to maximize lethal planned fires on the enemy.

While at NTC a Squadron is often attacked by enemyIDF and is nearly always in range of enemy IDF assets. The intelligence and fires cells both need to immediately respond when the squadron is receiving IDF. The fires cell is responsible for a squadron organic asset, the Q50 counterfire radar system. The Q50 ranges up to 10km and can sense 360 degrees. Whenever enemy IDF lands within the radar's sensing zone, the radar immediately calculates and displays the round's POI and POO. This information received by the Fires Cell from the Q50 is extremely beneficial to the intelligence cell. It aids the intelligence cell in identifying the disposition and composition of the threat in that area and allows the fires cell to effectively attrite the threat before it causes significant casualties. The Q-50's data also informs the intelligence cell how accurate their proposed enemy course of action really is and allows them to send the information to regiment to ensure the common operating picture (COP) is maintained. A cohesive intelligence and fires team understands the capabilities of the Q-50 radar identifying the POO and POI, the importance of the intelligence cell receiving that information, and the urgency for the fires cell to respond with friendly indirect fire in order to effectively suppress, attrite, or eliminate the threat.

The intelligence and fires cells are the only warfighting functions that have a co-dependent relationship with their higher headquarters during a current operation at NTC. The intelligence cells at both squadron and regiment feed each other information in order to grow their enemy situation template (ENY SITEMP) and their common intelligence picture (CIP), while the fires cells at both squadron and regiment utilize each other to service enemy targets with squadron and regimental organic assets. Both warfighting functions constantly communicate with their higher headquarters during the current operation and both Intelligence and Fires need to utilize the other's higher headquarters to improve their performance and ultimately their effectiveness.

An example at NTC is the submission of Restricted Operating Zone (ROZ) requests. At the squadron level, the only organic collection assets that are available and under the control of the squadron are the scouts and the Raven. To use the Raven, a squadron must submit a ROZ request at NTC and have it approved by regiment. It is extremely difficult requesting a ROZ be established through the intelligence cells at regiment. A solution to this problem is to teach one of the troopers in the fires cell how to properly request a ROZ and have them request it through the regimental fires cell. This drastically reduces time for approval from 24-36 hours through intelligence channels to on average four hours through fires channels. The enhanced efficiency of ROZ establishment enabled collection and a basic understanding of the CIP for the squadron Intelligence cell. The CIP allowed an accurate account of the threat which enabled the annihilation of the threat in multiple iterations.

In conclusion, the relationship between intelligence and fires is complex and involves many different areas which increase the measure of effectiveness for the squadron. The purpose of these two warfighting functions can be amplified, achieving greater lethality if they work cohesively. It is tempting for warfighting functions to work in isolation while at NTC, focusing on their own tasks and capabilities, while ignoring the tasks and capabilities of the other cells within the main CP. Specifically regarding intelligence and fires, they are severely limited in their effectiveness if they choose to work in isolation. When both warfighting functions form a strong cohesion and work together as one it creates a clearer and more up to date CIP, a clearer enemy COA, and more effective servicing of targets through indirect fire, leading to the overall success of the squadron at NTC.

CPT Harrison B. Haines served as the company Fire Support Officer (FSO) for Baker Company, 1-506th Infantry Battalion (Red Currahee), 1BCT, 101st ABN DIV from September 2020 until December 2021, the Battalion FSO for the same battalion from January 2022 to April 2022, and the FSO for 3/3 Squadron (Thunder), 3d Cavalry Regiment from July 2022 to present (as of May 2023). During his time as the Company and Battalion FSO in the 101st ABN DIV, CPT Haines led his FiST teams through multiple iterations of Platoon Live Fire, Company Live Fire, a live demonstration of echelonment of fires, and a rotation to JRTC in 2020. As the 3/3 Squadron FSO, he led his FiST through Regimental Virtual Fire Control Exercises (VFCX), Platoon Live Fire, Troop Live Fire, and a combined Arms Live Fire Exercise (CALFEX).

CPT Zachary J. Schmidt served as the Squadron Fire Support Officer (FSO) for 3/3 Squadron (THUNDER), 3d Cavalry Regiment from October 2020 until July 2022. During his time as the Squadron FSO, CPT Schmidt planned, trained, and executed a full training progression for the NTC 07-22 rotation in May 2022. Training events during the training progression include: Regimental Virtual Fire Control Exercise (VFXC), Platoon Live Fire, Troop Live Fire, and Combined Arms Live Fire Exercise (CALFEX). CPT Schmidt and his FiST Platoon experienced great success during the NTC 07-22 rotation.

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Rocket Artillery, *the* DIVARTY, *and* Long-Range Shaping Fires *at the* Tactical Level

CPT Mike Kelly & CPT Jack Skillman

The U.S Army's pivot towards large-scale combat operations (LSCO) has directly resulted in a force-wide emphasis on massed, long-range precision fires. Significant strides have been made regarding the development and acquisition of new systems as well as the modernization of existing ones. Barring any major disruption, the "modernization complete" Army of 2030 will be well equipped to strike a near-peer adversary in depth and at scale.

The Army has already answered the question of what systems and munitions will be used to achieve this end. It has not definitively answered the question of who will use them and in what quantity. We believe each division (DIV) should be task organized with two organic rocket batteries at a minimum. This task organization is essential if divisions are expected to operate as combined arms units of action within LSCO, shaping for their subordinate brigade combat teams (BCTs) while reducing their level of dependance on corps FABs.

TASK ORGANIZATION OF THE DIVISION IN LSCO, THE DIVARTY, AND THE LIMITATIONS OF CANNON ARTILLERY

Historically, the DIV is the smallest unit capable of independently conducting combined arms operations and sustaining them over time. There is widespread understanding across the force they will act as units of action in LSCO. There is also a common misconception regarding how they will task organize and deploy to conduct those operations. Divisions will not deploy in their "garrison configurations", where the Division HQ all its organic BCTs and functional brigades (BDEs) forward. Instead, a Division HQ will rapidly deploy or already be forward deployed once a conflict begins. BCTs and supporting units will be drawn from across the force and deployed. They will be task organized to that Division HQ upon entering theater and in effect, fall in under a two-star flag which isn't their own.

A division executing LSCO can expect a ratio of one cannon artillery Battalion per BCT at minimum. Divisions can also expect to receive additional cannon Battalions not aligned to a BCT. This augmentation is feasible with the advent of division artillery (DIVARTYs), which have the capability to command and control multiple Battalions and manage changes to command-support relationships during the course of an operation. During warfighter exercises, it is common for DIVARTYs to control as many as eight separate artillery battalions at a given time, though the number is usually closer to five.

A large quantity of general support (GS) artillery allows a division to effectively shape within its close area but fails to address a larger dilemma. The proposed battlefield framework of multi-domain operations (MDO) will require divisions

to assume responsibility for a deep area extending over 100km beyond its forward line of troops (FLOT). Division GS cannon artillery will only be able to mass on targets out to roughly 30km. This figure also assumes the use of unguided extended range projectiles, and the assumed risk of firing from position area for artillery (PAAs) near the FLOT. This results in the division fighting within a BCTs area of responsibility, operating concurrent to those BCTs and not shaping for them in advance.

THE FIELD ARTILLERY BRIGADE

At present, the Army's rocket artillery battalions are housed within Field Artillery Brigades, each of which is modified table of organization and equipped (MTOEd) 16 total launchers. The FABs primary mission is to serve as the force Field Artillery headquarters or counterfire headquarters to a corps. It can assume the same roles for a theater land component or joint task force. In practice, FABs are likely to act as force providers to divisions during LSCO as well. They provide trained and equipped rocket battalions attached to divisions and controlled by the DIVARTY. FABs will engage targets short of a corps FSCL, many of which are likely to be within a division's area of operations (AO). This is especially true in the context of counterfire. As a result, divisions benefit from corps FABs sharing some of the burden associated with the long range counterfire fight.

THE DEEP AREA IN MDO

This calculus is likely to change in the future. FABs will receive extended range munitions enabling strikes into what MDO framework

British Soldiers assigned to 26th Regiment Royal Artillery carry out a fire mission with M270 Multiple Launch Rocket Systems as part of exercise Dynamic Front 22 (DF 22) at the 7th Army Training Command's Grafenwoehr Training Area, Germany, July 18, 2022. DF22, led by 56th Artillery Command and U.S. Army Europe and Africa directed, is the premier U.S. led NATO Allied and Partner integrated fires exercise in the European Theater focusing on fires interoperability and increasing readiness, lethality and interoperability across the human, procedural, and technical domains. (U.S. Army photo by Kevin Sterling Payne)

defines as the "Deep Operational Fires Area". The leading edge of this area is projected as roughly 150km beyond the FLOT. Multi-domain task forces (MDTFs) will contribute to this effort with systems of their own. It should be noted however, each MDTF is authorized only one long-range precision fires battalion, based on the expectation corps level shooters will be placed in a reinforcing support relationship to the MDTF. FABs must meet corps level requirements while simultaneously supporting theater level ones via their relationships with MDTFs, limiting the level of support they provide to divisions, who will have to bear an increased level of responsibility for servicing targets at their level. MDO battlefield framework defines this area as the deep maneuver area. It is best described as a combination of the division deep and corps close areas when using current verbiage. BCTs cannot range it, and corps shooters lack the resources to simultaneously take responsibility for it. The obvious conclusion is that this area, ~40-150km past the FLOT, is the responsibility of the division.

GS ROCKET ARTILLERY FOR THE DIVISION

The most effective solution to this problem is to provide the DIVARTYs with organic rocket

artillery battalions, capable of operating in a GS role to the division. The DIVARTY has two primary obligations to the division during LSCO: suppression of enemy air defense (SEAD) and counterfire. Both are key enabling tasks and cannot be reliably accomplished with GS cannon units due to their limited range.

The DIVARTY simultaneously functions as the division force Field Artillery headquarters and counterfire headquarters. Success in the counterfire fight is essential to the success of the division at large during LSCO. Adversary forces employ a large volume of surface-to-surface systems and will seek to rapidly attrit friendly maneuver formations using constant, massed fires. BCTs are manned and equipped to execute reactive counterfire, but their ability to effectively do so in practice is highly limited. Their organic cannons will fail to range most targets, even if positioned just short of the BCTs FLOT. Furthermore, counterfire is an activity where seconds matter and every friction point significantly increases the likelihood of target decay. If a target is acquired and cannot be ranged, BCTs cannot afford the time needed to pass the mission to a higher unit. If cross boundary fire is required, they cannot afford the time required clear another unit's ground. If the trajectory will break the coordinating altitude, BCTs cannot afford the time needed to clear air via the division aviation element. With these factors considered, DIVARTYs lead role in the counterfire fight is not merely convenient, but necessary. Rockets provide the range needed to meet this requirement, and the organization of the DIVARTY allows for consolidated, expedient mission processing.

