FA Journal

A professional journal for US Field Artillerymen

Issue 1, 2023

National Guard preps for potential Arctic conflicts with Russia and China
Pg 14

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A soldier from the 1-120th Field Artillery Regiment, Wisconsin National Guard, watches as a CH-47 "Chinook" assigned to Detachment 1, Bravo Co. 3-328th Aviation Regiment, Michigan Army National Guard, lands during Northern Strike 23-1, Jan. 24, 2023, at Grayling Army Airfield, Mich. Units that participate in Northern Strike's winter iteration build readiness by conducting joint, cold-weather training designed to meet objectives of the Department of Defense's Arctic Strategy. (U.S. Air National Guard photo by Master Sgt. Scott Thompson)

CONTENTS:

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Article submissions do not have to agree with current doctrine, official policy or approved techniques or procedures. Ask yourself how the topic is going to help the artillery community. Only unclassified information can be published in the FAJ. Articles must promote safe techniques and procedures. Be accurate, logical and complete in your writing. Submissions must be clearly written with an evident thesis, no more than 2500 words. Strive to educate, not impress. A message is most clear when written in simple language, an abundance of adjectives, adverbs and words that the reader will have to look-up detracts from the message. If possible please include graphics, charts or photographs to supplement your article.

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The USFAA Staff reserves the right to edit an article and put it in the magazine's style and format. If you have questions on themes, subject matter or publication deadlines, please call 580.355.4677.

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PURPOSE:

The FA Journal continues the tradition begun with the first Field Artillery Journal published in 1911. To publish a journal for disseminating professional knowledge and furnishing information as to the Artillery's progress, development and best use in campaigning to cultivate, with other arms, a common understanding of the power and limitations of each to foster a feeling of hearty cooperation by all and to promote understanding between the regular and militia forces by forging a closer bond, all of which objects are worthy and contribute to the good of the country.

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Congratulations to Brigadier General Shane P. Morgan Chief of the Field Artillery

On a sunny, blustery afternoon, on the Old Post Quadrangle of Fort Sill and in the shadow of Block House, Signal Mountain, Shane P. Morgan, the 56th Chief of the Field Artillery received his promotion to Brigadier General.

Major General Ken Kamper presided over the ceremony and was the first to congratulate the newest General Officer in the U.S. Army. Other former commandants and commanding generals came in to give their support as well, including LTG (R) JT Thompson, MG (R) Al Shoffner, MG (R) Brian McKiernan, MG (R) Mark McDonald and BG (R) Andrew Preston.

Serveral dozen guests flew in from around the country including school friends, colleagues and family members. BG Morgan was surrounded by loved ones as he gained, what we hope, will be the first of many stars.

Farewell to CSM Michael McMurdy and Welcome to CSM Paul Fluharty Command Sergrent Major of the Field Artillery

CSM Michael McMurdy
14th CSM of the Field Artillery

CSM Paul Fluharty
15th CSM of the Field Artillery

CSM Michael McMurdy will be departing Fort Sill at the end of February as CSM Paul Fluharty will step in as the new CSM of the Branch.

CSM McMurdy has been a tremendous asset to the branch during his time on the Commandant's team. We wish him the best as he moves on to Ft Eustice.

CSM Fluharty comes to Ft Sill from the Schofield Barracks. His prior duty assignments include Section Chief and Platoon Sergeant assignments at Ft Drum. 1SG of Charlie Battery 1-377th FA, Bravo Battery 1-37th FA, both at Ft Drum, and HHB 3rd BN 7th FA at Scofield Barracks. Headquarters 1SG of HHC 25th Sustainment Brigade followed by Battalion CSM for 2-77th FA Ft Carson. Finally in his last assignment he served as DivArty CSM for the 25th ID DivArty.

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Wednesday

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4 MAY

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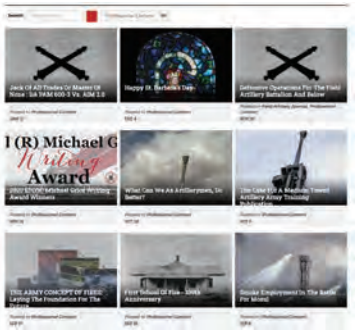

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National Guard preps for potential Arctic conflicts with Russia and China

By Meghann Myers

Originally Published by Militarytimes.com 1/30/23

While active duty troops have been traveling up to the far reaches of Canada and Norway to get acclimated to fighting in deep snow and bitter cold, in January members of the National Guard tested their cold-weather skills on some home turf: northern Michigan.

The first run of Northern Strike 23, a 10-day National Guard combined arms exercise, wrapped up over the weekend. This marks the sixth year the Guard has put on the event, part of the U.S. military's push to get ready for military confrontation in the Arctic, where, as ice melts, waterways become more navigable and countries like China and Russia increase their military presence.

"If you look at a map from the North Pole, you see how close all these countries are," Army Gen. Dan Hokanson, chief of the National Guard Bureau, told Military Times on Thursday. "And you also see the vastness of the Arctic. And as we look at the temperatures increasing and further access to the Arctic, some of these scenarios that almost nobody would operate in because they're so difficult, now we're starting to see countries move into those areas. And there will be competition there."

In addition to adversaries like Russia and China, there are NATO allies like Norway operating in the Arctic, countries that the U.S. would be obligated to support in the event of a confrontation.

"We've got to be able to go wherever that potential fight may be, and we need to provide presence there," Hokanson added. "You need to be able to go there, and not just go there and survive, go there, operate and thrive."

As part of his visit Thursday, Hokanson took some live-fire practice on the M777 Howitzer, one of the NATO weapons making a difference in beating back Russia's invasion of Ukraine.

Field artillery was the exercise's main focus, with members of the 20th Special Forces Group working with forward observers, along with an engineer platoon that helped build makeshift fire bases and maintain roads.

Also on scene were members of the Latvian special forces, a regular participant in Northern Strike and a country deeply alerted to Russian military expansion.

"They live this day to day, they've lived this for generations. And in many cases, that threat is present today," Hokanson said. "And you see the emergency and their support for Ukraine. But then also the focus, 'Hey, we need to be prepared if something happens along our border.' It's, in a way, a citizen emergency."

Northern Strike fits neatly into larger overall plans Hokanson has for the Guard, in terms of becoming more interoperable with the Army.

During a press conference Tuesday, he told reporters that the bureau intends to not only expand its exercise and training rotation lineup, but to modernize its brigade and division structure to more closely mirror the active duty Army.

"I think the biggest thing I took from today is, we say we need to operate in the most complex environments … and I think what we saw today is our Guardsmen realizing that … the Arctic is an important environment," Hokanson told Military Times. "And we need to take every opportunity to really train [in] environments [that] we may not be exposed [to] all the time — just to remember we can operate [there]."

About the Author:
Meghann Myers is the Pentagon bureau chief at Military Times. She covers operations, policy, personnel, leadership and other issues affecting service members.

Above:Army Gen. Dan Hokanson, chief of the National Guard Bureau, right, observes M777 Howitzer live-fire training during Northern Strike 23. (Photo courtesy of Military Times)
Left: Wisconsin Army National Guard, 1-120th Field Artillery Regiment, fires a 105mm High Explosive shell with the M119 howitzer during Northern Strike 23-1, Jan. 23, 2023, at Camp Grayling, Mich. Units that participate in Northern Strike's winter iteration build readiness by conducting joint, cold-weather training designed to meet objectives of the Department of Defense's Arctic Strategy. (U.S. Air National Guard photo by Master Sgt. Scott Thompson)

Joint Fire Support Team (JFST)

1st Armored Brigade Combat Team, 1st Infantry Division, Brigade Fire Support Element

By: CW3 Jacob Land, CW2 Andrew Goebel, CPT David Brister, MAJ Benjamin Risher

The Devil Brigade faces a heavy fight in a dense forested battlefield in the mountains of Germany. The air is frigid and there is no sign of relief from the weather as it bears down with sleet and snow. The brigade finds themselves blind to the enemy presence as UAVs are grounded due to the soup in the air. The cavalry squadron screens to the brigade's flank to prevent the encirclement of the unit. Unable to see in the brigade deep area due to the inclement weather limiting visibility and grounding aircraft, the enemy encroaches building combat power to commence their assault. The enemy begins their attack with the full might of a BTG into the frontline, catching the Devils off guard by breaching the line with two coys of T-90s supported by a battalion of 2S19s bombarding our defending battle positions causing mass casualties forcing the brigade to withdraw.

The Dilemma

The dilemma of maintaining observation of the brigade deep area is often times degraded due to inclement weather and anti-access / area-denial (A2/AD) capabilities of our adversaries aimed at limiting our forces' ability to effectively deploy aerial assets in support of target acquisition. The lack of aerial assets increases the importance of Army tactical formations to have ground-based observers capable of observing high-payoff targets in depth.

Current Brigade Target Acquisition Assets

Brigade Combat Teams (BCTs) have become reliant on echelon above brigade (EAB) assets such as satellite, UAVs such as Grey Eagle, and other higher level detection assets as primary means for detection and assessment within their targeting process. This reliance is due to lack of organic assets at the BCT level. The typical organic assets used to provide target acquisition and observation include RQ-7B, Shadow unmanned aerial vehicle (UAV), AN/TPQ-53, weapon locating radar (WLR), Prophet, the cavalry squadron, and combined electronic warfare intelligence (CEWI) teams. First, the RQ-7B, Prophet, and CEWI are assets shared between information collection and targeting purposes, which causes issues with having the right asset at the right time for the right target. Second, the cavalry squadron is typically performing either reconnaissance or security operations, which at times inhibits depth needed to observe target areas of interest (TAIs) or targets for the brigade. Last, the AN/TPQ-53 radar system provides acquisitions of enemy fires but is more of a reactionary target acquisition asset rather than a proactive observation platform. The BCT having an organic deep ground target acquisition asset will increase the unit's ability to layer assets in depth to optimize BCT level targeting for detection and assessment of brigade level high-payoff targets.

Insufficient Acquisition Assets at Brigade

Some would argue the RQ-7B, Prophet, and cavalry squadron within BCTs are suitable assets to support BCT targeting in the brigade deep area. First, RQ-7B is limited to line of sight (LOS) communications with ground control station (GCS), humidity, icing, and cloud ceilings. In the European theater the RQ-7B is not an optimal or reliant asset for most of the year due to dense overcast in the cooler months. The Prophet system has limited range and can be deployed dismounted but requires movement of heavy equipment and is not optimal for a deep reconnaissance role. Another consideration for Prophet is the requirement of processing, exploitation, and dissemination (PED) for signal intelligence (SIGINT) that will extend validation of targets. The cavalry squadron is optimal for target acquisition of brigade deep targets but is typically conducting operations in vicinity of the brigade close area. The squadron is also manpower dependent based on their task for reconnaissance or security operations, limiting their ability to position elements deep. In large scale combat operations (LSCO) it is likely BCTs will have less access to EAB assets due to the amount of land component forces bidding for the same limited resources. BCTs need to learn and adapt to fight with minimal external support but may still require increasing the organic capabilities within BCTs.

Acquisition Assets needed at Brigade

The BCT having a dedicated organic deep ground target acquisition asset will increase the unit's ability to layer assets in depth to optimize BCT level targeting for detection and assessment of high-payoff targets. Brigades historically had a dedicated Scout Platoon consisting of Scouts and Forward Observers in order to facilitate deep area target acquisition directly with the BCT HQ before modular formations were organized. This formation evolved into Combat Optical Lasing Teams (COLTs) consisting of Forward Observers in specialized vehicles with target acquisition lasing equipment and long-range communication equipment. These dedicated BCT assets enabled BCT level targeting with a direct line from sensor to BCT HQ to shooter in order to facilitate timely and accurate fires on brigade HPTs, provide essential information to answer the Commander's priority intelligence requirements (PIRs), and enable the cavalry squadron to focus on screen or guard operations

tasks if necessary.

Joint Fire Support Team Concept

The 1st Armor Brigade Combat Team, 1st Infantry Division (1/1 ID) tested a concept to fill this capability gap of a deep ground target acquisition asset with the Joint Fire Support Team (JFST) during exercise Combined Resolve XVI (CBR XVI) at the Joint Multinational Readiness Center (JMRC) in Hohenfels, Germany in December 2021. The JFST concept replaces the legacy COLT platoon with a similar approach of a platoon with four small four member teams of fire supporters that work in direct support (DS) to the brigade fire support element (FSE). During this particular rotation, the brigade did assume risk by reallocating forward observers from the maneuver units to form these JFSTs. A JFST consisted of a 13F20, Fire Support Sergeant, two 13F10, Fire Support Specialists, and one 1Z3X1, US Air Force Joint Terminal Attack controller (JTAC). The equipment and personnel of the JFSTs for 1/1ID came from the organic fire support teams (FiST) within the brigades' subordinate battalions. The sole purpose of these JFSTs is to be a dedicated BCT asset to provide early warning and observation for brigade level targets beyond the forward line of troops (FLOT).

What Worked

The utilization of JFSTs at Combined Resolve XVI (CBR XVI) proved having a dedicated brigade level target acquisition asset enables the unit to fight in the brigade deep area despite conditions in the area of operations. JFSTs increased the ground-based target acquisition capability beyond the FLOT, streamlined the sensor to shooter process, lessened the reliance on EAB and organic UAV assets for targeting, and enable flexibility for the BCT to utilize the cavalry squadron to focus on screening or guard operations.

A critical task for the JFST is to avoid detection from enemy reconnaissance efforts to maintain observation for the brigade. In order to do so, these small teams conducted these observation efforts through mounted and dismounted means far beyond the FLOT concealing their observation posts. Teams were equipped with HMMWVs (or JLTVs) for transportation, lightweight laser designator rangefinders (LLDRs), high frequency (HF) and satellite communication (SATCOM) equipment, and supplies for self-sustainment for extended periods. The proper equipping of the JFSTs enabled them to observe named areas of interest (NAIs) and target areas of interest (TAIs) for extended periods and provide timely reports and accurate targeting data for engagement while maintaining a small undetected footprint as much as possible.

The JFSTs enhanced the sensor to shooter link by directly communicating to the brigade intelligence support element (BISE) and the field artillery intelligence officer (FAIO) within brigade main command post (MCP). JFST teams provided this ability by reducing the middlemen in the sensor to shooter chain by reporting directly to the decision makers for target development, attack guidance, and fire mission processing. The JFSTs were also directly integrated into the JTAC support element of the 10th ASOS. The teams' positions in the brigade deep area facilitated the coordination to utilize air assets efficiently and effectively to engage HPTs. Trained fire supporters in Joint Forward Observation (JFO) and JTACs integrated into the JFSTs maximized the ability to use Joint Air Attack Teams (JAATs) to engage and destroy enemy formations. The situational awareness of these specially trained soldiers and airmen also provided the ability to redirect or refine the collection area of ISR assets supporting the brigade by providing reports of possible enemy presence or answering PIRs directly to the BISE ahead of time to permit reallocating those assets to another sector. The Joint Fire Support Teams consisting of these specialized soldiers and airmen would directly enhanced multiple efforts of intelligence collection and coordinated complex attacks on behalf of the brigade.

The JFST Teams provided much needed flexibility in operations for the brigade during CBR XVI. As the situation developed with the enemy, the brigade found a need to have the cavalry squadron conduct screening operations. This evolved into a recon-counter recon fight, limiting their ability to observe the deep area. The brigade sent in the JFST teams to establish observation posts to maintain acquisition capability in the deep area despite inclement weather conditions. As the battle developed, the cavalry squadron was able to focus on screening efforts and the brigade still received needed information to answer PIRs and develop HPTs for engagement.

What Didn't Work

The Joint Fire Support Teams presented unique challenges during CBR XVI with special support relationships, communication issues, and proper situational awareness. These issues stemmed mainly from the unfamiliarity of the purpose of the JFSTs, their role in the brigade, and ensuring feedback from the BDE MCP to the teams. The need for the JFST was identified during CBR Academics so the teams were pulled out of hide without any special training or considerations.

JFSTs being utilized by the brigade headquarters for observation of the BCT deep area presented a unique support relationship with the cavalry squadron. JFSTs maintained the brigade's ability to provide observation to the brigade deep area while the cavalry squadron conducted other operations, though the JFSTs still required sustainment support by providing rations, fuel, ammunition, and other supplies as necessary and at times communication relay support to pass along information when communication lines were not operating optimally. In future operations, solidifying the support relationship between the teams and the cavalry squadron will be paramount in order to sustain the JFSTs operations to feed the BDE MCP and maintain flexibility for the squadron.

The JFSTs operated in the BDE deep area making long range communications essential in order to provide reports and engage targets. Communication issues arose due to intense inclement weather conditions, possible jamming by enemy assets, or inability to secure satel-

lite link. These issues created gaps in capability for the teams to report pertinent information or call for support in critical times of the battle. JFSTs will need to be masters of HF, SATCOM, and short-range radio equipment in order to exercise full PACE plan in order to mitigate these issues and maintain communication with BDE MCP or the cavalry squadron.

