✕ Field Artillery

　　　Headquarters, Department of the Army. PB 6-21-4

Contents

Disclaimer

By Order of the Secretary of the Army:

JAMES C. MCCONVILLE
General, United States Army
Chief of Staff

Official

MARK F. AVERILL
Acting Administrative Assistant
to the Secretary of the Army
2126300

ANDREW D. PRESTON
Brigadier General, United States Army
55th Field Artillery School Commandant, Fort Sill, Oklahoma

Purpose

Cover
Soldiers from Charlie Battery "Copperheads," 3rd Battalion, 7th Field Artillery, 25th Infantry Division Artillery (25th DIVARTY) sling load an M777A2 howitzer onto a CH-53E while conducting elevator training drills with Marines from Combat Logistics Battalion 3 and Marine Heavy Helicopter Squadron 463rd as part of operation "Steel Crucible" on 14 September, 2021 at Schofield Barracks, Hawaii. This exercise increased joint Air Assault proficiency in a multi-domain environment. Operation Steel Crucible is a comprehensive, complex 2-week Battalion exercise comprised of key day and night live Fires and other joint training events. The 3-7th Field Artillery is conducting this operation with numerous partners to further enhance our preparedness to execute a range of missions in various joint, multi-domain battlefield conditions.

Army photo by SPC Jessica Scott, 25th Infantry Division

Congressional Medal of Honor Recipient
SSG Webster Anderson

SSG Webster Anderson received the Congressional Medal of Honor (MoH) for his demonstrated gallantry while serving with Battery A, 2nd Battalion, 320th Field Artillery, 101st Airborne Infantry Division (Airmobile) in Vietnam. His intrepidity in action, personal sacrifice, and commitment to his fellow Soldiers remains an inspiration to this day. SSG Anderson's heroics saved both Battery A's position and untold numbers of other Soldiers' lives. Early on 15 October 1967, the North Vietnamese Army's (NVA) infantry, employing heavy mortars, recoilless rifles, and rocket-propelled grenades, assaulted Battery A's position at its Fire Support Base (FSB) near Tam Ky in central Vietnam. The NVA forces breached the FSB's defensive perimeter and charged toward Battery A's gun pit. SSG Anderson, "with complete disregard for his personal safety," according to his MoH citation, mounted the exposed parapet of his position and rallied the defense. He directed Howitzer fire on the advancing NVA troops, and he provided rifle and grenade fire against the enemy soldiers who attempted to overrun his gun section's position. Anderson quickly became the focus of enemy small arms and grenade fire: two grenades exploded at his feet, knocked him over, and severely wounded him in both legs. Medical personal later amputated both of them. Despite being unable to stand, SSG Anderson pulled himself onto the parapet, from which he continued to direct Howitzer fire and encourage the Soldiers near him to fight. An enemy grenade then landed in the gun pit, near a wounded member of Anderson's gun crew. Anderson, "heedless of his own safety," grabbed the grenade and threw it over the parapet. The grenade exploded almost immediately after he released it, which grievously wounded him on his arm. Like his legs, surgeons amputated part of his arm to save his life. Although only partially conscious and in excruciating pain, Anderson refused medical evacuation so other Soldiers could receive treatment before him. Despite losing both his legs and part of his arm, Anderson survived and returned home. The Army promoted him to SFC upon his medical retirement in 1968, and Congress, on behalf of a grateful nation, awarded him the MoH. Anderson's MoH citation rightly reads that his "extraordinary heroism at the risk of his life above and beyond the call of duty are in the highest traditions of the military service." Anderson lived to age 70, until 2003, and he is buried in the Blackjack Baptist Church Cemetery in his hometown of Winnsboro, South Carolina.

FIRES SHOCK

It was a cool breezy day at the Estonian Defense Force's Nurmsi Training Area when speaker boxes in five U.S. and UK M270 Multiple Launch Rocket Systems crackled to life, providing the warning order for the pending Fire Mission to destroy adversary Air Defense Systems to enable U.S. and UK paratroopers Joint Forcible Entry (JFE) in support of the North Atlantic Treaty Organization (NATO).

By MAJ Colby C. Sortevik and COL Peter M. Sittenauer

That Fire Mission was the opening volley of *Fires Shock*, a series of precision Fires exercises and modernization events, over four months that bolstered personnel and systems interoperability between United States European Command (USEUCOM) partners and allies. More than bolstering interoperability, *Fires Shock* demonstrated the United States' commitment to European and African allies and partners and showcased the strength of these great relationships. The focal point of *Fires Shock* was the 45 days from May 1 through June 15, during which United States Army Europe and Africa (USAREUR-AF), with partners and allies, executed, in rapid succession, in conjunction with modernization efforts, six multi-national live-Fire exercises, in six countries, on two continents, ranging from the European High North to Central Europe, to Northern Africa, and every region in between. *Fires Shock*, underpinned by three tenets, Readiness, Strengthening Alliances and Partnerships, and Modernization, served as a demonstration of the European Theater Fires Enterprise's capability to infiltrate rapidly and dynamically mass Fires assets, as well as its capacity to command and control a multitude of operations across Europe and Africa.

In the Baltics, during Swift Response 21, U.S. and Estonian Special Operations Forces (SOF) infiltrated and identified adversary air defense systems in advance of U.S. and UK JFE operations in the Estonian Defense Force's Nurmsi Training Area. The bilateral SOF element was able to organically mensurate and transmit the precise location of adversary air defense systems to A Battery, 1st Battalion 77th Field Artillery, 41st Field Artillery Brigade (FAB) to engage with long-range precision Fires; setting conditions for a successful JFE of 600 U.S. and UK paratroopers and equipment, to include airborne capable cannon artillery from 4th Battalion, 319th Field Artillery Regiment, 173rd Infantry Brigade Combat Team (Airborne) to provide local Fire support. Capitalizing on SOF's ability to integrate with partner forces and infiltrate competitive or denied areas, Swift Response 21 demonstrated the European Fires Enterprise's ability to employ kinetic capability to penetrate adversary Anti Access/Area Denial capabilities to enable the greater combined/Joint Force freedom of maneuver to fight and win conflicts against a determined hybrid enemy.

Fires Shock combined multi-national live-Fire exercises, emphasizing interoperability of allied and partner systems, a multitude of modernization efforts, and demonstrated a combat credible force while developing, employing, and refining cutting edge sensor-to-shooter linkages in a dynamic environment. This composite demonstration was most apparent at Dynamic Front 21, the annual world premier Artillery live-Fire exercise, where more than 1,800 service members from 15 countries formed a multi-national FAB and employed more than 70 Artillery systems and sensors. Underpinning the digital sensor-to-shooter architecture of Dynamic Front 21 was the Artillery Systems Cooperative Activities (ASCA). ASCA is a software interface enabling interoperability between various nations' Fire Support/Control/Direction Systems. When utilized by multi-national formations, ASCA's effectiveness is amplified through interoperability across the formation. In a multi-national formation, countries can leverage their sensors, or allied and partner nation sensors through systems such as LINK-16, to detect targets and refine target data. Through digital ASCA protocols, this target data can be transmitted to another ASCA participant firing units; transcending the organizational boundaries of the participating countries' unique Fire Control Systems. The Fire Mission is then transmitted to an appropriate firing unit or platform within the ASCA architecture and prosecuted at a speed that only digital systems can perform. Another emerging capability employed during Dynamic Front 21 was the Advanced Miniaturized Data Acquisition System /AMDAS Dissemination Vehicle (ADV).

The ADV digests target data from the wide variety of sensors and databases to support sensor-to-shooter operations, performing as a collection aggregating target refinement node; capable of shortening sensor-to-shooter threads associated with deep sensing and long-range precision Fires. The interoperability of ASCA, exercised during Dynamic Front 21, enables allies and partners to bring to bear the full weight of the European Theater Fires Enterprise, synchronizing and converging effects at a time and location of their choosing.

Two weeks later, in Bulgaria, at Saber Guardian 21, B Battery, 1st Battalion, 77th Field Artillery, 41st Field Artillery Brigade executed a High Mobility Artillery Rocket System (HIMARS) Rapid Insertion (HIRAIN), demonstrating USAREUR-AF's readiness and ability to rapidly infiltrate and dynamically employ theater long-range precision Fires assets. This HIRAIN, the third conducted in the USEUCOM Area of Responsibility over the past year, reinforced existing employment strategies, infiltrating HIMARS simultaneously; providing an operationally flexible and resilient force projection package. This is significant because it showcased USEUCOM's commitment to European partners and allies through the coordination among the USEUCOM service components, providing massed long-range precision strike options supporting more than 13,000 service members from 19 different countries participating in brigade-level live-Fire, and air and missile defense exercises. Beyond demonstrating American commitment to European allies and partners, this HIRAIN validated employment strategies and methods, deterring adversary aggression on NATO's peripheries.

In June, executed concurrently with Saber Guardian 21, Defender Europe 21 Command Post Exercise, and African Lion 21, A Battery, 1st Battalion, 6th Field Artillery, 41st FAB deployed to

Setermoen, Norway to participate in Thunderbolt, an American – Norwegian bilateral Artillery live-Fire exercise.

Thunderbolt provided the unique opportunity for 41st FAB and the European Joint Fires Enterprise to demonstrate and maintain their readiness and enhance interoperability through their deployment and integration with Norwegian Forces and their nested execution of Field Artillery Table XII in the Arctic Circle. In addition to improving personnel and systems interoperability through knowledge transfer and cross-training, USAREUR-AF integrated emerging capabilities to include a LINK-16, an alliance federated system, enabled Advanced Field Artillery Tactical Database System; capable of receiving digital Calls for Fire from other LINK-16 enabled platforms. In the future, this capability could allow one nation's LINK-16 enabled sensors to transmit a digital Call for Fire directly to a second nation's ground-based Fire Control System, who could then, in turn, send target information to a third country's firing platform(s) through alliance and partnership channels such as ASCA. In this instance, Generation 4 and 5 aircraft from a variety of NATO and Partnership for Peace countries, including the U.S., UK, Norway, Finland, Sweden, Denmark, and Germany, participated in the Arctic Challenge Exercise 21. This new, Combined Joint All-Domain Command and Control pathway, Nordic-led, flag-level exercise executed concurrently and in close proximity to Thunderbolt; enabled the testing and evaluation of these capabilities. The widening of the aperture of available sensors and the ability to transmit digital Calls for Fire through various pathways through increased systems interoperability drastically increases sensor-to-shooter pathway resiliency, enhancing Alliance and Partnership capability and interoperability.

Following the November 20, 2020, merger of the United States Army's Europe and Africa Commands, USAREUR-AF Fires, and 41st FAB, in conjunction with Southern European Task Force and 7th Army Training Command began planning and coordination for the rapid employment of HIMARS to Morocco. As a result, A Battery, 41st FAB conducted first Europe to Africa, transcontinental HIRAIN as part of African Lion 21 in Morocco, and provided Fires in support of live-Fire exercises in close proximity to the strategically significant Strait of Gibraltar. This rapid employment demonstrated 41st FAB's ability to adapt to new environments and its capacity to command and control multiple firing units operating on two continents simultaneously. While on the ground in Morocco, A Battery, 1-77th FA, 41st FAB demonstrated the HIMARS mobility, communications, and ability to be integrated with allied and partner forces, forging new bonds with partners from several nations, to include Morocco, Tunisia, Senegal, and Spain.

Fires Shock emphasized American long-range precision Fires modernization and commitment to partners and allies. Still, more importantly, the agility of the European Theater Fires Enterprise and cooperation amongst partners and allies, both European and African.

These partnerships and alliances embodied through combined Joint exercises, exchanges, and interoperability efforts, increase system/process efficiency and further strengthen organizational and individual relationships within partnerships and alliances. Through the strong relationships and increased systemic interoperability, the effect of unified action through these partnerships and alliances is magnified, serving to deter potential adversaries through the presentation of ready, combat-credible forces capable of striking from strategically significant locations at a time of our choosing.

MAJ Colby Sortevik was commissioned in the U.S. Army Field Artillery in 2011. He has served in various positions throughout the United States and Germany and has deployed twice to Afghanistan and once to Djibouti. Most recently, MAJ Sortevik served as an Assistant Fires Support Officer at USAREUR-AF. Before his USAREUR-AF assignment, he served as the Commander of Headquarters, Headquarters Company 2-14th Infantry (Light) and A Battery, 2-15th Field (Light). MAJ Sortevik has a Bachelor's degree from Clarkson University and is currently attending the College of Naval Command and Staff at the U.S. Naval War College in Newport, Rhode Island. His awards and decorations include the Meritorious Service Medal, Combat Action Badge, Pathfinder Badge, and Parachutist Badge.

COL Peter M. Sittenauer has served as the Chief of Staff for the 56th Artillery Command supporting USAREUR-AF, since October 2021. He commissioned in the U.S. Army Field Artillery in 1997; he has served a variety of positions throughout the United States, Europe, and Southwest Asia. Previously, he served as the U.S. Army Europe-Africa Chief of Fires. He also served as the Commander of 1st Battalion, 14th Field Artillery Regiment (HIMARS) from 2015 to 2017 and the Director of the Multi-Domain Task Force Project Office for the U.S. Army Training and Doctrine Command. In total, he has seven years of overseas service; through stationing in Germany, combat tours in Iraq, and an operational tour in Kosovo.

"TODAY'S ARMY IS MUCH LESS ABOUT THE KNOWLEDGE WE HAVE, SO MUCH AS THE KNOWLEDGE WE CAN SHARE."

FKN FIRES KNOWLEDGE NETWORK

FOLLOW THIS LINK TO THE BRAND NEW FIRES KNOWLEDGE NETWORK:

HTTPS://INTRANET.TRADOC.ARMY.MIL/SITES/FKN/

Proactive Fires
with the Reserve FIST:
Fire Support Operations for the D Troop FIST in National Training Center 21-06

By 1LT Timothy Johnson

In April 2021, the 3rd Armored Brigade Combat Team, 4th Infantry Division completed a rotation at the National Training Center (NTC), which served as a successful culmination of the Brigade's combined arms training in preparation for large-scale combat operations. Crucial to these efforts were the actions of the 4th Squadron, 10th Cavalry Regiment (4-10 CAV), whose reconnaissance and screens helped shape the deep fight for the Brigade. In these efforts, the Squadron often faced the issue of being outmatched by indirect Fire assets by the Opposing Force (OPFOR), forcing reliance on indirect Fires to keep the OPFOR away long enough to send the Commander's Critical Information Requirements. To meet the reconnaissance requirements of the Brigade, the Squadron took the novel approach of taking the Dakota Troop Fire Support Team (FIST) and attaching the team to either one of the Scout Troops or as an Observation Post reporting directly to Squadron. If the Squadron had relied upon the more traditional task organization of always keeping Troop FISTs attached to their respective Troops, then the Squadron would be keeping the FIST of Dakota Troop in the reserve rather than helping the Squadron shape the fight against the OPFOR. As is with Fires platforms, keeping FISTs in the reserve only limits the capabilities of the Brigade to provide timely and accurate indirect Fire support, which is crucial when the Squadron needs to fight for space and time. Although it required more deliberate coordination, this flexible task organization directly enhanced the indirect Fires capability of the Squadron by allowing the Squadron Commander and Squadron Fire Support Officer to always have a FIST available to observe Named Areas of Interest (NAIs) and provide additional Intelligence, Surveillance, and Reconnaissance (ISR) capabilities while allowing the Scout Troops to use their FISTs to directly support their missions.

Task Organization of Dakota Troop FIST

Dakota Troop 4-10 CAV is typically the Brigade's reserve element, leading to a situation where if traditionally attached their FIST will remain underutilized in operations. Consisting of three platoons totaling 14 M1 Abrams tanks, Dakota Troop remained in the guard throughout the majority of NTC and was only activated under a few circumstances that happened very rarely in the rotation, with Dakota finally maneuvering in the Force on Force under Live Fire Conditions phase of the rotation. Therefore, there was an opportunity cost if the Squadron relied upon the traditional task organization. If Dakota's FIST were to have remained with their Troop throughout the rotation, they would have to remain in the guard with the rest of the unit, denying the Squadron and the Brigade the opportunity to have additional Fire support and targeting assets to help accomplish their tasks. Additionally, the Scout Troops would therefore have a larger share of ISR requirements to meet for Squadron, which would adversely impact their ability to accomplish their tasks. On the other hand, if Dakota Troop had to be activated then Dakota's FIST would have to change their mission and shift to supporting the Troop's scheme of Maneuver; this would pose a potential issue if Dakota's FIST had to move across a long distance on short notice in order to support Dakota Troop if their mission is to reinforce a Battalion on the other side of the Area of Operations (AO).

In order to ensure 4-10 CAV utilized their indirect Fires assets to maximum effect, the Squadron chose to attach Dakota Troop's FIST to the Scout Troops in their operations or move to observe one of the Squadron's NAIs in order to find and destroy any OPFOR elements on the High Priority Target List (HPTL). The rationale behind this decision was clear: 4-10 CAV had priority of Fires throughout their reconnaissance operations, and as such wanted to ensure they capitalized upon

this opportunity. With the targeting capabilities provided by the Fire Support Sensor System on the M7A3 Bradley Fire Support Team and the team's Lightweight Laser Designator Rangefinder, the Squadron would significantly enhance their indirect Fire capabilities by having these assets observing NAIs rather than remaining with Dakota Troop in the reserve. If the Brigade had to call up Dakota Troop to reinforce another unit, Dakota's FIST would move back with the Troop and provide Fire support with the Troop having priority of Fires due to the severity of the situation. The Squadron planned for this contingency by ensuring Dakota FIST kept a situational awareness of potential OPs and the vicinity of the Maneuver Battalions so that they were prepared to occupy one of those positions in the quickest manner while Dakota Troop moved out to support whichever unit needed reinforcement.

Dakota Troop FIST in the Box

The choice of Squadron and Dakota Troop to employ this flexible task organization created unique challenges with planning and coordination that the team encountered and learned from throughout the rotation. The first challenge came from adapting to the mission of the Scout Troops compared to the more traditional Maneuver tactics we had trained with the rest of Dakota Troop leading up to NTC. When we trained with Dakota Troop leading up to NTC we predominantly planned Fires for traditional offensive and defensive operations. This contrasts with the Fires plan for Scout Troops that more often relied upon targets of opportunity within NAIs. The Scout Troops would instead conduct zone and area reconnaissance missions in which dismounted scouts would transmit high payoff targets to the Troop FISTs who would then send the data to their mortars or the Squadron FIST depending on the target. As is typical with the Cavalry, we had little time to plan and quickly had to integrate with Apache Troop as they prepared to cross the Line-of-Departure (LD) and begin their operation. The late task organization change along with other pre-departure requirements led to the FIST missing the OPORD brief and having little time to understand Apache Troop's plan. What resulted was the FIST crossing the LD without as clear of an understanding of Apache Troop's scheme of Maneuver as we had hoped, and rather than enhancing Apache Troop's capabilities we found

ourselves having to seek clarification on what the Troop wanted us to do. This proved frustrating, but we learned for the third phase when attached to Comanche Troop that we had to be proactive in coordination to understand the schemes of Fires

and Maneuver in order to ensure Dakota's FIST remained an asset rather than a liability.

For the second phase of Force on Force, the Squadron decided to emplace us on an OP overlooking the central corridor as other Troops pushed out to the north and the west. From this position we were able to send up the locations of numerous OPFOR positions, including the location of a Cicada jammer that we destroyed, thereby enhancing the communication capabilities of the entire Brigade. In addition to the Cicada, we encountered numerous OPFOR Combat Security Outposts that we sent up to Squadron. While we didn't have the chance to fire at all those targets with the available Fires, our information allowed the Squadron and the Brigade to adjust the scheme of Maneuver and avoid being outmatched in a direct Fire situation. In addition to helping higher headquarters battle track from our location, we found that we could also act as a Retransmission (Retrans) Team for the Scout Troop FISTs who had dispersed with their Troops. Many of the Troops began to face difficulties with FM communications; numerous terrain features and 10+ kilometers often separated the Troops from the Squadron Tactical Operations Center (TOC). In those situations, we found ourselves relaying messages from the Scout Troop FSOs to Squadron Fires and vice-versa. These capabilities would not have been possible had we remained attached to Dakota Troop; rather than having our FIST shaping the location of some of the most critical operations for the Maneuver Battalions during the rotation, we would have remained

unutilized in the reserve with Dakota Troop while those Battalions faced the increased risk of a more unpredictable battlefield. By the third phase of the rotation as the Force on Force came to an end, we attached to Comanche Troop and were now confidently able to assist in their scheme of Maneuver due to our deeper understanding of what we were able to provide the Troop Commander and how our targeting and communication assets helped meet the information requirements of the entire Brigade.