Rocket artillery is also essential for effective surface-to-surface SEAD. U.S. forces will enter LSCO enjoying an advantage held for decades prior; a far superior quantity of sophisticated rotor and fixed wing air support platforms. The enemy will attempt to negate this advantage by employing a large and robust integrated air defense systems (IADS) network. Adversaries are aware that U.S. and coalition commanders are averse to the notion of friendly aircraft entering surface-based weapon engagement zones. So long as this limiting factor is in place, ground forces will be forced to engage the enemy on more equal terms. Joint SEAD operations will likely precede the commitment of ground forces into an AO, but they can still expect to contend with a formidable surface-to-air threat. At the division level, DIVARTYs assume the task of breaking the IADS network and enabling air-to-ground strikes in depth. While this would enable close air support (CAS) and aid interdiction (AI), it is especially vital given the role of the combat aviation brigade (CAB) in LSCO. The CAB is the most lethal asset available to a division and is capable of destroying large enemy formations if given the freedom to maneuver. It is unlikely that cannon artillery will be able to range most targets within the enemy IADS network, most of which will array themselves within the enemy support zone.

It is important to remember that delivery is only one aspect of the targeting cycle. Identification and battle damage assessment (BDA) are also essential. A DIVARTY is significantly more capable of counterfire and SEAD at scale, as well as engaging other high-value targets/high-payoff targets (HVT/HPTs) with precision fires. The DIVARTY (and the JAGIC by extension) are more directly tied to sensors at the division level, such as Grey Eagle and DIV level request for deployment order (RDO) compiled from multiple Q-53s. Its C2 capabilities also enable the integration of sensors that exist at higher echelons, such as special operations forces (SOF), ground moving target indicator (GMTI), electronic intelligence (ELINT) acquisitions, and national or multination technical means of verification (NTM). A BCT could theoretically employ rockets, but a DIVARTY is the lowest echelon capable of integrating them into the targeting process and generating desired effects.

SUSTAINMENT REQUIREMENTS YET UNSATISFIED

There are numerous challenges that must be overcome if divisions are to receive organic rocket battalions. Unfortunately for those divisions, most of these challenges are not ones they can resolve internally. Instead, they must be addressed at the enterprise level.

Rocket battalions supporting LSCO will generate significant sustainment requirements, even more so than their cannon counterparts. Rockets are CLV intensive, due in large part to the size of their pods and the common attack guidance they adhere to. An multiple launch rocket system (MLRS) BN has a pod capacity of 288 (128 with Distro PLT, 128 with section re-supply vehicles (RSVs), and 32 on launchers). High mobility artillery rocket

system (HIMARS) battalions carry half, due to their common use of the family of medium tactical vehicles (FMTV) as a base for launchers, RSVs, and distro vehicles. Rocket battalions are very capable of internal sustainment but sustaining the battalions themselves is much more challenging. Division GS rocket units do not benefit from the linear battlefield framework that BCTs operate within. BCTs receive supplies from a brigade support area (BSA), which in turn receives from a division support area (DSA). DIVARTYs cannot sustain through an organic BSA, as they operate across the division AO. Instead, Divisions must devise a way in which class five (CL V) is moved to BCT BSAs and transferred to rocket battalions.

Divisions can develop more efficient ways of moving CL V to rocket battalions once they take custody of it. The greater challenge lies in getting CL V to the DSA in the first place. Assuming the common experience of DIVARTYs during warfighter exercises reflects potential real-world conditions, rocket battalions will experience the following trends. They will expend approximately 25% of their CL V every 24 hours and begin failing to meet FATs after 72 hours as they gradually begin reducing fire orders, unless they can be resupplied. The root cause of this problem is the overall quantity of CL V available at the theater level, and this is a problem that must be solved at the enterprise level. During FY22 warfighter exercises, the start of exercise (STARTEX) quantity of GMLRs available in theater stocks was approximately 700 pods, roughly 75% of which were M31 Global Positioning System Multiple Launch Rocket System (GMLRS). M31s carry a 200lb unitary warhead. They are effective against point targets, but not the BTRY sized FA and ADA formations DIVARTYs must target in order to shape effectively. A standard counterfire order is 4 pods when using dual-purpose improved conventional munition (DPICM), this number is often doubled to 8 pods when units are forced to shoot M31 in counterfire role. There is often an abundance of M26 (unguided DPICM) available, but these rockets have a max range of 32km. They can only be employed by launchers firing from just short of the FLOT, significantly reducing their effectiveness. The M26A2 variant has an extended range of 45km, but there are so few in worldwide stock that they are all but irrelevant from a targeting perspective. At present, M26A2 has been phased out of use, and there are no plans to adopt a more modern unguided rocket with extended range. M31s have been highly effective during the GWOT, but the Army must seriously reconsider the role of DPICM in LSCO. It must also reevaluate the importance of cheaper, unguided rockets.

The Army must also build the capacity to sustain these new rocket formations, regardless of what munitions it ultimately equips them with. The Army would need to stand up 11 new Brigade Support Battalions, assuming each DIVARTY in the active force receives organic rocket units. This not only requires the facilities and equipment, but the personnel as well. Consider the maintenance requirements for example. HIMARS chassis are maintained by 91Bs (Wheeled Vehicle Mechanics) while MLRS chassis are maintained by 91Hs (Bradley Fighting Vehicle Systems Maintainer). Furthermore, the launcher modules of both are the responsibility of 94Ps (Multiple Launch Rocket System Repairer). Keeping these new Battalions mission capable would require a noticeable expansion of the Ordnance Branch MOS population.

CONCLUSION

Providing Divisions with organic rockets is the most means of shaping on behalf of BCTs in depth. It allows the Army to bridge the critical gap between long range fires in the operational deep area, and massed cannon fires in the close fight. Doing so will be a challenge that requires the adoption of new doctrine and training, and it will stress the systems of enterprise level acquisition and fielding. It is necessary despite the challenge. Shaping operations at echelon are only effective if continuous and cannot be gapped in the ~40-150km range. If Divisions are to be units of action, they must have the means to shape decisively. Failure to do so means that Divisions are more likely to face and enemy fighting on its terms, and U.S forces have no intention of fighting fairly.

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CPT Skillman commissioned through Ohio University ROTC and is currently an FACCC student. He previously served as a member of 2-15 FA and the 10th Mountain DIVARTY.

OPFOR Perspective

By MAJ Jonathan Niemerg

In 2015 I was the Battalion Fire Support Officer (FSO) for 1-509th PIR, which is the opposing force (OPFOR) for the Joint Readiness Training Center (JRTC). During my initial counseling, the battalion commander informed me that he was giving me all the responsibility to plan OPFOR fires, including how we employ our mortars, attack aviation, attached batteries, and conduct targeting. This was immensely empowering because our success (or failure) in employing fires was truly on me. However, this was also daunting because I had no officers or NCOs to assist me in planning fires. This meant I had to do all that work myself, but it also meant I would not have to deal with the diffusion of responsibility common among large organizations.

For my first rotation, I took this responsibility seriously and went to great lengths to ensure the plan I created was complete and doctrinally correct. This included hours of military decision-making process (MDMP) and making detailed FSTs/FATs, FSCMs, schedule of fires, overlays, and ensuring that our unit conducted targeting that maximized the use of Fires. So, it was a great surprise to me that my plan was utter garbage and ineffective when we finally implemented it. At the time, I did not understand that struggling with your first JRTC rotation is common for OPFOR, just like many leaders in Rotation Training Units (RTU) at JRTC. However, the opportunity I had that RTU did not have was the ability to try it again, which I did over nine more rotations. Over these rotations, I learned many valuable lessons, but the most important among them was how planning is about the process and not the plan and the importance of balancing mission requirements against risk to force. These lessons changed me as a Field Artilleryman, and I still use them daily even though it's been over seven years.

It's about the Process

The first lesson I learned as the Fires OPFOR planner is the importance of emphasizing the planning process and not necessarily the plan or products. After the ineffectiveness of my first rotation, I reflected greatly on my shortcomings. I mean, the battalion commander had trusted me to provide fires. Even though I had tried my best, I still felt I had let him and the unit down. During my reflections, I realized that my performance was because I had planned in a bubble. I had focused on the science of fire support and forgot about the art and human dimension of planning. Even though I had planned alongside the other staff and sat through the same planning sessions, I did not routinely interact with them to gain their perspective on the unfolding scenario. Additionally, I had made an overly detailed and inflexible plan and the products I created were highly directive and restrictive rather than enabling and supportive. Due to this disjointed and strict plan, the fire support plan immediately fell apart when we executed our operation. This is because the staff, commanders, and the company FSOs did not understand the intent behind my planning and did not have buy-in. Ultimately, I focused on creating the products and not the process. I failed to realize that all plans tend to fall apart after you cross the line of departure, and it's not necessarily the plan that makes a unit successful but the resourcing and understanding that the plan generates. For example, it doesn't matter if you can select the perfect position area for artillery (PAA) because the weather may go bad and the PAA may be untenable; likewise obsessing over the exact location over a target can be overly directive because the enemy may not go the way you expected. However, if your subordinates understand your intent and you have generally placed them in the right location with the right people and equipment then they can refine the

situation to get steel-on-steel and achieve the intended effect. After realizing this, I made a pact with myself to no longer plan in a bubble and I would simplify my planning. In this way, I only created control measures or requirements that needed to exist to prevent fratricide, enable maneuver, or make operations more permissive. I also focused on resourcing the fight rather than directing what exactly must happen with each asset. Finally, I deliberately increased my interactions with the other leaders in creating my plan. Some examples of this include:

• Integrating fires with the battalion operations officer (S3) and ensuring I didn't oversell our capabilities.

• Conducting targeting in conjunction with the battalion intelligence officer (S2) to the point that we were essentially the same cell. For example, I involved myself with collection to assist in increasing the accuracy of locations, and it got to the point where I often debriefed intel human intelligence (HUMINT) assets.

• Assisting the engineer officer in planning obstacles to maximize effects and our engagement areas. A good fire support plan factors the obstacles and terrain just as much as the maneuver you support.

• Validating our supply rates with the battalion sustainment officer (S4) based on current throughput to ensure the ammo arrived when I needed it and adjusting attack guidance when supply rates changed.

• Coordinating with the battalion signal officer (S6) to ensure the fires architecture was given just as much emphasis and redundancy as the command architecture.