Situational Awareness of the area of operations for the JFSTs is essential in order for the teams to fulfill their role for the brigade in acquiring targets and reporting PIRs. The JFSTs acquired targets and provided reports, though information from the BDE MCP was not being reciprocated back to the JFSTs as HPT and PIR guidance changed as the battle commenced. This led to an eventual lack of situational awareness by the JFSTs which led to conflicts with targeting efforts and intelligence collection. The brigade MCP must push updated guidance to these teams as the situation develops in order to ensure targeting and intelligence efforts accurately feed operations.

Recommendations

Joint Fire Support Teams can provide a much needed capability to the BCT to acquire HPTs, answer PIRs, and provide flexibility in reconnaissance efforts. The Soldiers and Airmen will need specialized equipment and training in order to facilitate these teams providing this capability. JFSTs will need a full complement of communications equipment from FM, HF, and SATCOM in order to ensure connection with the MCP. These teams will also need vehicles capable of transporting the team, though still minimizing their signature in order to remain undetected by enemy forces. Teams will also need to carry enough supplies to sustain the team for prolonged periods as it is a risk of being separated from the main force as the battle develops. Soldiers in JFSTs need to be experts in observation and reconnaissance by attending Joint Fires Observer (JFO) School and Army Reconnaissance Course (ARC). The equipment and specialized training will enable these teams to fulfill their role as the BCT deep area acquisition asset. BCT Staffs and Cavalry Squadrons will need to also train JFST operations in order to facilitate proper utilization and support for these teams. Incorporating JFST as assets in future command post exercises will enable staffs to practice utilizing these teams and understand the support relationships needed to maintain their capability.

The Joint Fire Support Teams could serve as a reliable asset that units across the Army could implement to provide brigades the ability to directly control fires in their deep area. 1st Brigade, 1st Infantry Division's experience in utilizing this concept during the rotation at Combined Resolve XVI directly enhanced the brigade's ability to conduct deep observation despite harsh conditions in inclement weather. The efforts of these teams in identifying HPTs and answering PIRs in a timely and accurate manner directly enabled the brigade to engage targets using air assets and indirect fire assets before contact on the ground with maneuver forces. The Army generating dedicated Joint Fire Support Teams for brigades would increase the capability of these formations to direct fires effectively and efficiently between the brigade close area and the division deep area.

The Battle now with Joint Fire Support Teams

The Devil Brigade faces an enemy force in the dense forested battlefield in the mountains of Germany. The Brigade's Joint Fire Support Teams are positioned observing critical TAIs on avenues of approach and identify a company of enemy armor approaching preparing for their assault. The JFSTs report to the BISE and FAIO of the enemy size, activity, location, unit, time and equipment. The FAIO generates the target, notifies the JFST the target's expected arrival time to the trigger is ten minutes. Simultaneously, the brigade fires support element (FSE) generates the fire mission and sends it to the field artillery battalion (FA BN) fire direction center (FDC). The FDC notifies the batteries to lay guns on the planned area targets with at my command (AMC). The enemy armor company approaches the trigger and calls for fire for effect (FFE) to the brigade FSE, the FDC, and to the batteries to commence firing. Shot over, shot out, splash over and splash out reports are given as the enemy armor enter the target area just as they clear the tree line into the brigade engagement area. The JFST reports desired effect achieved by destroying nine T-90s, forcing the enemy to abandon its assault and withdraw. The JFST's ability to maintain observation in the cold winter snow now enables the brigade to prepare for their own assault and pursue the enemy over the ridge.

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THE KILL WEB

DYNAMIC TARGETING IN MULTI DOMAIN OPERATIONS

By: COL Michael P. Stewart

All models are wrong, but some are useful.
— George E.P. Box

As the joint force faces increasingly complex threat systems and develops linked capabilities across all domains to counter those threats, we must also address our underlying processes and our ability to target those threat systems with the entire suite of tools available at any given moment. Specifically, we must adapt our model for dynamic targeting to meet the needs of current and future environments. The model imposed by the term "kill chain" is both incomplete and obsolete in reference to the dynamic targeting process. This model no longer accurately captures the complexities required to complete a dynamic targeting process in a contested electromagnetic environment. Instead, the dynamic targeting process for multi-domain operations must evolve into the concept of a "kill web" which provides multiple paths along multiple axes from a myriad of linked capabilities to attack the associated system that comprises the target. Further development of the kill web concept and its integrating capabilities should lead the joint force to a doctrinal definition of the term "kill web" for future incorporation into joint doctrine and applications.

The term "kill chain" has long been associated with the dynamic targeting process. This process is described by the steps of Find, Fix, Track, Target, Engage, and Assess (F2T2EA), as shown in Figure 1. That is, F2T2EA describes the chain of events in a process that leads from locating a target to creating desired effects on that target. Each step of the process can occur on a discrete platform linked to other platforms, as when a counter-fire radar acquires a rocket launched against friendly forces and then passes the location of the acquisition to an MLRS launcher or strike aircraft to engage. All of the steps of the kill chain can also occur within one platform, such as when a strike aircraft on an air interdiction mission with its radar, pilot, and munitions on board completes all of the dynamic targeting steps internally. While the term "kill chain" has never been doctrinally defined as the dynamic targeting process, most of the joint targeting community understands the association, and several publications describe the colloquial association of the term "kill chain" with F2T2EA.

Emerging concepts criticize the notion of a kill chain as being "linear and monolithic." While it was likely never intended, the metaphorical association of dynamic targeting with a chain does imply that the process is linear. Further, it follows that a break in one of the steps will disrupt the entire process, as a broken link makes a broken chain. Since the dynamic process should not be considered linear or monolithic, and a disruption at one node should not break the process, we find that we may have reached the logical limit of using a chain as the model to describe a process that actually spans multiple paths across capabilities and domains through the steps of F2T2EA. Such a process can be more accurately described as a kill web, not a kill chain. Using the model of a kill web to integrate capabilities through a dynamic targeting process, we can also build a more enduring concept to incorporate emerging technologies and capabilities in information, artificial intelligence, and machine learning.

Two Kill Webs: Target-centric and Capability-centric

Kill web analysis facilitates a multi-domain approach to target analysis and weaponeering. To

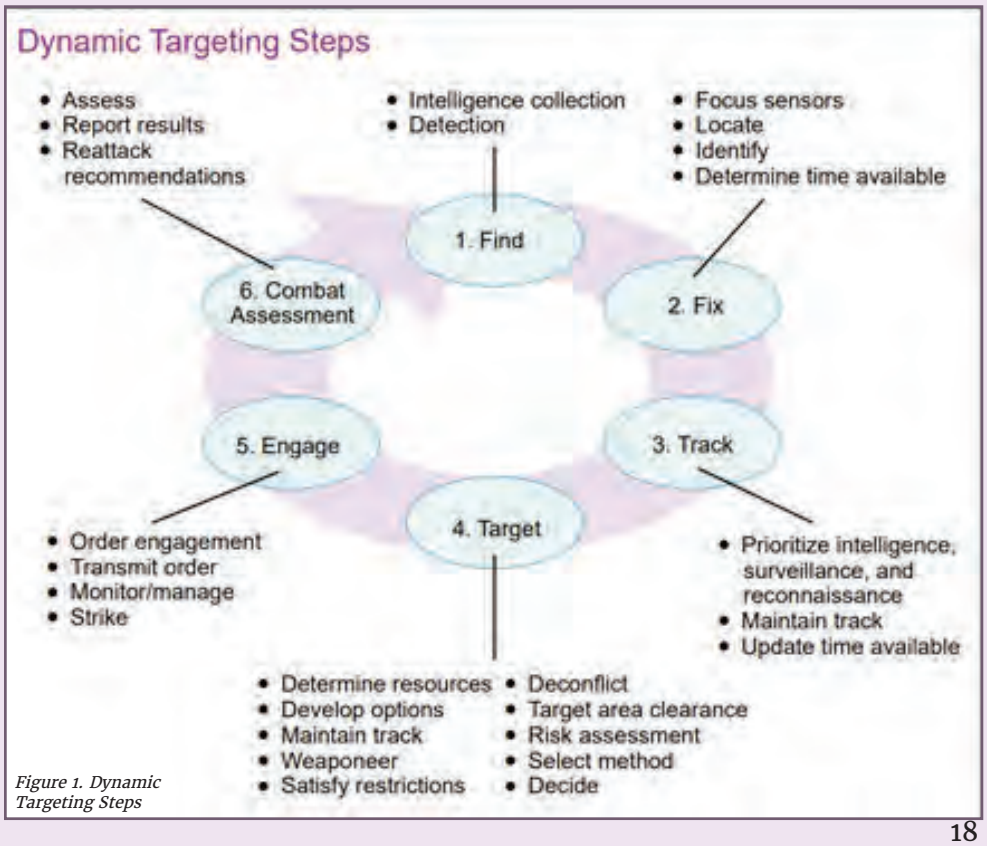
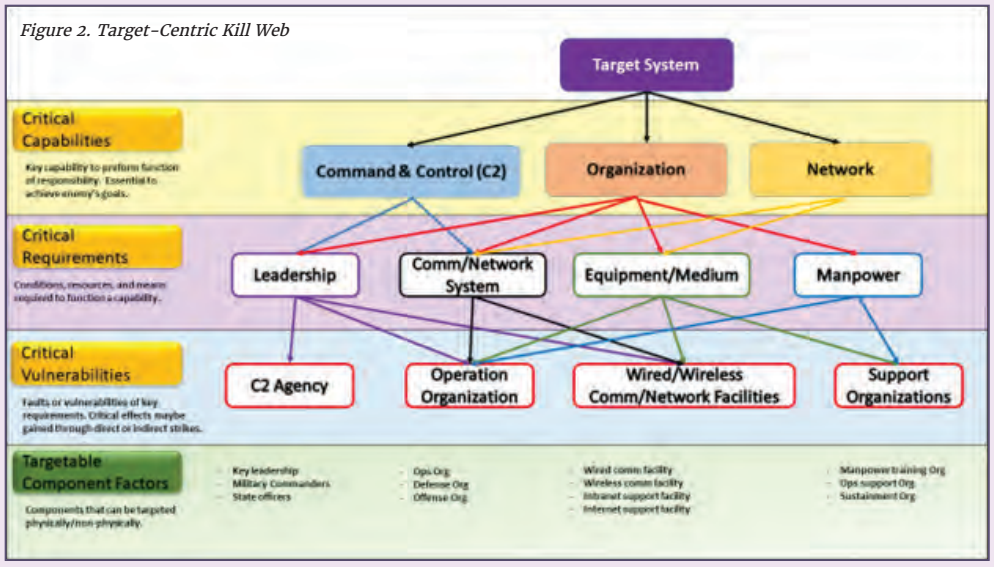


Figure 1. Dynamic Targeting Steps

Figure 2. Target-Centric Kill Web



effectively achieve the desired effects, the joint force is faced with the challenge of layering lethal and nonlethal effects to create convergence across domains to achieve operational objectives. This analysis drives defining a kill web in two approaches that are not mutually exclusive.

The first approach is target-centric. It describes the linkage of key nodes within a target system that when attacked can exhibit compounding second- and third- order effects. The target-centric kill web is essentially an application of Center of Gravity, or Target System Analysis (TSA), which has normally been associated with deliberate targeting. Pulling the concept of TSA into the kill web for dynamic targeting helps conceptualize how we can detect and differentiate high payoff targets within a selection of multiple acquired targets that may be simultaneously exposed. A diagram of this kind of analysis, which can be adapted as a target-centric kill web, is shown in Figure 2.

Deliberate analysis of a target system as a kill web reveals the relationships between critical capabilities, requirements, and vulnerabilities. These relationships, overlaid against an array of detected targets in a common operational picture, helps refine a high payoff target list and associated attack guidance in stride with a developing situation. Anticipating second- and third-order effects from a strike on one node or link within a target-centric kill web keeps the targeting effort synchronized to efficiently create the desired effects and achieve operational objectives.

For example, analysis of a target-centric kill web would reveal the links and nodes of a target system like a field artillery battalion. Using this kind of deliberate analysis could reveal that the most effective point to strike to break the target system may not be the howitzers or their support vehicles, but rather the link from the Fire Direction Center (FDC) to their guns. To locate and isolate the FDC, we can utilize a multi-domain approach. Within the Electromagnetic Spectrum (EMS) we can locate the FDC, jam the tactical network, and if required cue and execute a kinetic strike on the FDC. By disrupting or destroying this one link, we could render the system ineffective while limiting the friendly assets needed and eliminating the need to hunt and kill every gun and support vehicle. As the target system adapts to the loss of its FDC, continuous monitoring and analysis is required to conduct F2T2EA on the next vulnerability to keep the system from regenerating.

The second approach views a kill web from domain centric capabilities. In this approach, we describe a linked system of detection and delivery assets, providing multiple paths on multiple axes along which the critical steps of F2T2EA can flow across domains and capabilities. (See Figure 3).

As described in the Joint Concept for Fires 1.0:

Each dot represents a functional component of the F2T2EA process. The black lines linking these dots represent the kill chains from various domain capabilities. The blue lines represent alternate kill paths across different domains in kill webs. By being able to link any of these functional components across different domains, kill webs offer different combinations of sensors to shooters from all domains to complete the entire process for servicing a target. The scale and tempo of these kill webs require new processes or pre-authorized actions that supplant or augment current Joint Targeting Boards.

A capability-centric kill web describes how we disaggregate linear kill chains for specific capabilities and domains to create more resilient and adaptive paths from the "find" step through to the "assess" step. Constant awareness and links across capabilities become critical in applying a capability-centric kill web. The disaggregation and distribution of sensors and shooters, and the linkage across domains allows the joint force to find and follow an optimal path through the kill web. This also builds resilience across our targeting process by eliminating the notion that a break in any one node or link necessarily disrupts the kill web.

By combining the target-centric and capability-centric approach, we can arrive at a functioning definition of a kill web as the linked capabilities that provide multiple paths along multiple axes across domains to find, fix, track, target, engage, and assess effects against an associated system that comprises a target.

The Way Ahead

The evolution of weapons to incorporate networked warfare changes the targeting methodology. Each new system has built-in resilience that challenges the old concept of a kill chain and single-point vulnerability.

This evolution changes our lexicon. If the model of a kill chain is limited because of its implication of a linear and monolithic process,

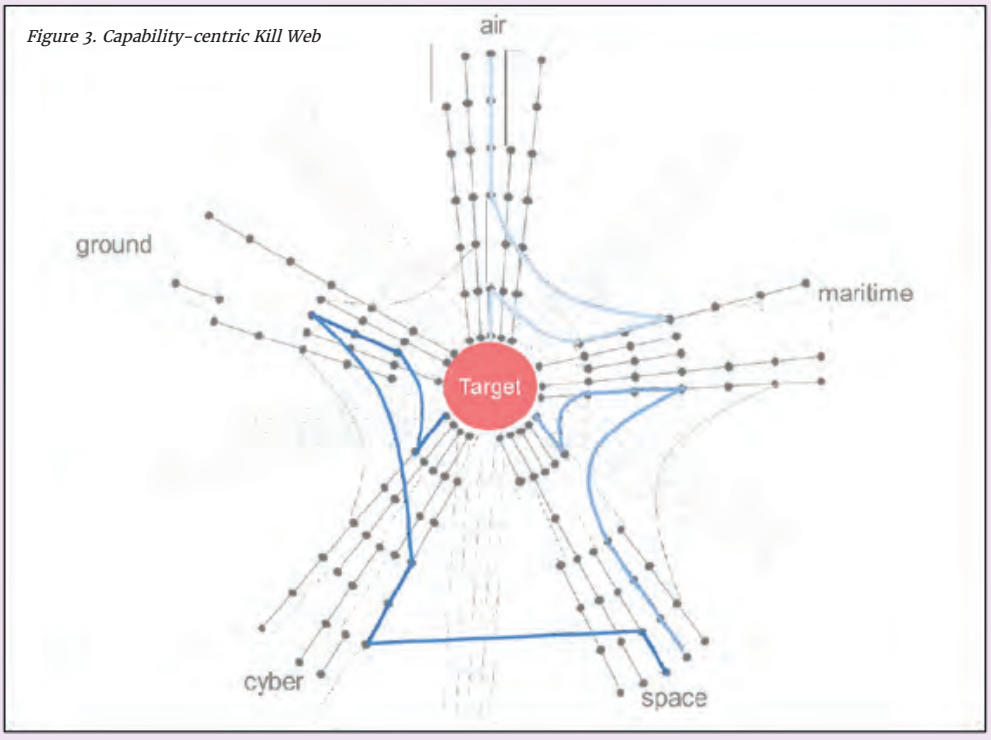


Figure 3. Capability-centric Kill Web

then a new model is necessary. Further, the term of art associated with dynamic targeting should be more formally established than a colloquial association; it should be a doctrinally defined association. The dynamic targeting process should be doctrinally associated with a kill web, not a kill chain. Concepts are emerging now that link an expanding network of sensors and shooters to create effects against increasingly complex target systems. These concepts fundamentally challenge the existing model of dynamic targeting as a kill chain. Instead of using a chain, the idea of a kill web implies a more correct model of both capabilities and target system as a linked series of nodes with multiple paths and multiple points of attack.