Dakota Troop FIST lessons learned

Throughout this rotation, our team learned some crucial lessons on the overall importance of flexibility and preparedness in implementing this employment option for the Dakota Troop FIST. The first was the importance of coordinating with the Scout Troops as soon as possible to ensure a complete mutual understanding of Dakota FIST's overall role in the operation. Following the first phase of Force on Force, the Apache Troop FSO tried to understand why we chose to move to a different location at a time when they faced OPFOR contact. The truth was that Squadron asked us to relocate so we could answer ISR requirements in AO Siberia, but due to limited coordination, the Troop believed we left to avoid direct contact with OPFOR. This misunderstanding could have been prevented by better explaining our overall role as a Squadron-level asset to the Troop Commander before LD. As soon as you are ordered to attach to a Scout Troop, meet with the

Commander and Troop FSO to explain what capabilities will be provided with your current slant along with asking for whatever they might have for a scheme of Maneuver in order to begin planning targets and locations for the OP. The second lesson is to be creative and flexible with what is provided to the Scout Troops or the Squadron. For example, there were times in the rotation where we had degraded targeting capabilities and felt frustrated with what we could not provide the Troops until we fixed our systems. It was in this frustration that we ultimately found our utility in acting as an additional battle tracker or impromptu Retrans team. Along those lines, the third lesson was the importance of keeping us up-to-date on the Squadron's graphics, Fire Support Coordination Measures, and locations. Due to the importance of our FIST to be flexible and potentially have to change our mission in the middle of an operation, it was critical to maintaining as much situational awareness of adjacent units as possible to ensure seamless coordination.

Dakota Troop training recommendations

If this is an employment option your unit wishes to pursue, there are a couple of training recommendations we suggest in retrospect. First and foremost, take the opportunity to train with the Scout Troops in addition to the tank Troop. Due to the training limitations, we faced from the COVID-19 pandemic, virtually all of our field training prior to NTC was either with Dakota Troop or on the OP observing for one of the

Field Artillery Tables. Some of the friction we encountered concerning miscommunication and the lack of understanding of Dakota FIST's role began when we were attached to the Apache Troop without any prior experience working with the Scout Troops instead we had to adapt on the spot.

Secondly, we recommend working with and relentlessly troubleshooting every communication system at the FIST's disposal. Our Squadron FSO proved tireless in ensuring our communications were functional prior to NTC, and the time we spent troubleshooting those systems in garrison proved vital in our comfort with the Primary, Alternate, Contingency, and Emergency communications plan as we encountered those anticipated problems with communication during the rotation. By the second and third phase of Force on Force, the Squadron began relying upon High Frequency (HF) radio in order to mitigate the aforementioned communications issues with distance and terrain. While this proved useful, Squadron Fires had the only HF radio for the Fire supporters. If your unit has HF radios to spare, allocate one to your tank Troop FIST to enhance coordination and Retrans capabilities the Troop FIST can provide.

The third training recommendation would be to ensure proper Fires rehearsals at the Squadron level. Missing the first Fires rehearsal due to observing for the firing Batteries calibrating their Paladins, caused our FIST to encounter a lot of uncertainty in the first phase of the rotation. However, once we attended and participated in the Fires rehearsals for the rest of the rotation we had a more profound understanding of our task and purpose. The Squadron FSO led the rehearsal on the terrain model in the Squadron TOC, with the Troop FSOs moving on the terrain model approximating their location by phase and briefing their Fires plans. In addition, we were also able to coordinate with Squadron S2 to determine the ISR requirements and HPTL for the NAIs we left to observe, which refined the FIST's efforts in sending up the most relevant targets as we observed from the OP. For a Troop FIST expected to potentially change their Fires plan on order, these rehearsals are highly recommended to ensure the situational awareness previously discussed and to ensure that if Dakota Troop is ever activated, the Dakota Troop FIST is ready to support that mission wherever it may be.

Conclusion

This unique FIST employment option and task organization assume risk; it requires a knowledgeable and flexible team that is comfortable operating in a manner beyond a traditional FIST. While our Field Artillery Battalion mitigated this risk by assigning experienced lieutenants to be the FSOs for 4-10 CAV, we managed to gain far more experience by using this method throughout the rotation. Any unit willing to assume and mitigate the risk that can come with a FIST acting on such a flexible basis, then this employment option will undoubtedly enhance the capabilities of indirect Fires at NTC and beyond.

1LT Timothy Johnson served as Dakota Troop's Fire Support Officer in 4th Squadron, 10th Cavalry Regiment, 3rd Armored Brigade Combat Team, 4th Infantry Division from March 2020 to June 2021. Before this, he served as a platoon leader in Bravo Battery, 6th Battalion, 37th Field Artillery Regiment in Camp Casey, Korea from 2019 to 2020. He is a 2018 graduate of the United States Military Academy and is currently serving as an assistant operations officer in the 4th Infantry Division Artillery before departing for the Field Artillery Captain's Career Course.

Zeros and Ones...
The Starting Point of Lethality

By CPT Ayesha Hosein, SFC Brian Reynolds; forward by COL Jim Collins, Iron Steel 6

Two months prior to a Field Artillery Battalion's deployment to the National Training Center, a unit is preparing for its culminating training event at home-station. The Military Decision Making Process (MDMP) is complete, the order of the operations is published and all Maneuver/Fire Support Rehearsals are complete. We are ready, so, the Fire Support, Fire Control, and Fire Direction Subject Matter Experts return to their respective Advanced Field Artillery Tactical Data Systems (AFATDS) to prepare for combat operations. One hour prior to the Brigade Combat Team crossing the line-of-departure the AFATDS database is set. However, after initial inspection, other than a few basic geometries and ammunition from the previous iteration of Digital Sustainment Training (DST), the database is woefully incomplete. Sound familiar? Are we conducting simulated combat operations while utilizing an invalid database? Do we know when and where AFATDS entries originate? What are the minimum data requirements to reduce Fire mission processing times in AFATDS?

First Armored Division Artillery (1st AD DIVARTY), *Iron Steel,* at Fort Bliss, Texas, has developed a series of Leader Professional Development, DST, and Command Post Exercises to maximize the use of the AFATDS. This article details observations related to the use of AFATDS from three battalion-level collective training iterations that occurred over the past eighteen months. First, this article outlines the management of the AFATDS database that is (relatively) standardized data and should originate from the digital Standard Operating Procedures (SOPs). Second, it examines elements of the AFATDS database that result from decisions made during MDMP (See Figure 1).
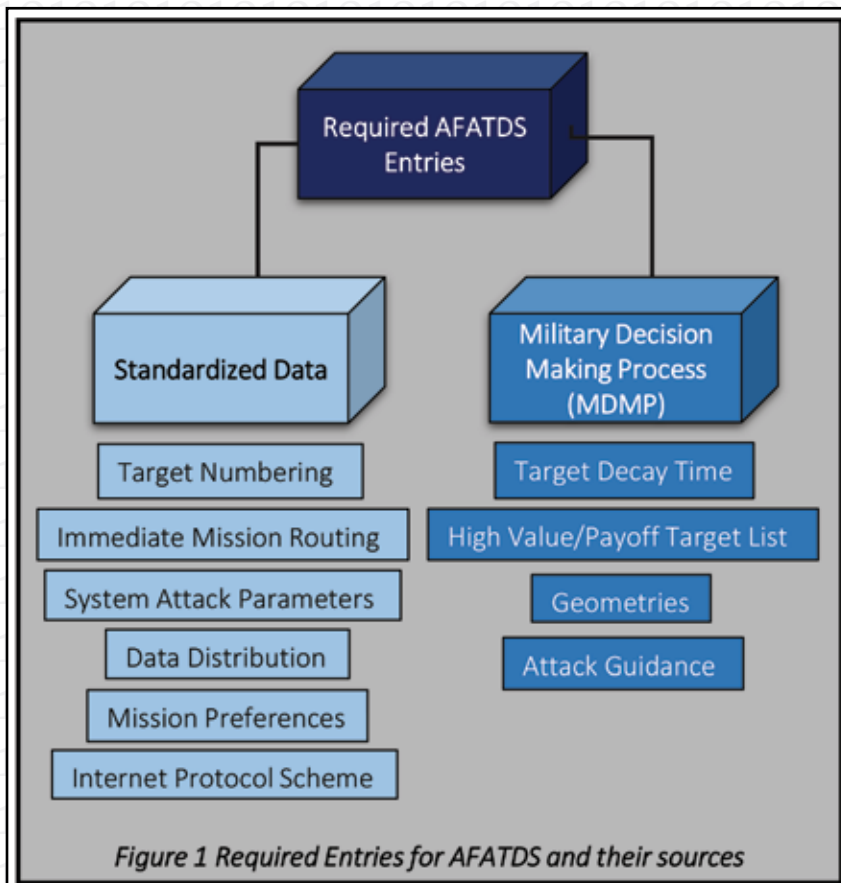
Before we proceed, two comments. First, consider the following assertion: proper database management significantly decreases Fire mission processing times, which in turn increases lethality. Second, DST is the foundation to overcome the challenges referenced above. This article will not detail *Iron Steel's* DST structure but, for reference, please read the previously published article in issue 52 of the *Redleg Update* titled, "Dagger Brigade Digital Sustainment Training."

Standardized data

A DST program is designed to train AFATDS at echelon. The starting point for that training is a digital SOP. Digital SOPs must contain standardized data. Some instances will require us to modify standard data, however, it remains relatively constant. AFATDS operators should validate that this information

Figure 1 Required Entries for AFATDS and their sources

is reflected in the AFATDS database during each DST event and combat operations. There are six required standardized data inputs to configure: target numbering, immediate mission routing, system attack parameters, data distribution lists, mission preferences, and a Division internet protocol scheme. The majority of these are not digitally transferrable, and all require unique entries at echelon.

Target numbering is used to identify the source of a mission by target block. Failure to manage target blocks may lead to recalculation at echelon and commonly target denial due to duplication criteria. Target blocks are assigned by the Division Fire Support Element (FSE) in Annex D to an operation order and usually are reflected in a units' Digital SOPs.

Immediate Mission Routing assigns a specific unit to execute immediate suppression and immediate smoke missions. This enhances processing time. If not properly configured, the box operator will have to manually select a shooter which increases Fire mission processing time. Units within *Iron Steel* pre-designate these firing units to expedite mission routing and, when required, modify ammunition allocation.

System Attack Parameters allow an FSE to quickly route missions to a pre-designated AFATDS. Bypassing all intervening AFATDS, Fire mission processing time is decreased and the manipulation of a mission will be minimal if needed at all. The Battalion FSE selects an organic mortar unit and/or a Direct Support FA battalion.

Data Distribution is AFATDS' network mapping tool to disseminate data digitally to other systems. The intent is to maintain a near real-time common operating picture of the battlefield. Every echelon will have its own unique data distribution list. Once data distribution lists are set up appropriately, geometries and unit locations can be shared without user input. Additionally, incomplete data distribution lists may require operators to push data manually as requests for updates arise.

Mission Preferences set the coordinating altitude which enables clearance of airspace. This is critical for Joint combat operations. Routing of the digital Munition Flight Path (MFP) is the most expeditious way for airspace controllers to integrate all surface and air firing platforms.

The Division/Brigade Fire Support Element are the two agencies that require munition flight paths and should be configured into every firing unit's mission preferences tab. Not having this preference configured correctly increases the time required to clear airspace by minutes; because operators will have to manually send MFP geometries individually.

Internet Protocol Scheme

Effective FM Digital communications require a comprehensive Division Internet Protocol (IP) scheme. Fire Control/Direction Officers should ensure that Digital SOPs contain communications infrastructure maps with digital network cards containing comprehensive IP schemes. Having all units within your Division's IP Scheme built into your communications workspace, allows a box operator to quickly select an already configured unit. If not, the operator may have to search within the Joint Master Unit List during the middle of a Fire mission, needlessly lengthening processing time.

These six categories are only representative of the numerous, relatively constant, standardized data AFATDS entries. It is important to distinguish them from entries that are a function of MDMP.

MDMP Outputs

Every step of the MDMP process produces outputs that feed the AFATDS database (See Figure 2, next page). Typically, units wait until the last step of MDMP (orders production) to establish and/or validate their database. The 1AD DIVARTY asserts that Courses of Action (COA) Comparison (war-gaming) requires the use of digital systems (i.e. AFATDS). Updating an AFATDS database concurrently with the MDMP process allows for healthy COA analysis. During Warfighter Exercise 21-4, 1AD DIVARTY's Fire Control Element (FCE) was charged with ensuring that all AFATDS inputs up to COA Analysis were captured in preparation for a wargame. The diligent database management allowed digital refinement of positioning and munition guidance while validating our COAs' feasibility. There are four outputs from MDMP that must be captured in your database: Target Decay Times, High-Value Target List and High Payoff target lists, geometries, and attack guidance. The aforementioned preferences can be configured to distribute digitally in AFATDS.

Figure 2 MDMP Outputs that feed into AFATDS
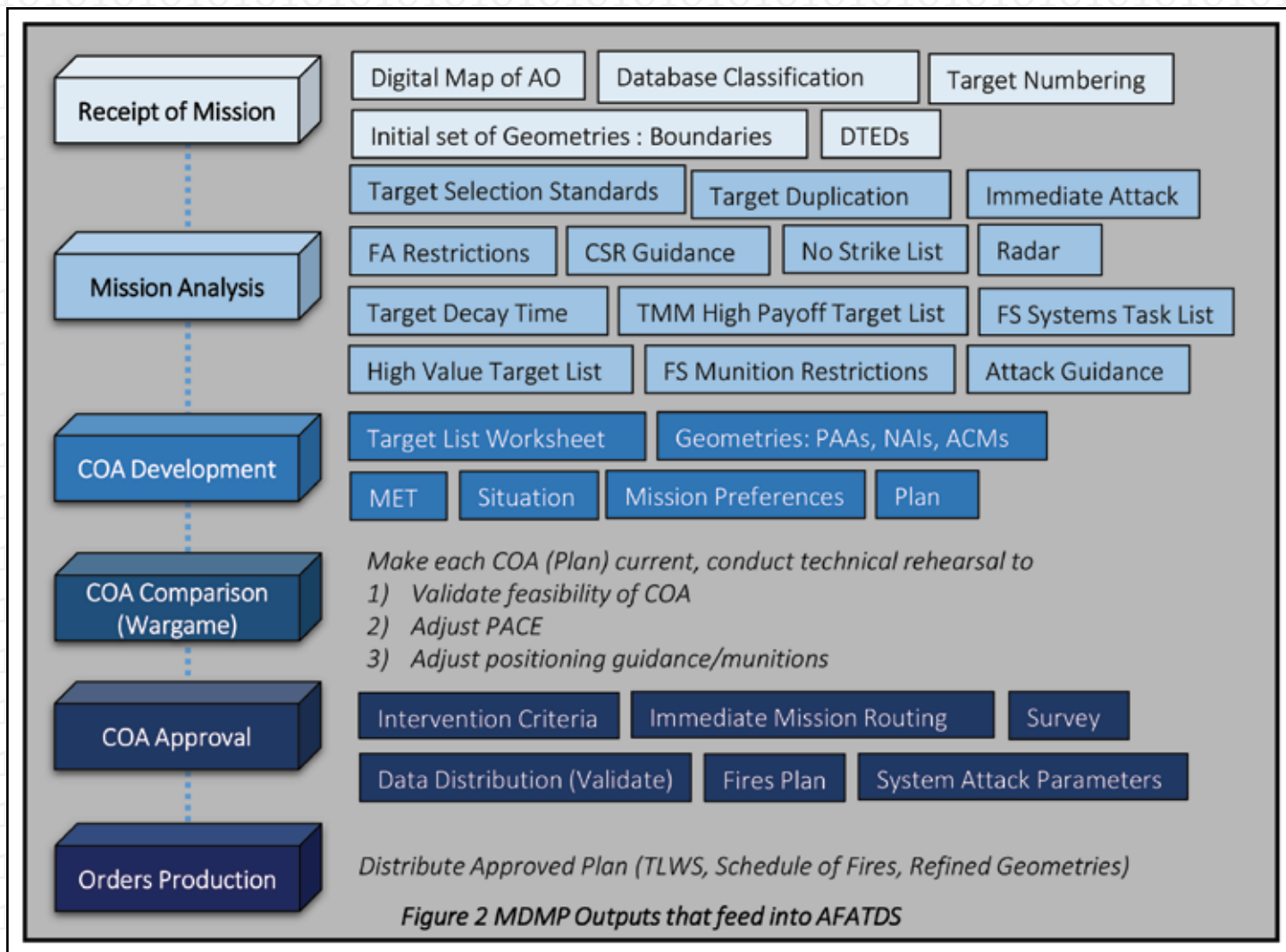
Target Decay Times are based on the length of time a specific enemy weapon system would remain in a location prior to displacement. These values are determined during the Intelligence Preparation of the Battlefield by the G2/S2. Not specifying Target Decay Times, in theory, could cause units to expend precious munitions on targets that are 1) no longer there 2) not a priority for the Commander any longer or 3) now occupied by friendlies. The Division/Brigade FSE should plan AFATDS at the point of data entry. This information should be disseminated to subordinate units via the "send current" feature in AFATDS.

The High-Value Target List and High Payoff Target Lists are outputs of several analytical processes. Simply put, they are developed during mission analysis using an integration of several variables to include: Commander's guidance for Fires and target value analysis. Then, subsequently refined throughout all stages of MDMP. Once input into AFATDS, the relative importance of

these targets is determined by an algorithm. The algorithm does not remove human decision-making – it allows human decision-making to occur in a controlled environment. The High-Value Target List and High Payoff Target Lists, ensure the Commander's priorities are executed regardless of who is on shift or how much sleep they had in the past 24 hours

Geometries are the digital version of graphic control measures. Geometries establish permissive or restrictive coordination measures within an area of operations to support surface-to-surface or air-to-surface Fires. Geometries originate during mission analysis and are continually updated throughout MDMP and execution. Geometries can have multiple authors: airspace managers, Brigade Combat Teams, adjacent units, Fire direction centers, Division/Brigade FSE, etc. Not having geometries properly built or updated in real-time: dramatically slows Fire mission processing and is potentially unsafe. More specifically, the lack

of geometries adds coordination requirements, and in extreme cases, poses an increased risk of fratricide. Geometries are managed by the Division/Brigade Support Element and disseminated via data distribution lists in order to maintain the most current SOP.

Attack Guidance is the required number of rounds to achieve a specific effect on an enemy system. The S2 Intelligence Preparation of the Battlefield determines the enemy order of battle to include the enemy system type and strength. *Joint Munition Effectiveness Manual* is the authority on the effectiveness of indirect Fires against various enemy target types. Not having attack guidance set in your database will result in an operator having to input the number of rounds for every mission, thereby increasing Fire mission processing time, while introducing the potential to mistype several rounds. The DIVARTY/BN FCE is the point of entry for this information and distributes this information to the lowest echelon of the Fire Direction Center.

Summary

Fire supporters should always employ their Modification Table of Equipment in a fashion that meets the mission of the Field Artillery in the timeliest manner possible. For the reasons articulated in this article, AFATDS, when utilized properly, enables artillerists to do just that. From Fire Support Coordinator to Box Operators, all must understand how artillerists rapidly employ and integrate all Fires. Ensuring that an AFATDS has six entries from standardized data along with the four MDMP entries outlined in Figure 1, Fire mission processing time will certainly decrease. Mastering the zeros and ones in AFATDS is the starting point of lethality!