• Discussing the upcoming operation with company FSOs and commanders to understand their perspective and generate

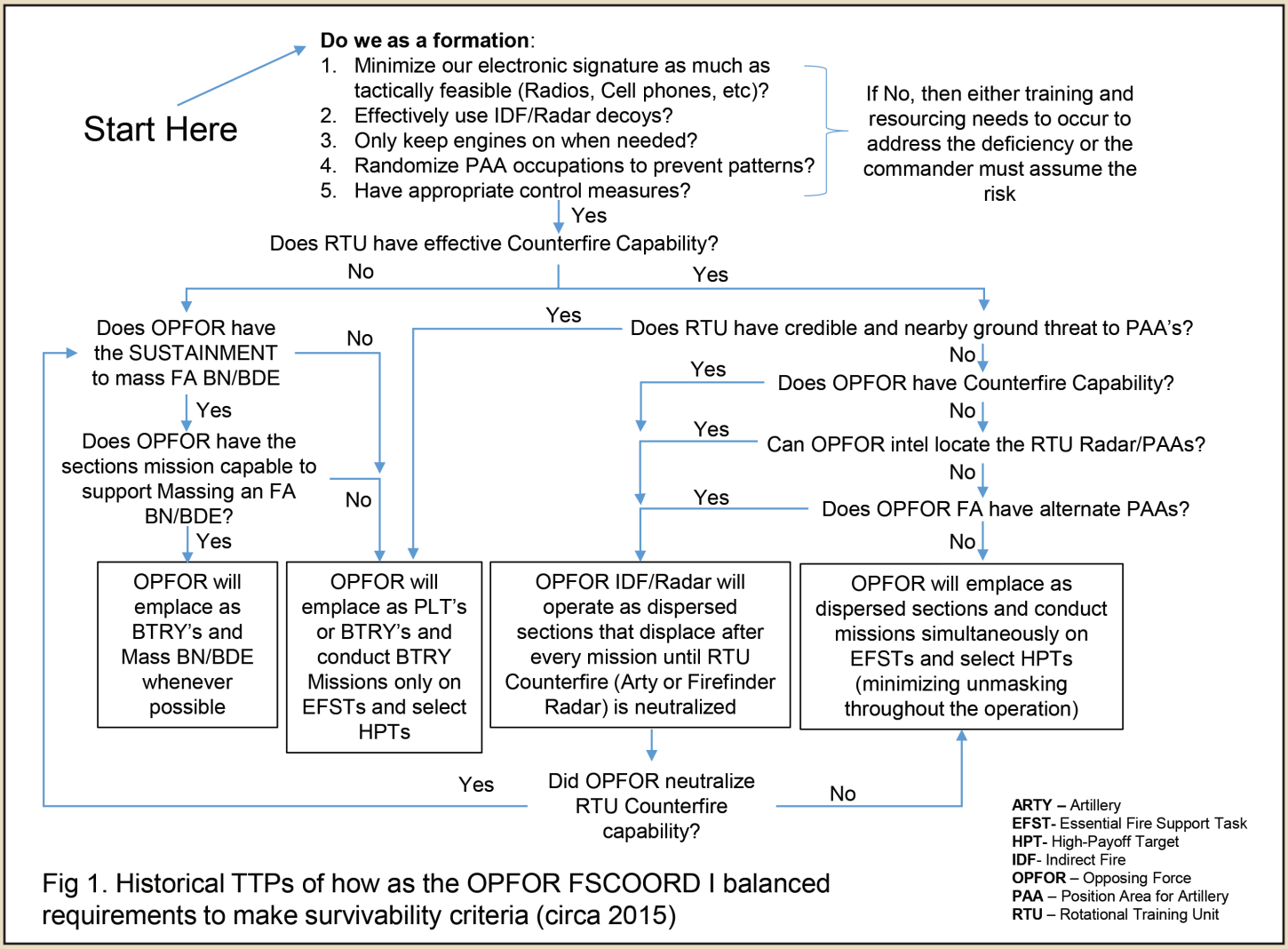


Fig 1. Historical TTPs of how as the OPFOR FSCOORD I balanced requirements to make survivability criteria (circa 2015)

buy-on for the battalion fire support tasks (FSTs).

- Emphasizing the importance of rehearsals within the battalion. I made companies and observers brief the intent behind their targets in their own words rather than regurgitating products. We also went over contingencies, risk to the plan, and used the combined arms rehearsal as well as the fires technical and tactical rehearsal to validate and assess our plan rather than as a check in the block. In that regard, if you thought something wouldn't work, then leadership expected you to bring it up.

- Integrating all the warfighting functions (WFF) during MDMP by having everyone gather around a physical map rather than slides. This was immensely helpful during friendly and enemy course of action (COA) planning when we would use an extra overlay to conceptually brainstorm and mark up before making the actual COA overlay.

Through these changes, it became apparent that the real art behind fire support and planning is about effective cross-communication and bringing the team together rather than making products. Don't get me wrong, there still needs to be a plan, and products need to exist. However, if you know that the plan can and will fall apart after crossing the line of departure (LD) then your priority is to make sure it is flexible and that those executing have what they need. Additionally, creating a solid conceptual plan that everyone understands is just as important as the details. When you fail to explain your concepts, leaders cannot understand how to execute or refine the details. Once you realize the importance of incorporating leaders, peers, and your subordinates into your fire support plan and getting their buy-in, you start making truly good plans.

Balancing the Mission against Risk to Force

The biggest lesson I learned as OPFOR was the importance of balancing deep and close mission requirements against risk to force/culmination. Survival is a great motivator, even in a training scenario. However, I was surprised that during my first few rotations in 2015, RTU still had a counterinsurgency mindset despite the rotation being in a decisive action fight. In that regard, they initially failed to change their tactics techniques and procedures (TTPs) and defaulted to not using fire support coordination measure (FSCMS) or displacing from their fire bases to shoot counterfire and FSTs. They would even continue to do this after OPFOR indirect fire (IDF) massed on their position. OPFOR did not have it easy, though. We only had about a

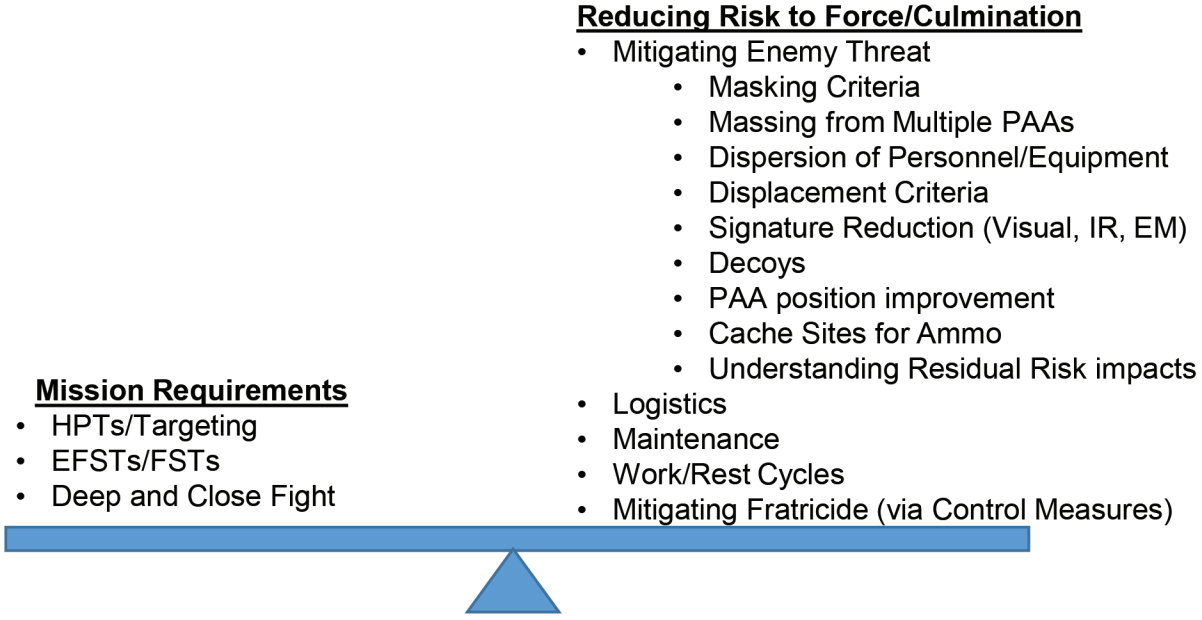


Figure 2. Mindset of balancing mission requirements against risk to force and potential culmination

battery's worth of sections that were not organic to the battalion and augmented each rotation. We also did not originally have a firefinder radar, which meant we could afford to get in prolonged counterfire fights with the RTU FA battalion and had to use our HUMINT to locate IDF and radar assets. These disadvantages led OPFOR to develop survivability tactics so that the indirect fire systems could survive long enough to counterfire RTU IDF and complete their fire support tasks. Some of these tactics include displacement after each firing mission, strict target selection standards/unmasking criteria, PAA management to prevent occupation patterns, and dispersion of the batteries into individual sections. OPFOR Fires also placed substantial emphasis on TTPs that reduced the signatures of the battery through the use of hide sites when not firing, created numerous decoys, incorporated cache sites for ammunition, had trucks turn off their engines when not in use, and reduced radio and cell phone signatures to an absolute minimum. The intent was for no one to detect our signature until we fired the IDF, and then immediately displace. Additionally, if we could not get the firing assets out in time, we focused on withdrawing the personnel and returning for the equipment later. These learned tactics, some of which may seem obvious now, were not immediately apparent and became incredibly successful due to trial and error but were only possible due to the climate of trust the battalion commander instilled within 1-509th. Due to our success, we were able to target RTU's IDF and counterfire capability, which pressured them to change their TTPs to compete. This was especially challenging as OPFOR because as we developed tactics, we also shared them during the final after actions review (AAR) at the request of the senior fires observer coach-trainer (OCT). Often the RTU would then give these new tactics to upcoming RTUs who developed counters to the new OPFOR tactics, which created further demand for new OPFOR TTPs and fostered an escalating cycle of evolving tactics. These escalating tactics were further amplified once JRTC restructured OPFOR fires to be near-peer, and they allocated OPFOR a firefinder radar and more IDF assets. With the new radar we incorporated conservative radar queueing schedules to enable its survivability, massed fires at a stifling scale, and even figured out ways to bait IDF and aviation to unmask. Figure 1 is a snapshot of this fires tactical mindset when I left OPFOR in 2016.

Fundamental to these evolving tactics was the balance of fires requirements against survivability. Through lots of blood, sweat, and tears, we learned that no ideal survivability criteria existed for the batteries. Instead, we needed them to be capable of conducting any of our TTPs, which created training requirements with the augmented battery before each rotation. We also created information requirements about the threats that I had the Fires and Intelligence cells continuously try to answer and refine. Key to this was not just the location of the RTU Fires Assets but control measures and their effectiveness. I found it oddly easy to figure out when a unit pushed their CFL too far forward. It usually resulted in a slower rate of clearance and counterfire for the RTU, which allowed OPFOR IDF systems to push towards the forward line of own troops (FLOT) inside their coordinated fire line (CFL) and increase our survivability due to the RTU no longer having permissive counterfire missions in that area. We could then use this increased survivability to mass fire missions against identified targets and displace before deconfliction would occur. Understanding this and the other threats to my assets also allowed me to continuously adjust our TTPs against requirements. Depending on the exact mission requirements would dictate whether we occupied PAAs as sections, platoons, or batteries. They also influenced the time and effort we put into survivability and signature reduction. For example, once I neutralized the RTU counterfire capability, I often didn't displace the firing platoons so they could process more fire missions and mass more IDF on the RTU. Figure 2 is a conceptual representation of the constant balance I made when determining our survivability criteria.

My experience as OPFOR taught me the critical importance of focusing on the planning process, not the plan. It also helped me realize the importance of balancing mission requirements against the risk to force when employing fires. These lessons may be from over seven years, but I feel they still are just as relevant then as they are today.

Since being the OPFOR BN FSO for JRTC, I have also been a BN FSO and BTRY CDR for 3/10 MTN, BDE LNO to the DIV Strike Cell in Iraq, BTRY CDR for A/1-30th FA (428th FAB), FACCC instructor, and I am currently completing AOC(CGSC) at Fort Leavenworth, KS.