Further discussion and experimentation on a kill web concept should refine the proposed definition above into a doctrinal term associated with the dynamic targeting process. With such a doctrinal evolution, the emerging concepts and capabilities can begin to link the nodes of the kill web together using an integrated network enabled with artificial intelligence and machine learning. Our fundamental understanding of a target as a system in its own right, with associated nodes and vulnerable points, can also be captured in the model of a kill web, and the method we use for conducting target system analysis can adapt with emerging sensors and networks.

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COL Michael P. Stewart is the current commander of the 434th Field Artillery Brigade at Ft Sill, OK. Stewart has served in the Army since 1998, and has seen various commands at Fort Belvoir, Fort Polk and at Fort Sill. He commanded a combat battalion in Iraq during Operation Inherent Resolve before coming to Fort Sill.

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WE GO TOGETHER

By: MAJ Wiley Grant

The Rodriguez Live Fire Complex during the August 2022 CJFCX. Elements from across 1st ABCT, 1AD and 16th Mechanized BDE (ROK) conducted live fires focused on interoperability and readiness.

On a cloudy day in the Korean countryside, elements from two brigades stood prepared to defend the Rodriguez Live Fire Complex (RLFC) from invading DPRK troops to the north. Long periods of quiet on the otherwise peaceful day were suddenly interrupted with the sound of artillery, mortar, and tank rounds impacting on the simulated invading force. This event, a Combined Joint Fire Coordination Exercise (CJFCX) six months in the making, highlighted the progress made with our partner forces from the Republic of Korea Army (ROKA) and identified the work that still needs to be done to improve our forces' interoperability.

Introduction

The CJFCX executed in late August of 2022, showcased the interoperability and readiness of the Combined 2nd Infantry Division with it's assigned counterparts in the ROKA 16 Mechanized Brigade as well as elements from the ROKA 977 Field Artillery and 1st Aviation Brigade. The final event saw the execution of live fires across the Korean Peninsula with both US and ROKA Multiple Launch Rocket Systems (MLRS), AH-64 Apache helicopters, 155mm Self-propelled howitzers, multiple calibers of mortars, and M1 and K1 tanks. Throughout all this, ROKA and US command posts exercised their ability to identify and track hostile forces and pass targeting information across the combined force. The Ready First Combat Team and 2nd Infantry Division fires enterprise enabled the exercise by establishing systems in the human, procedural, and technical domains of interoperability.

Human

The first step taken to ensure interoperability across the Combined Republic of Korea (ROK) and US force was the creation of several LNO teams within the participating ROKA units. Established at each level of command, the personnel in these teams enabled effective communication between US and ROK commanders and allowed for the synchronization of Joint fires and effects across the Division. Especially important to these teams was the inclusion of subject matter experts as the team leads. As a fire coordination exercise, most of these leaders were field artillery officers at the Brigade and Battalion levels which enabled them to assist with knowledge of the Division's overall fires plan, US capabilities, and the digital fires infrastructure. Rank, additionally, was a key consideration when assigning proper personnel to the LNO teams. Ready First chose to provide leaders of a rank proportionate with the echelon they would support. While the upfront cost of losing the Brigade FSO or Battalion FDO appeared to be steep, the increased interoperability provided by having those personnel synchronizing with adjacent units provided great rewards.

Another important point identified during initial planning for the LNO teams was the identification of bi-lingual personnel to serve as interpreters. The number of American service members that speak Korean is very small compared to the number of ROKA that speak English. This created a need within the LNO teams to rely on attached ROKA staff officers as well as any English-speaking ROKA members from the supported units. Of note, the 16th Mechanized Division did an excellent job at increasing the number of English-speaking service members in their Brigade Command Post which allowed for excellent communication throughout the exercise. Going forward, the ROK-US reliance on a small num-

SPC Ethan Wingard, 13F, discusses fire support procedures with a ROKA forward observer

ber of bi-lingual speakers could pose a major issue should hostilities commence, and casualties rise. To address this, the multi-national force must develop a system to mitigate the risk posed by the loss of bi-lingual personnel during combat operations.

Procedural

As the LNO teams worked with their supported ROKA units, they identified several differences in the processes and procedures that US and ROKA forces used in their doctrinal fights. One example of this was in the use of a Coordinated Fire Line (CFL). The definition of the CFL in US doctrine states that it is, "A line beyond which conventional surface-to-surface direct fire and indirect fire support means may fire at any time within the boundaries of the establishing headquarters without additional coordination" (JP 3-09). The CFL is a permissive coordination measure to allow for more responsive fires and effects against an enemy force. However, while working with ROKA forces during the CJFCX, LNO teams identified that while the CFL in the ROKA is doctrinally the same, ROKA forces generally view it as a restrictive fire support measure. There are many possible reasons for this differing viewpoint including the different organizational structures within the ROK Army and the generally restrictive measures employed by Combined Component Commands throughout the Korean peninsula to coordinate the sheer volume of air and ground forces expected to be positioned there during a conflict.

These same reasons likely also contribute to the different view that the ROK Army units have on the clearance of ground prior to the execution of indirect fires and close air support. The ROK Army forces have an exceptional adherence to safety both in tactical scenarios and real-world training. Where US forces generally abide by Risk Estimate Distances (REDs) when determining the echelonment of fires, ROK Army forces increase that distance where possible to ensure that no fratricide occurs. When the 2ID Joint Air Ground Integration Center (JAGIC) attempted to establish a kill box for CAS during the CJFCX, 16 Mechanized Brigade maneuvered its forces an additional 200 meters beyond the 800 meters established by the JTACs. Different procedures such as this could potentially desynchronize fires if not identified beforehand. Identification of Tactics, Techniques and Procedures such as this allowed Ready First LNO teams to help 2ID adjust plans going forward to ensure that enemy forces were rapidly engaged. Understanding how our partners fight and how we can adjust our processes and procedures to better synchronize our forces is an essential task of LNO teams to enable greater interoperability and Combined readiness.

Technical

The CJFCX demonstrated the great ability of US and ROKA forces to work together in combat. Despite this success, LNOs identified that a lack of compatible communications and mission command systems prevented greater interoperability. The Brigade LNO team placed with the 16th Mechanized Brigade brought with them a CPN with supporting communications operators, a COVIN-K dish for upper-TI redundancy, an AFATDS, a CPOF, VOIP phones, and FM radios with a variety of ground mount antennas. These systems enabled the LNO team to communicate with the Ready First Combat Team and 2ID over upper-TI and FM comms. Given an overall lack of compatible equipment, the LNO teams were in most cases the quickest and sometimes the only method of receiving information from the Division during the exercise. Throughout the exercise, the 16 Mech LNO team was responsible for sharing critical enemy intelligence and fire mission data using vocal transmission and handwritten notes. In a real combat scenario, with the fog and confusion of war, these methods could quickly devolve into a large game of telephone where the incoming data might not be correct, if it arrived at all.

The problem with systems interoperability stems from several sources. The largest of these is that the shared network infrastruc-

ture for US and ROK forces on the Korean Peninsula (Centrix-K or CX-K) is not widely used by many ROK forces. They use a similar upper-TI network (TICN) to communicate intelligence and targeting data across their command posts using the Army Tactical Command Information System (ATCIS). Neither the TICN network nor the ATCIS system is currently compatible with CX-K, though the connection is possible given the appropriate approval from senior government officials and the removal of existing policies and firewalls. Unless those actions should occur, solving the interoperability problems between a US AFATDS and a ROK ATCIS is not possible. Furthermore, while a system does exist that allows for US and ROKA firing data to be transferred across our two networks (Joint Fires Operating System-Korea or JFOS-K), that capability is retained at the ROKA Corps and Ground Component Command level. Thus, the first step to solving the interoperability problem is ensuring that our networks are interoperable.

If a solution is found for the interoperable network problem, there will still be further barriers to the sharing of firing data between ROK and US forces. These barriers will shift to the systems connected to the network, rather than the network itself. Lower echelon units that rely on AFATDS and ATCIS will still not be interoperable due to the design of these systems. What is required in this case, is a shared software or hardware solution that allows for targeting data to be shared across Combined force in a rapid and accurate manner. The solution to this problem already exists in the Artillery Systems Cooperation Activities (ASCA) software current in use by NATO forces in Europe. ASCA would allow ROK and US forces to quickly mass Joint fires and effects to better achieve targeting goals in support of combat operations. Until a product like ASCA is introduced onto the Korean Peninsula, ROK and US forces will continue to rely heavily on LNO teams and slower, alternative methods of information transfer that drastically reduce our combat effectiveness.

M109A7s from 2-3 Field Artillery fire in support of the CJFCX.

Conclusion

In summary, the Ready First Combat Team and the 2nd Infantry Division made huge strides in ensuring the readiness and interoperability of the Combined Division during the Combined Joint Fire Coordination Exercise in August 2022. The effective use of LNO teams and key equipment helped to overcome existing barriers to interoperability and allowed for an effective demonstration of the capabilities of a Combined force. Looking to the future, the challenge remains how to ensure the rapid and efficient transfer of firing data between US and ROKA units at the division level and below. Having identified this challenge and the many others facing interoperability between ROK and US forces, the mission now is to find efficient and cost-effective ways of overcoming these challenges to ensure that the Republic of Korea and it's US partners are always ready to "Fight Tonight".

About the Author: MAJ Wiley Grant is the Fire Support Officer for the 1st Armored Brigade Combat Team (Ready First) of the 1st Armored Division and was the lead brigade staff officer responsible for the planning and execution of the August 2022 Combined Joint Fire Coordination Exercise.

An M3A3 from Atlas FiST and a ROKA forward observer team call for fire in support of the simulated brigade defense during the CJFCX

BATTLE GROU

Moving the U.S. Army JFO Program Forward

Observations from a rotation as NATO Enhanced Forward Presence, Battle Group Poland

By: 1LT Austin Wilhelm and SSG Bismark-O'Brien

Operation European Assure, Deter, and Reinforce

In February 2022, 1-185th Infantry arrived at Bemowo Piskie, Poland, and assumed responsibility of NATO Enhanced Forward Presence, Battle Group Poland. 18 Joint Fires Observers (JFOs) from Headquarters and Headquarters Battery (HHB), 2-146th Field Artillery supported two infantry rifle companies and one reconnaissance troop through several multinational exercises. JFOs from 2-146 also worked with NATO partners in Estonia, Lithuania, Romania, and Poland, providing targeting data to over 50 flights of U.S, U.K., Spanish, German, and Polish aircraft. However, 6 months prior to their deployment, the 1-185 fire support platoon did not have a single current JFO.

This article will discuss some of the challenges two Joint Fire Observer Evaluators (JFO-E) observed in their efforts to train junior JFOs and operate in a joint environment. The authors have found, in many cases, that the lack of established structure and oversight across the force, inefficiencies of tracking methods and systems, and lack of appropriate sustainment and equipping for the Army JFO program are hindering the application of joint firepower and limiting interoperability. The combined issues lead to decreased readiness and administrative burden within the Army JFO program. The problems can be broken into three broad categories: structure, training management, and sustainment.

Structure

Managing a JFO program at the Brigade Combat Team (BCT) level and below often seems to occur in

a vacuum. Though the JFO Memorandum of Agreement (MOA) establishes "JFO certification and qualification training requirements and delineates the standardization and oversight responsibilities for JFO programs", there is no element actively working to unify and standardize JFO efforts between BCTs in the Army (JFS ESC, 2020, Pg. 1). Though there are exceptions, JFO programs typically exist isolated within one brigade with no oversight at the division and corps level to align that program with the rest of the force. In January 2021, the United States Government Accountability Office (USGAO) published Close Air Support: Actions Needed to Enhance Friendly Force Tracking Capabilities and Fully Evaluate Training. This report identified "a lack of oversight of the Army's JFO program", particularly above the brigade level (pg. 39). Almost two years later, we have observed no change to this situation from our perspective at the company and battalion level.

Because Army JFOs are certified at formal schoolhouses and then sent to units across the Active Component and National Guard to maintain currency, there are wide discrepancies in an individual JFO's ability to maintain that currency based on what unit they are assigned to. Of the 2,450 L7 slots on the Army MTOE, some 1300 are active component with the remaining 1145 being National Guard (Sink and Ostrin, 2022, Pg. 58). We experienced, as part of the training cycle leading up to arriving in Poland, that almost all JFOs coming to the 1-185 fire support platoon from other brigades had attended the formal school house but had not

conducted a single simulation or recorded a training event for up to four years since becoming a JFO. While the 2021 report from the USGAO identified that specific sampled units "had less than 50 percent qualified JFOs", we have experienced that several Brigade level elements simply do not even maintain JFO Programs (GAO, 2021, Pg. 39). For example, despite being home to the 79th IBCT and 40th Infantry Division Headquarters, there is no functional Army JFO Program in the state of California. The 2015 consolidation of fire supporters under the umbrella of Division Artillery has not seen a higher echelon taking ownership of JFO Programs above brigade level across all Army formations.

Training Management

The issue of a lack in oversight is compounded by how JFO training is currently tracked. Across the Army, "there is no identified database to maintain JFO training above the brigade level, and JFO training qualifications and currencies are being tracked manually at the unit level" (Pg.75) This makes it almost impossible, at this time, to determine how many Army JFO slots are filled with fully qualified and current JFOs. JFOs typically move from unit to unit with paper packets intended to capture the JFOs training record. Soldiers moving from units that struggle to keep accurate records of completed training will often arrive at a new unit with no documents or records save those provided by whatever JFO school they attended.

There is additionally a lack of standardization in how units compile these records, and over-reliance on the JFO to maintain training records often leads to training not being recorded and loss of qualification/certification. Ultimately many units demonstrate an inability to keep detailed records for reporting and planning purposes. A solution to this problem would be to move to a digital record manager for programs to input and save vital records. Though this is implemented in the Air Force for our TACP partners, it is, to date, not done in the Army.

One short-term solution we found to be effective was fully digitizing all JFO-related packets within the unit's Microsoft Teams account. Microsoft Teams is a common administrative platform across all brigades in the Army. Building the JFO program into Teams served two major functions. First, it created transparency for higher headquarters through easily buildable excel products within the platform. Second, it creates an enduring, easily transportable record of each JFOs training history.

If all JFO programs united into a common Microsoft Teams workspace, it would not only allow program managers to easily move packets between brigades, but it would also create a space for collaboration and information sharing between those program managers. This could be an effective intermediate plan until the Army moves to a fully digital tracking system for its JFO program.

There are two long-term solutions to training management. One would be to identify the training requirements and task, conditions, standards as outlined in the MOA and incorporate them into DTMS as well as identify the positions that would require the completion of those tasks. This utilizes existing Army programs for training management. The second would be to develop as parallel system to DTMS to allow for easier tracking of training and digital certification from both JFO-Es and JTACs. Both systems would allow oversight from higher headquarters and components and enable reports of training certification and readiness across the force.

Sustainment

Equipment proved to be the most difficult challenge for the JFOs assigned to EFP-Battle Group Poland. In many BCTs, Army JFOs are simply falling behind the rest of the Joint Fires Community in understanding and employing communications equipment. Lack of equipment or equipment incompatibility led to our program being unable to organically meet many of the communications-related JMETL tasks as outlined in chapter ten of the JFO MOA; particularly Digitally Assisted Close Air Support (DACAS) and Video Down Link (VDL) requirements. Of primary concern was the communication incompatibility between U.S. Army radio systems and USAF radio systems and our total lack of DACAS systems. This drastically increased the time for coordination and target data acquisition and eliminated the JFO ability to talk directly with the aircraft for correlation.

Army JFOs serving as Forward Observers at platoon level are very often only allocated one or two 1523E/F (SINCGARS) radios. The JFO MOA recommends that JFOs

be equipped with "man-portable, multi-band, long range, and beyond line-of-sight (BLOS) communications equipment: capable of communication with Command Net, Fires Net, Tactical Air Direction" in FM, UHF/VHF, and SATCOM (EFS, 2020, pg. 49). However, most dismounted JFOs are limited to SINCGARS radios, making it impossible for them to integrate into most tactical air nets. Company FiST elements are inconsistently able to fill this communications gap with mounted radio systems, but at great cost to mission processing time. Our overreliance on FM-based NETs also caused setbacks in our ability to interoperate with NATO Joint Fires assets. Additionally, the need to communicate up Army channels and across to USAF or NATO partners hinted at possible force structure design issues that only further increased mission processing and delays of fires.

Some Company FiSTs were able to temporarily source Harris PRC-152s from their supported maneuver companies, greatly increasing the capabilities of their communications networks. After training with and employing the PRC-152, we found it to be the most reliable means for voice communication with TACP and air assets However, this practice of borrowing equipment not organic to our table of organization and equipment (TOE) is not sustainable and does not address the underlying issue many BN fire support platoons face.

We found that we were significantly behind the curve with DACAS employment and associated equipment. The JFOs in the 1-185 fire support platoon were able to build rapport with the BN TACP from the 116th Air Support Operations Squadron and get significant exposure to the portable Link 16 radio AN/PRC-161 (BATS-D) and DACAS processes. However, during all training events, JFO's were reliant on the TACP for communications and equipment support to fully integrate into the kill-chain.

Without fielding radios like the AN/PRC-161 to JFOs across the army, they will be unable to consistently train and refine DACAS techniques, tactics, and procedures (TTPs). It should be noted that other Army JFOs operating in the EUCOM AO did have DACAS capable handheld radios like the AN/PRC-161, however, their commands purchased those radios with their own procurement funds. We feel that, at this point in time, all JFOs operating at platoon and company level are long overdue for a communications equipment upgrade. This is necessary for JFOs to keep up with current CAS TTPs employed by TACPs.