CPT Ayesha Y. Hosein served as the 1ˢᵗ Armored Division Artillery's Fire Direction Officer along with her counterpart, SFC Brian A. Reynolds, Senior Fire Control Non-commissioned Officer and Digital Master Gunner. This Fires Team conducted three command post exercises over a period of nine months, in preparation for Warfighter (WFX) 21-4. Artillery Fires for WFX 21-4 was responsible for 39% of enemy casualties, the highest artillery percentage within the past five years. The 1ˢᵗ AD DIVARTY's success was due to 1) a thorough Digital Sustainment Training Plan under SFC Reynolds, the Division's senior Digital Master Gunner, and 2) effective air asset integration and airspace management under the direction of CPT Hosein, a graduate of the Echelons Above Brigade Airspace Course.

COL Jim Collins served as the 1ˢᵗ AD DIVARTY Commander from 2019-2021.

Soldiers assigned to Alpha Battery, 1st Battalion, 320th Infantry Regiment, Division Artillery, 101st Airborne Division (Air Assault), execute a live-Fire training exercise on the Mark 119 Alpha 3 during Operation Lethal Eagle Nov. 5, 2021, at Fort Campbell, Kentucky. This exercise is to certify us and understand we are properly equipped for real life situations. "Running into issues out in the field is problematic, so to have those issues during exercises is ideal so that in real situations, we can run smoothly and understand how to avoid them," said SGT Garret Jones, 4th section gunner, 2nd Platoon, Alpha Battery.

Photo by SPC Kelvin Johnson Jr, 40th Public Affairs Detachment

Teniante Aguilar, 2nd FA BN Fire Direction Officer, demonstrates how he calculates the quadrant elevation using a Graphical Firing Table.

How a Field Artillery Advisor Team builds a Partner Force in Honduras

By CPT Joseph Dang, SFC Quentrell Nelson, SSG Lemuel Blue, SGT Seth Wilbourne

Big Picture

Honduras along with its western neighbors, El Salvador and Guatemala, form a geographic region commonly referred to as the Northern Triangle. Decades-enduring struggles with violence, under-governed geographic regions, and corruption permeating department and national layers of government sap the country's resilience and impedes its ability to make measurable progress in elevating the population's standard of living beyond belabored and uncertain survival.[1] Exacerbating these stressors, the devastation wrought by Hurricanes Eta and Iota in 2020, compounded by the crushing economic blow of the Covid-19 Pandemic have placed Honduras at a tipping point -where assistance efforts must produce lasting results in addressing its root causes of instability.

Contained within the Integrated Country Strategy for Honduras, enhancing the existing security apparatus within the region becomes an absolute necessity. The 1st Security Force Assistance Brigade, out of Fort Benning, Georgia, regionally aligned with U.S. Southern Command, providing this partner-building capability through its advisor teams which partner with host-nation forces. As part of this larger picture, Field Artillery Advisors build a partnership with the Honduran Artillery Forces; expanding their function to scale into the framework of Large-Scale Combat Operations (LSCO). Advisory efforts of this nature equip Honduran Commanders to develop reliable options in the contingency that the spectrum of competition edges towards conflict while also professionalizing the force structure at large. As part of this layered advisor effort, Field Artillery Advisor Team (FAAT) 1412 formed partnerships with the truly unique personalities of Honduras' three Field Artillery Battalions during their employment in Honduras from March through September 2021.

Introduction

The Battalion Commander welcomes us to the Officer's Mess where we join him for a Honduran breakfast. His staff awaits us around the dining table, *and we take our places behind our seats. Praying in Spanish over our meal, the Commander thanks God for our arrival – that it was part of His ordained plan. Four U.S. advisors, three Honduran Field Artillery Battalions; our story is one of relationships formed over Arroz con Frijoles, tortillas, games of volleyball, and training in Honduras' 108-degree heat. The purpose of this article in the recounting of our six-month advisor employment; is to convey what building a Partner Force looks like from the advisor's perspective.*

Problem Set

Honduras' Field Artillery Battalions augment the countries' already challenged police apparatus. Disciplined and largely trusted by the population, soldiers conduct and supervise the transportation of inmates, manage military checkpoints, traffic stops, and conduct patrols along the country's *Frontera*. As artillery units are not leading the current fight against the country's immediate transcontinental criminal organization threat-set, their warfighting proficiency takes second priority to pomp and circumstance. Honduran Armed Forces Day is punctuated by the artillery Battalions' live-Fire; where 105 mm and 155 mm Howitzer shells and 160 mm mortar rounds fly over a reviewing party, and hammer into Zambrano's impact area. Honduras' President, his cabinet, and all military chiefs of staff attend this display; which is purposed to highlight the discipline and power of the nation's armed forces. Although Honduran artillery units maintain a position of national importance; their competing mission requirements, rapid personnel turnover, and limited training time available present a challenge in maintaining their war-fighting edge.

Enter the U.S. advisor

As we established relationships with the Field Artillery Battalions, we saw equipment held together by sheer Honduran ingenuity and willpower.[2] Enhancing artillery capability as a deterrent to the USSR aligned Sandinista regime in Nicaragua in the late '70s through '80s brought the U.S. M102 and M198 Howitzer systems into the country.[3] Fielding these weapons along with U.S. advisors, bolstered Honduran Field Artillery

1 Danielle Renwick and Rocio Cara Labrador. Central America's Turbulent Northern Triangle. Council on Foreign Relations. https://www.cfr.org/backgrounder/central-americas-turbulent-northern-triangle. July 1, 2021.
2 FAAT 1412. *Findings and Rec_Honduran Field Artillery Equipment.* May 15, 2021.
3 Nicarágua Army. Global Security. https://www.globalsecurity.org/military/world/centam/ni-army.htm. 29 July 2021.

capability to present a credible deterrent to any threat actor attempting to gain unwelcome access through the most likely avenue of approach, the Choluteca gap on the border with Nicaragua. After more than 40 years of elapsed time, Honduran Field Artillery units once again meet US advisors.
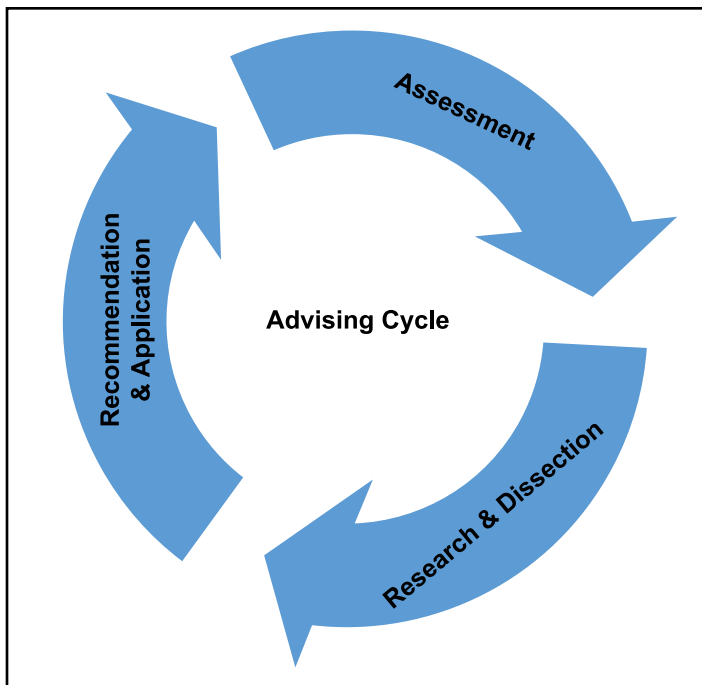
Beginning with Assessment, advisors enable their partner force's leadership to see themselves and assist through the Research step which informs their Recommendation and Application.

Assessment

Beginning with Assessment, advisors draw out the Partner Force's capabilities, limitations, challenge-sets, and their leadership's vision. This process forms the entry-point and can range from a sit-down engagement with a leader to a full-scale Battalion capabilities demonstration. As a function of personality, our team discovered that we were more inclined to hands-on learning. Observing and exchanging Tactics, Techniques and Procedures (TTPs) in action, our team often used Subject Matter Exchanges to gain a more complete assessment of our Partner Force units.

Relating back to our vignette with the 4ᵗʰ Field Artillery Battalion (FA BN), we conducted our unit assessments in Choluteca's 108-degree heat blanket; observing the Tropas and Sargentos emplace and employ their 160 mm mortar in a dry-fire exercise. The crews execute their battle drills with skill, discipline, and enthusiasm. The Battalion Commander directs us to his Fire Direction Center (FDC)- Central de Tiero. A

Sargento demonstrates how he calculates Deflection and Quadrant for the Israeli-made 160 mm mortar. When asked what method he uses to account for Angle of Site, the vertical displacement between the mortar and the target, as the technique he is using appears unfamiliar. The Commander explains his Battalion's processes and asks what method we would use for this calculation. The advisor explains the method from FM 6-40 as it applies to an M777A2 firing high angle. Meanwhile, the other teammates are similarly engaged with the mortar crews on their laying procedures, explaining how they ensure their pieces are correctly laid on the Azimuth of Fire.

The Advising Cycle revolves around not only the partner force's systems and processes, but equally around personality and relationships between advisors and partner force commanders.

Research and Dissection

After the day's expiration, we make the four-hour drive back; physically exhausted by the heat, but more so mentally by questions occupying the problem-solving capacity of our team's 30 years of collective artillery experience. What we found as the Research and Dissection Phase of the Advising

Cycle is the most consuming. However, we have discovered that this phase is where advisors make the greatest gains by analyzing unit TTPs for efficiencies and vulnerabilities. This phase regularly extends beyond 72 hours. As a team, we deep-dive into the techniques observed and compare them to existing doctrine (the primary doctrine used by Honduran Artillery Forces is a Central American release of *FM 6-30, 6-40 and 6-50* dated 1998 from the Security Cooperation Office).[4]

Our team's research conducted in this manner illuminated vulnerabilities in two out of three Battalion FDC's Fire Mission Processing. A lack of procedural secondary-independent checks within the FDC and emplacement of the gun-line introduced an elevated risk for unmitigated and potentially disastrous error. We understood through this method of analysis, that the Honduran Field Artillery Battalions would need to train additional leaders to conduct checks, specifically at the crew and platoon level to ensure accurate transmission of data (Accurate Computational Procedures: 5th Requirement for Accurate Fires).

Research, utilizing the faculties and problem-solving of every Field Artillery MOS (13B, 13F, 13J, 13A, etc.) proved to be instrumental when dissecting and researching the TTPs that our Partner Force uses. Although adapted from U.S. doctrine, Honduran TTPs have evolved based on their unit's limitations in training and manning as well as the use of non-U.S. equipment. An example of a modified TTP is the method that the 4th FA BN uses to compensate for the vertical interval (VI); vertical displacement between the firing unit and target elevation. As Honduras' geography is more than 80% mountainous there is always a vertical displacement between the firing unit and the target. In order to compensate for this, 4th FA BN adapted their own two methods to adjust the quadrant elevation and account for VI (*See Figure 2*).[5] By understanding the Honduran methods for Computational Procedures, we developed an appreciation and respect for their ingenuity. Since their weapon system is Israeli-made and ballistically dissimilar to the U.S.'s largest caliber mortar, there is no established method for certain Computational Procedures.
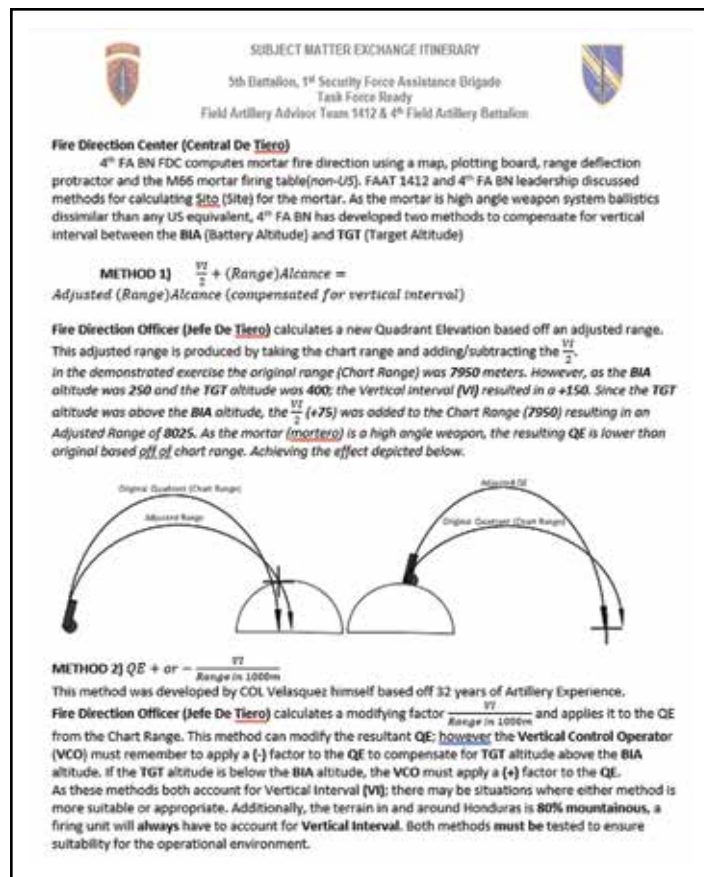

Figure 2: an example of the results of the team's research gathered from observation in the field.

Recommendations and Applications

Honduran Commanders have derived their own solutions – drawing from experience and their studied knowledge. This provides advisors a truly unique opportunity to employ problem-solving alongside the Partner Force Leadership and come up with recommendations to reduce vulnerabilities.

In our partnership with 4th FA BN, we understood that the greatest introduction of vulnerabilities were not the processes themselves, but the shortage of leaders within the formation who truly understood the steps of the process. During our observations, we studied how many leaders in the formation understood the Computational Procedures that they were responsible for. We discovered limitations in the number of FDC leaders that knew both of the Battalion's methods for calculation of site. Similarly, we discovered a limitation in the number of gun-line leaders that knew what checks to perform to ensure their

4 *Central American Field Artillery Doctrine (22 JUNE 2021).* 1st FA BN_#10_22JUN21.
5 FAAT 1412. *FAAT 1412 and 4th FA BN_SME_09-10JUN21.* Jun 10, 2021.

weapons were correctly laid on the Azimuth of Fire. We found that the formations often had one leader who performed the function; limiting depth and the ability to correct error. This discovery informed our application and recommendation to the Honduran Battalion Commander. Focusing on the fundamentals, we understood that for every Soldier that we were able to train to use a map and compass, we provided the Battalion an additional set of eyes to ensure that weapons were correctly laid on azimuth. For every crew we trained to understand the plan and the Commander's intent, we alleviated the Commander to plan the next operation concurrent to ongoing operations. Working together with the Honduran Battalion Commanders, we developed a module of instruction that incorporated map training and terrain navigation at entry-level and built into a Fire Support planning exercise for Combined Arms Offensive and Defensive Operations.

Conclusion

As advisors, we are by default, problem solvers and by application, relationship builders. Our goal focuses on equipping our Partner Force's leadership with an outside perspective on what

direction they can take their formation and employing feasible solutions to address finite capability gaps and vulnerabilities. We gain this perspective by taking in a detailed assessment of their unit's capabilities and practices, and by conducting vigorous research involving the full faculties of each team member's skillsets and experiences. This is what enables the advisor team to speak into the partner-force Commander's decision-making. Over time, this sustained engagement builds trust between the advisor and the Partner Force leadership. In our employment, we grew to know our Honduran partners as they grew to know us; our names becoming familiar personalities within their formations.

Upon the early return of one of the members of our team, one of the Battalion Commanders asked, "Donde esta Sargento Azul?"

We explained that SSG Lemuel Blue had returned to the states to attend a Senior Leader Course, a professional development requirement for non-commissioned officers and would not be returning. A twinge of sadness colored his response as we both remembered SSG Blue's enthusiastic and inviting presence. Our advisors and the Partner Force leaders

The advisor team engages across the partner force formation to provide recommendations to address finite capability gaps and vulnerabilities; but the advisor forms the human link to the partner force, its processes, its capabilities and its leadership.

share in each other's challenges, victories, losses, and in reluctant goodbyes. During the engagement which functioned as our team's parting with the Battalion, the Commander shared, "It has been an honor training with your team. You showed that you really cared about training our soldiers, sub-officials and officials well. It has been a blessing."

In the months we worked with the Honduran Field Artillery Battalions, we found ourselves completely immersed in brainstorming solutions and recommendations for our next engagements. Late into evening and weekends, we would find ourselves in our office space, researching how to improve and refine our instruction methods; reiteratively bouncing ideas off of one another. We honed our advisor approach to a razor's edge; even as we sought to reduce vulnerabilities within the Honduran formations. Initially, we set out to build capability. Through the advising cycle, what we ended up building was a partnership.

Team Leader CPT Dang has served in the Army for nine years on both towed and rocket artillery systems. Prior to advising, CPT Dang served as a Battery Commander for an M270A1 Multiple Launch Rocket System Battery in South Korea. His battery maintained a deterrent and flexible response option to maintain armistice conditions on the peninsula and provide immediate and scalable

Fires in the event of contingency operations. CPT Dang's advisor focus remains on engagement with Partner Force leadership to expand their playbook to incorporate options for the full spectrum of contingency operations.

Assistant Team Leader SFC Quentrell Nelson has served in the Army for 10 years on M119A2 and M777A2 Howitzer systems. Prior to advising, SFC Nelson served as a Senior Drill Sergeant at Fort Benning, Georgia. Earning Drill Sergeant of Cycle, SFC Nelson demonstrated incredible aptitude in developing and molding Soldiers. SFC Nelson's advisor focus is the establishment and enhancement of systems within the Partner Force.

SSG Lemuel Blue has served in the Army for nine years on the M119A3, M777A2 and M109A6 Howitzer systems. SSG Blue has advised Partner Force Commanders in Tunisia in the establishment of the Air to Ground Integration Schoolhouse enhancing joint Fires interoperability. Advising at the national level, he provided input to the Tunisian Artillery Commandant on how his formations could more reliably meet the Five Requirements of Accurate Fire, focusing on Accurate Target Location. His advisor focus engages and equips the trainers within each Battalion to incorporate the fundamentals of reconnaissance, planning, and resourcing.

SGT Seth Wilbourne has served in the Army for four years as a Forward Observer in 1-503rd Infantry Battalion (Airborne), out of Vicenza, Italy. SGT Wilbourne honed both his skills and versatility as a Fire Supporter through employments and exercises working with a myriad of Partner Forces in the European Theatre. SGT Wilbourne's advisor focus is to build the Partner Force's ability to gain an understanding of the terrain and the enemy and to achieve effects through Fires.

Advisors greet 4th Field Artillery Battalion on the first day of a three-week Subject Matter Exchange. Pictured from left to right; LT Romero (4th FA BN S1), LTC Velasquez (4th FA BN CDR), Carlos Sierra (FAAT 1412 Linguist), CPT Joseph Dang, SFC Quentrell Nelson, SSG Lemuel Blue and SGT Seth Wilbourne.

The promise of a Digital Kill Chain is so enticing and so easy to visualize, it is easy for the experience of Digital Sustainment Training (DST) to be completely demoralizing. The prototypical comment or thought of, "if I have a cell phone in my pocket that can open my garage door from another continent, why can't my digital equipment deliver a call for

unit to run with the idea. In 1996, then Colonel, Raymond T. Odierno co-authored an article in the *Field Artillery Journal,* "Advanced Field Artillery Tactical Data System (AFATDS): Digitizing Fighting with Fires." In his article, GEN Odierno (Retired) discussed the need for what he called "Fire Support Sustainment Training (FSST)."[1] His concept, which was still in development

Kill Chain Sustainment

By LTC Samuel Linn, MAJ Nathan D. Levy, and 1LT Matthew G. Eden

Fire 20 kilometers away?" is both reasonable and salient. Top Guns committed to pursuing digital excellence two years ago, and have directed our best minds and massive effort into understanding the digital tools, developing our processes, and investing in our people and organizational culture, to master the Digital Kill Chain from the Forward Observer (FO) in an Infantry Platoon to the 155 rounds exiting the tube of our M777 Howitzers. The following is an overview of our program, which we have named "Kill Chain Sustainment." It is detailed, robust, time-consuming, and has proven effective in dramatically improving our Digital Kill Chain's readiness and reliability. As a word of caution, the ability to reliably close the Digital Kill Chain is not a problem we believe we have solved – there are significant and persistent network, program, and support issues that we the Army need to address to optimize our Brigade Combat Team (BCT) Kill Chain. That said, having put our 100% into what is on our Modification Table of Equipment and in our motor pool, the following represents our best effort to that end.