Reflections on Multi-Domain operations

By COL Mark Osano, LTC Douglas McDonough, and MAJ Alistair Fider

The publication of FM 3-0 creates an exciting new time for our Army as it codifies key tenets of Multi-Domain Operations (MDO). With new doctrine comes new questions on implementation ranging from placement of the Multi-Domain Task Force (MDTF) to how to best converge lethal and non-lethal effects. 8th Army (8A) had many of these same questions as it sought to identify processes, architecture, and capability gaps to achieve an MDO capable field army within the Korean theater of operations (KTO). After completion of Ulchi Freedom Shield and the Korean Army's 17th ID Warfighter in 2022, 8A reflected on lessons learned and steps necessary to begin its transition to an MDO capable formation. 8A critical reflections included three major themes. Those themes are that units possess the necessary resources to conduct MDO organically, the need for a paradigm shift to successfully converge lethal and non-lethal effects through the targeting process and that units must not allow a lack of organic authorities to prevent them from requesting and integrating MDO concepts.

Resources to conduct MDO at echelon already exist

As the only U.S. Field Army, 8A has the unique challenge of defining terms of reference and doctrine for a field army as well as how to support the complex command structure that is the KTO. As the KTO's Field Army, 8A has both an Army Forces Korea (ARFOR-K) role and an operational mission set that includes countering weapons of mass destruction (WMD). As the ARFOR-K, 8A has the responsibility to set favorable conditions for conflict. MDO becomes essential as the information and human dimensions contribute to favorable conditions in the hyper-connected, modern society of the Republic of Korea (ROK) as well as the information reach into the Democratic Republic of Korea (DPRK or North Korea). As an operational headquarters conducting counter WMD, MDO is essential because of unique battlefield circumstances that preclude a sole reliance on lethal effects. 8A must generate creative solutions via non-lethal means to accomplish its ends. While the army's transition to MDO lends itself well to the KTO mission, 8A had to determine how to conduct that transition.

When 8A started to discuss MDO, many gravitated towards the multi-domain task force (MDTF). This is natural as HQDA heavily touted the new organization in its strategic documents and messaging. What the 8A staff quickly realized when developing concepts is that the MDTF is a finite resource and likely will not be available at echelon. While the MDTF has its multi-domain cells of 5-6 personnel or more that can attach for special mission sets, the reality is that most conventional units below the theater army likely will not see an MDTF element embedded in its organization. At the time of publication this appears to be true for 8A. The more we studied the problem, however, the more we realized we had access to all the capabilities we needed.

As we looked across the various architecture, authorities, and processes, we already possess either the organic assets or the access to those assets required to leverage capabilities to conduct MDO. The fundamental sensor to shooter architecture already exists with army systems such as advanced field artillery tactical data system (AFATDS), distributed common ground system army (DCGS-A), and air defense systems integrator (ADSI); supporting networks throughout the joint, inter-organizational, and multinational community (such as Link 16); and the human relationships established with our ROK partners. While these threads do not yet operate at the speed needed to fight a multi-domain operation, they do exist. Army level efforts like Project Convergence will greatly enable the architecture and speed necessary to conduct MDO.

8A continues to look for opportunities to experiment and iterate with its architecture. One effort is to link the electronic warfare planning and management tool (EWPMT) with distributed common ground system-army (DCGS-A) and AFATDS. Another example is 210 Field Artillery Brigade who continues experimentation with 7th Air Force on the automated tactical targeting and tounterfire kill-web system. 8A multi-domain wargames planned for late Spring 2023 will allow us to continue to explore efficiencies. Experimentation and iteration at echelon will ultimately allow us to find efficiencies in the sensor to shooter kill web. While capabilities and architecture allow us to generate speed in MDO, the most impactful element to embrace MDO which requires a true paradigm shift for the fires warfighting function is adjustments to the targeting process during armistice and competition.

Paradigm Shift: Targeting as the Focal Point

Targeting in MDO is about convergence, a new term added to FM 3-0 that "creates exploitable

opportunities that enable freedom of action and mission accomplishment".[1] Convergence means synchronization through the targeting process of both lethal and non-lethal effects. Many units attempt non-lethal effects integration but continue to fixate on lethal effects, mistakenly driven in large part by the air tasking order (ATO) cycle. The ATO inspires a certain reverence within the targeting community and is how process is driven in many organizations.

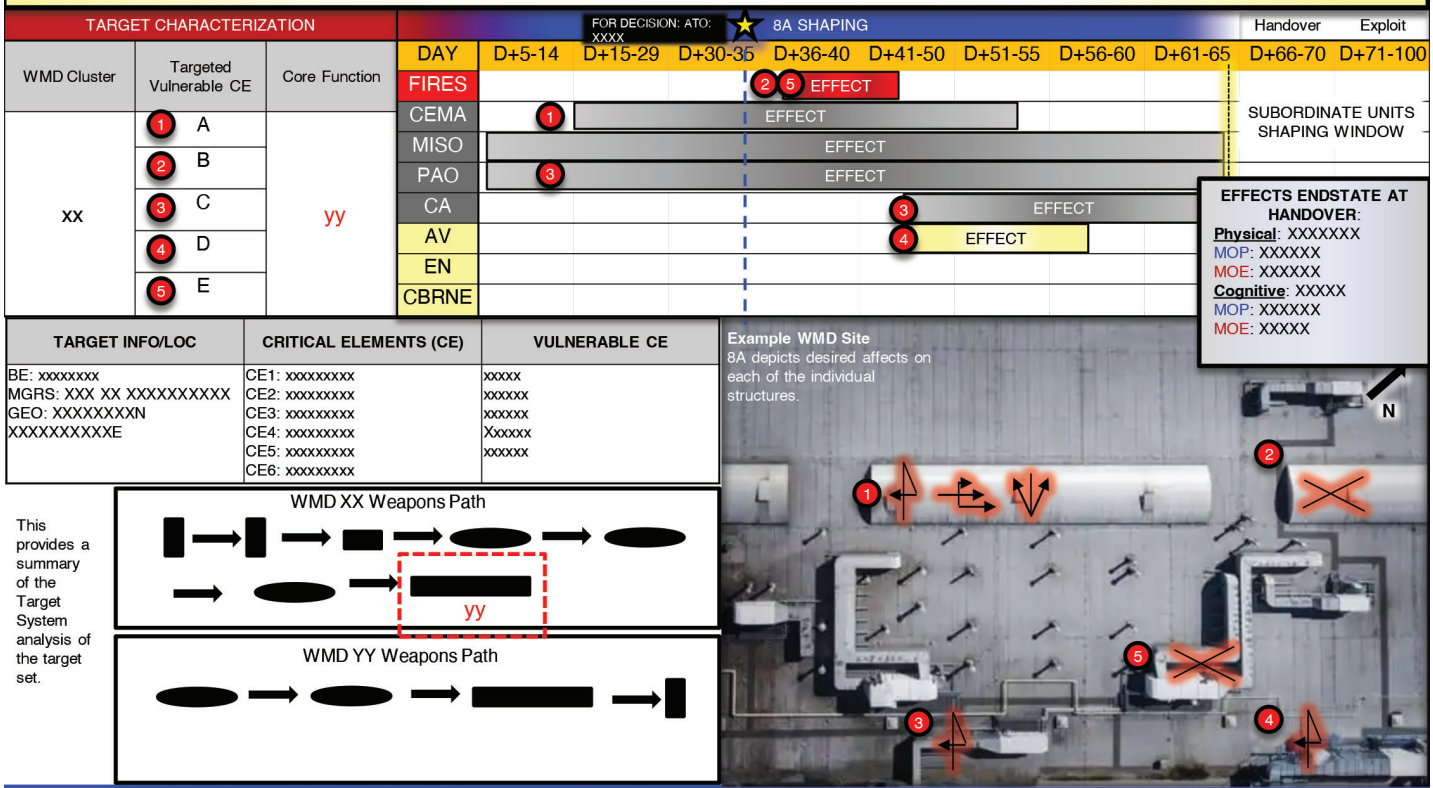
Despite a heavy emphasis on the ATO, the ATO cycle is not truly multi-domain as it leaves out a preponderance of non-lethal capabilities and fails to holistically consider MDO. MAJ Kyle Borne, utilizing terminology from ADP 3-19, highlighted this in a targeting article he published in Military Review in 2019. He stated that cross-domain fires in their simplest form are just one domain affecting another (i.e., surface to air missiles). Multi-domain fires take cross-domain assets and synchronizes them to create synergistic effects in windows of convergence.[2] The ATO, with some exceptions, primarily plans for cross-domain fires in support of the army ground component. Layering effects from multiple domains remains the goal and one which the ATO does not fully achieve. This is due to the short planning horizon of the ATO driven by the apportionment of sorties.

Part of the challenge that makes the ATO less than efficient is time. The ATO traditionally looks 72 -96 hours out and drives army targeting cells around that planning horizon to ensure they can deliver lethal effects in accordance with commander targeting guidance. This fails to holistically account for all non-lethal effects. FM 3-60 (still in draft) recognizes this, stating that "core information capabilities planning horizons and ability to gain placement and access often require more than a typical 24-96 hour period to properly plan and expect to create the desired effect".[3]

FIGURE 1: Example Effects Sync matrix

Converging Lethal and Non-Lethal Effects

8A used this product to show a holistic picture of effects across all domains beyond the 72-96 hour window commonly used to meet the ATO planning cycles. The ATO cycle is depicted in the dashed blue line. The Current Recommendation block describes the holistic effects against the target. This product shows where shaping handoff occurs with subordinate elements to ensure there is no confusion about whom is coordinating effects at what echelon. This product prevented bifurcating between lethal and non-lethal effects as well as enabled us to look beyond the current ATO cycle, a must if we were to effectively consider non-lethal effects planned against a target set.



1 Field Manual 3-0: Operations (TRADOC, 2022), 3-3.
2 Borne, Kyle, "Targeting in Multi-Domain Operations." *Military Review* May-June (2019): 61-67.
3 Field Manual 3-60: Targeting (TRADOC, 2023), 4-8.

8A staff quickly realized during our exercises that targeting decision boards, informed solely by the ATO cycle, left 8A senior leaders uninformed about the full suite of effects planned against a target which hindered their ability to provide guidance and make decisions. To provide a more holistic look, 8A staff adjusted its process. These changes did not relegate the ATO to obsolescence, however. Rather, 8A expanded its planning horizon beyond the ATO to fully converge both lethal and non-lethal effects on the battlefield. For each WMD site, 8A built an "Effects-Sync Matrix". This matrix is a one slide chart that depicts effects arrayed across both lethal and non-lethal delivery assets over a 90+ day window (see Figure 1). This differed from previous efforts where 8A lacked the visualization of the deliberate synchronized shaping efforts for target sites and briefed effects strictly within the ATO 96-hour horizon.

The Effects-Sync Matrix depicted the holistic multi-domain effects planned against a target as well as the lead time necessary to plan for effects outside the ATO cycle (specifically non-lethal effects). Importantly, this format still provided a snapshot of decisions required to meet ATO planning horizons. This format, coupled with the information collection synchronization matrix, provided better synchronization across the 8A staff which ultimately provided 8A leaders a more holistic picture of effects against a target site. This enabled 8A leadership to provide effective guidance and make informed decisions. In addition, the targeting team had to integrate and understand many of the information-related capabilities (IRCs) requested during the targeting effects working group, which led to fuller staff discussion and better lethal and non-lethal effects fusion. Understanding differences in lethal vs non-lethal targeting process was critical to effects fusion.