Conclusion: It is Time to Move the Army JFO Program Forward

Due to the same tracking issues we have identified, it is difficult to determine the full extent that these issues are affecting the rest of the JFOs in the force. It is our intent to bring these issues to the Field Artillery community and help move the Army JFO program forward.

Expanding the oversight structure at levels above the BCT and moving to modern digital tracking systems will first give the Army Joint Fires community a better idea of where it currently stands. It could also provide JFO programs within BCTs the support and structure they need to sustain themselves more effectively than if they existed isolated with little support or oversight. While we understand that some Division Artillery formations have filled this gap, not all have.

Next, deliberate steps need to be taken to ensure that all Army JFO programs are equipped with, at a minimum, USAF and NATO-compatible voice and DACAS radio communications platforms. Some BCTs may be at the cutting edge of this technology, but others are falling behind the curve. The consequences of equipment capability were felt especially sharply at the platoon to battalion level, where mission execution often relied far too heavily on jury-rigged, temporary solutions.

About the Authors:

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SSG Bismark-O'Brien graduated from Hayfield Secondary School in Alexandria, VA. He enlisted in 2015, as a 13F; Joint Fire Support Specialist. He has served in the FA as a Forward Observer, company Fire Support NCO, and battalion targeting NCO. He has 4 years of overseas service in the CENTCOM and EUCOM AOs. SSG Bismark-O'Brien holds a BS in Political Science from the University of Maryland (2021) and is pursuing a master's degree in Adult Education at Auburn University.

Maintaining Proficiency Through Interoperability

By: CPT Joshua Keenan, FA

Army Directive and EUCOM. Spring 2022. Enter Presidential Directive for action, authorizing and ordering M777A2's to be shipped to Ukraine in support of their defense against Russian aggression. In the late hours of a grueling weekend, Soldiers from C Battery, 5th Battalion, 25th Field Artillery Regiment, 3rd Infantry Brigade Combat Team, 10th Mountain Division work tirelessly to prepare, stage, and bid farewell to their M777A2 Medium Towed Howitzers. These cannons will be soon shipped to the European Theatre to eventually be part of a strategic package that NATO will provide for the Ukrainian defense of Russian aggression in this protracted Russo-Ukrainian War. Soon these Soldiers and their leadership will face months without their cannons and still be expected to maintain training and proficiency and prepare Soldiers for the upcoming deployment readiness exercises and eventually deployment. The most experienced M777A2 Soldiers on today's modern battlefield are Ukrainian. Cannon, rocket, and missile fires are being conducted on both sides of the conflict with numerous pieces of equipment and methods of execution. The Ukrainian conflict is indicative of the effective use of the M777A2 in a Large-Scale Combat Operation. Given the necessity of our country's support to the conflict, how does a M777A2 battery maintain proficiency without howitzers. The following article details C/5-25th FAR's experience. (See Fig. 1)

Pay in mind that the last time the Soldiers of Carnage Battery shot live rounds was February 2022 during an Artillery Table XV during support for the 75th Ranger Regiment at JRTC, 60 days prior to their Easter present to the Ukrainian front. Within 30-, 60-, and 90-days proficiency begins slowly declining as routine repetitions and crew drills can no longer take place. Carnage supported Cadet Summer Training and saw a majority of Soldiers depart for Fort Knox, Kentucky. A battalion change of command and eventually a battery change of command will be added in the transition from Summer to Fall. All the while the Soldier's ability to send artillery rounds through a cannon atrophies. The 'how' became a little more complicated.

Interoperability: Active Duty and the Army National Guard. So, no joke, there I was sitting as the AS3, my new boss looked at me and said, "Find some M777A2s and figure out how to have Soldiers train on them." As a former New York Army National Guardsman, I looked at him, "Yes sir.", and went back to my office to pick up my phone. My understanding and knowledge of MUTA (Multiple Unit Training Assembly) immediately helped frame questions and begin planning concurrent with the units called. The first phone call was to a friend who is still currently in the Louisiana Army National Guard. Not of the same MOS but willing to help, he pointed me in the direction of one of the State unit's switchboards and through a series of calls I got in touch with the Active Guard Reservist (AGR) present for the day and began the conversation. While I coordinated with our resident state our Battalion Master Gunner called the Texas Army National Guard. At the time the Texas Army National Guard BCT Commander was the BDE Rear-D Commander and familiarity had already existed. A call was even placed back to my home state as I reached out to my old Fire Support Non-Commissioned Officer to ask where the NYARNG M777A2s were training. Many handshake conversations later, the S3s for our respective units began the coordination. 1st Battalion, 133rd Field Artillery of the TXARNG and the 1st Battalion, 141st Field Artillery of the LAARNG were on board and more than supportive. DIVARTY, 10th Mountain Division also saw an opportunity with 2/10th MTN DIV collective training event 'Mountain Peak' and offered their assistance in the fashion of utilizing C Battery, 2nd Battalion 15th Field Artillery's newly acquired M777A2s post-exercise.

Figure 1

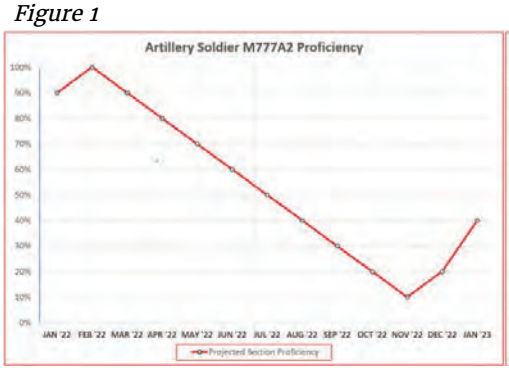
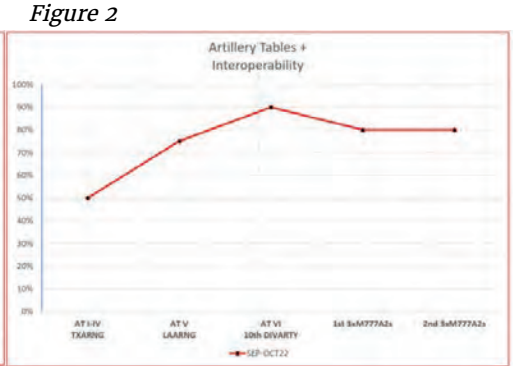
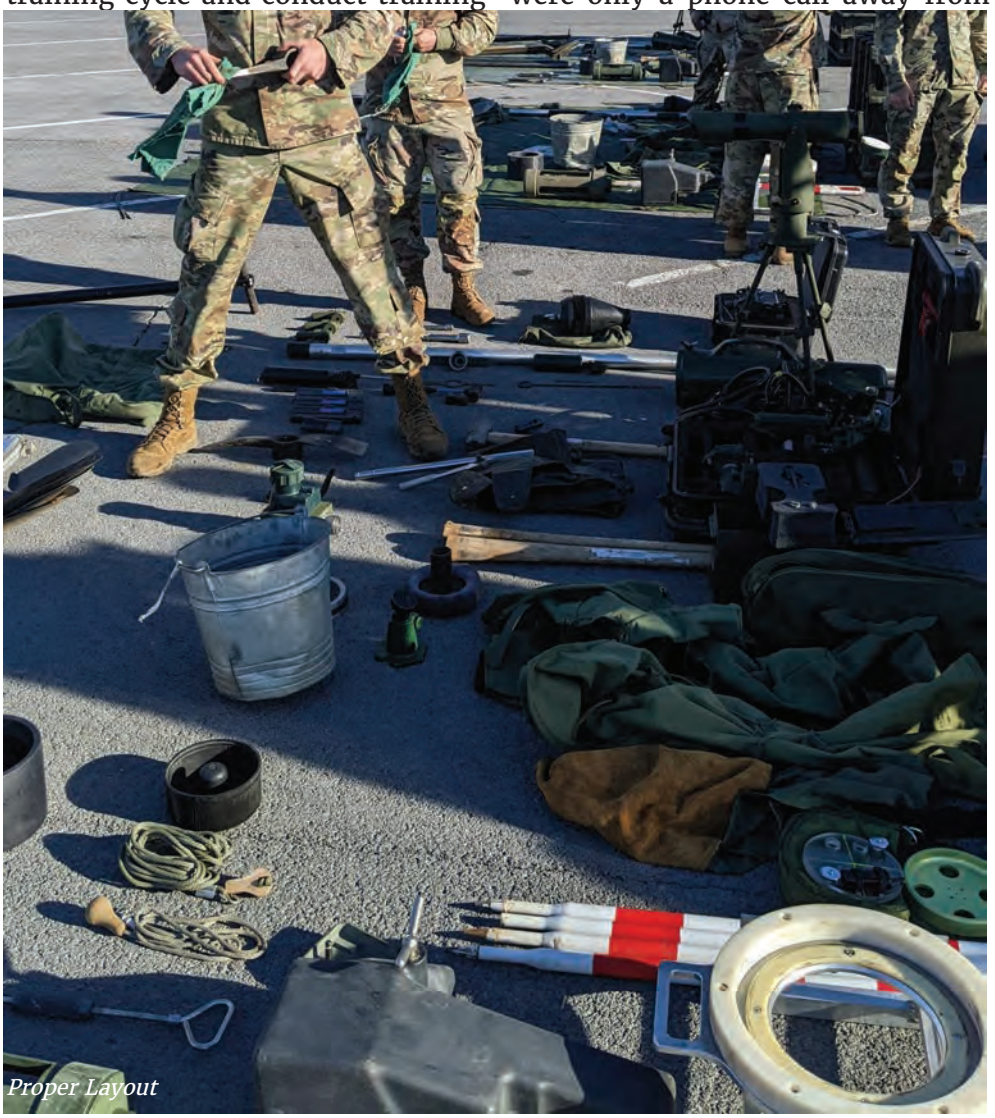


Figure 2



On August 2022, our Battalion conducted a change of command, and I was the new Charlie 'Carnage' Battery Commander, primed to see through what had started at my own desk weeks ago in the S3 shop.

Doctrine: Artillery Tables and Property Handover. The field artillery branch has certification and qualification tables that we conduct as a progressive gated training cycle to start with small unit level operations and then finish with larger scale unit training events. Artillery Tables I-IV would be executed with the TXARNG's howitzers and training land. Table V would be conducted with the LAARNG's howitzers and their training area. Finally, with DIVARTY providing support and oversight, C/5-25 FAR would fly to Fort Drum, New York to conduct AT VI, a live fire howitzer section qualification on C/2-15 FAs systems. From September to October, we would conduct a 40-day training cycle and conduct training on three separate unit's M777A2s in three different states. (See Fig. 2) Plan in place but now to the property. Rather than 3161 we conducted thorough, dress-right-dress, layouts of equipment and 2062 from end-user to end-user, section chief to section chief. By bill of materials (BOM) and technical manuals from Texas, Louisiana, to New York the amount of attention to detail we had in equipment was there. A change of command style layout was conducted and was key to identifying anything and everything the section chiefs and crew members needed to understand the equipment they were receiving prior to their own PMCS. (See Proper Layout Picture) It helped that the facilitators of our equipment were more than willing to assist and always had representatives there to assist. From the ARNG we had no less than an (AGR) Active-Guard Reserve representative, a 91F Artillery Repairer, and were only a phone call away from coordination with MATES (Maneuver Area Training Equipment Site) for contractor support. In New York, from our active-duty component, supporting us was 10th DIVARTY staff to include the S4, PBO, HHB, and FSC components who assisted in the layouts and equipment procurement. Everything from fuel cans, live artillery rounds, and hot chow came from lateral planning while we conducted our training in the weeks prior. Exactly what a DIVARTY should be supporting their artillery battalions with. We were very deliberate at every turn on property. A positive by product of this path was equipment and proficiency was gained because of this path. In a very short window, we signed for two howitzers at the TXARNG, two howitzers, with the LAARNG, and three howitzers from C/2-15 FA. Now how do we use this support and not waste months of planning and coordination?



Proper Layout

Efficiency: Time and Effort. Prioritizing and maximizing time and Soldiers hours to accomplish tasks efficiently. Planning the artillery tables at a location is simple but planning an hour-to-hour schedule in a limited time window has more to it than a broad stroke. Leaders and Soldiers were instructed to push for competency and the will to train until understanding took place. Section chiefs then took onus to account for each Soldier and man hours required they had and train in areas they knew needed extra attention and prepare for their upcoming tests. These man hours were managed down to the minute to ensure optimal timeline planning. If a Soldier required extra attention and learning, the other sections were willing to absorb them and help them address gaps in knowledge of actions. Platoon leadership developed hour to hour schedules based of Task Training and Evaluation Outlines within the subtasks of the Artillery Tables and built rotating schedules necessary for the limited amount of equipment we were using. Downtime from a howitzer meant class time. Class time meant doctrine, slides, and testing. Once with the howitzer rarely was there a time when

Breech Block Maintenance

PL Watching Crew Drills

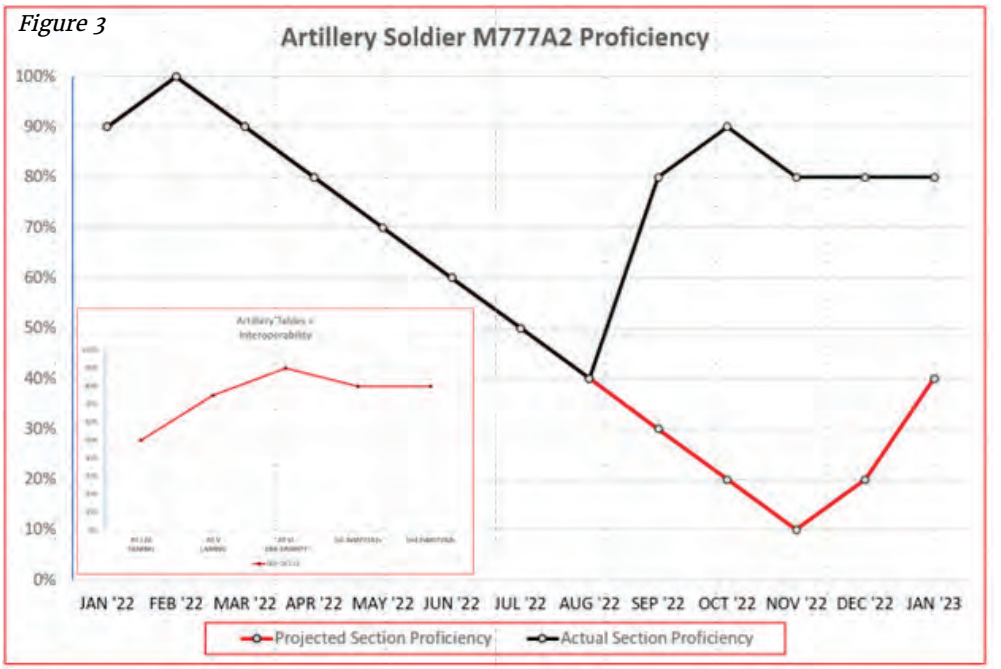
Soldiers weren't rotating from position to position to laterally understand their crew. Soldiers were learning their level and one level up if a failure occurred and they needed to step up or move position. (See Breech Block Maintenance and PL Watching Crew Drills Pictures)

Fleeting Up: A result of our training was that two PFCs were able to become Gunners for their respective howitzer sections, held for SGTs, which we didn't have enough of. Enabling success despite personal shortages was the theme for our battery. It's promoted and encouraged for Soldiers to train levels up to eventually fill in and accomplish learning at a higher level. I can't stress enough the need for retraining and the planning for retraining. Especially retraining windows when planning with a small window of opportunity. Soldiers and leaders took time through their own planning to account for extra hours of both study and execution. Even when we anticipate that we will have quick success for a task from a TE&O we still allot time incase things don't pan out as planned, forcing us to adhere to the 8-Step Training Model.

Motivating Soldiers to put forth effort and accomplish tasks efficiently rather than mailing it in was the catalyst for this success. At every level leadership engagement was present, leaders found a way to make it happen. Lieutenants were present and learning each task that the Soldier had to perform, leading from the front. Non-commissioned officers were instilling discipline through multiple methods of engagement and leadership. They provided not only the backbone objectives to our planning priorities but execution by enforcing standards. The section chief's level of involvement in planning enabled our unit to finish our training cycle by flying up to Fort Drum, New York and firing live rounds to complete our Table VI qualification. This was also a motivating factor as about 80% Soldiers hadn't fired a live round for half a year or since their AIT upon arrival to the unit. The culmination of weeks of preparation and training bore fruit and success for these Soldiers, and it wasn't lost on them that they accomplished something that is unique to 2022. We adapted and overcame. Our success was not only from our own efforts but the other participating entities we engaged with who were all of different states and organizations. First and foremost, what was on my mind before executing this training cycle was professionalism as professionalism and proficiency require time and effort as well.