Every After Action Review (AAR), white paper, and comment from our Combine Training Centers, as well as the *Field Artillery Professional Bulletin*, discuss the need for a disciplined DST program. Most articles discuss DST but don't thoroughly explain the concept enough for a

at the time the article was published, was original. "FSST consists of weekly individual training on AFATDS and a monthly 36-hour Field Training Exercise (FTX) where we concentrate on Division-wide collective tasks that develop the entire Fire support team from the Division Fire Support Element (FSE) down through the Platoon Fire Direction Center (FDC)." In 2021, COL Thomas "Tom" Caldwell and LTC James "Jim" Nemec of the National Training Center wrote a similarly themed article about how to improve call for Fire processing in units.[2] During our research this stood out as the best concept for DST on a six-week linear progression model. Many of the Top Guns had previous experiences with the use of a nodal DST program that was compartmentalized and did not integrate the entire Kill Chain. DST was Battery or Field Artillery (FA) Battalion (BN) internal, generally did not include Fire Support Teams (FISTs), and was not a routine battle rhythm event. What we call Kill Chain Sustainment (KCS), is part of disciplined command maintenance every Monday, from all sensors to shooters and back to sensors, as well as everything in-between. KCS improved our digital/voice communication and user operability across the BCT's Kill Chain.

Any new organizational undertaking units should consider *Knowledge Management (KM)*. The Army defines KM as "The process of

---

1 Odierno, Raymond T. "AFATDS: Digitizing Fighting with Fires." Field Artillery, 1996, 14–14. https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/atp6_01x1.pdf.
2 Caldwell, Thomas, and James Nemec. "How to Improve the Employment and Effectiveness of Digital Calls for Fire Processing." Field Artillery, June 2021.

enabling knowledge flow to enhance shared understanding, learning, and decision making. The four components of KM are *people, process, tools,* and *organization*."[3] The Brigade (BDE) Kill Chain is a KM problem: How can the Kill Chain enable decision making (rapid execution of Fires), through *people, processes, tools, and organization*?

- *People* are the human dimension of the Kill Chain. In a BCT, the Kill Chain encompasses more than just Field Artillerymen and women with their organic equipment. *People* in the BCT Kill Chain can also include leaders at echelon, mortar men, intelligence, aviation, signal, and protection representatives.
- *Processes* are the analog/digital Standard Operating Procedures (SOPs) and Tactics, Techniques, and Procedures that link *people* and *tools* in the Kill Chain. Every method of communicating between sensors and shooters is a *process.* Processes help with task and time management as well as the onboarding of new personnel.
- *Tools* in the BCT Kill Chain is the network of collaboration. It can include information management tools like AFATDS, Precision Fires-Dismounted (PF-D), Mortar Fire Control System (MFCS), Joint Battle Command-Platform (JBC-P), Data Dissemination Services (DDS), Distributed Common Ground System-Army, Theater Air Integration System. Analog tools can include PACE Plans, validated Common Operating Picture (COP), and targeting inputs/outputs.
- *Organization* in the BCT Kill Chain is the culture of collaboration and decision-making. If the culture is not enforcing, using, or adhering to defined roles for *People, Processes,* and *Tools,* shared understanding will be limited and effective KM cannot be implemented.

The purpose of Kill Chain Sustainment is to align the efforts of *People, Processes, Tools,* and *Organizations* to create a well-maintained, seamlessly integrated, and lethal Fire Support Enterprise that employs all means of communication abilities from the sensor to shooter.

Program overview

Kill Chain Program Leadership: Our Kill Chain Sustainment Program is led by disciplined participation from several leaders in the Battalion and BDE-to include FA Battalion Commander. The FA Battalion S3 and the BDE Fire Support Officer (FSO) approve long-term plans and short-term adjustments in regards to tasks to execute each Monday. The S3 and BDE FSO also co-chair the KCS Pre-Brief meeting which is conducted each Thursday afternoon. The Battalion Fire Direction Officer (FDO) and the BDE Fire Control Officer (FCO) develop plans and run execution of each event.

Kill Chain Sustainment Working Group: Other key leaders in the Kill Chain Sustainment Program are FA Warrant Officers with the BDE Targeting Officer, the Battalion S6, and selected NCOs and Officers from the Batteries and Maneuver Fire Support Teams. These individuals, with the BCT FCO and BN FDO, form the Kill Chain Sustainment Working Group. They create and refine plans based on the assessments that are conducted after each training event. Critical to the output of the KCS Working Group is the plan presented at the Kill Chain Sustainment Pre-Brief. Additionally, the KCS Working Group discusses issues that either require support from outside agencies or require the need for acquisition of material not on-hand that could better enable the Kill Chain (upgraded or non-standard supply needs).

Battle Rhythm: KCS is comprised of two battle rhythm events each week. The main event is the execution of KCS, generally held on each Command Maintenance day. Execution usually starts in the morning and is completed when units meet training objective release criteria that are approved by either the Battalion S3 (Batteries) or the BDE FSO (FIST). Key to meeting release criteria (aside from training objectives) is the submission of AAR comments, submission of DA Form 5988s, and other paperwork for systems requiring maintenance attention.

The KCS Pre-Brief is generally held on Thursdays (or the second to last working day of the week.) Allowing for a workday between the KCS Pre-Brief and KCS execution enables units

3 Army Operational Knowledge Management Proponent. *Techniques for Effective Knowledge Management.* ATP 6-01.1. Washington, DA: HQDA, 2015.

to conduct routine Troop Leading Procedures to prepare for the event. Typically the KCS Pre-Brief lasts 15 to 20 minutes. At least two leaders from each FDC and Battalion FIST attend. The Battalion S6 sends a representative to the event to ensure the correct Communications Security (COMSEC) will be on-hand when the event initiates. The FDO and FCO run the meeting while the Battalion S3 and Brigade FSO chair the meeting. During the meeting, the FCO and FDO brief the AAR and Kill Chain COP from the previous KCS. The Kill Chain COP is a graphical representation of the current network status of each pertinent system within the Kill Chain (see Figure 1) The FCO and FDO then brief the Concept of Operations for the next KCS and allow subordinate unit representatives to ask any questions or voice any concerns with the plan.

Kill Chain Sustainment Phases and Efforts

Kill Chain Phases: We developed three phases of our KCS program: Assessment, Establishment, and Improvement. These phases are built to be flexible based on training plans, but also can be executed in a manner that can incorporate efforts from different phases. For example, in Figure 2 on the next page, the System Diagnostic effort is the baseline effort that is incorporated into all three phases.

Kill Chain Assessment: This phase is the foundation for the KCS program. System Diagnostics is the single effort in this phase, however, System Diagnostics is an enduring effort across each phase.

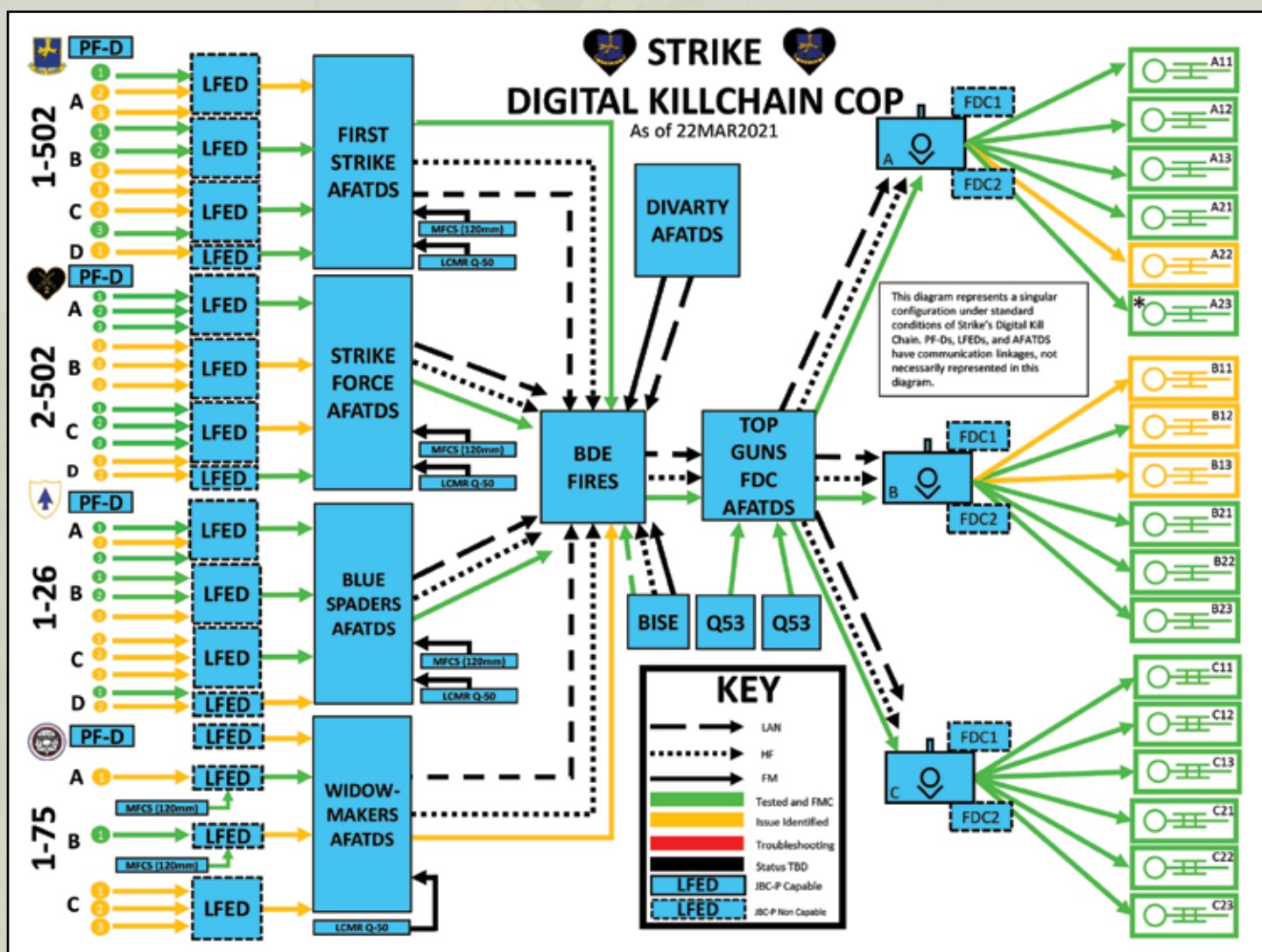*System Diagnostics:* During the assessment

Figure 1: Digital Kill Chain COP: This chart assists the Brigade Commander and Field Artillery Commander in visualizing the status of each item of the Digital Kill Chain.

phase, this effort is generally conducted in a classroom environment and focused on turning on equipment and checking for connectivity issues. This effort serves as an opportunity to test all inoperable or malfunctioning systems. Some systems within the Kill Chain are self-testing, such as the AFATDS and most counter-fire systems. Other systems, such as the PF-D, may require more hands-on troubleshooting and testing of each cable and component.

Tasks completed during *System Diagnostics*:

- Establish the full Kill Chain (PF-D/ Lightweight Forward Entry Device [LFED]/ AFATDS with each PF-D sending a When Ready (WR) Fire Mission.)
- Conduct further troubleshooting on any system unable to complete to send the WR

mission and receive digital shot/splash/ rounds complete and identify specific components of the system that are Not Mission Capable (NMC).
- Fill out and turn in DA Form 5988s for digital systems.
- Conduct this effort during every follow-on phase of KCS. If a system is unable to complete the closeout criteria for a specific event, a specific component should be identified as NMC, then added to the unit's Equipment Status Report.
- Test power output of the radios to ensure proper wattage.
- Clean antennae mounts.
- Test vehicle mounts and cables.

Digital Basics: The Digital Basics effort is intended to disseminate existing digital knowledge and
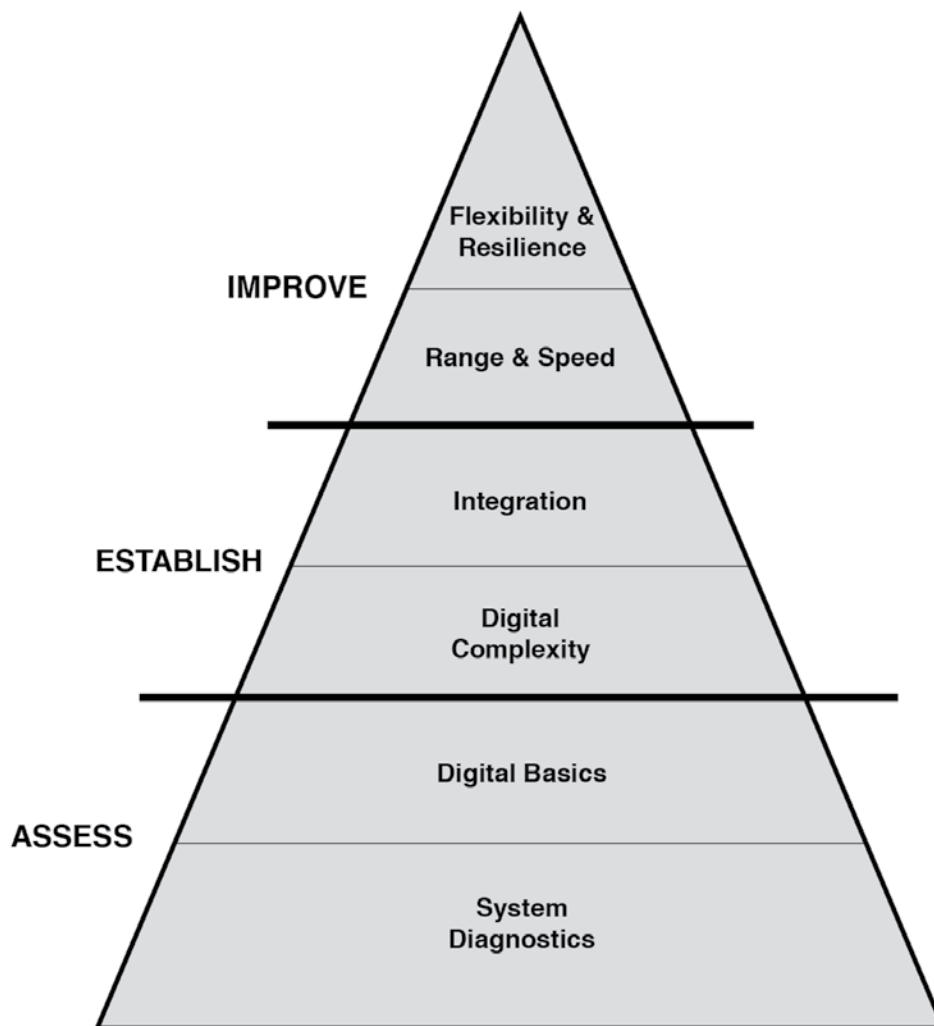

*Figure 2: KCS Phases and Efforts: The different phases of the KCS program are listed across the left side, and the efforts are contained in the main diagram. *Note: Systems Diagnostics should be conducted throughout all phases.*

identify any gaps requiring attention. We found this to be a great opportunity to train incoming personnel on digital systems and communications troubleshooting, as well as to review and apply any lessons learned to our SOPs. The main method to conduct Digital Basics is to have each subordinate unit teach their Soldiers how to complete a specific task. Following this class, a Subject Matter Expert (SME) should pick a random Soldier from each unit and test them on their ability to complete the task. If they are unable to successfully perform, the entire unit should be retrained on the task.

Examples of tasks conducted during *Digital Basics*:

- Troubleshoot Digital communications using the system's troubleshooting guide.
- Set up the configuration of communication and ensure that the parameters are the same between radio and digital systems.
- Load COMSEC from a Simple Key Loader.
- Adjust data distribution.
- Process FMs from, to, and/or through each device (When Ready, At My Command, and/ or Time On Target).

Kill Chain Establishment: Kill Chain Establishment focuses on the building blocks of the minimum amount of training a unit needs to be familiar and proficient with the Digital Kill Chain. A unit can conduct a partial KCS cycle completing these events in six weeks to be ready for a culminating training event. Kill Chain Establishment has three efforts:

Digital Complexity: The Digital Complexity effort is used to challenge and stress digital systems to further advance the ability of the Fires Enterprise.

Examples of tasks conducted during *Digital Complexity*:

- Process multiple types of Fire missions from the sensor to shooter, and back to sensor again.
- Establish all devices and send a Fire Support Coordination Measure (FSCM), compile the FSCMs at the BDE Fires/BN FDC level, and ensure that the FSCMs automatically redistribute. Conduct FSCM scrub to ensure delivery of FSCMs on each device.
- Send Target List Worksheet (TLWS) down

to FO level and have FOs submit target refinements to process new Fire Missions.
- Conduct a full Fire Support Technical Rehearsal (with a pre-determined TLWS).
- Send a large number of missions at once to test the maximum number of missions that can be processed at once.

Integration: The integration focus is best used to integrate higher echelons, adjacent units, counter-fire elements, and mortar units.

Examples of tasks conducted during *Integration* are:

- Integrate AFATDS with DDS server in the Target Intelligence Data System with the BDE S2.
- Integrate Air Defense Air Space Management/Brigade Aviation Element Tactical Airspace Integration System for a complex airspace problem.
- Incorporate adjacent and higher headquarters AFATDS into Kill Chain.
- Incorporate BN mortars into the Kill Chain.
- Disseminate FSCMs to both Command Post of the Future and JBC-P.

Kill Chain Improvement

Range and Speed: The range and speed focus should be used to improve establishment and transmission times as well as test and improve the range of all systems.

Examples of tasks conducted in this effort are:

- Test power output of the radios to ensure proper wattage.
- Clean antennae mounts.
- Test vehicle mounts and cables.
- Incorporate new and innovative communications methods.
- FDCs and FSEs configure communication routing methods (relay).
- Use the SPEED Analysis tool to determine FM range estimates in the training area.
- Send the unit out to the multiple points in the training area to stress technical range limitations.
- Stress BDE Fires and BN FDC TOC/TAC digital handoff.

Flexibility: Flexibility is used to test the adaptability of the Kill Chain and the ability of individual units to assume control of the higher echelon in case the tactical situation deems so.

Examples of tasks conducted in this effort are:

- Platoon (PLT) FDC assumes control from the BN FDC.
- Each BN FSE connects directly to BN FDC.
- BN FSE assumes control of BDE Fires.
- FDCs and FSEs configure communication routing methods (relay).
- Kill Chain Working Group plans a simulation in which there are faults and system failures injected, and subordinate units are required to follow the PACE plan and assumption of control plans to continue the mission.

8-12 Week Training Plan

KCS Cycle Planning: We found that it is possible to execute an abbreviated KCS cycle in eight weeks (Kill Chain Assessment and Kill Chain Establishment). However, to fully execute a KCS cycle (Assessment, Establishment, and Improvement) it can take as long as 12 weeks while taking into account block leave, training events, and other requirements. The Kill Chain Working Group meets bi-monthly to plan future iterations and assess ongoing KCS operations. The BDE FCO and BN FDO chair the working group, with participation from SMEs from across the Kill Chain. They review both short-range and long-term training calendars, guidance from the FA BN Commander, and the long-term goals for improving the Kill Chain. With this information at the forefront, they discuss possible plans for the next 8-12 weeks of KCS. The Kill Chain Efforts are used as a framework for planning but may occur in any order or combination that supports the goals of the working group. The following is an example of an eight-week plan that we created for our third KCS Cycle:

- **Week 1**
  - º Phase: Assess
  - º Effort: Systems Diagnostic
  - º Plan Overview: Each PF-D sends a When Ready FM from the sensor to shooter, utilizing the entire Kill Chain to establish a connection and validate equipment.