Just as important as expanding its time horizon was achieving shared understanding among the intelligence, lethal and non-lethal effects communities. The challenge is each of the IRCs have separate and distinct processes to develop, plan and deliver effects in the operational environment. Army fire support elements typically focus on the decide, detect, deliver, and assess (D3A) model[4]. However,

4 Army Techniques Publication 3-60, Targeting (Washington, DC: U.S. GPO, May 2015), 2-1.

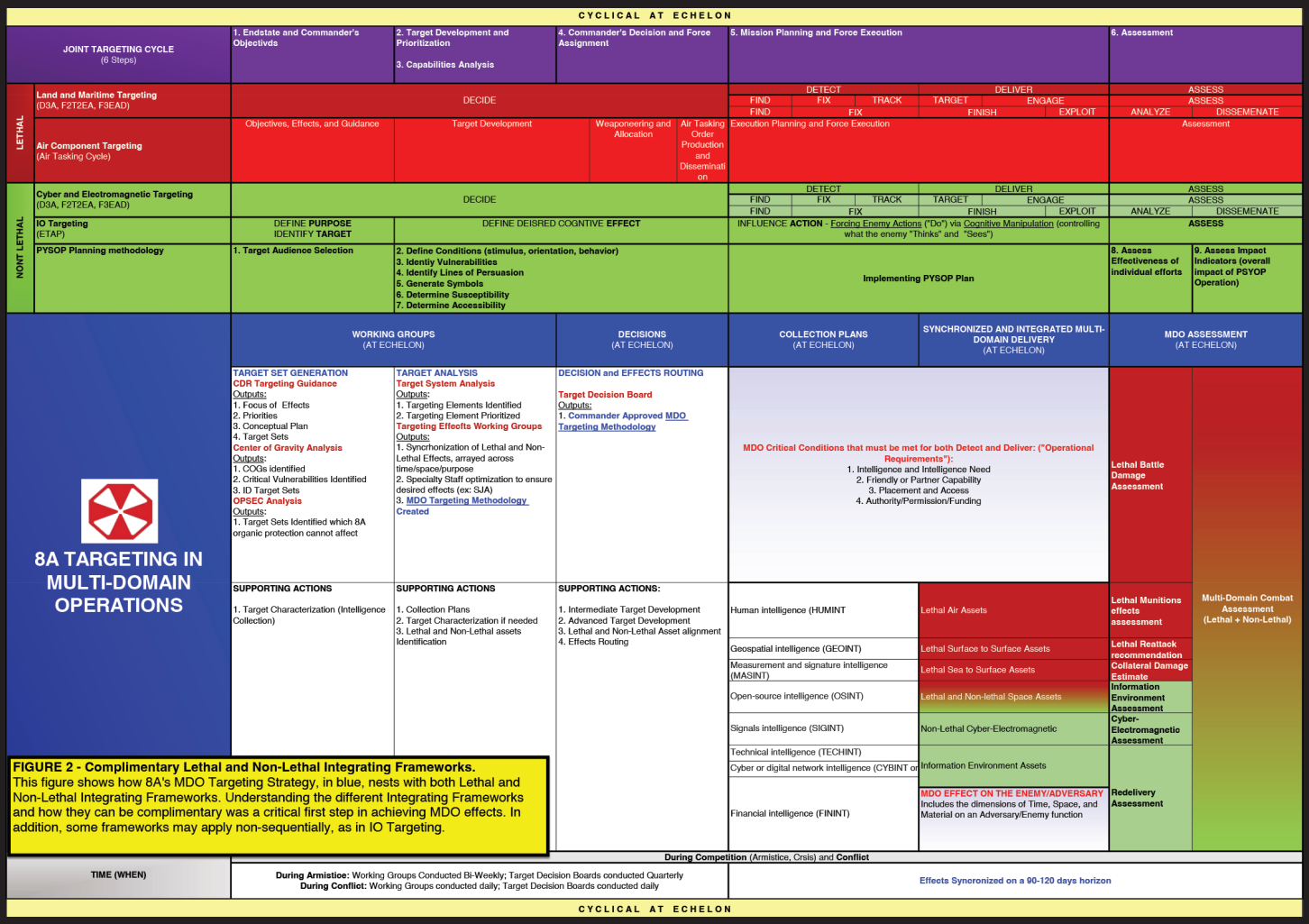


FIGURE 2 - Complimentary Lethal and Non-Lethal Integrating Frameworks.
This figure shows how 8A's MDO Targeting Strategy, in blue, nests with both Lethal and Non-Lethal Integrating Frameworks. Understanding the different Integrating Frameworks and how they can be complimentary was a critical first step in achieving MDO effects. In addition, some frameworks may apply non-sequentially, as in IO Targeting.

psychological operations (PSYOP) and cyberspace forces identify, analyze and refine target development to attack the appropriate target audiences or key cyber terrain in ways that are non-sequential to D3A. The importance of understanding the differing but complementary integrating frameworks of the various IRC's planning and execution processes improved coordination and synchronization into the 8A targeting process to achieve the desired time on target effect (see Figure 2).

Authorities

As we progressed through more integrated planning and synchronization, classification levels and target hand off between echelons became a challenge. Many of the non-lethal assets required higher levels of classification for discussion, planning and execution. This required simple coordination to either hold the decision boards in the 8A secret compartmentalized information facility (SCIF) or plan for a transition to the SCIF if leadership needed a more detailed description of a particular capability. This was an issue between already congested battle rhythm events that we needed to address. Moreover, operating in a combined multi-national environment continues to add to the complexity for coordination, integration and synchronization between echelons and alliance partners.

Rules of engagement and permissions are restrictive in the KTO, much like they are across all combatant commands and theaters of operation. Examples are authorities for Military Information Support Operations (MISO)/PSYOP, military deception, cyberspace operations and additional special technical operations. Add the additional layer of multi-national operations and complexity continues to increase. In the KTO, multi-national considerations are particularly important to apply MDO effects based on both ARFOR-K and operational requirements. 8A overcame these impediments by understanding the sensor to shooter architecture as well as the nuanced policies and authorities to leverage capabilities and assets not resident within its command. Higher echelons are receptive to requests for non-lethal effects IF we submitted the request. Far too often, units would not request an effect because they did not maintain the organic authorities.

There is no silver bullet that solves the authority challenges, but persistent engagement and preplanned condition-based concepts of operation (CONOPs) remains the best practices. Persistent engagement in the KTO enables trust between not only multinational partners but also between external agencies within and external to the U.S. Army or the joint force. This only occurs over time, which is a strength of 8A's theater given the 70 plus years of the ROK-U.S. alliance. Meanwhile pre-planned CONOPs help articulate to U.S. and ROK decision makers the complexity of a solution but more importantly its need and feasibility. A lack of authorities and organic technological capabilities should not hinder units from requesting, applying and integrating MDO concepts.

Conclusion

In 1999, two PLA Colonels, Qiao Lian and Wang Xiangsu penned the work Unrestricted Warfare which was a case study on how the American's viewed the Gulf War and more important, how China could compete against the U.S. in the future. One of their essential principles was "multidimensional coordination"- or coordination among different forces in different spheres in order to accomplish an objective[5]. Reminiscent to multi-domain operations, the lesson is clear. As fires professionals, we must embrace non-lethal capabilities and incorporate them into the targeting process if we truly want to achieve convergence at echelon. 8th Army came to this conclusion due to reflection and experimentation over the course of two exercises in 2022. 8A maintains all of the capabilities to conduct MDO at echelon and while work remains in synchronizing the capabilities and achieving the authorities necessary to leverage those capabilities, an important first step was to adjust 8A processes to account for MDO. By holistically including non-lethal capabilities in a digestible format, broadening our aperture beyond the ATO, and seeking to understand IRC frameworks, 8th Army took an important first step in converging both lethal and non-lethal effects in support of the commander's objectives.

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5 Qiao Liang and Wang Xiangsui, Unrestricted Warfare (Naples, Italy: Albatross Publishers, 2020), 183.

The Young Officer on a Higher Echelon Staff:

The Action Officer

By CPT Andrew Winters

The prospect of working at any echelon above battalion level can be vastly intimidating and mystifying, especially for the company-grade officer. While the adage exists that company-grade officers should stay as close to the line as possible, staffs of all echelons would be unable to function without the action officer. To the likely dismay of many young officers, the captain and major population comprise most of the officers on staff from the division level to the field army. However, unlike their more experienced major counterparts, captains on higher echelon staff are likely to have just left their respective captains' career courses without the experience of working on a battalion or brigade level staff. This article aims to demystify the staff, help the young artillery captain navigate his way through a fire support element, and possibly even motivate young officers to seek out a higher echelon staff through the lens of professional development.

Understand the Organization

The first step to surviving and flourishing on staff is understanding the purpose of your newly adopted organization. Every organization has its own task and purpose, ranging from the divisions' assigned operational tasks to the theater. Gaining a firm understanding of your unit's purpose in

Col. Wheeler R. Manning, commander, 403rd Army Field Support Brigade, briefs Lt. Gen. Willard M. Burleson III, commanding general, Eighth Army, on the brigade's diverse mission set at Camp Carroll, South Korea, Oct. 6. Burleson visited Army Pre-Positioned Stocks-4 Warehouse 15 operated by the Army Field Support Battalion-Northeast Asia, where he was also briefed by battalion commander, Lt. Col. Edward K. Woo, who detailed APS-4 and AFSB-NEA operations. Burleson took over duties as Eighth Army commanding general and chief of staff, Combined Forces Command, Oct. 2. He most recently served as the U.S. Forces Korea assistant chief of staff for Operations.

the bigger picture will help shape your role in the organization. Sometimes, this role to fill is outlined and specified at your echelon, yet other times it is left generally vague, such as that of the fire support officer or operations officer within a fire support element.

The two primary questions to help guide the young staff officer are: What does my organization do, and how do I support the organization? For example, if the organization's main effort is conducting reception, staging, onward movement, and integration (RSOI) for a theater, the fire support officer should ask themselves how they fit into the mission. In this regard, a fire support element will likely be tasked with supporting the reception and certification of units. Thus, by understanding the requirements of artillery unit certification, and having the ability to communicate with other staff organizations, such as the G3 and G4, the fire support officer can support the RSOI mission for the echelon they have found themselves in.

Finally, understanding how the organization operates internally will help the staff officer navigate their planning horizons and establish internal due dates for themselves. Most organizations work via operational planning teams (OPTs) or working groups, that then generate solutions to be presented up their chain from the action officer level all the way to the approval authority, which most likely is in the hands of a general officer. This creates a level of necessary bureaucracy that must be navigated and can lead to disgruntlement. This stifling feeling can be mitigated through a total team player mentality.