Professionalism and Respect. One thing NCOs taught me a long time ago while I was serving in the New York National Guard was respect. Respect for Soldiers and people regardless of their story you may not know or think you know. Take care of Soldiers, do the right thing, and be a good person. Whether it's a handshake or a casual conversation about life I've learned to take the time to treat everyone with the same level of dignity and respect that Soldiers deserve. Needless to say, I felt immediately at home when coordinating with the Soldiers and leaders from the ARNG. The response to assist and provide was nothing short of astounding and the tone was set for my battery to not only maximize

Figure 3

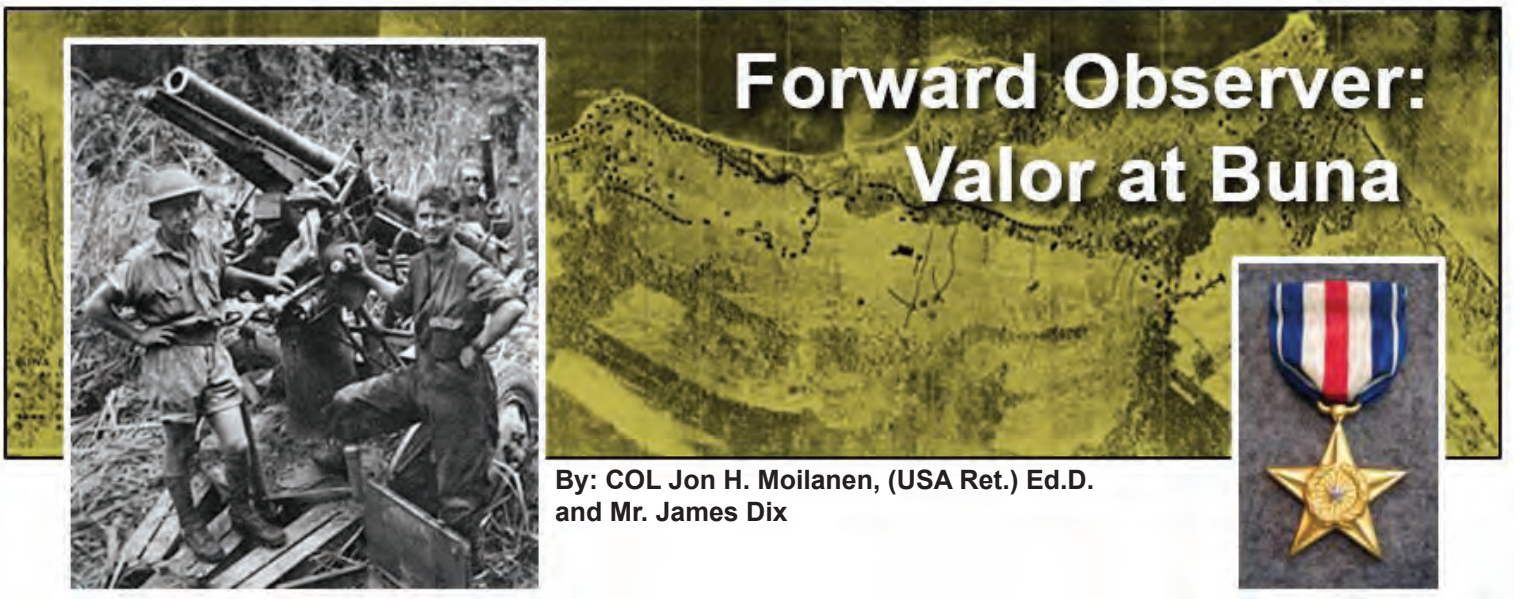


the amount of training time and efficiency available on another unit's system but to be professional and grateful for their help. Active-duty units can also use their subject matter experts to enable COMPO 2 unit's success as well. We assisted them by providing Master Gunner and Digital Master Gunner assistance during the TXARNG's annual training and helped troubleshoot digital systems that we would soon be using. Our MG also helped provide training mentorship to the LAARNG MG during our TBL V certification. At the end of the day, we are all still just Soldiers. The level of respect I have for these two units is immense and the notion of 'weekend warriors' is still a fallacy I combat to ensure we take our peer Soldiers seriously. My experience with the ARNG, as a guardsman and active-duty Soldier, continues to be cemented as a professional organization that utilizes minimal allotted time to accomplish a wide breadth of tasks and drills as Soldiers and citizen Warriors. An organization that absolutely requires efficiency to achieve proficiency.

Conclusion: The Way Ahead for Interoperability. The Army continues to provide support for the on-going conflict in Europe. More directives might come, but it is Interoperability that will enable us to account and accommodate for the gaps in our training swings as military organizations. Our established doctrine sets our training objectives, but it is the relentless pursuit of efficiency that will enable us to train and achieve results that will enable us to win decisively on the battlefield. (See Fig. 3)

Our organization received our first three new M777A2s late November 2022 and anticipate our next three early December however our Soldiers are already training on their equipment, discovering the ins and outs of their gear, and re-testing their crews in preparation for the next doctrinal Artillery Tables. We are also already in coordination with these respective Army National Guard units to accommodate training for their future MUTA schedules and are working with 10th DIVARTY to provide oversight on our upcoming tables. This path we've wound up on quite simply started from a few simple phone calls and the trust and ability of the unit's being called. Question, when is the last time you coordinated with the local Army National Guard unit or Active-Duty unit near you for training assistance? From a former ARNG and current RA Soldier, it might be worth picking up the phone.

About the Author:
CPT Joshua Keenan currently serves as Commander of 'Carnage' Battery, 5th Battalion, 25th Field Artillery Regiment, 3rd Brigade Combat Team, 10th Mountain Division at Fort Polk, Louisiana. He is a graduate of ROTC at SUNY Brockport, New York, Air Assault, Joint Fires Observer, Joint Firepower Course, Master Resiliency Course, among others. He is a former NYARNG 13A with 2nd Squadron, 101st Cavalry Regiment, and Call-to-Active-Duty transfer to 1st Battalion, 37th Field Artillery Regiment, 1st Stryker Brigade Combat Team, 2nd Infantry Division.



By: COL Jon H. Moilanen, (USA Ret.) Ed.D.
and Mr. James Dix

Observed artillery fires are critical to achieve desired mission support effects on the battlefield. This tactical vignette illustrates forward observer valor with "eyes on target" during the early Pacific World War II Buna campaign in New Guinea. In extremely harsh jungle conditions, an artillery forward observer proved his value in pinpoint direction of accurate fires during the grueling Allied combined arms attack to seize an air strip at Buna. Lieutenant Robert A. Dix displayed leadership, personal initiative, and bravery behind enemy lines to target enemy gun positions stalling Allied assaults to seize the air strip. Lessons learned at Buna demonstrated artillery as an essential multiplier of combat power in close combat for the remainder of the Pacific War.

Southwest Pacific at War in December 1942

An Allied strategic estimate stated, "the main object of the Japanese was to cut the air and shipping lines of communication between United States and Australia." Japan sought to seize Port Moresby on the southern coast of Papua-New Guinea to protect its flank of Pacific expansion. However, allied naval, air, and land battles disrupted its operations and forced Japanese withdrew to consolidate defenses along the northern coastal area of New Guinea at Gona, Sanananda, and Buna. The Allied combat operations of September to November 1942 in New Guinea are beyond the scope of this article. December combat of the 32d Division Warren Force and forward observer actions of Second Lieutenant Dix at Buna on 24-25 December 1942 focus this tactical vignette. His Silver Star citation recognized heroism before and on Christmas Eve 1942. Notwithstanding, a special forward observer story emerges from personal recollections and a 1943 hometown newspaper article of combat at the Old Strip near Buna.

32d Division Mission

Three Allied objectives were to defeat the enemy at Gona, Sanananda, and Buna. The Australian 7th Division focused on Gona and Sanananda. The U.S. 32d Division objective of Buna and its former government station was a coastal area about three miles in length and one mile in depth.

The 32d Division task-organized two forces. Urbana Force was to seize the Buna Mission area. Warren Force was to seize two Buna airstrip areas and linkup with Urbana Force. Both U.S. forces were separated laterally in zone by rivers, creeks, swamp, and jungle.

Artillery Support for 32d Division

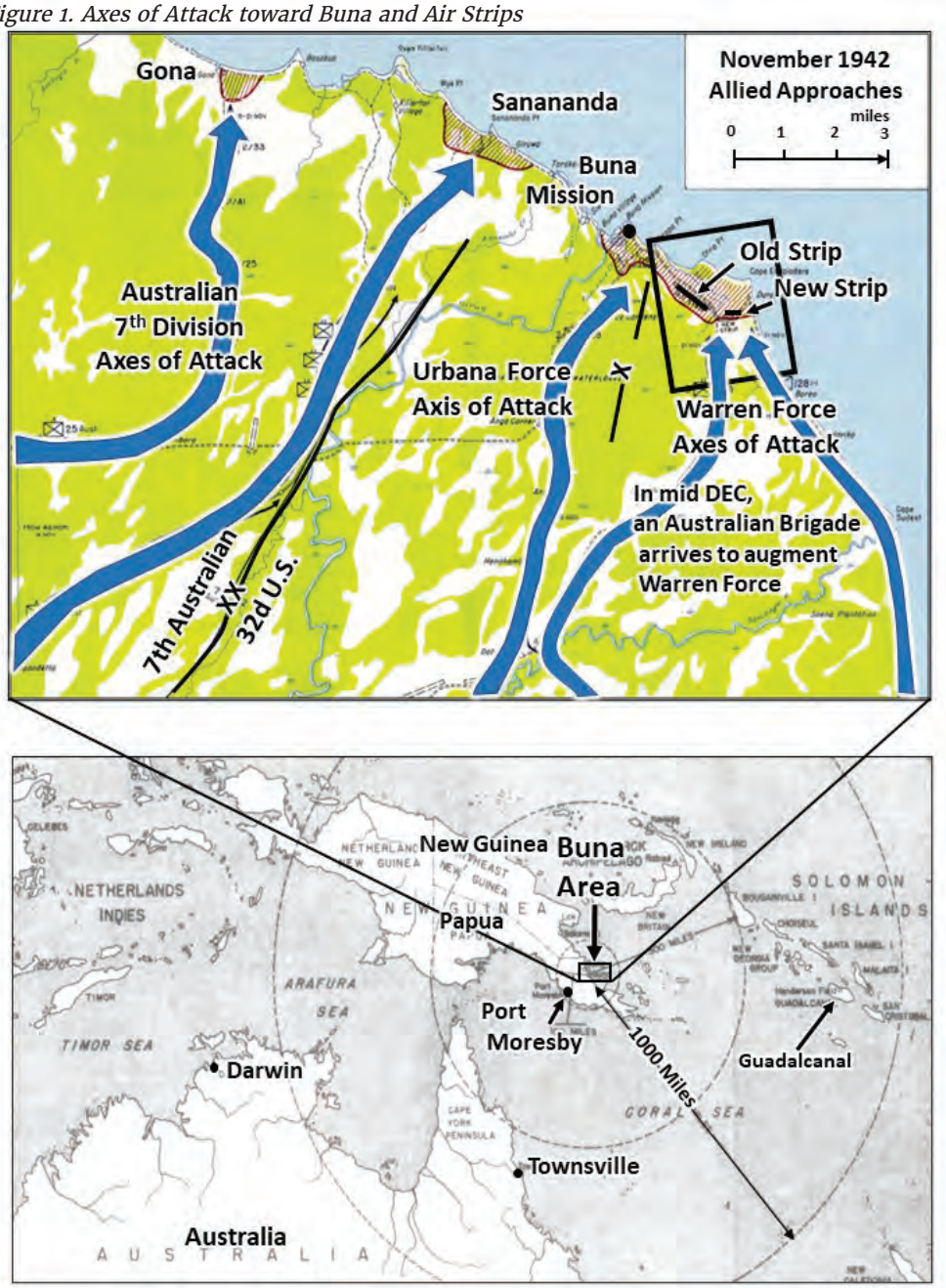
The 32d Division, already deploying units to Europe in early 1942, was abruptly redirected to San Francisco for deployment to the Pacific. The 32nd Division arrived in Australia by mid-late May. On 14 September 1942, Staff Sergeant Dix received a direct commission to second lieutenant and was selected as aide de camp to Brigadier General Waldron, the 32d Division artillery commander.

Ordered to New Guinea on short notice, the 32d Division concentrated forward from mid-September to November as part of an Australian and U.S. force. The division artillery headquarters group arrived in mid-November to a support area southeast of Buna without any artillery.

General MacArthur's decision to deploy the 32d Division to New Guinea without its division artillery would have grave consequences during the campaign. Two concerns by MacArthur's headquarters were insufficient ability to transport artillery or ammunition, and doubt that artillery could maneuver in jungle-swamp terrain. Claims that aviation bombing support could provide required artillery effects proved unsatisfactory even though Allied bombing and strafing did improve during the campaign. Neither Major General Harding, the 32d Division commander, nor Brigadier General Waldron believed that infantry could operate effectively without robust artillery support. Waldron continued to vigorously request artillery be deployed forward with the division in the combat zone.

Combat Conditions at Buna 1942
Terrain and Weather

Figure 1. Axes of Attack toward Buna and Air Strips



The coastal area was no more than three feet above sea level. Jungle and swamps were nearly impenetrable undergrowth. Rivers and creeks fed into a large lagoon of fetid swamps or deep muck. Thick kunai grass, at times over shoulder-height, covered much of the other landscape. Trails were usually single-file width with limited visibility. Plantation coconut groves were overgrown with brush or kunai grass. The topical environment of recurring heavy rains, extreme heat and humidity, tropical diseases and infections, lack of potable water, limited rations, and recurring firefights without pause caused physical exhaustion and debilitating psychological effects on all combatants.

Enemy Forces and Defenses

Rather than an Allied estimate of a few hundred weakened enemy at Buna, more than 2,500 Japanese soldiers and marines occupied defenses—almost half of them fresh reinforcements from Rabaul. The Japanese commander had soldiers and naval landing (marine) infantry, an element of engineers, an element of an antiaircraft battalion, about 450 naval laborers, and several hundred service troops.

Note. The enemy defense symbols are not to scale locations but emphasize mutually supporting defenses-in-depth along the Old Strip and Buna area. Points identified as bunkers on the air strip integrated with concrete and open-wall airplane dispersal bays, fighting positions. and trench lines. Similar defenses-in-depth existed near the New Strip and plantation groves north and northwest of the two air strips.

Japanese forces protected two dirt air strips. Buna defensive flanks anchored on the coastline. Simemi Creek to the north and jungle-swamp to the south of the Old Strip obstructed Allied approaches to Buna. Defenses included a network of fighting positions and camouflaged bunkers constructed at ground-level reinforced with overhead protective cover of logs and earth. Bunkers were typically about

Figure 2. Enemy defenses at Buna Old Strip

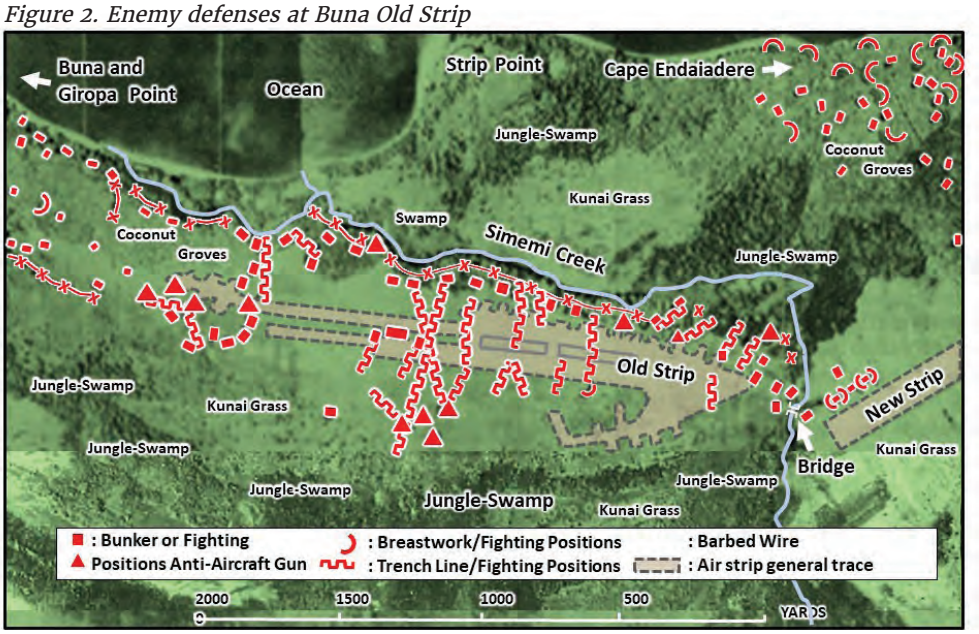


Figure 3. Camouflaged enemy bunker construction

30 feet long with multiple gun ports about three feet in length and six inches high to allow several weapons to fire simultaneously against an assault. Excellent camouflage and dense vegetation made bunkers nearly invisible to approaching soldiers. Defenses-in-depth provided mutual crossfire patterns and allowed Japanese infantry to maneuver and support forward fighting positions. Fighting positions and trenches crisscrossed the Old Strip and barbed wire channeled attacking forces into kill zones.