Digital Shot/Splash/Rounds Complete are received at the PF-D and End of Mission must reach PLT FDC. Any non-mission capable system must provide a specific broken component or fault.

- **Week 2**
  - º Phase: Assess
  - º Effort: Digital Basics
  - º Plan Overview: AFATDS Operators report to DIVARTY IT Lab. BN FDC and BDE Fires give them a block of instruction on proper data distribution settings and configuration for Local Area Network (LAN) connection. The settings are then reset and each operator must fix the settings and establish a LAN connection. The remaining systems then establish a FM line-of-sight connection, and a When Ready mission is sent from sensor to shooter and all associated messages are received digitally.
- **Week 3**
  - º Phase: Establish
  - º Effort: Integration
  - º Plan Overview: Task each Maneuver BN Mortar PLT to participate in KCS. They are required to establish a connection with their MFCS to the BN FSE and receive one Fire Mission and an FSCM from each PF-D in their BN.
- **Week 4**
  - º Phase: Establish
  - º Effort: Digital Complexity
  - º Plan Overview: Use Electronic Warfare (EW) team to test the Radio Frequency (RF) signature for different forms of communication (FM Voice, FM Digital with different message types and packet sizes). Use data to advise Commander on communications plan and to provide feedback to program managers and software developers on which type of communication had the smallest RF signature.
- **Week 5**
  - º Phase: Assess
  - º Effort: System Diagnostics
  - º Plan Overview: Conduct standard System Diagnostics. (This week fell on BN Change of Command, so we needed a plan that validated Kill Chain while not taking up much time).

- **Week 6**
  - º Phase: Establish
  - º Effort: Integration
  - º Plan Overview: Task Maneuver and FA BN Command Post to participate in KCS. Transfer FSCMs from the AFATDS at echelon to the Command Post of the Future/Joint Battle Command Platform to ensure the ability to update geometries in real-time.
- **Week 7**
  - º Phase: Establish/Improve
  - º Effort: Digital Complexity/Range and Speed
  - º Plan Overview: Validate High Frequency (HF) capabilities and ensure that indirect routing is set up in the AFATDS. This will increase both range and speed by using HF and having each AFATDS serve as a retrains.
- **Week 8**
  - º Phase: Improve
  - º Effort: Flexibility and Resilience
  - º Plan Overview: Conduct a two-day FTX in which you give a full Operation Order and conduct technical rehearsals. Then conduct notional Fire Missions as planned. Have the EW team serve as Opposing Force and measure RF signatures and use those signatures to target friendly units. Inject system failures at all levels and test the unit's ability to connect to the next higher echelon to continue operations.

We have found it to be extremely important to have realistic goals for each KCS Cycle and to make sure that it is nested with the long and short-range training calendar. Our first KCS cycle was far too ambitious for our capabilities at the time, forcing us to reassess and re-plan. Each cycle should build upon one another to ensure the greatest capability leading to major collective exercises.

Additional Considerations

Be flexible: Have a backup plan in the case of last-minute taskings, COMSEC issues, maintenance issues, etc. The backup plan can be as simple as the single standard everyone knows during System Diagnostics or Digital Basics.

Concurrent training: Each week's plan and release criteria can be assessed as the minimum standard. We found it useful to encourage concurrent training at the subordinate levels to take full advantage of Soldiers' time. Concurrent training can be as simple as OE-254 set-up races or incorporation of Threat ID pictures into digital Calls For Fire.

Keep the AARs: Periodically review multiple AARs at the KCS-Pre-Brief to ensure you are not returning to bad habits.

Use a PRM-36 or Vapor: Use these tools to test the power output of Advanced System Improvement Program (ASIP) radios Internet of Things to identify network issues. ASIP radios (RT-1523) have power output requirements at Low (.01 w), Medium (.1 w), and High (5 w) settings. The PRM-36 or Vapor can test the power output of radios, mounts, and antennas to ensure your systems are working within a 10% variance of the requirement. If that power requirement is not met, the range will severely be restricted.

Find the Motivated Experts: As a commitment to KCS continued, we found that we needed to hunt the motivated experts for particular systems in the Kill Chain. At times, Soldiers at the rank of Specialist were the source of information regarding troubleshooting that was not recorded in manuals or references. Two different Specialists even conducted formal and informal classes on AFATDS and Precision Fires-Dismounted (PF-D) inside the Battalion and with adjacent units. One of our Specialists was even awarded a Certificate of Appreciation from Program Executive Officers (PEO)-C3T when he found power through-put failure in a NETT Warrior basic hub. That discovery led to the development of a new cable for the battalion to test, and in less than 6 months it was fielded to Army units.

Develop a unit Troubleshooting Guide: From FO to gunline four digital platforms require technical competence: PF-D, LFED, AFATDS, and M119/M777 Fire Control Cell/Control Display Unit. Between these nodes, there is an infinite number of combinations of failures. At times, a PF-D End-User Device (EUD), Ultra Link, cables, and radio can be fully functional, but a break elsewhere in the chain could limit the reception of a Message to Observer. Troubleshooting guides developed

from Fort Sill, Center for Army Lessons Learned, PEOs, and companies often do not include steps to troubleshoot in a unit environment. We were able to develop and continually update a unit troubleshooting guide for different systems. Working with outside agencies and resources greatly increased the troubleshooting knowledge.

Support outside of the Battalion: In the Fires community, we often don't have organizational expertise to fix every problem set. We found that with the Digital Kill Chain, there is no single service to fix or resolve all of our problems. In 15 months, Top Guns worked with other units, local Field Service Representatives (FSRs), the local Mission Training Center, the local Communications-Electronics Command Trail boss, PEO-C3T, PEO-Soldier, PM Mission Command, FS C2, Army Futures Command, software engineers, Item Managers (IMs) and multiple Fort Sill representatives.

What we found was that our systems cross several programs. There might often not be an SME who can fix one problem. Establishing relationships to find the correct point of contact to steer us in the right direction was crucial. In the case of the PF-D, the Army has not yet sourced an FSR requirement for the software. We had to rely on a separate PEO's FSR to load software, and call support engineers to attempt to resolve connectivity issues. Also with the PF-D, at one point we needed simple power cables for the EUD, but the wrong part kept arriving after we ordered. After making some contacts, we were told by the IM to order the wrong part again, then forward the document number to the IM, and the IM would then manually change the order to the correct part.

Conclusion

A Field Artillery Battalion is the human network of a BCT – with a Soldier in every Maneuver Platoon in the BDE, we exist to combine the five requirements for accurate predicted Fire, to deliver effects with precision and rapidity, and in accordance with the Commander's targeting guidance. The digital tools layered on top of our human network are a patchwork of systems, going through varying degrees of upgrades and updates, that must all work together at once to provide the Digital Kill Chain we all can visualize. The ability to see accurate target location and description enter the Kill Chain and process digitally by echelon is a beautiful and ruthlessly efficient thing to watch when fully established. The system, because of its fragility and fragmented structure, relies more heavily on empathy and trust than anything else – once a seed of doubt that someone else's part of the network is the cause of an incomplete chain, it is easy for all other nodes to give up hope. A master-the-basics approach that squeezes uncertainty out of the Kill Chain from the start, consisting of NCOs and Officers willing to first understand, not just their node on the Kill Chain, but the links between nodes and how their actions impact the nodes up and down the chain, we found essential to any measure of success. If we learned one lesson, it is that this is a complex and fragile system requiring significant investments for any measure of success. Any expertise we developed we saw as an opportunity to provide the Army, Army Capabilities Managers, Program Executive Offices, and other Army Research & Development, procurement, and testing agencies feedback into our experiences, that they may impact and improve our next iterations and innovations in future Kill Chain development.

LTC Samuel E. Linn is currently the Battalion Commander for 1-320th Field Artillery Regiment, 2nd Brigade Combat Team, 101st Airborne Division. He holds a Bachelor of Science from the U.S. Military Academy and a Master of Business Administration from the University of Pennsylvania's Wharton School of Business. LTC Linn has served and deployed with the 101st Airborne Division, the 3rd Battalion, 75th Ranger Regiment, the 2nd Infantry Division, and the 4th Infantry Division. He served as an Assistant Professor of Economics at the U.S. Military Academy, West Point, and served as the Professor of Military Science for Fordham University.

MAJ Nathan D. Levy is currently the Fire Support Officer for the 2nd Brigade Combat Team, 101st Airborne Division (Air Assault). He holds a Bachelor of Arts from Arizona State University and completed his graduate degree capstone project working with the Army Knowledge Management Proponent Office through the Florida Institute of Technology. MAJ Levy has operational experience with Operation Iraqi Freedom, Operation Enduring Freedom, Operation Resolute Support, Operation Freedom Sentinel, and United States Africa Command Regionally Aligned Forces.

1LT Matthew G. Eden is currently the Fire Control Officer for 2nd Brigade Combat Team, 101st Airborne Division (Air Assault). He holds a Bachelor of Science in American Politics from the U.S. Military Academy. 1LT Eden served as a 94M Radar Repairer while enlisted. His previous assignments as an officer include Fire Direction Officer and Assistant Operations Officer. He currently manages all DST/KCS operations for the 2nd Brigade Combat Team.

Background screen, pages 22–29: Soldiers from Battery B, 2d Battalion, 114th Field Artillery Regiment, Mississippi Army National Guard, set up for a defensive perimeter June 7, 2016. (Photo by PFC Justin Humphreys, 102d Public Affairs Detachment/Released.)

Reflections of a DIVARTY Commander

By COL Jim Collins

In December 1997, I reported to the 3rd Infantry Division (3ID) at Fort Stewart, Georgia. More specifically, to 3ID Division Artillery (DIVARTY), Marne Thunder. I was a young Lieutenant immersed in what I thought was the best unit in the Army. I keenly remember both DIVARTY Commanders during my tenure and, over the years, I have come to appreciate the importance of their technical and tactical expertise and how they were standard-bearers for the King of Battle. Contrasting those early formative years to 2021, I reflect on "what I wish I would have known back then." Now, as a current DIVARTY Commander, allow me to provide several observations that I could have benefited from 24 years ago. Agree or disagree – all I ask is that you think about my reflections. If you disagree, discuss them with your colleagues or a mentor. If you agree, find a reason to challenge them. But, at end-state, trust one thing – this DIVARTY Commander (and I am confident it applies to all Field Artillery Commanders) wants you to succeed – the future of the King of Battle may depend on it!

First and foremost, before we proceed, let's acknowledge one consideration – you (we) are different. That is not meant to be a compliment or an insult – just a mere fact. The Field Artillery requires a heightened degree of precision – this applies to the calculation of a gunnery solution to the file structure on your computer. We need to approach every aspect of the Field Artillery with the precision it deserves. If embraced, the difference is not a liability but a source of pride. In my opinion, this has practical application for everything we do.

Advice for an incoming Battery Commander

What is the difference between a good Battery Commander and a great Battery Commander? Simple, for the first six months of your command, do not focus on your idealization of what a Commander "should do." For example, a firing Battery Commander will often dedicate a disproportionate amount of time for an upcoming Howitzer Table VI qualification. In my opinion, while Howitzer Table VI is important, it will occur to a reasonable standard with or without the Battery Commander's day-to-day involvement. However, three other aspects of command will inevitably be neglected without the Commander's routine involvement:

1. Command supply discipline. First, know the Army standard for property accountability. If the property is not present (yes, that includes all classes of supply, not just class VII) someone must be held accountable. Second, before starting change of command inventories, learn how to use Global Combat Support System-Army (G-Army). If 100% of Class VII, with all associated Class IX,

is not built into GArmy, you will likely spend an exorbitant amount of time throughout the rest of your command to fix it. It is worth the investment in time and mental energy to get it right prior to your first day of command.

2. Arms room. Simply put, adhere to AR 190-11, *Physical Security of Arms, Ammunitions, and Explosives*. I consider the arms room an easy way to measure discipline. An undisciplined arms room means an undisciplined unit. In this case, I don't think exceptions apply.

3. Barracks. Will you be a Commander that stays out of the barracks to "give the Soldiers freedom and time to unwind" or will you be the Commander that surges leaders and emphasizes standards into the barracks? Before you make that decision, first, understand the issue. This is not just about the barracks, it is about good order and discipline throughout your unit. Find the right balance. Mastery of these three variables is the difference between a good command and a great command.

Day with DIVARTY

Once a month, Command Sergeant Major Jean-Pierre Alcedo and I host several senior NCOs and junior officers from each of the Field Artillery Battalions. The day consists of four events. First, a team-building PT event. Second, three Leader Professional Development discussions. Third, a digital sustainment training scenario. Lastly, prior to COVID 19, the day concluded with a social at my residence. All events are important for different reasons and, I acknowledge this may sound vain but, in my opinion, the social was especially important. From my time at Fort Stewart, I have several memories of visits to my senior leaders' homes ranging from my Battalion Commander's Holiday Reception to the DIVARTY Commander's Hail and Farewell. Twenty years later, the Army has given me the privilege of living in a historic home on Fort Bliss. I consider it an honor to welcome visitors into the DIVARTY Commander's home and try to create similar memories for the next generation of leaders. I hope in 20 years an officer recalls a visit: "do you remember the countless pictures of cannons and the entire bookshelf of REDLEG reading?" Of course, mentorship is branch immaterial but we need more artillery officers to aspire to be like other artillery officers.

Command and Support Relationships of the Field Artillery Battalions within a Division and the Fire Supporters in a Brigade Combat Team

First, this topic is an entire article of its own but allow me to make three broad assertions:

1. For many, this has been a topic of discussion for the past 7-10 years. No, it has been a topic of discussion for the past several decades. But let's be clear – it is about lethality.

2. Remove emotion from the discussion. This is not about which training meeting the Commander attends or their rating scheme or maintaining modularity. Remember, it is about lethality.

3. Is it "easier" to have one boss versus multiple bosses? Yes, but in this case, easier is not better. A Fire supporter who cannot maintain a professional balance between their Maneuver unit and the Field Artillery Battalion will not succeed. A Field Artillery Battalion that cannot maintain a professional balance between their Maneuver brigade and the DIVARTY will not succeed. And, yes, Field Artillery Battalions are assigned to the Brigade Combat Teams (BCTs) but, don't try to oversimplify it, you still have two bosses. Remember, once again, it is about lethality. Everyone has a role within this discussion, from junior leaders to General Officers, the conversation was ongoing in 1997 and is still ongoing. Continue to mature this discussion.

Are you familiar with a Field Artillery Battalion Modified Table of Organizational Equipment (MTOE)? I will make a potentially contentious statement: I, the DIVARTY Commander, do not delegate the decision for Soldiers not to maintain/train 100% of their MTOE equipment. Have you ever heard this comment: "we don't use that piece of equipment?" The fact remains, the Army has given us that equipment for a reason. A practical example: the Stand-Alone Computer Unit (SCU) in the Bradley Fire Support Vehicle is

an underutilized capability that, if Fully Mission-Capable, and linked to the Fire Support Sensor System, can significantly expedite Fire mission processing times, reduce target location error and minimize human error. I do not delegate the decision whether you employ the SCU on the observation post. If it does not work properly, fix it; if it is obsolete, submit feedback to the BCT Command Capability Managers Fires; if you don't need it, submit a change to the MTOE. Until then, it is required for Fire support qualification.

There is one variable that is indisputably different between a junior officer and the DIVARTY Commander – perspective. Regardless of the degree of intelligence, an officer with three-

But, continuing with the example above from the Field Artillery Battalion, how many tasks should a formation of 504 Soldiers be able to accomplish in a duty day? From a Soldier's perspective, to simplify the day, let's say three. From the DIVARTY Commander's perspective, to increase readiness, let's say ten. The two perspectives are contrary – one seeks simplicity while the other may be in the best interest of the Army. Neither is right nor wrong, it is about perspective.

Most of you are familiar with Army Systems of Record. For example, G-Army is the system of record for supply, equipment services, etc. I can't

REDLEGS, we are different...

five years of service will naturally view issues differently than an officer with 20+ years of service. One perspective may be based on experience; another perspective based on what is in the best interest of the unit; another perspective based on what is in the best interest of the Soldier, etc. It is not about right or wrong; it is about perspective. Two examples:

1. Command Maintenance may provide a good example of differing perspectives. In this case, the Brigade Commander's perspective is likely aligned with what is in the best interest of the unit. A Field Artillery Battalion has approximately 504 Soldiers. Not including physical training and lunch, command maintenance should consist of seven hours in the motor pool. 504 Soldiers x 7 hours = 3528 hours. Is it feasible to do proper preventive maintenance checks and services on ~134 pieces of equipment within 3528 hours? Most Brigade Commanders think so. Therefore, by close of business on Monday, why isn't 100% of equipment 5988Es completed to standard? Of course, there are countless reasons why. But, how can we close this gap in perspective?

2. Have you ever asked the question: "which glass ball can I drop – there are too many priorities?" I will be the first to acknowledge everyone is very busy and there are a lot of competing priorities.

state with the same conviction I used for the MTOE assertion but, to the greatest extent feasible, I require all Field Grade officers to scrutinize any decision not to fully utilize an Army system of record. All of us have routinely said, "We use too much PowerPoint." I agree, so instead, use the system of record. Weapons qualification: use the Individual Weapons Report from Defense Training Management System (DTMS); maintenance meeting: use the Equipment Status Reporting from G-Army; immunization readiness: use the Immunizations Report or Unit Medical Readiness Report from Army Medical Department Medical Protection System. Sounds easy but to execute you must first learn how to use each system; second, instead of updating slides, input comprehensive data into each system; third, condition the team to use these products. An example: when I was a Battalion S3, prior to every quarterly range conference, I queried DTMS for individual weapons qualification by Battery. Typically, units averaged 65%. At the conference, I resourced the required number of ranges to get each unit to 100%. Inevitably, the Battery commander would subsequently state "I don't need five M4 ranges, I am at 90% individual weapon qualification –why didn't anyone ask me prior to the conference." Why would I ask? The system of record shows you are at 65% – execute the range.

In conclusion, allow me to reiterate the purpose of this article (I assure you it is not about nostalgia). The purpose is singular: the Field Artillery leaders

at echelon, want you to succeed. As previously stated, the future of the King of Battle may depend on it! I leave you with four summative assertions:

1. REDLEGS, we are different – but that is a strength.
2. We need more artillery officers to aspire to be like other artillery officers. In a Division, we may be assigned to four separate Brigades but collectively we have a lot to learn from each other.
3. Be a technical and tactical expert. Your senior rater may not demand that of you – but your "other boss" does.
4. Never disparage another branch. However, it is encouraged to routinely affirm to anyone that will listen – I am a proud member of the King of Battle! The most lethal branch in the Army!

KING OF BATTLE
Best of luck,
A DIVARTY COMMANDER

COL Jim Collins served as the 1st AD DIVARTY Commander from 2019–2021 and he currently serves as the Multi-Domain Effects Director, CENTCOM CJTF, ARCENT, Camp Arifjan, Kuwait.

Below: COL Jim Collins, left, the commander of Division Artillery, 1st Armored Division and CSM Tito Ferrera, the acting senior enlisted advisor for 1AD, prepare the colors during a casing ceremony prior to Headquarters and Headquarters Battalion's deployment to Afghanistan, at Fort Bliss, Texas, August 1. The casing of the colors is a tradition which formally encases the colors in a protective sheath, reflecting a unit's deployment or movement and signifying the continued service away from home station.