Become a Total Team Player

Higher headquarters are built around their staffs. While it may be possible to plan a training event alone at the battery level, undertaking a task at the division level or above alone is next to impossible. It is critical to understand that operations being planned at these higher echelons affect hundreds, if not thousands, of Soldiers, civilians, and contractors. Understanding that no task can be completed by a single staff officer, they may need to broaden their horizons and reach out for collaboration with various staff sections that may have their own take or

COL Wheeler R. Manning, Commander, 403rd Army Field Support Brigade, briefs LTG Willard M. Burleson III, Commanding General, Eighth Army, on the brigade's diverse mission set at Camp Carroll, South Korea, Oct. 6. Burleson visited Army Pre-Positioned Stocks-4 Warehouse 15 operated by the Army Field Support Battalion-Northeast Asia, where he was also briefed by Battalion Commander, LTC Edward K. Woo, who detailed APS-4 and AFSB-NEA operations. Burleson took over duties as Eighth Army CG and Chief of Staff, Combined Forces Command, Oct. 2. He most recently served as the U.S. Forces Korea assistant chief of staff for Operations.

conceptual understanding of the issue. Thus, it becomes necessary to overcommunicate.

Overcommunicate

This principle comes down to recognizing what you know, who needs to know it, and ensuring that you tell them. For example, referring to the RSOI mission set, if your task is to support artillery table certification for multiple artillery units coming into theater, you should communicate early and often with the G4 of your assigned staff. Without a doubt, the necessary ammunition requirements must be worked out, and this staff section may have a better understanding of the

ammunition requirements and the steps to take to ensure the facilitation of several units worth of certification.

This overt communication is equally important within your own staff section. Many times, as an action officer, you will be tasked with attending different types of meetings that you may or may not have a briefing role in. However, the information presented in that meeting may be of critical importance to the members within your own staff directorate. Timely and accurate reporting of the meeting to everyone within your directorate is paramount. Additionally, this type of reporting requires excellent writing skills in order to present the information in a concise manner. This can be achieved via an executive summary, or meeting minutes, taken throughout the briefing and presented in written format, either printed or via e-mail. This reporting should include what the meeting was about, key points of discussion, and enough analysis of the information to allow an individual unfamiliar with the topic to speak intelligently about it to a third party. This type of reporting feeds directly into the next point of becoming a sensor for your directorate.

Integrate and become a sensor

Much like the purpose of our radar systems, the young staff officer must become attuned to the happenings around them. Whether this type of information gathering occurs in prepared meetings, or by the coffee maker, it is important to not only listen but to understand the information presented. Much like the requirement to present meeting minutes or summaries to all parties involved, gathering information from other staff sections can help inform your director and assist the staff. Operationally, this can come in the form of implied tasks. Referring to our last example, if you overhear that ammunition shipments are being delayed through a conversation with G4 personnel, it may have impacts on your mission to train and integrate inbound artillery units. Understanding how this information can affect the larger picture can assist your directorate in producing an accurate assessment to be presented to the decision maker of the organization.

Yet, while you may know the importance of becoming a sensor, it is also critical to integrate yourself within other staff sections. Integration, also known as "rubbing elbows and shaking hands," is an important aspect of staff work. The action officer can only do so much without outside information and connections. Think back to your time at a battery and trying to square away a training area after the space was denied or already booked. Without the knowledge of who to go to, you could have possibly spent hours trying to find a solution to your training requirement. However, if you know who the right people are to talk to, you can try and work out a co-use agreement or even resource new land for your training.

The importance of relationships

Full integration as a sensor comes down to relationships. Ask yourself these questions: Are you friendly and open to others when they come to you with requests? Do you seek out other persons from other units or staff sections if you feel that you aren't understanding the full picture? Do you seek collaboration on projects? If the answer to these questions is negative, time on higher echelon staff can get very uncomfortable at an alarming rate. While it is not necessary for staff to be extroverted, the ability to build and maintain relationships goes a long way.

In full transparency, the previous paragraphs of this article lead directly to relationships and how to build them. Understanding the big picture of the organization, being open to teamwork, communicating early and often, and providing people with information are fundamental ways to build relationships. While much of the article has focused on assisting your own directorate, reaching out to assist other directorates will also pay dividends in the future. If you know something you are working on will directly influence another directorate, early communication and collaboration will help build rapport and assist in team building. It is important to remember that the team is not only your directorate, but the entire staff!

The sanity check

The most valuable piece of information to remember for the young staff officer is the officer and non-commissioned officer pairing. It is easy to forget the importance of this relationship in officer-heavy organizations. Despite no longer

Soldiers assigned to 41st Field Artillery Brigade work with Romanian and Latvian on Course of Action Development as part of the Military Decision Making Process during training exercise Dynamic Front 21. Dynamic Front 21 includes approximately 1,800 participants from 15 nations, May 3 - 21, 2021 at the U.S. Army's Grafenwöhr Training Area, Germany and Torun, Poland. DF21 is a 7th Army Training Command-led, U.S. Army Europe and Africa-directed exercise designed to increase readiness, lethality and interoperability by exercising allied and partner nations' ability to integrate joint fires in a multinational environment at both the operation and tactical levels. (Official U.S. Army photo by Spc. Ryan Barnes)

having a platoon sergeant, the non-commissioned officers (NCO) in your directorate are still ready and willing to advise you on the way forward. As you navigate your way through the staff, it is critical to work with your non-commissioned officer counterpart to gain that last piece of the puzzle that you may be missing. If you are soon to brief superiors in your directorate on a plan you are working on, or courses of action on the way ahead, you must gain the north and south of your counterpart. They will likely see your plan from a different point of view. However, if you find yourself wondering if you're going crazy, they will provide the sanity check you are looking for.

Conclusion

Working on staff at echelons above brigade can seem daunting, however, it's important to remember that Field Artillery Officers are seen as expert integrators. If you view your time on staff as a learning experience, you will gain a deeper understanding of the bigger picture while developing your integration and communication skills. Utilize the time of staff to refine your verbal and written communication skills, and develop relationships with your superiors, peers, and subordinates. Integrate yourself with multiple staff sections and provide much needed analysis where it is needed most, and if you find yourself in doubt, simply ask your NCO.

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Confronting the Counterfire Dilemma: The power of Proactive Pattern Analysis in LSCO

By Cw3 William Woods and CW3 Benjamin Grooms

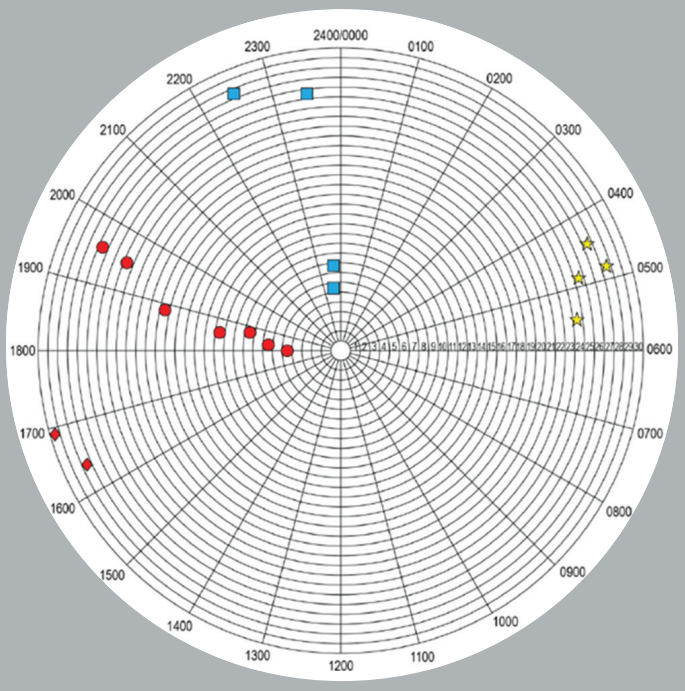

Figure 1 (Pattern Analysis Plot Sheet ATP 2-33.4)

The operational environment is rapidly evolving with emerging threats. The Army gained valuable insights from recent conflicts while enjoying a technological advantage over a less-advanced adversary. Two decades of counterinsurgency (COIN) in the Middle East masked peer and near-peer threat advances in military capabilities development- a challenge to U.S. military superiority. During the Global War on Terror (GWOT), coalition forces had fire superiority and complete overmatch in the counterfire fight; such advantages will not be present in future operational environments. To prevail in large-scale combat operations (LSCO) and resolve this dilemma, the Army must fight and win the counterfire fight against an enemy with functional equivalency in counterfire capability.

The counterfire dilemma arises from the adversarial doctrine that relies heavily on high volumes of indirect fire (IDF) with reduced displacement time. Observations from Combat Training Centers (CTC) reveal that organizations struggle to process acquisitions from weapons locating radar (WLR) on time and have minimal effect on the opposing force's (OPFOR) artillery. With deception techniques, efficient reactive counterfire, and responsive ISR-shooter flow, the threat indirect fires (IDF) poses an increased problem set for U.S. counterfire. By adopting an analytical methodology that supports targeting, the Army can overcome the disadvantages of being outnumbered and outranged by our peer adversaries in LSCO.

Common Trends / Observations from the NTC / JMRC

- Units do not utilize pattern analysis to synchronize detection and delivery assets.

- Units do not fully employ their field artillery battalion targeting officers or S2s and fail to integrate with the BCT S2 focusing on targetable data (Field Artillery Intelligence).

- Units fail to collaborate with S2 before targeting working group (TWG) to update event templates.

The first step in mitigating the counterfire dilemma is to look at the basic principles of pattern

analysis. The Army's doctrine and technique publications provide insufficient guidance on the pattern analysis function of a Target Processing Section (TPS) or Counterfire Operations Section (COS). While Army Technique Publication (ATP) 3-09.12 mentions the pattern analysis plot sheet (Figure 1) as an example of a tool that can be used to manage radar zones, it does not adequately define the outputs of pattern analysis. Similarly, intelligence doctrine such as ATP 2-33.4 fails to clearly define pattern analysis or its integration into counterfire planning and execution. Unit counterfire standard operating procedures (SOP) and observations from CTC reveal a general need for more understanding and implementation of comprehensive pattern analysis methods.

Pattern analysis begins by analyzing enemy fire support (FS) systems and updating running estimates made during the military decision-making process (MDMP). Careful consideration of terrain and threat course of action must be given during the information preparation of the battlefield (IPB) as this sets the foundation for future pattern analysis. The counterfire officer (CFO), in conjunction with the S-2, should include the following in their analysis of enemy FS systems: enemy FS capabilities and limitations, slope and communications analysis that assists in determining potential position areas of artillery (PAA), identification of ingress and egress routes, the situational templates, and the event templates.

- **ATP 3-09.12 (1-32) states that counterfire planning begins during the MDMP and continues throughout the targeting process by feeding the targeting working group, targeting decision board, and information collection plan.**

The abovementioned analysis establishes the baseline assumptions for where artillery can and cannot operate and explains how, where, and when the enemy commander will utilize FS assets. Planners include these factors to establish radar zones, named areas of interest (NAI), target areas of interest (TAI), and radar employment considerations (positioning, azimuth of search, and cueing). Continued pattern analysis and ensuring the current intelligence assessment is updated often help the preparation of Enemy Course of Action Overlay & Descriptions that lead to the brigade's ability to conduct targeting.