The air strips provided clear ground level fields of direct fires. Kunai grass obscured allied observation from jungle tree lines. Antiaircraft artillery and medium-bore gun emplacements were capable of ground level direct fire along the Old Strip. An Allied assumption that Japanese artillery at the Old Strip had been destroyed by aerial bombing proved false. After the Old Strip was seized in late December, the tally of enemy artillery guns included at least two 75-mm guns, two 37-mm guns, and 25-mm dual- or triple-barrel automatic cannons. 3-inch [76.2-mm] guns were northwest and southeast near the strip in a triangular pattern with one 3-inch gun north of the strip.

Aide de Camp and Forward Observer

Robert A. Dix enlisted in 1938, age 20, into the 105th Cavalry of the Wisconsin National Guard's 32d Division. His unit was redesignated field artillery in 1940 and Dix received training as an artillery forward observer. Promotion was swift to corporal by 1940 and sergeant and staff sergeant in 1942. Lieutenant Dix witnessed Waldron's repeated requests, strongly supported by Harding, to obtain artillery for the 32d Division. With Australian support, Waldron received a small number of artillery pieces and later noted in a letter "not his own, and not as much as he would have liked, but better than no artillery at all." By 26 November, the total pieces of artillery remained minimal in support of the 32d Division area of operations.

Only one U.S. 105-millimeter howitzer was eventually airlifted into the Buna area. A 32d Division history states its artillery support during the campaign never exceeded eight Australian howitzers or guns of various medium-bore shells and one 105-millimeter American howitzer. When no 3.7-inch shells remained by late December, recently arrived 4.5-inch howitzers replaced some artillery support.

Note. One recollection Robert Dix shared with his son Jim was the frustration of no available artillery to support the tactical missions of the 32d Division. Jim remembers, "It was then that the general called my Dad into his tent and ordered him to join up with a group of Australian infantry to go searching for Japanese artillery pieces or heavy anti-aircraft guns, and capture some to be used by the allied forces. My Dad remembers the general being upset and frustrated and yelling that "It was time for the 32nd to do some shooting too!"

Other indirect fire support to U.S. forces was minimal early in the campaign. Most 81-mm mortars and heavy machine guns had not arrived initially with the infantry units. Of the high-angle mortar support already at the front, 60-mm and 81-mm mortars had only shells fused for super-quick that detonated on contact with the ground rather than penetrating deep before exploding in Japanese bunkers. Heavy jungle vegetation, effective Japanese camouflage discipline, and frequent communication equipment failures hampered Allied artillery effects. Massed mortars eventually provided good indirect fires support.

Attack on Buna

Warren Force approached the Buna airstrips on narrow jungle tracks. A log bridge across Simemi Creek, covered by intense enemy fires, stopped any advance across the deep, swampy creek. Farther northeast in zone, defenses-in-depth burrowed into coconut groves halted any U.S. advance. By 1-2 December 1942, the 32d Division stalled well short of its objectives. Air support was tenuous initially but Allied tactical bombing-strafing missions gradually improved. Lack of division artillery and ammunition resupply were continuous concerns.

Lieutenant General Eichelberger had just arrived at Buna as the U.S. I [First] Corps commander with orders from General MacArthur to relieve Harding. Eichelberger assessed the situation at the front lines and decided Harding's relief from division command was necessary. Commanders of the division's two major subordinate forces were

Artillery pieces supporting 32d Division during Battle for Buna			
Artillery Type	Equivalent *mm*	Number	Unit providing Artillery Pieces
3.7-inch Pack Howitzer	~ 94-mm	3	Australian 1st Mountain Battery (O'Hare)
25-pounder Gun-Howitzer	~ 88-mm	2	One Troop, Australian 2/5 Field Regiment (Hall)
25-pounder Gun-Howitzer	~ 88-mm	4	One Troop, Australian 2/1 Field Regiment (Manning)
105-mm Howitzer	105-mm	1	from Battery A, U. S. 129th FA Battalion (Jackson)

Table 1. Artillery support to 32d Division

relieved and replaced, as were several other commanders of regimental, battalion, or company units. Eichelberger appointed Waldron the 32d Division commander.

Waldron Wounded in Action

Eichelberger and his small staff were forward with 32d Division. Waldron ordered a 5 December attack by Warren Force against defenses east of the Buna air strips while he positioned himself in Urbana Force to seize Buna.

As Eichelberger and Waldron commanded well forward in attacks of 5 December, Waldron was shot through the shoulder by a sniper and evacuated. Brigadier General Byers, corps chief of staff, succeeded Waldron as commander of division units at the front. Resolute Japanese defenses blunted U.S. advances for almost two weeks. When Byers was wounded on 16 December and evacuated, Eichelberger was the only U.S. general officer present and took command of all American forces forward at Buna.

Note. Waldron waited his turn in a lengthy line of wounded soldiers at a medical aid station. Dix probably accompanied Waldron. Eichelberger's aide, standing near Eichelberger, was also seriously wounded on 5 December. Dix likely returned to the division command group now commanded by Byers until Byers was wounded 16 December and evacuated. When Australian Brigadier Wooten was placed in command of Warren Force by Eichelberger on 17 December, Dix probably continued as an aide or special liaison officer to Wooten. Jim Dix remembers his father reflecting on Buna as "performing special assignments which often placed him with Australian units because they had the artillery which supported the U.S. Army forces."

Attack on the Air Strips

Australian reinforcements of Brigadier Wooten's brigade headquarters, two infantry battalions, and a small tank group arrived to join Warren Force. Warren Force attacked 18 December with objectives to clear northeast of Buna, maneuver westward toward Buna Mission and Giropa Point, and linkup with Urbana Force. Grinding assaults cost significant U.S. and Australian casualties. One Australian battalion lost one-third of its attacking strength on the first attack day.

The log bridge across the Simemi Creek with swamp on either flank remained a kill zone defended with Japanese machine gun and mortar fires. U.S. and Australian forces seized the New Strip and area north of Simemi Creek by 20 December.

Assault on the Old Strip

Australian patrols found a neck-deep ford across Simemi Creek and emerged at the eastern end of the Old Strip. As Japanese withdrew into defenses of the Old Strip, they detonated explosives that destroyed the Simemi Creek bridge. Close combat on the Old Strip was grueling but by night 23 December, Australians advanced several hundred yards westward. U.S. infantry crossed Simemi Creek near the bridge site and maneuvered south of the Old Strip along southern tree lines and swamp. Bridge repair by combat engineers and infantrymen under sporadic Japanese fire allowed M3 light tanks to cross the bridge early on 24 December. A salient comment in the Australian record understates the hard-won progress: "Thus six days of hard fighting had been needed to complete the first phase of Wooten's attack."

The stage was set for a coordinated assault to seize the Old Strip. The Old Strip area was a "warren of trenches and bunkers" with fortified positions across the width of the airfield from the southern swamp north to Simemi Creek. The 24 December assault on the Old Strip started well but slowed to a yard-by-yard crawl under intense Japanese fires.

An assumption that allied bombing had destroyed Japanese artillery at the Old Strip proved false. As M3 light tanks moved forward with infantry, a sudden direct-fire shot disabled one tank. Additional shots quickly destroyed two other tanks. Gunfire from concealed defenses on each side of the air strip pummeled the infantry. Allied assaults advanced only about two hundred yards with heavy casualties.

Forward observers located one 3-inch [76.2-mm] gun on the south flank after it fired on the tanks. Artillery promptly knocked it out of action. However, forward observers were unable to locate the remaining guns, so Brigadier Wooten decided not to commit more tanks until he confirmed that all of the enemy's medium-bore guns were out of action. Allied infantry assaults were largely unsuccessful. Bitter infantry fighting continued into the night along the line of contact on the Old Strip.

Lack of observed artillery fire hampered effective support. No accurate Buna maps existed initially that forced reliance on infantry reports and sound bearings from listening-observation posts. An improvised Buna target diagram was eventually replaced with an accurate four inch-to-one mile Buna map. Gradual improvements included multiple observation posts, reliable radio-telephone communications, and airplanes as aerial spotters to adjust artillery fire.

Behind Enemy Lines on Christmas Eve

Dix infiltrated into the enemy lines on 24 December to pinpoint and target antiaircraft artillery and fighting positions preventing the Allied advance. By comparing U.S. and Australian Army records and interview recollections of Dix to his son Jim, an account unfolds of his forward observation post actions of 24-25 December at the Old Strip.

His son Jim recalls his father's Christmas Eve account behind enemy lines:

My Dad and another officer were directed to get behind the enemy lines to pinpoint exact locations of camouflaged artillery and positions on the air strip that had to be destroyed. The two officers with two local native guides maneuvered behind Japanese defenses and infiltrated close enough to hear Japanese whispering in their defenses. During the fighting my Dad's group pinpointed locations of enemy positions and received small arms fire themselves. The other officer was severely wounded and my Dad carried him over his shoulders into the thick jungle but he was seen and

again came under fire. It was too dangerous for all four of the team to get back to friendly lines, so he told the two guides to hide and he would return to them later that night. This forced him to wade farther into the swamp while carefully carrying his fellow officer. He brought his wounded teammate to a frontline aid station and then reported on located enemy positions.

He was not ordered to return but chose to return that night to his two native guides. Once he found them, it was too dangerous to get past the Japanese again and told the guides the attack in the morning would advance to their position and relieve them. They spent that night—Christmas Eve—in the dark dense jungle trying to not be detected by enemy looking for them.

The next morning [25 December], assaults advanced far enough to find my Dad and his two native guides. Back at a forward headquarters, my Dad was ordered to "grab some chow" and get some rest.

Once I asked my Dad what he was thinking that night to stay calm and undetected. He said it was Christmas Eve, so he kept thinking about Christmas carols and praying. He said that when he returned to a make-shift field site the next day, he found several soldiers sitting in a circle listening to a radio that was playing Christmas songs. It was then that he heard the song "I'm Dreaming of a White Christmas" by Bing Crosby for the first time. My Dad said he had never seen so many grown men cry as they thought about being home in Wisconsin with their families.

Japanese bunkers and fighting position fires repelled allied patrols north of the air strip and assaults on and south of the air strip. The allied line of contact appeared as a shallow arc with most of the Old Strip runway in enemy control and the allied southern flank east of where most 3-inch guns were emplaced.

Heavy Japanese fires continued from the western and northwestern end of the Old Strip. Not all enemy artillery pieces were in open berm anti-aircraft positions. At least one 75-mm artillery piece was destroyed with a flat-trajectory shot into a bunker embrasure. Allied artillery was "chipping away" at bunkers on the air strip while indirect fires degraded defenses-in-depth. Allied artillery conducted intermittent harassing fires day and night within a limited supply of ammunition.

By early afternoon of 25 December, a U.S. patrol infiltrated through swamps on the south flank and positioned to the west of enemy antiaircraft gun emplacements and defenses. Wooten reinforced this flank with one Australian company and one U.S. company by nightfall for an attack to commence early 26 December with assaults along the line of contact.

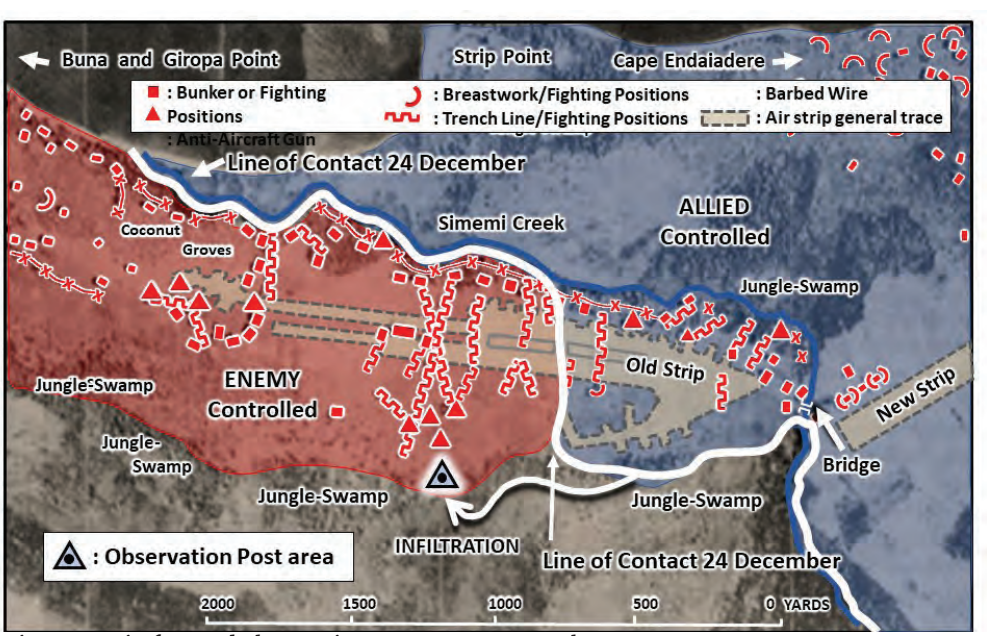


Figure 4. Dix forward observation post 24-25 December

Warren Force Artillery

Limited artillery support included 25-pounder artillery positioned to the rear and both flanks of Warren Force, and two 3.7-inch mountain guns positioned just south of the New Strip. One 105-mm howitzer was positioned farther south along a main trail. Two 4.5-inch howitzers also provided support from 20 December to 2 January.

One 25-pounder piece moved forward by 26 December and dug-in near the Simemi Creek bridge to hammer defenses on the Old Strip with direct-fire. Forward observation posts provided accurate direct and indirect fire effects.

Shortage of artillery ammunition was a constant concern. By 26 December, no ammunition remained for the 3.7-inch pack howitzers. Fortunately, four Australian 4.5-inch howitzers arrived. Two pieces arrived at a rearward air strip, were reassembled, and moved up a trail within supporting range while the two other howitzers landed by sea and were dragged inland to provide effective fire support.

Warren Force Seizes Old Strip

Each day was hard-fought infantry close combat. Vicious fighting pushed westward and north of the Old Strip 26-29 December through swamps, kunai grasslands, and coconut groves toward Giropa Point. Allied units began clearing swamps and groves of fanatical isolated stragglers and groups that fought until killed. Warren Force captured only twenty-one emaciated Korean laborers and one Japanese soldier as an indicator of Japanese refusal to surrender. The two senior Japanese commanders committed ritual suicide rather than surrender.

Close combat continued to the west of Warren Force before link-up with Urbana Force on the coast. Even more tenacious fighting continued in the Australian zone of the Sanananda-Gona coastline until late January. Allied forces declared an end of major combat actions in the Buna area as of 22 January 1943. Combat in Papua-New Guinea continued well into 1945 until defeat of Japanese forces. Eichelberger's after action report acknowledged "efficient artillery support was largely

due to the excellent work of the forward observer."

After the Battle at Buna

Second Lieutenant Dix was awarded the Silver Star for valor by Eichelberger including comments that "On numerous occasions he [Dix] conducted artillery fire as a forward observer while under heavy enemy fire and with utter disregard for his personal safety…On December 24, while in a tree observing artillery with another officer, the latter was wounded and Dix aided him to safety in heavy enemy fire…his actions were far above the call of duty." A war correspondent "somewhere in Australia" reported on Dix's valor. His Milwaukee Journal newspaper article dated 26 January 1943, accented Dix's Silver Star "gallantry in action on and before 24 December 1942."

Jim Dix's collection of his father's personal papers adds:

In March 1943, my Dad, now a First Lieutenant, received orders to report to Brigadier General Waldron at a hospital in Australia. Waldron asked my Dad to accompany him for medical care in the United States. My Dad initially declined but did accompany him in April 1943 for Waldron's convalescence at Letterman General Hospital located in California.

After supporting Waldron's convalescence, Dix enjoyed a brief leave home to see his wife in Milwaukee, Wisconsin. He attended the artillery officer advance course at Fort Sill, Oklahoma, and remained as an instructor of artillery tactics and jungle warfare. Promoted to captain in 1944, he continued teaching tactics while sharing Buna combat experiences, and deployed to India and China to instruct Allies on artillery methods. After the Allied victory of World War II, he sailed from Calcutta, India in October 1945, transited through the Suez Canal, and arrived at New York City on 15 November 1945. He returned to Camp McCoy, Wisconsin on 20 November. Captain Dix, promoted to major, continued to serve in the U.S. Army Reserve.

32d Division Casualties at Buna

Allied forces experience and wisdom required three more years in a world at war to achieve unconditional victory. Notwithstanding, the U.S. casualties at Buna tallied a harsh price in human carnage. These forces were part of the larger Allied New Guinea Force that included the Australian 7th Division, as well as Army and Australian aviation and logistics support teams.

The 32d Division sustained almost 2,000 casualties in the Buna area—353 killed, 1,508 wounded, and 93 missing. The almost 400 other U.S. casualties on the Sanananda front are not tallied in this number. There were almost no U.S. replacements as casualties mounted and strength of units steadily decreased, until in several instances, units were nearly field extinct when relieved at the front. Of the 32d Division's total strength of 10,825 in the combat zone, the three combat teams experienced "9,688 casualties including 7,125 sick, a casualty rate of almost 90 percent." At Buna, 1,400 Japanese dead were buried with—500 west of Giropa Point and 900 east of it. Other enemy casualties were never found.

The 32d Division required extensive reconstitution of its units and training to rebuild teamwork and combat capabilities as a fighting force. Nonetheless, the 32d Division regained operational readiness as one of the numerous U.S. Army divisions employed in field army commands of the Pacific War throughout the "island-hopping" campaigns that ended with unconditional surrender of Japan in 1945.