(U.S. Army photo by SPC Matthew J. Marcellus)
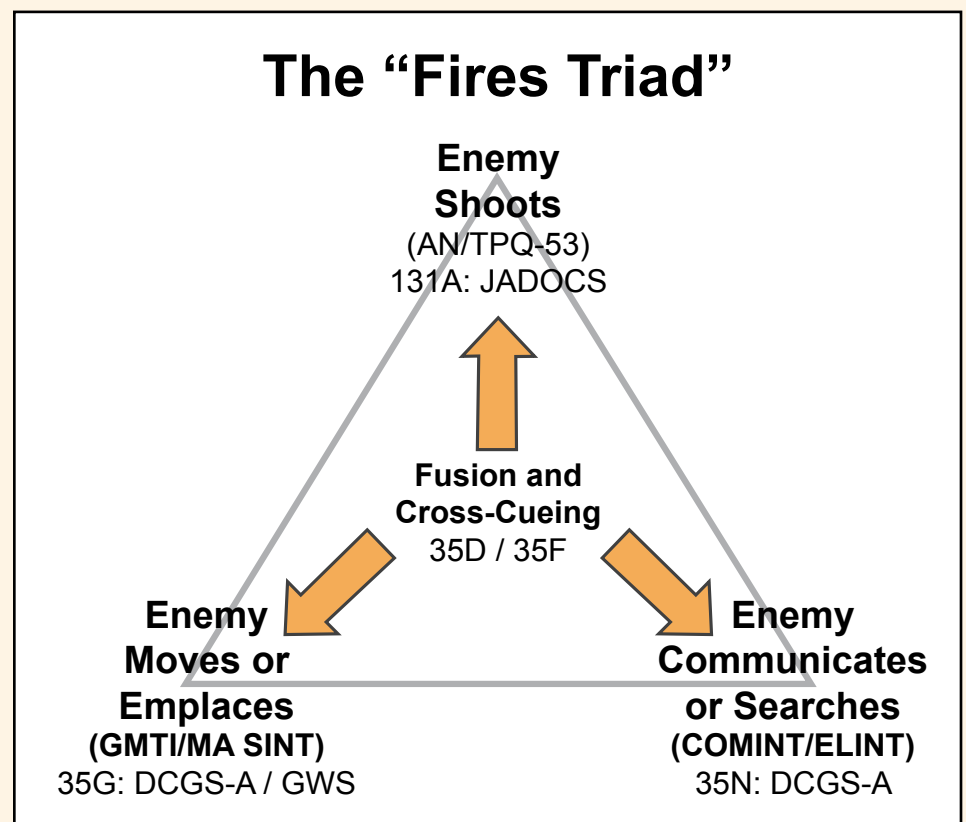
The Fires Triad

By

MAJ Christopher D. Thornton,
MAJ Michael A. Benner,
and MAJ Jeremy Crallie

The current generation of Aerial-Intelligence Surveillance and Reconnaissance capabilities, the E-8C Joint Surveillance Target Attack Radar System (JSTARS), the E-3 Sentry Airborne Warning and Control System, and the RC-135 Rivet Joint were known in the Joint community as the "Iron Triad." These assets were designed to work together as a team--complementary sensors that would find nearly any target in a theater of operations. However, in Large-Scale Combat Operations (LSCO), we fully expect that the "Iron Triad" will not always be present to support the Division and Corps deep areas. Therefore, there is an urgent need for the Division Artillery (DIVARTY) and Field Artillery Brigade (FAB) to have the capability to interpret whichever sensors are available: a "Fires Triad" of detection to rapidly identify targets and deliver timely and accurate Fires even in an Anti-Access/Area Denial (A2AD) environment.

We're Often Not Fast Enough

Warfighter Exercises are the capstone training events for U.S. Army Divisions, Corps, and Army Service Component Commands. Taken individually, the primary objective of these exercises is to enable units to rehearse Mission Command processes against a peer threat. However, these exercises also provide an opportunity to identify and address significant capability gaps with potential Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy solutions. Throughout FY20-21 series Warfighter Exercises, the Mission Command Training Program consistently observed

---

The "Fires Triad"

Enemy Shoots
(AN/TPQ-53)
131A: JADOCS

Fusion and Cross-Cueing
35D / 35F

Enemy Moves or Emplaces
(GMTI/MA SINT)
35G: DCGS-A / GWS

Enemy Communicates or Searches
(COMINT/ELINT)
35N: DCGS-A

"Fires Triad" Detection Concept (Image credit: MAJ Chris Thornton)

that the tactical intelligence and Fires Enterprise does not link sensors to shooters quickly enough for consistently effective counterfire and counter-battery Fires.

While airspace clearance can be cumbersome and digital Fire mission processing requires significant practice to conduct on time, a significant contributing factor is that the intelligence Processing, Exploitation, and Dissemination (PED) specialists best suited to support counterfire and counter-battery Fires do not exist at the Field Artillery units tasked with executing these missions as the Counterfire Headquarters (CFHQ). While several Divisions have task-organized temporary PED teams to ensure success during the Warfighter Exercise, PED capabilities of DIVARTY and FABs need to be expanded for sustained LSCO.

The World Class Opposing Force (WCOPFOR) is intended to provide a realistic "un-cooperative sparring partner" for Army Divisions and Corps. The Integrated Fires Command (IFC) is the principal organization of the WCOPFOR responsible for providing long-range rocket and cannon Fires. The IFC typically consists of artillery, aviation, missile, and Special Purpose Forces components, which are task-organized to best achieve the objectives of the WCOPFOR. The integration of sensors and shooters under a single headquarters provides the WCOPFOR efficient sensor-to-shooter processes and the ability to mass Fires in dispersed formations to achieve effects on key critical friendly capabilities such as air defenses and RADARs.

Of all the IFC's capabilities, artillery proves to be the WCOPFOR center of gravity. On average, approximately 75-90%[1] of friendly forces casualties during Warfighter Exercises are due to WCOPFOR indirect fire systems from 2019 to the present. Through the use of its artillery, the WCOPFOR can seize and maintain the initiative early in Warfighter exercises and significantly disrupt the movement of friendly forces.

Besides the advantages of WCOPFOR's flattened sensor-to-shooter links, some systems' capabilities contribute to their ability to successfully employ indirect Fires. The average displacement time of most WCOPFOR artillery systems remains under ten minutes.[2] As the average time for units to identify an enemy system with a sensor has consistently been approximately two minutes, followed by an additional nine minutes to clear airspace and process a counterfire mission, a unit has a very short window of opportunity in which to engage targets before they displace.[3]

Both predictive analyses of future enemy Position Areas of Artillery (PAAs) for effective counterfire and the ability to conduct reactive counter-battery Fires[4] are required to destroy enemy Fires formations, and both components are particularly important in LSCO due to a large number of enemy artillery formations. Integration of the Ground Moving Target Indicator (GMTI) and Electronic Intelligence (ELINT) information into the DIVARTY or FAB counterfire analysis process is recommended as it not only facilitates the predictive analysis[5] through survivability moves within an enemy PAAs but also allows continued sensor contact through displacements of enemy firing units and sensors[6] and across gaps in ground RADAR coverage.

To track enemy firing batteries through displacement within or between PAAs, and identify the sensors that

1 US Army Mission Command Training Program. FY19 Mission Command Training in Large-Scale Combat Operations Key Observations, page 44. https://usacac.army.mil/sites/default/files/publications/20-15.pdf
2 MAJ Maher, Benjamin and MAJ McCaroll, Michelle. "How the DIVARTY and Field Artillery Brigade Fights (In Support of the Division and Corps: An Assessment of Today's Force Field Artillery Headquarters." https://www.fieldartillery.org/news/how-the-divarty-and-field-artillery-brigade-fights--in-support-of-the-division-and-corps- (This reference lists the time at seven minutes. The G6 self-propelled howitzer, present in FY19 and some FY20 Warfighter exercises but currently not in the order of battle for the WCOPFOR, reduces this average time somewhat as its displacement time is three minutes.)
3 Ibid.
4 US Army Mission Command Training Program. FY20 Mission Command Training in Large-Scale Combat Operations Key Observations, pages 11, 20-21, 30. https://call2.army.mil/docs/doc18085/18085.pdf
5 Ibid, page 11.
6 MAJ Maher, Benjamin and MAJ McCaroll, Michelle. "How the DIVARTY and Field Artillery Brigade Fights in Support of the Division and Corps: An Assessment of Today's Force Field Artillery Headquarters." https://www.fieldartillery.org/news/how-the-divarty-and-field-artillery-brigade-fights--in-support-of-the-division-and-corps-

enable long-range Fires, some Divisions have started adding Geospatial Intelligence Analysts and Signals Intelligence Analysts to interpret theater-level intelligence feeds. We have observed that incorporating additional PED capabilities at the DIVARTY or FAB is an effective method that enables proactive counterfire and reactive counter-battery cueing procedures. By having a capability to interpret GMTI and ELINT indications of enemy firing batteries and associated sensors at the point of execution, these DIVARTYs and FABs are in effect the streamlined sensor-to-shooter links IFC achieves through its task organization and structure.

Current PED Capabilities and Relevant Doctrine

The primary tool DIVARTY and FAB S-2s have at their disposal to analyze enemy indirect fire systems is a density plot product known as a "heat map." This product is an effective tool to visualize the preponderance of sustained Fires in the area of operations, which can drive higher headquarters information collection and targeting efforts, improving deliberate and dynamic targeting. Despite its value in support of deliberate and dynamic targeting, in some cases, the heat map is not produced by the DIVARTY or FAB, or not incorporated

into the Division-level analysis of the enemy. The Division planning without the "heat map" can also lead to gaps in Intelligence, Surveillance, and Reconnaissance coverage of enemy artillery formations, and increased delays in sensor-to-shooter processes.

The most effective method to overcome the challenges of providing timely and accurate Fires despite short displacement times that the Mission Command Training Program has observed in the Warfighter exercise is the incorporation of GMTI capability at the FAB and DIVARTY.[7,8] Whether provided to a PED section at the DIVARTY or FAB or simply multi-cast to a Joint Automated Deep Operations System and analyzed by organic all-source personnel not formally trained in interpreting this data, GMTI allows units to provide timely intelligence at the point of execution regarding enemy artillery displacements. As the enemy firing batteries conduct Fire Missions, the point of origin is revealed to the DIVARTY or FAB Counterfire Officer if it is within the coverage area of the AN/TPQ-53 weapon-locating RADAR.[9] As the enemy employs its counterfire RADAR capability, this is recognized by friendly ELINT sensors. As the enemy conducts survivability moves of sensors and shooters, this is visible via GMTI collection. Using the AN/TPQ-53 acquisitions, ELINT and GMTI

together lead to particularly effective cross-cueing. When implemented, it also enhances the ability of the S-2 to provide intelligence support to proactive counterfire: when an enemy artillery formation is observed departing a PAA for a secondary position, the S-2 section can determine its heading and speed via GMTI to attempt to predict its destination, providing an opportunity for clearance of airspace and ground for organic or Joint Fires and/or dynamic re-tasking of friendly Unmanned Aerial Surveillance systems.

DIVARTY and FAB S2 sections are manned and equipped to conduct all-source intelligence, geospatial engineering, and targeting activities are given current personnel and equipment authorizations on their Modified Table Organization and Equipment (MTOE). Their Intelligence staff collect, process, and analyze one type of asset: ground-based counterfire RADAR.[10] However, this prevents the synergy between these sensors and complimentary GMTI and ELINT capabilities.

DIVARTYs and FABs further lack an organic ability to employ Joint Worldwide Intelligence Communication System or National Security Agency Network without the Trojan equipment required to access the Trojan Data Network. FABs (but not DIVARTYs) do possess

7 MAJ Maher, Benjamin and MAJ McCaroll, Michelle. "How the DIVARTY and Field Artillery Brigade Fights in Support of the Division and Corps: An Assessment of Today's Force Field Artillery Headquarters." https://www.fieldartillery.org/news/how-the-divarty-and-field-artillery-brigade-fights--in-support-of-the-division-and-corps-

8 MAJ Harrington, Peter and CPT Dallager, Emily. "Fighting a FFA HQ in Large Scale Combat Operations," pages 4-6. March 2021. https://www.milsuite.mil/book/docs/DOC-948952

9 Army Techniques Publication 3-09.12, Field Artillery Counterfire and Weapon Locating Radar Operations, page 1-11, October 2021.

10 Army Techniques Publication 3-09.12, Field Artillery Counterfire and Weapon Locating Radar Operations, page 3-2, October 2021.

FAB and DIVARTY S-2 Personnel MTOE (Image credit: MAJ Mike Benner)
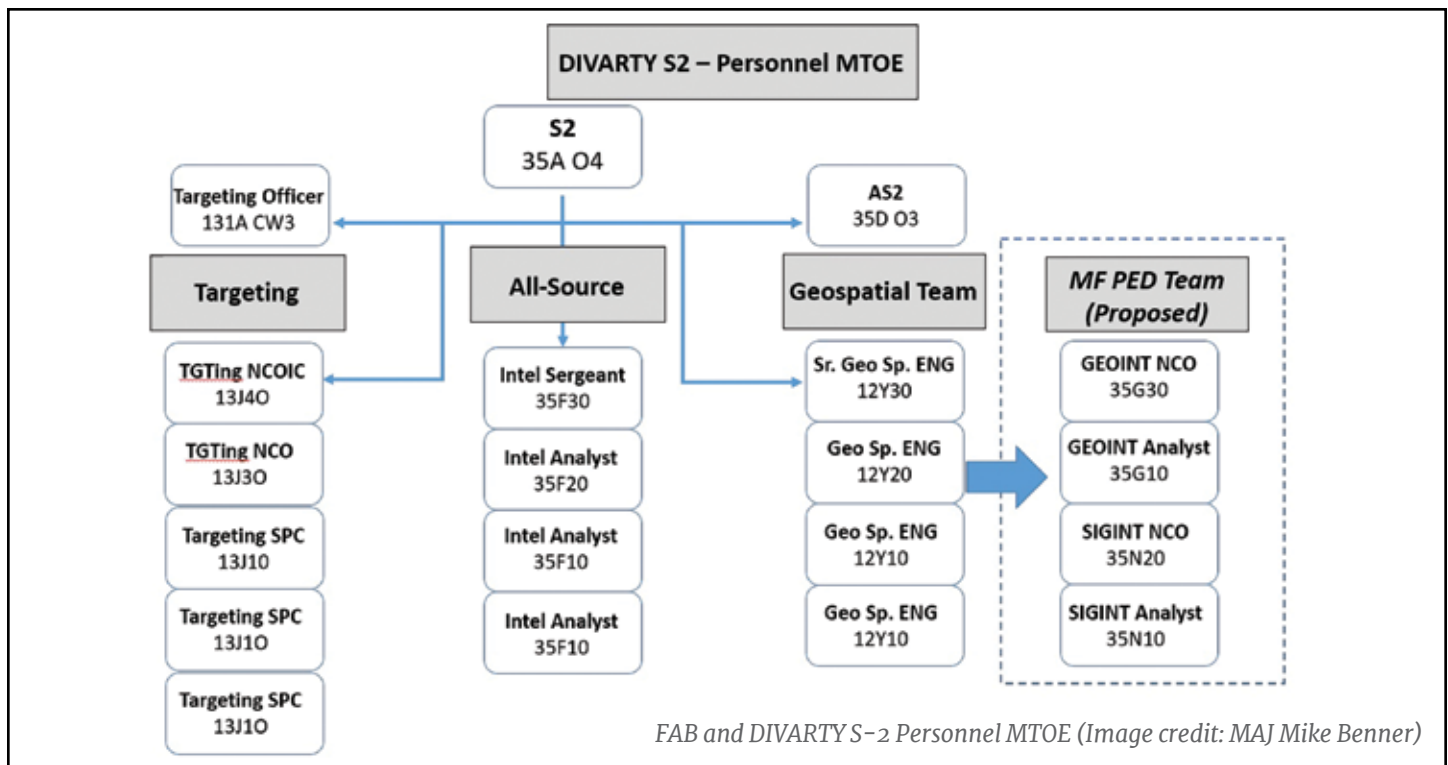
a single Signals Intelligence (SIGINT) officer to assist in planning, but no additional SIGINT staff to process or analyze raw SIGINT or ELINT information such as lines of bearing or specific frequencies as it is collected. Lacking a Tactical Intelligence Ground Station (TGS) section and its ability to ingest theater- and national-level feeds such as GMTI and ELINT, the formation is also unable to receive these feeds organically.

Despite these limitations, collateral-level GMTI and ELINT processing on organic Distributed Common Ground System-Army (DCGS-A) is all that a DIVARTY and FAB require for effective deliberate and dynamic targeting. Some DIVARTYs and FABs have filled these gaps in MTOE through requests for augmentation from the Division G-2 section, and the Division can attach a TGS

section from one of its Brigade Combat Teams (BCTs) to receive intelligence feeds without an additional burden on its limited Satellite Communications data. Filling these gaps through attachments creates their costs, as any Soldier or piece of equipment attached to that DIVARTY or FAB generates a personnel shortage in another unit. Those costs may be feasible to impose in an exercise of short duration with limited numbers of training audiences and lower command enablers but are likely not feasible when a Corps or Division is fully deployed with all BCTs and functional and multifunctional Brigades in an LSCO environment.

Although there is no specified requirement for a DIVARTY or FAB staff to process, collect, or analyze anything but its AN/TPQ-53 RADAR acquisitions, there are doctrinal requirements and processes

in Corps and Division-level Fires and intelligence doctrine which collectively provide a template for how to utilize GMTI to achieve more lethal, timely, and accurate Fires. Corps- and Division-level intelligence doctrine describes how a Geospatial Intelligence (GEOINT) section,[11] comprised of both imagery analysts and geospatial engineers, provides the capability to process and analyze Measures and Signatures Intelligence (MASINT) feeds such as GMTI. Field Manual 3-09, *Fire Support and Field Artillery Operations*, published in April of 2020, acknowledges the requirement to incorporate tracking a moving target into its dynamic targeting process.[12] Corps and Division intelligence doctrine also provide a template of how to monitor mobile High-Payoff Targets through target detection enabled by the integration of a Field Artillery

---

11 Army Techniques Publication 2-19.3, Corps and Division Intelligence Techniques, Chapter 2 Section 2-25, May 2015.
12 Field Manual 3-09.12, Fire Support and Field Artillery Operations, Chapter 2 Section 2-70 April 2020

Intelligence Officer, a Field Artillery Warrant Officer with the Division G-2 Analysis and Control Element.[13] Finally, targeting doctrine lists whether a target is moving or stationary as one of the essential targeting information conditions,[14] which is a doctrinal argument for the inclusion of GMTI analysis at the FAB or DIVARTY.

Relying solely on the Corps or Division G-2 staff to interpret these feeds is possible, but risks delays in sensor-to-shooter links and fire mission processing, particularly if communication between the Division Main Command Post (MCP) and the DIVARTY or FAB is degraded or denied. The previously referenced doctrine extractions and unit practices provide a rationale that can be applied to the DIVARTY or FAB requiring the capability to process these intelligence feeds. Units that have been task-organized to receive them have demonstrated that with the required expertise and capability to leverage GMTI and ELINT, they can more effectively deliver timely and accurate Fires despite WCOPFOR range overmatch and short displacement times.

Interim Solutions and Proposed Changes to Facilitate More Lethal Fires

In preparation for Warfighter Exercise 20-1, 1st Cavalry Division (1CD) formed a multi-disciplinary PED capability at their DIVARTY to fuse AN/TPQ-53, GMTI, and ELINT information to enable more effective counterbattery fire in support of dynamic targeting. They formed this team primarily with manning from the Division's aligned Expeditionary Military Intelligence Battalion (EMIBn). This team provided not only the 35G Geospatial Analysts to interpret and track the ground moving target indicator GMTI data in support of counterfire, but also allowed rapid tipping and cueing based on ELINT signatures of enemy counterfire and air defense RADARS.