The following action is to take proactive steps to analyze enemy FS systems. One approach involves identifying observable behaviors and collecting the necessary data for further analysis. This process begins by formulating analytical considerations based on the assumptions made during MDMP, determining data collection (including tools and responsibilities at each echelon), potential patterns, and outputs that support targeting. The chart on the next page (Figure 2) is "a way" that units could include in their SOPs. SOPs should further specify who will be responsible for data collection, what logging and displaying method will be used, and what observations can be derived from the data.

Common Trends / Observations from the NTC / JMRC

- Counterfire Operations Sections struggle to integrate during the Detect phase of the Targeting Process. As a result, WLR are not deliberately synchronized and lack the necessary integration into the BCT Targeting.

- Counterfire Operations Sections often utilize its WLR to confirm the location of the enemy FS threat, but struggle to integrate acquisitions and other relevant intelligence data into further assessments or analysis.

Counterfire data should be logged and displayed for further analysis through analog and digital tools and implemented at all echelons by unit SOPs.

Analog products are filled out by hand on a battle board or map overlay and are more reliable under field conditions. They provide a physical media independent of a computer system. However, the issue with analog products is time and organization. While a counterfire log, map overlay with point of origin (POO)/ point of impact (POI), and pattern analysis plot sheet are valuable analog products, they can be time-consuming to maintain and harder to spot longer-term patterns. Adding additional analog tools requires a tradeoff of time, physical space, resources, and the value of the analysis at each echelon.

On the other hand, digital tools rely on a computer for storage or display. They can be anything from a spreadsheet to emerging artificial intelligence software. The benefit of digital tools

Analytical Planning	Planning Assumptions	Data Collection	Patterns	Outputs	Who provides analysis
Where will threat fire from?	• PAA analysis • Range TTPs	• Heat Map • Range analysis • GMTI • OPIR, etc.	• Use of same PAAs • Sequential PAA location • Type of terrain preferred (urban use, wood line, roads, fields)	• NAI/TAI • Radar zones	• WLR Section Chiefs • TPS/COS • CFO • FA S-2 • BCT S-2
When will the threat employ IDF?	• SYNCMAT (threat and friendly actions) • EVENTEMP	• Event correlation plots • Pattern Analysis Plot	• Threat COA correlation • Time of day/ week	• ICSM • TAI • Cueing (situational, Demand)	• TPS/COS • CFO • FA S-2 • BCT S-2
Why is the threat firing / what are they firing at?	• SYNCMAT (threat and friendly actions)	• POO/POI Plots • Heat Map • Volume by type/ unit	• IDF support to Threat targeting / maneuver • Threat counterfire Analysis • Deception Analysis	• EVENTEMP • NAI/TAI • Threat HPTs	• CFO • FA S-2 • BCT S-2 • BCT S-3
What systems will the threat use and how are they being employed?	• EOB • Threat Temp • EVENTEMP	• IDF usage by type • POI plot • Threat type to target • Volume	• Matching threat system to target set • Volume to size of target or size of firing element (linked to TTPs and BDA)	• NAI/TAI • updating EOB • Radar Zones updated	• CFO • FA S-2 • BCT S-2
What ingress / egress routes will the threat use?	• PAA analysis • Route analysis	• Heat Map over route analysis • GMTI	• PAA distance from main routes • Routes commonly used • Resupply methods • Hide sight usage	• NAI/TAI	• CFO • FA S-2 • BCT S-2 • S-4 • ENG
Are friendly radars being effectively employed?	• IPB • Wargaming	• Acquired vs Missed (Location, Cueing) • Shellrep/crater analysis	• Risk assessment (radar and friendly, Cueing)	• Cueing Schedule • RPA placement	• WLR Section Chiefs • TPS/COS • CFO
Other Factors that support counterfire Analysis?	• Logistical analysis (BSA, resupply TTPs, Caches) • Jamming/interference analysis • Threat counterfire				

Figure 2

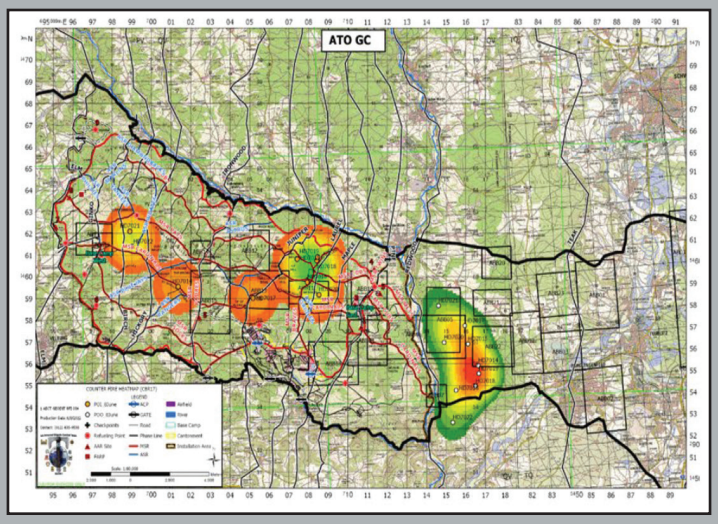

Figure 3

is the ability to leverage computing power to organize large amounts of data and output tailored information to be analyzed. Digital Common Ground Systems (DCGS) heat map outputs are a good example (Figure 3), but there are also automated spreadsheets and other digital tools. Digital tools have the potential to support operations more effectively than analog products, but they rely on computer systems, proficiency in utilizing selected programs, and additional coordination.

Even if presented aesthetically, raw and compiled data do not constitute analysis. The analysis is an output from staff members who interpret the data, identify patterns, and provide inputs for the TWG. A good example of this is a heat map. While it is an excellent tool for detecting patterns in the threat's use of the area, it cannot determine where a threat will fire from next without considering other relevant information. Therefore, it must be used with additional tools to provide insights into the threat's subsequent actions and requires collaboration with other staff members.

While the CFO has the ultimate responsibility for analysis compilation and integration into targeting processes, other staff inputs are necessary for a comprehensive analysis of the enemy's FS system. The S-2 can use various intelligence disciplines, such as geospatial intelligence (GEOINT), signals intelligence (SIGINT), and human intelligence (HUMINT), to provide valuable information on potential firing positions, enemy communications, tactics, and vulnerabilities.

Pattern analysis should be a continuous process involving collaboration at every step of the acquisition process, intelligence enterprise, and with key staff before the TWG. By codifying inputs and data collection, understanding the patterns observed and how analysis outputs integrate into operational processes, intelligence, targeting, and fires elements can effectively plan against a high payoff target set at each echelon. The CFO must create shared understanding across the war fighting functions by balancing his responsibilities on the current operations floor and collaboration with the brigade intelligence support element and future operations. This collaboration ensures that all counterfire data have been synthesized to help inform commander decision points, answer priority information requirements, and nest targeting recommendations in time and space.

The Army must confront the counterfire dilemma in a dynamic and rapidly evolving operational environment. Observations of 15 CTC rotations have illuminated the need for more comprehensive pattern analysis methods. Outputs of pattern analysis must be further defined and integrated into counterfire operations and the targeting process. Inculcating inputs such as terrain analysis, weather patterns, and enemy capabilities is necessary to analyze patterns effectively in a LSCO environment. Conducting pattern analysis at every step of the acquisition process and utilizing tailored tools and SOPs can overcome the disadvantage of being outnumbered and outranged by peer adversaries. With a deeper understanding of pattern analysis and a proactive approach to counterfire, the Army can maintain military superiority, retain combat power, and succeed in LSCO.

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During rotations at the Joint Multinational Readiness Center (JMRC), the Vampire and Mustang teams consistently observe units with an unclear understanding of the law of armed conflict. Brigades routinely impose unnecessary constraints on themselves that hinder the engagement of high payoff targets (HPTs) in support of brigade targeting objectives. Targeting must be a whole of staff effort, and the staff's understanding of the law of armed conflict is critical to the expedient engagement of HPTs. The targeting team must leverage the knowledge of the brigade's judge advocate to clearly understand what they can and cannot do under the law of armed conflict prior to executing operations. Brigades must move past the rules of engagement imposed on them during counterinsurgency. They must gain an understanding of how to proportionally engage distinct targets, balance risk, and make informed tactical decisions, within the left and right limits of the law of armed conflict. Without a clear understanding of what is legally possible, staffs often take appropriate options away from the commander. – LTC Tyler Donnell and MAJ Joshua Herzog, Vampire 07 and Vampire 03 at JMRC.

UNLEASH THE KING OF BATTLE: LEGAL MYTH BUSTERS

By MAJ Jason D. Young, MAJ Joshua M. Herzog and CPT Chad M. Bird

Today's senior commanders and lawyers are extremely versed in counter-terrorism policy and restrictive rules of engagement. They are skilled in restraint, they patiently wait for positive identification, and they justify kinetic action in terms of hostile act and hostile intent. These attributes shaped how we fought over the last two decades – executing stability operations with kinetic strikes, in support of counterinsurgency (COIN) operations. After 20 years of honing experience and training for a COIN fight, senior commanders and lawyers conflate recent policy for the law of armed conflict (LOAC). LTG Pede and COL Hayden published an article describing this as a counter-terrorism "hangover." The readiness of the Army requires a retraining of the force to apply the LOAC – not legal misconceptions based on training and experience – to unleash the King of Battle and win in large-scale combat operations (LSCO).

This paper will address common misconceptions of the law observed during combat training center (CTC) exercises at the Joint Multinational Readiness Center (JMRC). The paper will discuss these observations as legal "myths" to clearly identify the legal standard and contrast the standard with recent policy. The paper unleashes the King of Battle by providing fire supporters and staffs an understanding of the law and the tools to train timely and responsive fires.

Legal Principles

First, the basic law of armed conflict principles must be defined before dispelling the legal myths overheard in fire support elements (FSE) and brigade staffs.

The principle of military necessity "justifies the use of all measures needed to defeat the enemy as quickly and efficiently as possible that are not prohibited by the law of war."[1] This principle is not an unlimited, win-at-all-costs, declaration because the principle of unnecessary suffering prohibits tactics that maim, torture, or cause wanton destruction to civilian objects. These two principles complement each other and highlight the purpose of the law of armed conflict – defeating the enemy while preserving minimizing destruction of civilian life and civilian objects.

The next two principles—distinction and proportionality—are the cornerstones of target engagement. Distinction requires commanders to distinguish combatants from civilians and military objectives from civilian objects.[2] Title 10 of the United States Code Subsection 950p defines military objectives as "those objects during hostilities which, by their nature, location, purpose, or use, effectively contribute to the warfighting or war-sustaining capability of an opposing force and whose total or partial destruction, capture, or neutralization would constitute a definite military advantage to the attacker under the circumstances at the time of an attack."[3] The principle of proportionality requires commanders "refrain from attacks in which the expected harm incidental to such attacks would be excessive in relation to the concrete and direct military advantage anticipated to be gained."[4] The principle of *proportionality* also requires commanders to take feasible precautions to reduce the risk of harm to civilians and other persons and objects in planning and conducting attacks.[5] The commander must act in good faith based on the information available to them at the time when analyzing these principles.[6] The staff must assess the military advantage prior to engaging every target. Generally, this assessment occurs during the creation of fire support tasks and the high-payoff target list in dialogue with the commander exercising the targeting process. Military advantage is not restricted to tactical gains but is linked to the full context of one's war strategy.[7] For example, the use of air raids solely to confuse the Germans as to the landing location during Normandy in World War II was a military advantage.