Tactical Observations from Buna

The U.S. Army conducted interviews and battle analysis immediately after the campaign. One salient observation on artillery stated, "The artillery had not played the part of which it was capable in the campaign, mostly because not enough pieces of the right type for the task in hand had been sent forward….The campaign established that artillery, provided it was of the right kind, was one of the best weapons a commander could have when faced with bunkers of the type that the Japanese had built in the Buna-Gona area."

Candid assessment of combat experiences at Buna informed artillery support in subsequent World War II campaigns, battles, and engagements. U.S. Army observations and lessons learned included:

- Artillery can be employed in jungle terrain.
- Combined arms tactics and techniques need improvement to defeat field fortifications.
- Artillery, provided with appropriate ammunition types-fuses, is an effective "bunker-buster."
- Forward observers require accurate up-to-date maps and reliable tactical radios.
- Airpower bombing and strafing missions proved value-added to artillery effects.
- Artillery ammunition supply rates and consumption must be intensively managed.
- Soldier and units must be acclimated to an operational environment.
- Frontline unit rotation to rest areas fortify morale, health, and combat readiness.

An article published in the May 1943 U.S. Army Command and General Staff College's Military Review shared early combat observations in Pacific island campaigns as tactics and techniques improved with training, experience, enhanced planning, and quality leadership. Observations from that article include:

- Jungle combat occurs at ranges rarely exceeding one hundred yards and usually opens with direct fires within twenty-five yards.
- Combat aviation can be employed as a temporary substitute for artillery to support infantry.
- Aviation complements reconnaissance, intelligence, logistics, and direct support.
- Combat engineers should be attached to units in jungle operations.
- Native guides-scouts-auxiliaries are critical to situational awareness and support.
- Jungle hardships demand physical fitness and prior tactical acclimation of soldiers and leaders.
- Commanders and leaders must display initiative and troop

leading excellence.

Service and Sacrifice

A proud recognition of military duty occurred on 3 July 1967. Lieutenant Colonel Robert A. Dix retired from the U.S. Army Reserve with almost 30 years of military service. From enlisting as a cavalryman in 1938, rapid promotion to noncommissioned officer and direct commission as an officer in World War II, to a distinguished civilian career after World War II, Robert A. Dix displayed outstanding service to his nation.

Jim gained another insight into his father's experiences at Buna. Jim's mother confided a special occurrence after the family's annual Christmas gatherings at home. Jim states:

Traditionally, our family would have a buffet feast and beverages, open presents, and then have more to eat and drink. My Dad was happy and always enjoyed the family celebration. But, after everyone had left the house late on Christmas Eve, my Dad would go sit in the front room by himself next to the Christmas tree lights, and he would end up crying like a baby. This happened every Christmas Eve according to Mom. Apparently whatever happened at Buna never left his brain or heart, and he thought about that night in the jungle every year.

Lest we forget. So many citizen-soldiers performed their duty with honor and diligence. Their service and sacrifice were often at the cost of wounds or life. At other times, psychological cost could resurface afterwards for decades. Lieutenant Dix demonstrated valor with deliberate decisions as a leader, saved lives in combat, and contributed to unit mission success.

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Note. In the photograph of three allied soldiers in the title image of this article, the individual in the right-front is believed to be Lieutenant Robert Dix based on family photograph comparisons of the World War II era. The other two individuals are Australian soldiers at a Japanese antiaircraft gun emplacement on Buna Old Strip.

About the Authors:

James Dix is the son of Lieutenant Colonel Robert A. Dix. Jim's collection of his father's personal papers and official military documents was the genesis of this article and World War II tactical vignette. The historical overview features the heroism of his father as a forward observer in the 32d Division during combat actions at Buna, New Guinea in December 1942. Jim graduated from the University of Wisconsin-Madison and became a successful electrician and small business owner in Wisconsin. Now fully retired, Jim conducts genealogical research of worldwide family heritage and administers and researches for a local historical society in Wisconsin.

Colonel Jon H. Moilanen, (USA Ret.) Ed.D. is an armored cavalry officer commissioned Regular Army in 1973. A 30-year active component career includes command at troop, battalion, and group echelon, and teaching at civilian university undergraduate and military college graduate levels. Jon is a published author, illustrator, and contributor to U.S. and international military periodicals and U.S. military doctrinal and academic forums. After retirement in 2003 as Dean of Students and Administration, U.S. Army Command and General Staff College (CGSC), he served as a military intelligence contractor and Department of the Army Civilian military intelligence specialist to the U.S. Army TRADOC G-2 until fully retiring in early 2019.

The Field Artillery AIT School Certifies First Female Instructor

By: Kalen Haynes, Ft Sill PAO Office

The first female Field Artillery Advanced Individual Training Instructor instructor is serving at the Fires Center of Excellence and Fort Sill.

Staff Sgt. Elena Bryan, a 13 Mike, Military Occupation Specialist, High Mobility Artillery Rocket System, Army 1st Battalion 78 Field Artillery, Alpha Battery, is the first female instructor certified in the Field Artillery AIT school's history.

Bryan instructs two classes of 24 Soldiers, teaching them gear functional responsibilities, vehicle assignments and the basics of field artillery.

Bryan's chance to make an impact on her Soldiers motivates her to work harder.

"I do my job every day," Bryan said. "As best as I can, because there's going to be that one male or female Soldier that looks at me and says, 'if she can do it, I can do it too'."

Bryan's motivation for becoming a Field Artillery instructor is to make a path for female Soldiers to advance into leadership positions.

"I want to be an instructor," Bryan said. "I want to be the first, I want to do this for females coming into the 13M world and know they have a path to follow."

Bryan's nearly nine years of service have taught her to be a positive role model for Soldiers to look up to and trust in confidence.

"The interaction with the Soldiers is so important," Bryan said. "I can teach them my job, – everything I have learned from E1 to E6 – and now they will be able to do their jobs from E1 to E6."

Bryan trusts her leaders, Capt. Hailey Lui and Staff Sgt. Steven Tiborsky, to support her growth.

"The people I work with really support me," Bryan said. "My school chief Tiborsky, has been the backbone of me becoming an instructor. I knew him previous to this and we work well together. That's what keeps me grounded, someone like him who has a year and a half experience on me, and I get to learn from somebody that I know and trust."

Bryan became a Field Artillery instructor in May of 2022, and is one of the first females to instruct Soldiers to fire the M270 Alpha rockets at Fort Sill.

SAVE THE A-10 WARTHOG

By: CW5 (Retired) Ken Jones

From my perspective as a retired Army attack helicopter aviator, we owe it to the ground soldiers, those on the front lines, to keep the A-10 Warthog close air support (CAS) airplane in service until a replacement of equal or better capability can be fielded. Additionally, there should not be a proposed 50% reduction in the TACP force structure of the Air Force as cutting TACPs is bad policy. This looks like the Air Force is moving away from providing low level over the shoulder precision close air support and that is not good.

I say this from my 35 years of Army attack helicopter (AH-1 Cobra and AH-64 Apache) aviator experience where I started learning, in the early 1980s, that the A-10 was an exceptional CAS aircraft, especially when used in conjunction with attack helicopters. The synergy of the A-10 and the AH-1 / AH-64 in combat missions is phenomenal. I learned these lessons from participating in dozens of JAAT (Joint Air Attack Team) live-fire exercises, training (JAAT, Rescort [Rescue/Escort] / Sandy CSAR / PR missions and Air-to-Air (A-10 versus AH-64) with the Air Force Fighter Weapons School A-10 / JTAC squadron, and live-fire combat JAAT (with the A-10) missions in Afghanistan. One of these JAAT (A-10 & AH-64) missions in Afghanistan was during the rescue of the 4 female aid workers (1 British, 1 Kenyan, and 2 Afghan) by Delta Force / SAS in 2012 where I was the AH-64 team air mission commander.

I have also participated in over 100 peacetime / combat missions using Air Force TACPs (Tactical Air Control Party Specialists) which also have JTACs (Joint Terminal Attack Controllers) within the TACP. TACPs / JTACs are truly outstanding in coordinating aerial firepower, and they have saved numerous soldiers' lives in combat. The Air Force wants to get rid of all the A-10s and reduce the TACP force by 50% and, in my opinion, this does not pass the common-sense test. A TACP (JTAC) Overview link follows: **https://sofrep.com/specialoperations/tacp-jtac-overview/**

If you've seen the movie that came out in 2022, you can understand the concept: the soldiers in the thick of battle in the Korean War, who watched the F4U-4 Corsairs fly low, directly overhead. Their morale is bolstered, as they realize the might of the U.S. military is behind them. In fact, some of the pilots flew so low that the soldiers on the ground could see the pilots' faces. And that's what CAS brings to the fight – pilots who are literally over the shoulder of the ground soldier, who can see from their perspective what it will take to help them win the battle. See the CAS video links at the end of this article.

That is what the A-10 brings to the fight for the ground soldier. Not a high altitude, soda straw view, but dedicated CAS airplanes and pilots in the thick of it so that these airborne grunt pilots can use all of their senses and even their peripheral vision to take it all in and do "pass after pass" until the job is done. The Broken Arrow video scene from "We Were Soldiers Once" has a great CAS sequence to further drive home this point and illustrates the importance of the A-10 and why it is just as relevant now as ever.

After watching the Broken Arrow video scene, imagine sending F-35 pilots who are poorly trained in CAS to support these troops, while trying to figure out the ground situation when flying at a very high altitude, looking through a very narrow radar picture when above the clouds. Additionally, the importance of well-trained TACPs is evidenced in this video clip that shows that fratricide can happen when poorly trained pilots are tasked to support a dynamic / defensive fight.

In order to execute CAS effectively in combat, Air Force pilots need extensive training with their Army counterparts. Cutting A-10s will exacerbate an already significant training shortfall. The Air Force already doesn't have enough fighter and attack aircraft now to support all of the Army rotations at the National Training Center. For perspective, the Air Force had 134 fighter and attack squadrons during Desert Storm. The Air Force is now down to 57 squadrons, and is planning on cutting 15-20 more squadrons over the next 5 years in order to pay for a smaller fleet of "multiple hundreds of millions of dollars per copy" fighters.

Close Air Support is – as the name implies – air support to friendly forces, in close proximity to the ground soldier who is doing combat with the enemy. Without it, friendly forces are largely on their own. CAS is what gives the U.S. military an advantage in combat and serves as a testament to the dedication we give our Soldiers, Marines and Sailors. The U.S. has your back.

The Air Force vision of future CAS is reminiscent of their failures in Korea and Vietnam. In those wars, the Air Force inventory of fast delicate fighters could not provide adequate CAS. In Korea they scrambled to buy back P-51s from the Air National Guard. In Vietnam, they had to borrow venerable A-1 Skyraiders (father of the A-10) from the Navy. Yet somehow, the Air Force hasn't learned its lesson. Eliminating the A-10 in favor of expensive delicate fighters with pilots that don't train much for CAS is a bad plan. High altitude fast movers dropping bombs on coordinates isn't the same as low level over the shoulder support from dedicated CAS professionals with eyes on friendlies. Using high altitude aircraft for CAS will put the front-line ground troops at greater risk and the consequences of losing the A-10 Warthog could be significant. The Air Force says they're willing to "accept risk" to the CAS mission. The problem is, that risk isn't theirs to accept. The risk is

to the Soldiers, Marines, Sailors and Commanders on the ground.

While the Army has not always recognized the term "CAS" for its own helicopters – often referring to the term as CCA (Close Combat Attack) or similar monikers* – it essentially provides the same "over the shoulder" airpower to ground soldiers . . . just at a much slower speed enroute to the target area than the Air Force's A-10 Warthog. Thus, the A-10 can get to the target area much quicker.

The AH-64 Apache is a mainstay for the Army and is expected to remain its heavy attack asset for the next 20+ years.

It is, without a doubt, the premier attack helicopter, but as a helicopter, its speed and firepower will never compete with much faster aircraft like the A-10. What the Apache brings to the fight is its ability to hover and literally hide in the terrain, flying so low that it is mostly undetectable by enemy radar. Employed as a team, the Apache and the A-10 become even more lethal due to complementary capabilities. Soldiers in a tough fight will need CAS, CCA, and on occasion, a joint effort from Apaches and A-10s.

The Army has a looming capability gap. Once FVL (Future Vertical Lift) comes online, the Army will not have escort aircraft fast enough to support it. In short, FVL is the Army's transition into the future, with plans to replace much of its aging fleet with much faster and more advanced aircraft. While new aircraft like the Bell V-280 Valor – the future replacement for the UH-60 Blackhawk – can fly at 300 knots, the Apache is significantly slower and won't be able to keep up. Even if the Apache is modified with a pusher-prop – imagine an aft-facing fan at the back of the helicopter instead of a tail rotor – its top speed would likely be limited to around 230 knots. The A-10 is a 350 knot CAS aircraft flown by pilots who regularly train with the Army, meaning it's an ideal platform to support the Army's fleet of FVL.

An Apache modified with a pusher-prop may yield an aircraft that can potentially fill the gap, but until that time, the Army needs what the A-10 provides: speed, payload, survivability, low level / below the clouds CAS, not to mention the wealth of knowledge A-10 pilots bring to the joint fight. Ultimately, this isn't just a capability gap for the Army, but a Joint Force capability gap. The DoD still needs the A-10, and we owe it to the soldiers on the front lines to make sure that they are covered.

The F-22 and F-35, while very capable in their own unique ways, are not CAS-based platforms and have no business putting rounds down near our ground soldiers nor flying at very low altitudes; case in point, the F-35A (Air Force variant) does not even train for CAS. They weren't designed for it. Its engine is surrounded and cooled by fuel, meaning that the aircraft is highly vulnerable to AAA/SAMs. That's why it's prohibited from flying near thunderstorms. Its inaccurate gun was designed for self-defense, so it only carries 180 rounds (that's 3 passes) and has a reputation for missing targets. They aren't equipped for and do not train to support the Army in a close/maneuvering fight. Meanwhile, the A-10 was built to survive in a low and close fight. The pilot sits in a tub of titanium armor that was designed to withstand direct hits from 23 mm exploding shells. The A-10 can also fly much slower over the target area than an F-35. The A-10 can also operate out of a shorter dirt runway much closer to the battle area, which allows the A-10 to not require air-to-air refueling tanker airplanes, whereas the F-35 requires long, hard-surfaced runways that are usually much further from the battle area, thus requiring

A U.S. Air Force A-10 Warthog from the 66th Weapons Squadron conducts joint training with Soldiers of C Battery, 2nd Battalion, 12th Field Artillery Regiment, 1st Stryker Brigade Combat Team, 4th Infantry Division, as part of the U.S. Air Force Weapons School during a joint training mission near Nellis Air Force Base, Nevada. The Air Force Weapons School is a five-and-a-half-month course that provides selected officers with the most advanced training in weapons and tactics employment. Photo by Sgt. Meghan Berry

air-to-air refueling. The Air Force has a huge problem in that it does not have enough refueling tanker airplanes, and these tanker aircraft are easy targets.

Some would argue that in a contested fight – sometimes referred to as LSCO (Large Scale Combat Operations) – an aircraft like the A-10 can't help the Air Force gain air superiority. While that point can be debated (but not against enemy helicopters), what cannot be debated is that in combat there will always be ground soldiers in need of close air support. That will probably never change. And the A-10 was designed specifically to do just that. That, and kill tanks. Lots of tanks. So while the F-22 and F-35 can strive for air superiority, the A-10 can do what it does best: CAS and tank killing.

And don't forget that the A-10 was a part of the solution for the Fulda Gap scenario that allowed the military and civilian policy planners – who lived in the shadow of the Cold War – to think widely about what large-scale conflict might mean and how the U.S. could be effective in such a conflict. Ask yourself: are things that different today than they were then? Not really.