The 1CD DIVARTY trained on integrating GMTI and ELINT with AN/TPQ-53 acquisitions with the multidisciplinary PED team over a series of Command Post Exercises (CPXs) against a live WCOPFOR, routinely achieved success against the enemy IFCs, destroying 75-90% of enemy firing systems and 50% of enemy RADARS within 36 hours, preventing massing of Fires on friendly forces.[15] When the enemy is reduced by attrition of sensors and delivery systems such that firing as battalions and batteries is no longer feasible, reducing the enemy to disruption Fires by the remaining delivery systems.[16] Their multidisciplinary PED team did not eliminate 75% of enemy firing systems in Warfighter Exercise 21-1 within the same timeframe as in their CPXs, but the inclusion of the capability did ultimately force the WCOPFOR to shift from the massed Fires to harassment Fires by their remaining delivery systems.

Across FY21 Warfighter Exercises, we have observed training audiences that leverage GMTI at a minimum at the FAB or DIVARTY has overall been more agile and lethal than those that have not. The addition of SIGINT specialists, when available, also proved valuable. The 1CD DIVARTY demonstrated the PED team construct in Warfighter Exercise 21-01 facilitated both reactive counter-battery Fires and proactive counterfire by leveraging its ability to interpret theater and national-level intelligence feeds, and that interpretation of ELINT was value-added for cross-cueing of sensors and destruction of enemy 1L-220U ZOOPARK 2 counterfire RADAR systems.

To achieve this end, the 163rd EMIBn augmented the 1CD DIVARTY's organic all-source capabilities by providing Military Occupational Specialty 35G GEOINT Analysts, 35N SIGINT Analysts, a TGS and a Trojan Spirit and associated subsystems with a TACON command relationship to the 1CD DIVARTY. TGS subsystems like the Surveillance Control Datalink Ground Data Terminal and Joint Tactical Terminal allowed the DIVARTY not only to receive data from these sensors directly to reduce the burden on the network but

13 Army Techniques Publication 2-19.3, Corps and Division Intelligence Techniques, Appendix A Section A-15 – A-19; Appendix F Section F-31–F-36, March 2015
14 Army Techniques Publication 3-60, Targeting, page 2-5, May 2015.

15 MAJ Speiss, Andy, CW3 D'Urbano, Michael, and COL Forbes, Brett. "Processing, Exploitation and Dissemination (PED) Enabled Dynamic Targeting at the Division Artillery: Adjusting the Counterfire fight for today's Large Scale Ground Combat Operations," pages 2-3, 8, 9. https://www.milsuite.mil/book/docs/DOC-852182
16 Ibid page 3, 8

when coupled with specialized analysts experienced with the intelligence feeds, enabled the formation to analyze this data within the scope of its role as CFHQ—counterfire and counter-battery Fires short of the Fire Support Coordination Line.

GEOINT Analysts tracked enemy firing batteries through PAA displacements and survivability moves observed via GMTI on the MOVINT Client software installed on the DCGS-A laptops and/or Geospatial Intelligence Workstation. These formations could be distinguished based on whether they were assessed as wheeled or tracked vehicles, number of tracks, and proximity to AN/TPQ-53 acquisitions prior to movement. SIGINT and ELINT Analysts received Division reports of enemy counterfire and Air Defense RADAR systems in chat and focused their attention on ELINT near PAAs. Augmented by single-source intelligence specialists, the DIVARTY S-2 section fused this data with AN/TPQ-53 acquisitions based on expected enemy PAAs.

There are several factors to consider for effective counterfire and counter-battery Fires, such as well-rehearsed digital fire mission and clearance of Fires procedures,[17] proactive clearance of Fires, and a deliberate targeting process that identifies alternate sensors and shooters should the primary become unavailable. The multi-disciplinary nature of the PED team and a shared understanding of sensor capabilities and datalinks meant that, even if certain capabilities, such as GMTI, were not available, the DIVARTY maintained the capability of aggressive predictive analysis and dynamic targeting and could ensure effects against enemy Fires and sensors.[18] The ability to leverage all available intelligence feeds at the point of execution increased both the agility of the formation to identify high-payoff targets and the accuracy of its Fires.

Task organizing additional personnel and equipment, not organic to the DIVARTY is a luxury, not all units can afford: many Divisions in the active Army have manning shortfalls in these specialties, and even when there is an EMIBn to provide additional specialists, exercises with an aligned Division must be balanced against that battalion's other commitments. National Guard Divisions do lack aligned EMIBns to provide augmentation to their Divisions, and even if they did, the number of days the personnel would be available for exercise support would be limited. Increasing incorporation of artificial intelligence into the intelligence process may simultaneously reduce manning requirements for PED and analysis and increase the value of fielding the TGS' successor to DIVARTYs and FABs in the future to increase their situational understanding, analytical agility, and, ultimately, their lethality.

Many of the benefits experienced by 1CD at Warfighter Exercise 21-01 in terms of situational understanding, more agile dynamic targeting and counterfire, and enhanced lethality can be achieved by a DIVARTY or FAB under exercise conditions through training and Division-internal task organization. A secure facility able to deliver simulated threats and assets is available at most Foundry sites with the correct enablers. Organic 35F All-Source Intelligence Analysts can be trained to rapidly interpret GMTI data on the Geospatial Intelligence Workstation or DCGS-A with MOVINT Client software installed in this environment. Key emitters such as the ZOOPARK and CHAIR BACK RADAR systems, identified by ELINT, received by the TGS' Joint Tactical Terminal antenna and processed by the Division G-2 SIGINT cell, can be provided in a dedicated chat channel and at the collateral level and analysts at the DIVARTY or FAB can fuse this data to target these systems. However, this still leaves the FAB or DIVARTY heavily dependent upon the upper-tactical internet for this data, which would most likely come from the Division MCP.

Modifying existing MTOEs through either zero-personnel growth or low-growth changes would dramatically improve the DIVARTY and FAB's ability to collect, process, and analyze the disposition of enemy artillery, either before or after firing, with the ability to execute proactive counterfire as the desired end state. For example, replacing

17 US Army Mission Command Training Program. FY20 Mission Command Training in Large-Scale Combat Operations Key Observations, pages 20-21.
18 MAJ Speiss, Andy, CW3 D'Urbano, Michael, and COL Forbes, Brett. "Processing, Exploitation and Dissemination (PED) Enabled Dynamic Targeting at the Division Artillery: Adjusting the Counterfire fight for today's Large Scale Ground Combat Operations," https://www.milsuite.mil/book/docs/DOC-852182

the 4-person 12Y Geospatial Engineer section with two 35G GEOINT Analysts and two 35N SIGINT Analysts would deliver a modest organic PED capability without personnel growth. Another consideration would be whether or not to replace the 125D Geospatial Engineering Technician with a 350G GEOINT Technician to ensure the unit maintains an understanding of geospatial datalinks and Measures and Systems Intelligence capabilities and datalinks. We do not consider the addition of Trojan and 35T Military Intelligence Systems

and a flexible collection plan, the frequent command post displacements and shifting availability of aerial sensors due to A2AD expected in LSCO further complicate the ability for a Division to consistently provide and interpret these intelligence feeds to units not equipped to receive them. Divisions and functional and multifunctional Brigades must plan through such transitions with effective communications planning in mind. This means being able to operate under both data plans that employ the upper tactical internet

provides intelligence feeds can lead to success under exercise conditions but will likely not be sufficient for LSCO. A shift in the capabilities of the FAB and DIVARTY to provide a modest PED capability would put the "Fires Triad" at the point of execution and would allow these formations to adapt to the available sensors and intelligence feeds available to them in combat, which will vary by a theater of operations, and change during the operation, as the enemy presents multiple dilemmas across domains. To do less is to fail to provide the King

If the space domain is truly to be contested in future near-peer conflicts, near-peer threats will also present a robust anti-access/area-denial threat...

Maintainers to be required as functional and multifunctional brigades rely on Division echelon support for DCGS-A systems already, and no additional DCGS-A equipment is required.

Dependency upon upper tactical internet and the Division's MCP for the majority of its connectivity and intelligence feeds presents multiple questions for how these formations will truly conduct LSCO for the current and future Army. If the space domain is truly to be contested in future near-peer conflicts, near-peer threats will also present a robust anti-access/area-denial threat and will challenge friendly forces in the electromagnetic spectrum, a Division in LSCO cannot expect that a DIVARTY or FAB would be able to receive relevant intelligence feeds and remain connected and aware at all times. With even a modest multidisciplinary PED capability

and theater- and national-level intelligence feeds and able to shift to data plans on alternate and contingency communications methods as required. Such communications have depth because they rely heavily upon U.S. Message Text Format, orders consisting of small files such as spreadsheets pushed between command nodes by systems such as High Capacity Line-of-Sight radios to enable mission command and the orders process when the upper tactical internet is degraded or denied. While this is exceptionally challenging, it will be critically important for success in LSCO.

Ultimately, an interim manning solution to provide the "Fires Triad" to these units under exercise conditions should be seen as just that: an interim solution. Cross-trained analysts not backed by the necessary specialties and lacking the equipment that

of Battle with the eyes he will need to dominate the Division and Corps' deep area in LSCO.

MAJ Chris Thornton is an Intelligence Observer, Coach, or Trainer (OC/T) with the Mission Command Training Program (MCTP), Operations Group-Bravo (OPSGRP-B). His previous assignments include Division Collection Manager for 1CD, Task Force Observe Detect Identify Neutralize executive officer, a JSTARS instructor, and Field Artillery Battalion S2.

MAJ Michael A. Benner is the senior Intelligence warfighting function OC/T for FABs and DIVARTYs under MCTP, OPSGRP-B. His previous assignments include Field Artillery Brigade S2 with 210th Field Artillery Brigade, Combined Arms BN S2 with 2-9th Infantry, Division Headquarters, Headquarters Company, Commander with 2nd Infantry Division, and a branch detail as an Infantry officer with 10th Mountain Division.

MAJ Jeremy Crallie is an Intelligence OC/T with MCTP, OPSGRP-B. He has predominantly observed Divisions, DIVARTYs, and FABs over eight Warfighter Exercises. His previous duty assignments include Intelligence Planner and Combat Aviation Brigade S2.

On November 23rd, 2021, the command teams of Fort Sill hiked up Signal Mountain to the mecca of all Field Artillerymen, *Blockhouse*, where every Redleg learns to cut a charge. The base charge is stored safely within its walls until retrieved each year in celebration of the patron saint of Field Artillery, Saint Barbara. *Photo by Judith Oman, CPG, Fort Sill.*

Risking our Battalion Aid Station
to save our Artillerymen

By SFC Hector M. Najera and SGT Quentin A. Mendez

These past 19 years of conflict during the Global War on Terrorism have resulted in unrealistic medical evacuation expectations for future conflicts. The Yom Kippur War of 1973 (06-25 October 1973) saw an estimated 7,500 wounded Israeli casualties, 21,000 wounded Syrians, and 30,000 wounded Egyptians in 19 days as the combined arms conflict illustrated the deadly, casualty-producing results of artillery and air defense (Los Angeles Times, 1991). Large-scale Combat Operations (LSCO) with near-peer or peer-to-peer adversaries will place a large strain on our medical support operations. The increased casualty rates, large casualty densities, and the lack of air superiority will require Role 1 medical treatment facilities to be positioned in the most advantageous locations to provide the timely medical care needed to preserve the unit's fighting strength. Field Artillery (FA) units face a unique challenge in caring for multiple "urgent" casualties during LSCO due to the artillery and counterfire threat that they face. Commanders must position their Battalion Aid Stations (BAS) as far forward as tactically possible if they are to effectively triage casualties, provide urgent care, or enable onward movement to a higher role of care – all while mitigating risk to the mission. FA units training at the Joint Multinational Readiness Center (JMRC) assume little risk when considering the placement of their medical platoon and BAS.

In my two years as an Observer, Coach, or Trainer (OC/T) at JMRC, all but two units have co-located their BAS with the Combat Trains Command Post (CTCP). A CTCP co-location generally provides little to no benefit to the Medical Concept of Support (MEDCOS), due to their position in the battlefield, reduced support from Battalion, and relative distance from the firing Batteries. This proximity to the Brigade Support Area (BSA) provides much logistical support for the Forward Support Company (FSC), but it places the BAS too close to the Role II to provide any meaningful medical support to the forward Batteries. Logistical support can be provided to these Batteries with little difficulty, but the firing Batteries often find themselves proximal to other, non-organic, aid stations. These FA BASs find themselves treating less than 12% of their Battalion's casualties. Positioning the BAS with the Battalion (BN) Tactical Operations Center (TOC), however, is often a more suitable location. This is geographically closer to the firing Batteries, has better communications with subordinate Batteries and higher echelons, and benefits from the same level of security. The BASs that co-located with the Headquarters and Headquarters Battery (HHB) treated at least 83% of their Battalion's casualties due to their improved MEDCOS.

Table 7-6 of the Army Training Publication (ATP) 3-09.23 *Field Artillery Cannon Battalion*, shows an example of how a CTCP could be configured based on various factors. This example includes the BAS at the CTCP and it is this inclusion that leads many to accept it as the doctrinal option for BAS occupation. This table is merely an example and doctrine provides Commanders with much-needed flexibility.

MAJ Johnson treats patients wounds at the Battalion Aid Station after a mass casualty scenario, while at the National Training Center in Fort Irwin, California. (U.S. Army Photo by CPT Katherine Zins)

Artillery firing Batteries win wars, but it is the BAS that conserves the FA BN's fighting strength. In order to do so, FA BNs must stop defaulting to the CTCP as the BAS location and BN Medical Operations Officers (MEDOs) must be leveraged as the force enablers that they are. BN MEDOs possess the doctrinal knowledge and expert medical analysis to help shape the FA BNs MEDCOS. Much in the same way that tactical fire direction can be either centralized or decentralized, so too can the MEDCOS. From a Battalion perspective, a centralized MEDCOS is achieved at the TOC whereas a decentralized MEDCOS is at the CTCP. This is due to the heavy BN staff support available from the TOC and the BAS's direct access to the tactical Commander. A MEDO operating from the CTCP must adhere to the principles of conformity, proximity, continuity, and flexibility with any effective MEDCOS – an issue many have faced at JMRC. Before the first Fire mission is processed, a MEDO at the CTCP may already be at a disadvantage on account of their location within the battlespace providing little benefit to the firing Batteries and the reduced BN support from being geographically displaced from the TOC. Co-locating the BAS with the TOC allows the MEDO to exercise control with maximum responsiveness and speed of execution in their doctrinal responsibility to provide Army Health System (AHS) support to the FA BN. This isn't to say that placing your BAS at the CTCP will equate to a failure in the medical mission. On the contrary, the situation on the battlefield may indicate that the CTCP is, in fact, the ideal location for the BAS. This, however, should be a decision made based on the tactical environment, the mission, the Medical Common Operational Picture, and anticipated medical support requirements.

BAS placement is a decision made by the Combatant Commander, in conjunction with the BN MEDO, to provide the most effective medical support to the Battalion's Field Artillerymen. This decentralized location requires a competent, knowledgeable, and trusted MEDO as it is difficult to achieve medical synchronization across the Battalion, particularly when Commanders are still vying for centralized control. In order to effectively execute an efficient AHS support plan, BN MEDOs must be synchronized with the Fire Support plan – this starts with inclusion in the Military Decision-Making Process (MDMP). The MDMP is where the FA Battalion integrates the Battalion's planning process with that of the Brigade's. By including the MEDO, the medical team gains the knowledge of pertinent information such as running estimates, time analysis, constraints/restrictions, and facts/assumptions. The MEDO

Table 7-6. Field trains and combat trains (example)

Field Trains	Combat Trains
Forward Support Company (-)	Forward Support Company (-) FWD
Forward Support Company Commander And First Sergeant	Field Maintenance Teams
Maintenance Platoon Headquarters (-)	Headquarters and Headquarters Battery Commander (If collocated with battalion command post)
Food Service Section	Maintenance Collection Point
Maintenance Section	Maintenance Control Section
Distribution Platoon Headquarters (-)	Battalion Aid Station
General Supply Section	Class III Section (-)
Class III Section (-)	Class V Section (-)
Class V Section (-)	Field Artillery Battalion S-1 And S-4 (-)
Field Artillery Battalion S-1 And S-4 (-)	
Note: This is one example of how the field and combat trains could be configured based on mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC). The commander will configure the field artillery battalion trains to meet operational requirements. FWD – forward, S-1 – manpower and personnel staff officer, S-4 – logistics staff officer	

can provide suggested BAS locations during Course of Action (COA) development that enables the BAS to be placed within supporting distance (specifically to high casualty areas), in relative safety, and without obstructing the tactical mission. Different phases of the operation may require the BAS to jump locations to continue providing the most effective support. During the COA development of the MDMP, FA Battalions plan D3A (Decide, Detect, Deliver, and Assess) methods for FA tasks to include triggers while integrating these triggers with higher echelon COAs (per ATP 3-09.23). This level of detail does not go into the medical planning process at the BN level, however. If FA BN Commanders are not willing to assume the risk in decentralized control of their BAS placements, FA BNs should consider the triggers that would result in moving the BAS to better facilitate the MEDCOS. For example, placing the BAS at the CTCP will provide little benefit to the BN in most situations (as it would be too far to the rear). If a firing battery is expected to take increased casualties (or has taken increased casualties), will relocating your BAS to an advantageous position be tactically feasible? If your RADAR deployment order places your RADAR teams in inadvertently austere locations, without internal medical support, is there an identified location to relocate your BAS to provide the ability to also conduct medical evacuation and treatment for this personnel? The tactical situation remains fluid and the MDMP should identify alternate locations for the BAS that can best contribute to the overall AHS support plan within the FA Battalion. Co-locating the BAS

with the TOC is generally the more ideal location within a Field Artillery Battalion. This location is mutually beneficial. On one hand, the BAS is geographically closer to the firing Batteries (and often Brigade), thus reducing evacuation times. Battery-level Casualty Evacuation (CASEVAC) is improved by this reduced time/distance, and the BAS has an increased ability to push their medical evacuation platforms forward to collect casualties (or assist, such as in the event of a mass casualty situation). By being closer to the firing Batteries, the BAS is capable of directly treating more of their casualties. This allows the MEDO to better manage, plan, and coordinate force health protection assets throughout the Battalion. This is also particularly beneficial to the medical platoon as it provides the medical platoon leadership additional face time with the battery medics during casualty transfers. This is an opportunity for the medical leadership to resupply class VIII medical supplies (via speedballs or custom ordered lists), provide guidance and mentorship, and relay or gather important information (a process that is even more beneficial during times of degraded communications). On the other hand, the HHB benefits from this situation by having their medical treatment facility proximal to the BN TOC – a location that is often considered a target area for opposing forces. This places the BAS near the area of expected casualties. This location at the BN TOC also places the BAS closer to a wider range of communication assets and the ability to maintain communications between the BAS, BN TOC, and the firing Batteries has been the differentiator between having

an effective medical asset and an unreliable medical section. Little to no adjustments need to be made to the overall security plan – either at the BN TOC or at the CTCP. The medical platoon is rarely included in the base defense plan thereby eliminating any adjustments in that area. Planning must be made, however, to provide medical support to the area not being co-located. This is considerably easier for the CTCP when the BAS is at the TOC. The CTCP is generally safer than the TOC on account of its location, has less risk of enemy attack, and will require less overall medical support. Their proximity to the BSA and the Role II also enables direct medical support from that location. The FSC also has a large vehicle fleet with a larger casualty load capacity. This makes their CASEVAC plan far easier to design than that of the HHB. This does place your BAS at a greater risk of attack, damage, or capture. This can be mitigated by a proper base defense plan but is also a decision that the tactical Commander must consider: do we place our Battalion Aid Station in increased danger to provide the most effective medical care for our artillerymen? How do we reduce the risk aversion that is prominent in our FA Battalions as it pertains to our BAS site selection? This starts with changing the way we visualize the next conflict America may face.