The commander may attack military objectives when civilians or civilian objects are in the collateral effects radius if the military advantage is not excessively outweighed by the incidental harm to civilians. The analysis contemplates the execution of fire missions with effects on civilians and civilian objects – the key is the commander's reasonable determination based on the information available at the time.

LSCO Legal Myths

Next, common misconceptions observed across the staff during CTC rotations must be identified and analyzed.

Unobserved Fires - This misconception is a conflation with the LOAC principle of distinction. ATP 3-09.30 Observed Fires is concerned with an observer seeing the point of impact to direct rounds onto the target and conduct assessments, not with LOAC compliance. Any rule of engagement (ROE) restrictions on unobserved fires are imposed by operational requirements, not compliance with the law of war. Clearly defining the difference between observed fires and targets identified or "observed" by a sensor must be defined by the ROE to mitigate confusion and requirements.

Positive Identification (PID) – This misconception is a tightening of the LOAC principle of distinction born out of COIN requirements. Considering the strategic context for stability

1 U.S. DEP'T OF DEF., DOD LAW OF WAR MANUAL, para. 2.2 (June 2015, updated December 2016) [hereinafter DOD LAW OF WAR MANUAL]
2 DOD Law of War Manual, para. 2.5
3 10 U.S.C. § 950p(a)(1)
4 DOD Law of War Manual, para. 5.12
5 DOD Law of War Manual, para. 5.2.3 (The collateral damage methodology is the primary process to ensure feasible precautions are taken.)
6 DOD Law of War Manual, para. 5.4.3.2
7 DOD Law of War Manual, para. 5.12.2

operations the restriction was prudent. The LOAC standard requires a commander to take reasonable efforts to distinguish from military objectives and non-military objectives based on the information available at the time.

Hostile Act / Hostile Intent; and Self-Defense – These terms represent the application of the LOAC principle of distinction when an element is not clearly identifiable as a declared hostile force; however, in a LSCO scenario the majority of engagements are against a declared hostile force – the enemy. When units use these terms, the implication is that self-defense negates the legal requirement to conduct a proportionality assessment. In other words, the impacts to civilians don't matter because a unit is in a self-defense situation. That is simply not valid. The requirement to weigh the military advantage against the expected collateral damage is present in every operation. To be sure, the military advantage of defending friendly units is extremely high, but it does not permit every tactic regardless of the impacts to civilians.

Civilian Harm Prevention is the most important factor in a Commander's targeting decision – This statement represents a misunderstanding of the LOAC principle of proportionality. The legal requirement requires the commander to refrain from attacks when the military advantage is *excessively* outweighed by incidental harm to civilians or civilian objects. There is also a requirement to take feasible precautions to protect civilians.[8] In broad terms, commanders should focus on the military advantage first, then ways to mitigate harm to civilians. Put another way, enemy first, enemy always – the most important factor in a commander's targeting decision is achieving the necessary effects on target. This is why military necessity is the preeminent LOAC principle.

Collateral Damage Methodology (CDM) isn't necessary in LSCO – This statement often implies a mistaken belief that a proportionality assessment is not required in LSCO. The collateral damage methodology is a flexible tool to inform commander decision making.[9] The collateral damage methodology accomplishes several LOAC requirements: 1) the Chairman of the Joint Chiefs of Staff Instruction (CJCSI 3160.01D) requires identifying the target—distinction; 2) the CDM provides the commander an estimate of the incidental harm to civilians and other collateral concerns—proportionality; 3) and the process of weaponeering and employing mitigation techniques often satisfies the requirement for taking feasible precautions.

The requirement to weigh the military advantage against the expected collateral damage is present in every operation.

We don't have the software to conduct Collateral Damage Estimates (CDE) – CJCSI 3160.01D, No-Strike and the Collateral Damage Methodology, permits "field CDE" in the dynamic targeting process.[10] While field CDE is not defined explicitly, it can be used to hastily mitigate collateral concerns when collateral damage estimation tools are not available to the personnel employing munitions on a target: forward observers, Joint Terminal Attack Controllers, etc. field CDE guidance and requirements are outlined and published by the respective combatant command.

Applying the Principles Above to Myths Heard on the "Training Battlefield"

Military Objective + [Military Advantage > Civilian Harm] = Engagement of Target is Permissible[11] Utilizing a formula-based approach allows the staff, targeting team and legal sections to quickly analyze targets and present information for a decision on dynamic targets. The above formula can be applied to the scenarios listed below by analyzing the

8 DOD Law of War Manual, para. 5.12
9 CJCSI 3160.01D, No-Strike and the Collateral Damage Estimation Methodology, 21 May 2021
10 CJCSI 3160.01D
11 The term "Engagement of Target is Permissible" is reductive and does not mean a target is authorized or approved. The formula is an effort to simplify the analysis required by a commander so the staff can advise the commander that they can legally fire in accordance with the law of armed conflict. Therefore, using the analysis above commanders and more importantly staff advisors will be better equipped to drive the analysis and the discussion for an informed, streamlined process of lawful targeting.

distinction and proportionality principles of the LOAC. These scenario specific approaches aid the targeting team's preparation and training to conduct dynamic targeting in large-scale combat operations. These scenarios are worth running through command post (CP) battle drills to streamline information presentation to ensure timely and effective decision making.

Fires into Populated Areas – "We can't fire into [insert civilian populated area]. There are still civilians in the town and until they are ALL gone we cannot shoot."

Example, a battery of 2S19s, 8 x 152mm self-propelled howitzers, fire upon a friendly unit. The friendly unit receives the acquisition and notices the enemy battery is dispersed in an area consisting of 10 structures. Intelligence assets confirmed the civilian population has mostly left the town with approximately 10% of the pre-conflict population remaining. The unit has indicated that 2S19s are #2 on the high payoff target list (HPTL) and subject of a fire support task. The unit does not shoot, nor do they brief the commander on options to shoot, due to a belief that civilians in the area make it "illegal."

Distinction [Military Objective]: Military units are per se "military objectives." 2S19s by their very presence and use contribute to military action, namely attacking friendly troops and equipment. Destruction of these weapon systems offer a definitive military advantage by preventing the 2S19s from targeting friendly elements now or in the future.

Proportionality [Military Advantage > Civilian Harm]: The FSE conducts field CDE and determines the 2S19s are in a town with about 10 civilian structures, including civilian inhabitants, but only 10% of the population remains (approximately 100 people). The friendly brigade is the inferior force and must gain the relative advantage against the enemy through the use of organic indirect fire assets to achieve the operational end-state. The FSE determines that high-explosive rounds are the appropriate munition to achieve the desired effect on the target given current supply limits on precision munitions through the weaponeering process (feasible precautions).

Engagement of Target is Permissible: The staff should present this analysis to the commander and a reasonable commander may conclude that the civilian harm is not excessive in relation to the military advantage and direct target engagement.

Unobserved Fires/Positive Identification (PID) – "We cannot shoot, we do not have full motion video of the target (PID)."

Example, the brigade (BDE) identifies a tracked vehicle formation using moving target indicators (MTI) traveling down route "Jaguar" toward a friendly position. The battle captain indicates that there are no friendly vehicles on that route. The brigade S3 indicates that there is not a reasonable certainty (PID) the column is a military target.

...a reasonable commander may conclude that the civilian harm is not excessive in relation to the military advantage...

Distinction [Military Objective]: Although MTI is a low-fidelity sensor, when paired with the other data, it may provide the commander enough information to reasonably conclude that these elements are in fact the enemy's military units. The other data may include: the S2's enemy situation template assessed this route was a likely avenue of approach for the enemy; the BDE messaged a different route as the primary civilian movement corridor (maybe this was even agreed to with the enemy); and the BDE has not observed any large civilian movements on the route with the indicators for the past several days.

Proportionality [Military Advantage > Civilian Harm]: If the commander concluded that the column is likely an enemy tracked formation traveling on the road, then the next step is assessing proportionality. There is a significant military advantage in destroying and stopping an enemy tracked formation traveling toward a friendly position. There are no indications of civilians in the area but destroying the road (a civilian object) is incidental to the attack.

Engagement of Target is Lawful: The staff should present this analysis to the commander and a reasonable commander may conclude the MTI,

when paired with the other assessments, represents a tracked enemy formation rapidly closing on the BDE's position and direct target engagement.

Of note, the commander could also look to target the road directly, "civilian objects may lose their protected status if they are being used for a military purpose or if there is a military necessity for their destruction or seizure."[12]

Hostile Act / Hostile Intent – "we cannot fire artillery on those guys, they haven't done anything wrong yet"

In this scenario, the electronic warfare officer (EWO) identifies signal making intermittent broadcasts and assesses the frequency as a known enemy band with no known common civilian usage. The EWO obtains a cut near a hilltop overlooking a future friendly avenue of attack. Despite no known civilian structures or routes on the hilltop, the BDE fire support officer shuts down the conversation by saying "we CANNOT shoot because they may not be bad guys, we haven't seen them do anything wrong yet."

Distinction [Military Objective]: The hostile act / hostile intent comment is stray voltage. A hostile act analysis is used when a person or vehicle, not clearly identifiable as the enemy, is a lawful target. Here, the EWO identified a signal reasonably assessed as the enemy and provided an approximate location on a hilltop. The transmission is on a known enemy frequency and is located on key terrain at an ideal observation point. The commander may reasonably conclude that the signal is emanating from a small enemy observation post without the need for confirmation through a hostile act, or through a full-motion video feed.

Proportionality [Military Advantage > Civilian Harm]: The enemy is using an asset to send vital information, targeting data, to the rear for target engagement. There is a significant military advantage in destroying the vehicle. There are no indications of civilians in the area.

Engagement of Target is Lawful: The staff should present this analysis to the commander and a reasonable commander may conclude the signal producing equipment along with enemy personnel are military objectives, ripe for a direct target engagement.

Conclusion

Uncaging the King of Battle requires a rewiring of the mental models used by commanders and staffs in the targeting process. There was a time for a bias for restraint. Now commanders need a bias for action. The heuristics developed for a highly restrained COIN fight slow the decision-making process and foreclose lawful options from command consideration. The timely and effective employment of fires demand emphasis on law of armed conflict training now, not when a formation is in the middle of the fight. The legal myths busted in this article are a solid step forward in creating shared understanding on the basic LOAC legal requirements and provides LSCO scenarios that will unleash the King of Battle in future operations.

Uncaging the King of Battle requires a rewiring of the mental models used by commanders and staffs in the targeting process.

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12 Operational Law Handbook Ch.2V.A.2b.

The balance of power: a M109 Paladin mobile howitzer pictured during a Field Artillery Basic Officer Leaders Course (BOLC) training event on 25 May, 2022 at Fort Sill, Oklahoma. (Photo by 1LT Alana Larcombe, Fort Sill PAO)

The Bravo 22 Salute Battery fires a ceremonial cannon at the Memorial Day celebration at Fort Sill, Oklahoma on 29 May, 2023. *(Photo by Ki'Arra Williams, Fort Sill Public Affairs Office)*

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