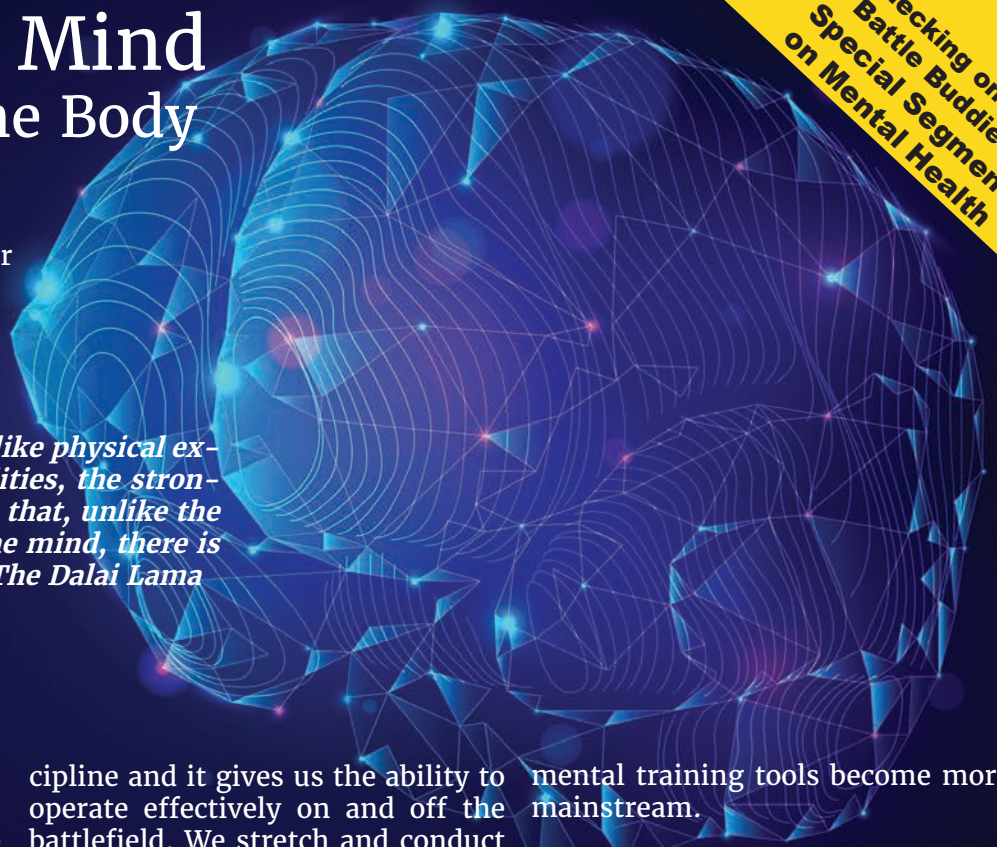
Bottom line: currently there is NO equivalent platform – across the DoD – that can provide the speed, firepower, and precision support in low-level close proximity to friendly forces like the A-10 Warthog. Period. Until that time, our policymakers need to extend the life of the A-10 so it can hold on to the unique gap that it provides until a replacement of equal or better capability can be fielded. The A-10 is a proven aircraft with a proven mission and giving it the axe is a disservice to the U.S. military at large – but, in particular, a disservice to our Soldiers, Marines and Sailors on the front line.

What can you do to help? Engage your local Congress representative, Senator, and tell them that the Air Force needs to pause its divestment plan of the A-10 and keep all of its TACPs Terminal Air Control; Party Specialists) until the GAO (Government Accountability Office) can do a full non-biased study of this effect to the joint fight. Ground soldiers are at great risk if the A-10 goes away. There is simply nothing comparable to replace it and probably won't be anytime soon. Be sure to check out Troops-in-Contact.org to learn more and why this is such an important issue for our military. This website also has a sample letter to send to your Congress representative or Senator.

U.S. Marines with Marine Wing Support Squadron (MWSS) 473, 4th Marine Aircraft Wing, pose for a group photo in front of an A-10 Warthog during Integrated Training Exercise (ITX) 4-22 at Marine Corps Air-Ground Combat Center, Twentynine Palms, Calif. on July 18, 2022. Marines from Marine Air Control Squadron 24 controlled the U.S. Air Force A-10s as they landed and then received fuel from Marines with MWSS-473. (U.S. Marine Corps Photo by Sgt. Matthew Teutsch)

Training The Mind
Like We Train The Body

By: Kevin Bloom
HIMARS Platoon Leader
and Founder of The Optimal Warrior



"Developing inner values is much like physical exercise. The more we train our abilities, the stronger they become. The difference is that, unlike the body, when it comes to training the mind, there is no limit to how far we can go." - The Dalai Lama

Can the mind be trained? For millennia, warriors from around the world have trained their minds to enhance their capabilities in battle. From the samurais of Japan to the Spartans of ancient Greece, mental readiness is not a new concept. It has been at the foundation of some of the most lethal militaries the world has ever seen, giving warriors the strength to make decisions in the harshest of conditions with clarity and confidence. So where did it go? As we turn the page into a new year in 2023 and as Soldiers in the greatest military in the world, it is time we start to take a deeper look at the mental readiness of ourselves and our great military.

While the mechanism of mental training has changed over the centuries, modern science combined with contemplative findings has led to drastic change in the light of mental training in the civilian sector. Words like mindfulness, mindset, and other cognitive tools have become normalized in the last decade as mental health issues such as depression, anxiety, and other psychiatric conditions continue to rise. A call to action has been made in the civilian world and the Army is beginning to answer that call as well.

The military prides itself on physical fitness and for good reason. Physical fitness promotes discipline and it gives us the ability to operate effectively on and off the battlefield. We stretch and conduct prevention and recovery drills to ensure that our physical fitness is above and beyond to complete the mission. We lift weights, sprint hills, and conduct long distance runs to ensure we cover all facets of strength and conditions to complete tasks ranging from loading artillery shells to 12 mile ruck marches. We train hard. We fight. We win.

It is time we apply that same philosophy to mental training. Just like we conduct bicep curls, bench press, and sit ups to train different parts of the body, we can now leverage the tools that are at our disposal to improve our overall mental health, increase our attention span, and be more present in all areas of our lives.

But here is the thing, the physical attributes that improve as a result of physical exercise are visible to the naked eye. They are obvious and clear which makes it easier for us to see why we should conduct the training. When we see our muscles get bigger, we are proud because there are visible signs of our progress. While the wow factor may not necessarily be seen on the outside of the Soldier, the benefits of mental training continue to be researched and proven year after year as the epidemic continues and mental training tools become more mainstream.

What is the issue?

In the military, we are facing the same mental health epidemic as the civilian population, and in some cases much worse. Being in the military, unique stressors such as frequent moving, deployments, long hours, and dangerous conditions can create added stress for Service Members and their families. This can take a toll on the mental health of the Service Member, leading to issues with sleep, negative thoughts, anxiety, and several other adverse effects that affect the mind.

Not only have we seen an increase in issues regarding mental health, but we also have never been as distracted as a society. With smartphones, social media, and advertisements being thrown at us from every direction, our attention is being pulled away from the present moment, thus leading to many adverse effects on and off the job.

At home, a Soldier must be able to be present with his or her family, tending to the kids and his or her partner. They must be able to move forward from the stress of the day, avoid distraction, and be there on the homefront. If they aren't, this lack of awareness can cause problems with the family and can then lead to negative impacts on the Sol-

dier at the personal level.

At work, whether it is loading a rifle, sending an email, or conducting dry fire missions on a howitzer, being attentive, focused, and present is essential to both the safety of the Soldiers and the successful completion of the mission. If a Soldier's mind is not focused on the task in front of her or him, it could cost someone's life.

So how do we train to improve the mind's of the Soldiers within our ranks?

Current Army Solution:

The Army is already working to improve mental readiness at the unit level by implementing the Holistic Health and Fitness (H2F) program. This program started in September of 2020 and has been slowly spreading across the ranks. The program's primary goal is to address both the physical and non physical components of Soldier Readiness.

According to the H2F doctrine, the five domains of Soldier readiness are:

- Physical readiness
- Nutritional readiness
- Spiritual readiness
- Mental readiness
- Sleep readiness

This is a new and improved approach to take care of Soldiers. When we look at mental readiness, the Army considers it to be the ability to meet the mental demands of any combat or duty position, adapt successfully in the presence of extreme risk and adversity, accomplish the mission, and continue to fight and win. For more information on the H2F program, refer to FM 7-22.

As the Army continues its efforts to improve the mental health of the force, here are three ways we can improve our mental health and become more effective inside and outside the workplace at the individual, section, and platoon level.

Mindfulness:

This is a term that has been popularized over the last decade and ultimately has strayed away from its original meaning. While many people view mindfulness as awareness, it is not just that. Jon Kabat Zinn, the originator of the modern day mindfulness movement, defines it as, "awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally." So as we move through our work day and life at home, mindfulness is a way for us to be in the moment, ultimately making us more productive, efficient, and experiencing more states of joy and happiness.

Kabat-Zinn founded the Stress Reduction Clinic (now called the Center for Mindfulness) at the University of Massachusetts (UMass) in 1979. This is where he began to see that Mindfulness techniques have major effects on the brain, body, immune system, and overall quality of life.

To help enhance attention to the present moment, improve mood, and better understand the mind. Here is a quick tool and some resources I have found helpful:

Tool-

Mindfulness meditation is the practice of paying attention to the present moment with a non judgemental disposition. Meditation is not only created for the monk on the side of the mountain, instead, high performers all over the world benefit from mindfulness meditation to include professional and olympic athletes, special forces operators, and C-suite executives.

Here is a brief 4 Step Guide on "How to Meditate" as well as a few resources to check out-

- Find a quiet place. This could be your bedroom, car, or a quiet place in your office building.
- Set a timer for 5, 10, or 15 minutes. It is important to start small because it can be overwhelming and challenging at the beginning.
- Close your eyes and start to focus on your breath coming in and out of your body. By focusing on the feeling of the breath and noting when the breath comes in and out of your body, you are setting the anchor of your meditation. This will be what you come back to when distraction arises.
- As random thoughts arise, come back to the anchor of your breath and focus on your breathing once again. Continue to do this every time distractions come up and remember that as thoughts come up and you return back to the anchor of the breath, you are improving your attention span and ability to be in the present moment.

Books and Apps-

The 10 Percent Happier App-
Guided Meditation App
Mindfulness Based Stress Reduction Course created by Jon Kabat Zinn

Movement:

When I say movement here, I don't mean just going to the gym or going for a run. This type of movement has attention and power behind it. We want to be mindful of the movement we are doing so that the practice itself works to increase our awareness, decrease stress, and release the tension in our body.

Tool-

Yoga can be described as a practice that connects the body, breath, and mind. It uses a combination of simple and complex poses to connect the body and mind, improving overall awareness, boosting relaxation, and lowering physical markers of stress.

I have thoroughly enjoyed the, Yoga with Adriene Youtube Channel. She has several introduction videos that demonstrate the basics of Yoga and why it is so important for us to incorporate yoga into our mental and physical training routine.

Mindset:

A mindset is a series of self-perceptions or beliefs people hold about themselves. These determine behavior, outlook, and mental attitude. By diving into our mindset, we can start to see how and why we do the things we do, believe the things we believe, and envision the future the way we do. It helps us to understand the wiring beneath the surface and it can allow us to open

U.S. Army Soldiers, assigned to, Combat Aviation Brigade, 1st Armored Division (1AD CAB). Participate in the yoga course of the Holistic Resiliency Training that the 1AD CAB Unit Ministry Team coordinated in Powidz, Poland, on Jan 26, 2023. The training focused on the five domains of holistic fitness and trainers used an interactive approach to learning This exercise enhanced the readiness of individual Soldiers and 1AD CAB as a collective, ultimately resulting in improved combat effectiveness. Photo by Spc. William Thompso

doors within ourselves that will ultimately lead to greater understanding of who we are and move forward down a path that better aligns to what we are called to do.

Improving our mindset will make us better people at work and on the homefront. Here are a few tools to help to understand your mindset a little better.

Tool-

Journaling gives us the ability to write down on paper the thoughts we have, emotions we are feeling, and beliefs we have about the world. It helps us to get things out of our minds and out on paper so that we can visually see them with our own eyes. There are thousands of journaling exercises out there and I highly encourage you to pick and choose the ones that best fit where you want to grow.

The book Mindset by Carol Dweck gives a great foundation about how the way we think influences what we can accomplish, what we believe, and how we interact with the world.

Conclusion and Way Forward:

Each one of these tools can be researched and practiced at a much deeper level, but the goal of this article is to get the ball rolling so that in 2023 we can not only improve our mental health, but also enhance our ability to operate effectively inside and outside the workplace by improving our attention, decreasing stress, and better understanding the inner wiring of our brain. We must continue to remove the stigma of working on our mental health and instead we should work to celebrate it. If done correctly, both the military and the civilian world have the opportunity to normalize these practices into the workplace and at home. It's time for change. It's time we approach mental fitness the same way we approach physical fitness. It's time for change.

About the Author:
Kevin Bloom is a HIMARS Platoon Leader in the Colorado Army National Guard. After recently returning home from a deployment to the Middle East, he started The Optimal Warrior. The primary mission of the company is to provide Service Members, First Responders, and Modern Day Warriors with strategies and techniques to improve their mindset. He saw the importance that mindset and mindfulness practices had on the success of himslef and his platoon. His goal is to help coach Soldiers to improve their mindset and ultimately become the best version of themselves.

FA TECHNOLOGIES
Partner Spotlight

Enabling Cost Effective and Realistic Training for Artillery
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Figure 1. Dutch LARIT at the Artillery School in T'Harde, the Netherlands

In 1989, the Dutch Army wanted a training system for their M109A2/A3 howitzers. Live Firing ranges had limited range, and were increasingly expensive and difficult to schedule. They also wanted to reduce fuel use, ammunition use, and wear and tear on the guns. The artillery instructors wanted features in the simulator that would make it easier and safer to train recruits. The ability to slow down the simulated recoil to demonstrate the danger area, for example, is a useful training tool. The Dutch Army built a basic prototype themselves and then sent the designs to industry for bid. A small machine shop, Van Halteren Metaal B.V. (now Van Halteren Technologies (VHT)) won the competition. They delivered 15 M109 LARIT simulators to the Dutch Army. To improve the training experience, Van Halteren contracted their TNO (Dutch government research organization similar to DARPA) to develop an ammunition recognition system which they called ARES. ARES was developed using inductive technology, in which an inductive ring is placed in the breech and sensors are placed in the simulated rounds, fuzes, and charge bags. Without contact, the system knows the type of round, the fuze and fuze setting, the charge bags used and their orientation. This information is automatically sent to an instructor station. This allows instructors to tailor instruction based on the trainee's experience. Novices can be "walked" through the tasks at a slow pace. Experts can be drilled in rapid fires.

Every HCT that VHT produces is unique based on customer requirements. Some customers want maximum fidelity and others want the lowest cost. One of the examples of maximum fidelity and realism was the Swiss HCT.

The Swiss Army developed an M109 variant known as the KAWEST (Kampfwertsteigerung = upgrade of combat capabilities). This system featured an inertial navigation system and a newly designed 47 caliber gun. It is able to fire three-round bursts within 15 seconds or maintain a constant firing rate of over one round per minute. The Swiss Army wanted an advanced training system that could match the performance of the gun. Van Halteren won the competition and delivered all the HCTs. This system is a fully simulated mock up using a surplus turret and the actual rammer. It includes a driver trainer and a Commander's Out the Hatch simulated visualization.

The Israeli Army decided to buy Howitzer Crew Trainers for their M109A5 Doher and Rochev howitzers. One of the innovations VHT developed for the Israeli program was the "Appended" trainer. In this system, the barrel of an actual gun is replaced with a simulated barrel. A tray system is put around the gun to catch the "fired" rounds. The training barrel can be replaced with the actual gun by a depot crew in less than eight hours.

In the mid-nineties, STRICOM (now PEO STRI) was writing the requirements for what would become known as the Fire Support Combined Arms Tactical Trainer (FSCATT). STRICOM sent a team of engineers from Orlando and soldiers from Ft Sill to the Van Halteren factory in the Netherlands. SGM Shrewsberry led the crew in drills and tests. The RFP was released and Van Halteren was a subcontractor to a losing team. Despite this loss, Van Halteren went on to win every other HCT competition in the world.

In 2000, Van Halteren was asked by the U.S. Army National Guard Bureau if they could make a simulator for the M198 towed howitzer. With L3 (prime contractor for FSCATT) as a partner, Van Halteren developed and demonstrated an M198 HCT at the world's largest training and simulation conference, I/ITSEC.

Figure 2. Swiss KAWEST

The latest innovation is upgrading from a hydraulic simulator to electric which improves reliability and maintenance. These were ordered for the M109 by the Austrian and Latvian armies.

HCTs are viable training tools that can adapt to the digitized environment. They are the closest things to a real system, provide opportunities for reps and sets without wearing down actual components, yet allow for use of actual crew compartments should the customer desire.

Figure 3. Appended M109s at the Israeli Defense Force

Figure 4. M198 Simulator demonstrated at I/ITSEC, NGAUS, and Fire Support Conference in 2001

HCT training leads to Increased hands-on crew throughput and safe practices at the Training Base.

From its experience of listening to the customers, VH continues to innovate. VHT has produced, under its own funding, a demonstrator 155 electric appended simulator. We offer customers world-wide a no-cost demonstration of our technologies. Give us a howitzer, and we'll give you an advanced training system.

VHT VAN HALTEREN TECHNOLOGIES

It was integrated with a Forward Observer Trainer and manned by a crew from the New Hampshire National Guard. It was later demonstrated at Fort Sill. Unfortunately, a program was never established.

VHTs simulators are not limited to the M109 and M198 families. Van Halteren entered and won the competition for the British AS-90 TT (Turret Trainer) simulator. In 2019, the British Army had a celebration for the 50,000th round fired with and estimated savings of £125 million on ammunition. The German PzH2000 ATT (Advanced Turret Trainer) is a Van Halteren simulator which is supplied to Germany, Qatar, the Netherlands, and Hungary. The French Caesar CCTS (Caesar Crew Training System) is a Van Halteren simulator and it is used by France, Saudi Arabia, and Indonesia.

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The U.S. Field Artillery Hall of Fame was designed to recognize a wider array of FA men and women, across various branches, of assorted ranks, and civilians or volunteers who have contributed greatly to the branch. There was also a need to recognize those former Red Legs, who served and then, using the core values of the FA, went on to reach the top levels of their chosen profession.

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