Former Surgeon General of the Army and Commander of Army Medical Command Lieutenant General Nadja West once stated, "A Soldier with a head wound in Afghanistan could arrive from the point of injury to Bethesda Naval Medical Center where the

Medical Specialist was standing by within 24 hours of being wounded," (Vergun, 2016). This is no longer the case. In today's day and age of advanced/advancing enemies, Field Artillerymen and women are more susceptible to artillery and retaliating counterfire than ever before. As counterfire results in Mass Casualty (MASCAL) situations, line medics with their finite amount of Class VIII between their aid bag and the units' Combat Lifesaver (CLS) bags, casualties can be expected to still be at their organic BAS 24-hours after the point of injury. The expectation is to have stressed evacuation channels and no air assets available during these conflicts, increasing the necessity for far-forward medical care. Nearly 20 years of air superiority are coming to an end. What we will face in future near-peer or peer-to-peer conflicts in LSCO – particularly as it applies to FA BNs facing counterfire – is a lethal, high casualty producing fight. Soldiers will die. Cannons and Howitzers will be lost, as will their crew. The human toll of a war with Russia, China, or any near-peer will be high. Minor examples of this can be seen in the Yom Kippur War, the Korean War, and throughout World War II. Military tactics have evolved and so has the weaponry of our enemies. Combatant Commanders and medical planners must position their medical assets in the most tactically feasible and medically advantageous locations. Field Artillery Battalion Commanders must not shy from the risk of losing medical assets. Only by doing so, can the Field Artillery Battalion aid station provide the most medical care to save the lives of your Field Artillerymen.

In conclusion, consider the following steps to mitigate risk to the mission and preserve the unit's fighting strength:

• Incorporate FA Home Station Training/ Preparation for LSCO BAS Placement.
• MDMP/Command Awareness for Medical assets – begin building repetitions by having the MEDO present and involved during MDMP. As the Commander and MEDO work together, they increase trust and cohesion.
• CLS/ Tactical Combat Casualty Care- All Combatants (TCCC-AC) training – Medical personnel need assistance, particularly during LSCO and especially during MASCAL. Training your Field Artillerymen in CLS and TCCC-AC will help ensure that everyone has access to immediate lifesaving interventions, regardless of their location on the battlefield.
• Medic Class VIII/ Pharmacology training with Unit Provider – LSCO, the delayed evacuation times, and the move towards prolonged field care will result in a large emphasis in pharmacology. Set your medical platoon up for success by ensuring they are trained and facilitating training time for the provider to conduct training.
• Role I set-up (CTCP and BN TOC) with Command walk-through– Home station training is paramount to rotation training and operational success. Train to establish your BAS at both CTCP and BN TOC locations to learn how to best synchronize. Include command walk-throughs at both locations to educate, receive guidance, and demonstrate spatial awareness.
• Casualty Collection Point (CCP) set-up and rehearsals – CCPs save lives. Train to establish and operate a CCP, for they are the bridge between your point-of-injury care and the BAS. Include a CCP at each location, for every field training event, and ensure that all artillerymen understand their importance.
• Communication/ COMSEC change-over rehearsals – Communication poses an issue, regardless of location. The CTCP and BN TOC have different levels of support, equipment, and obstacles. Learn to be familiar with each location during set-up drills and develop plans to mitigate forecasted issues/concerns.
• PACE plan for 9-line rehearsals with CTCP and/or BN TOC – Develop a medical PACE plan for your BN at each location and identify personnel/sections that can assist the medical platoon in receiving/sending information throughout the battlespace.
• MASCAL crawl/ walk/ run rehearsals with all factors (CLS, S-1, S-2, S-4, and Command Team) – Whether at the BN TOC or the CTCP, conduct a full MASCAL rehearsal and then rehearse it again.

SFC Hector M. Najera is a Healthcare Specialist (68W) in the U.S. Army. He is currently serving as an OC/T at the Joint Multinational Readiness Center in Hohenfels, Germany. He has previously served as a platoon sergeant and S3 Plans/Operations NCO in 1st Medical Brigade, Fort Hood, Texas, and as a battery senior medic with 2-1st Air Defense Artillery, Kunsan Air Base, Korea. He has deployed twice in support of Operation Enduring Freedom as a platoon medic with the 36th Engineer Brigade.

SGT Quentin A. Mendez is a Healthcare Specialist (68W) in the U.S. Army. He is currently assigned to the 4th Battalion, 319th Airborne Field Artillery Regiment out of Tower Barracks, Grafenwohr, Germany. SGT Mendez has conducted rotations through JMRC with 4-319th and has assisted as a guest OC/T.

Targeting

at the
Infantry Battalion level:
Observed gaps
in practice *and* doctrine

By MAJ John Fridlington and MSG Douglas J. Hurst

Infantry Battalion staffs often culminate in regards to a perceived capability while conducting just the bare minimums of the Military Decision-Making Process (MDMP) due to the lack of doctrinal knowledge on targeting and creativity. They often fail to capture and synchronize the intricate details of the "who, when, where, and how" of what they want to kill during the planning process. Not utilizing the Targeting Methodology during the MDMP process leads to a lack of detailed plans. Infantry Battalion staffs do not utilize the Targeting Methodology due to lack of trained personnel to focus on the targeting process, the perceived lack of sensors and delivery assets organic to the Infantry Battalion, the lack of Targeting Working Groups (TWGs), and lack of doctrine covering targeting at the Battalion level. All the above reasons degrade the Commander's ability to thoroughly plan and synchronize the targeting of the enemy thus limiting his ability to effectively shape the enemy before direct fire contact.

Observer, Coach or Trainers (O/CTs) at the Joint Readiness Training Center (JRTC) observed numerous general trends related to Targeting from Infantry Battalion staffs during the Fiscal Years 2020 and 2021 Decisive Action Training Environment Rotations. One observed trend is the Battalion Staff and ground sensors are not privy to the Named Areas of Interest (NAIs) and their associated Information Requirements (IR). The Battalion S-2 creates a generally sound NAI plan but does not ensure thorough shared understanding. Often, only the Battalion Commander and Battalion S-2 understand the plan. At best, the Scout Platoon seniors might also understand the NAIs and IRs. This lack of shared understanding leads to unobserved NAIs and unanswered IRs preventing the proper shaping of the enemy at the right time.

Another trend observed by O/CTs is the lack of utilization of Forward Observers in the collection plan. Forward Observers generally stay co-located with their Platoon Leaders and serve essentially as an additional Radio Telephone Operator with a Fires net. Rarely do Forward Observers deliberately occupy Observation Posts (OP) and overwatch NAIs but when they do, they lack the IRs to provide an observation that will help the Commander make decisions. The Intelligence Collection and Synchronization Matrix (ICSM) usually just mirrors Brigade and above assets with minimal Battalion asset input.

Oftentimes, the lack of integration between the Battalion S-2 Section and the Battalion Fire Support Element (FSE) causes the gaps in Forward Observer integration as well as the ability to target at the Battalion level. The Battalion S-2 generally conducts Intelligence Preparation of the Battlefield independently of the FSE, leading to the Fire Support Officer (FSO) placing "cross-hairs on the red diamonds" rather than truly determining what, where, when, and how to best destroy the enemy. The lack of integration does not stop in the plans tent. The S-2 and FSE often lack crucial communication while conducting dynamic targeting on the Current Operations floor. Battle Damage Assessments (when provided at all) often do not make it from the Fires Desk to the Intel Desk degrading the S-2's ability to continually update the Enemy Common Operating

Picture and make assessments to provide the Commander. This crucial breakdown in staff integration prevents determining what needs to be killed and integrating the detection and delivery assets necessary.

A final general trend observed across Infantry Battalion staff is the lack of a common collection matrix understood by all necessary players. The S-2 usually creates the ICSM including collection assets, NAIs, and collection times during initial MDMP at the Initial Staging Base or Rotational Unit Bivouac Area. The product rarely makes its way to the FSO or subordinate Commanders. As the rotation continues, the product becomes more and more scarce and often nobody on the staff knows what is currently collecting where.

Fire Support O/CTs looking deeper into the details of the friction Infantry Battalions experience in Targeting observed certain trends and proposed ways ahead to increase the lethality of deliberate and dynamic targeting in support of the Battalion Commander's vision and intent.

First, Battalion staff personnel do not receive adequate training in the Army's Targeting Methodology of Decide, Detect, Deliver, Assess (D3A). In the best-observed Battalions, the Commander, FSO, and S-2 understand the methodology but do a poor job of utilizing it. The assigned "Targeting NCO" in the FSE always serves more as an assistant Fire Support NCO rather than integrating with the intelligence section and conducting targeting. The level of experience and familiarity with the Targeting Methodology of that Staff Sergeant leads to him reverting to his comfort level and focusing on the just Fires rather than providing the necessary coordination with the Intelligence Section.

To help alleviate this issue, the Brigade Targeting Officers and NCOs need to conduct home-station training with FSOs, Arial Fire Support Observers,

LTC Kirk John Junker, seminar lead instructor and director of the Joint Targeting School in Dam Neck, Virginia, discusses key points and principles of joint targeting during a targeting seminar at Camp Arifjan, Kuwait Oct. 12, 2016. The open forum seminar allowed key leaders to learn and discuss important strategies and doctrine concerning the concept of joint targeting. (U.S. Army photo by SGT Aaron Ellerman)

and Targeting NCOs on how to conduct targeting. Battalion S-2s, S-3s, S-4s, and Executive Officers would also benefit from attending the training as targeting is a staff integration function and not a Fires or intelligence function. The targeting process frequently collapses when not driven by the Executive Officer or S-3. The training needs to focus on how to apply the targeting methodology at the Battalion level, establishing and integrating into a targeting cycle, and how to conduct a TWG.

JRTC O/CTs also see Infantry Battalion staffs with a perceived lack of assets for the detect and deliver steps of the Targeting Methodology. Many S-2s rely heavily on Brigade and above air-based sensors and the Scout Platoon only as ground-based sensors while many FSOs only feel they truly have Battalion mortars for delivery. This limited view of assets gives Commanders very little in the ways of deliberate targeting and forces them to rely more on reacting to contact dynamic targeting.

Successful units at JRTC use creative means to expand their organic sensor plans. A way is the consolidation of Company RQ-11 Ravens under Battalion control. Another method is assigning flight times and NAIs to the Company in mission orders. As mentioned above, Forward Observers rarely leave their Platoon Leaders' side. Forward Observers must be utilized as ground sensors and assigned NAIs in Company Areas of Operation (AO) to answer IRs for the Battalion. Commander's must accept prudent risk and enable Forward Observers to operate forward of the Forward Line of Troops and the Coordinated Firing Line (CFL) with minimal security, much how they trust the Scout Platoon to do. Proposed OPs within the Tasks to Subordinate Units portion of mission orders need to force Companies to utilize their assets to their fullest potential. Likewise, Forward Observers must train for this mission set

in order to earn the Commander's trust. The lack of utilization of Forward Observers increases the perceived lack of ground sensors with the ability to cover nine additional NAIs.

Fire Support Officers also often do not utilize AH-64 Apache support to the full capability. Although Army Attack Aviation (AAA) belongs to the Brigade or higher, it often operates under subordinate Infantry Battalion control or at a minimum within a Battalion AO. AAA with a clear reconnaissance-based task and purpose excel at thoroughly covering large NAIs as long as they are flying with common graphics and useful IRs to answer. The sensors on the platform allow them to reconnoiter far beyond the reach of ground sensors and operate forward of the CFL for additional lead time on enemy indicators rather than reacting to Maneuver contact short of the CFL as is often the trend. They also possess the added capability of detecting and delivering with one platform with a human operator capable of providing their identification.

Commanders must also look at their Rifle and Heavy Weapons Platoons as delivery assets. Oftentimes, Commanders want to attack High Pay-Off Targets (HPT) with mortars or above Battalion-level assets when identified in the Battalion AO. Sometimes, a Weapons Platoon is the timelier or more effective means of delivery on HPTs but is forgotten. Weapons Platoons or Companies laying ambushes on Targeted Areas of Interest (TAI) coupled with an early warning from air-based sensors could prove devastating, particularly in a counter-reconnaissance fight on the defense.

Infantry Battalions must also begin conducting TWGs as a battle rhythm event. Infantry Battalions likely do not possess the staff bandwidth, assets, or area of operations to fully nest in the
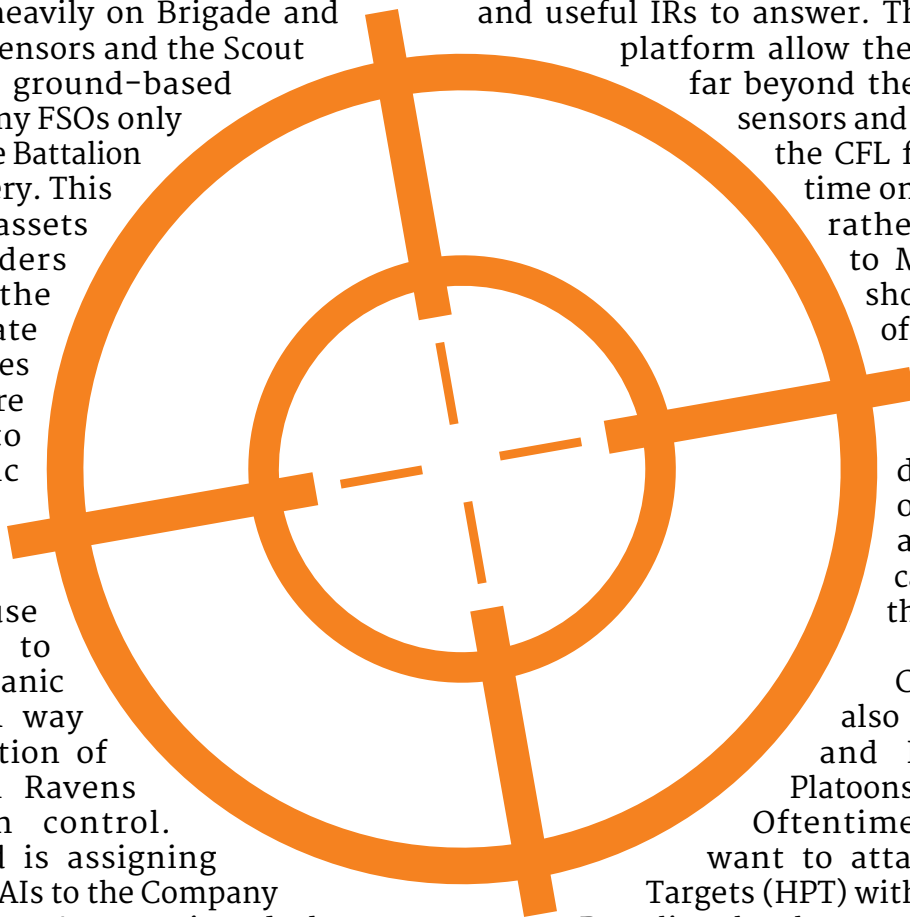
Brigade's usual 72-hour targeting cycle and the Air Tasking Order (ATO) cycle (other than in deliberate MDMP sessions leading into major operations), although they do need to work to achieve a 48-hour cycle. The Battalion TWG needs to occur daily with the input of updated running estimates, assets available (Maneuver, ISR, and Fire Support), Enemy Situation Templates, Enemy Event Templates, Brigade, and above ISR available, and Brigade and above Targets assigned to the Battalion. The output includes nominations for NAIs, TAIs, and Targets on a Target Synchronization Matrix along with a draft ICSM for 24-48 hours out and confirmation/approval on 24 hours and in. The right personnel must attend the TWG. The S-3 or higher must chair the meeting and approve decisions within 24 hours. The Battle Captain must provide the current friendly situation and assets available along with planned operations for the next 24 and 48 hours. The S-2 needs to possess all current information on the enemy as well as the ICSM. The S-4 needs to provide updates on logistics that could positively or adversely affect targeting. The FSO needs to provide friendly Fires assets available, targets, and mortar rounds available.

Finally, the FSO and S-2 must identify targets or NAIs in their sensor or delivery plan that cannot be organically serviced coming out of the TWG. Once identified, they must begin submitting Joint Tactical Air Requests, Air Mission Requests, or other enabler requests to fill those gaps. These requests preferably are deliberate and fit into the higher headquarters targeting cycle and ATO cycle however, immediate requests with plenty of lead time should still be requested. Although Brigade does generally possess the assets needed, an Infantry Battalion must try to plan to accomplish their mission with organic assets as Brigade usually focuses on the deep fight beyond the Brigade CFL. The TWG enables the staff to prioritize the efforts of all warfighting functions. The need to prioritize a Class V resupply to the mortars or the need to request replacement Soldiers to the Scout Platoon to observe NAIs are examples.

Army doctrine plays a key role in the lack of targeting conducted at the Infantry Battalion level. Both FM 3-60 *Targeting* and ATP 3-09.42 *Fire Support for the BCT* does not mention targeting below the Brigade-level. The Program of Instruction at Field Artillery Captains Career Course gives broad introductions on the Army's Targeting Methodology (D3A) as well as the Joint Targeting Methodology (F3EAD) but does not teach future FSOs how to apply the methodologies to real-world scenarios, especially at the Battalion level.

The Army needs to involve the Army Multi-Domain Targeting Center at Fort Sill in writing doctrine to guide Infantry Battalion staff through the targeting process. This can occur through updating the current publications or creating a new publication focused solely on the Battalion level. The Fires Center of Excellence at Fort Sill, The Intelligence Center of Excellence at Fort Huachuca, and The Maneuver Center of Excellence at Fort Benning must all give input and buy-in for the doctrine to be meaningful as all three Warfighting Functions own pieces of the targeting process. These three key Centers of Excellence also need to start incorporating more targeting in their programs of instruction during the Captain's Career Course. This will help bridge the knowledge gap present at the Infantry Battalion level.

Infantry Battalion staffs fail to enable their Commander's ability to plan and synchronize deliberate targeting of the enemy for a multitude of reasons. They do not utilize the Targeting Methodology in conjunction with MDMP due to lack of trained personnel to focus on the targeting process, the perceived lack of sensors and delivery assets organic to the Infantry Battalion, the lack of Targeting Working Groups, and the lack of doctrine covering targeting at the Battalion level. Solutions exist to all these challenges through creative problem-solving, home station training, and publication of doctrine. These things will make the U.S. Army Infantry Battalion an even more lethal weapon in the arsenal.

MAJ John Fridlington is currently a student at the Command and General Staff College at Fort Leavenworth, Kansas. Previously, he served as an Infantry Battalion Fire Support Officer and as an Observer, Coach or Trainer at the Joint Readiness Training Center at Fort Polk, Louisiana. Fridlington formally commanded C Battery, 2nd Battalion, 32nd Field Artillery Regiment and has two operational deployments with the 1st and 3rd Brigade Combat Teams of the 101st Airborne Division.

MSG Douglas J. Hurst serves as the Brigade Fires Operations Observer, Coach or Trainer at the Joint Readiness Training Center. He has also served as the Task Force 2 Battalion Fire Support NCO O/CT. Previously he served as the Division Joint Fire Support Sergeant with 4th Infantry Division and Brigade FSNCO and Brigade Fire Support Operations NCO with 2nd Brigade, 10th Mountain with deployments to Iraq and Afghanistan.

Soldiers with 2nd Battalion, 11th Field Artillery, 25th Infantry Division work with M119 Howitzers to enhance their basic artillery skills on Schofield Barracks, Hawaii, June 14, 2020. Cannon Crewmembers from the "On Time" Battalion play a vital role during missions by supporting ground forces, handling ammunition, operating weapon systems, and calculating targets.

U.S. Army photo by 1LT Stephanie Snyder

U.S. Army soldiers assigned to 2nd Battalion, 17th Field Artillery Regiment, 2nd Stryker Brigade Combat Team, 7th Infantry Division, fire the M777 Howitzer during Table 12 of the Field Artillery Certification and Qualification at Yakima Training Center May 4, 2021. Field artillery tables are procedures designated from Table 1 through Table 18 and provide crew, section, and team qualification through collective training up to the battalion and Brigade Combat Team levels to support the commander's assessment of training readiness.

U.S. Army photo by SPC Dean Johnson, 2nd Stryker Brigade Combat Team, 2nd Infantry Division

The 2022 submission deadlines for the

Field Artillery Professional Bulletin:

Spring edition, Jan. 3
Summer edition, Apr. 4
Fall edition, Jul. 1
Winter edition, Sep. 1

Submit your articles to: sharon.g.mcbride4.civ@army.mil

PIN: 210925-000