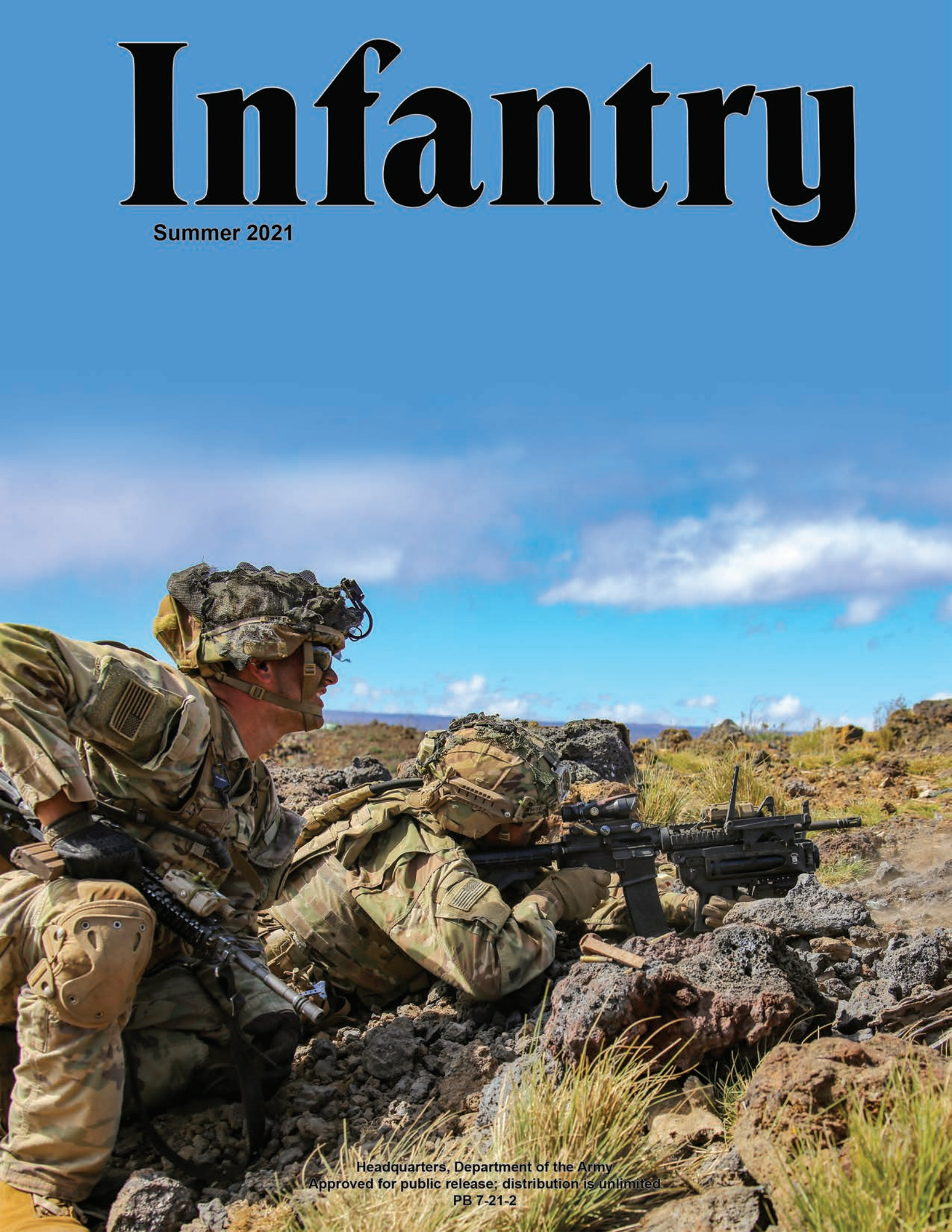
Infantry

Summer 2021



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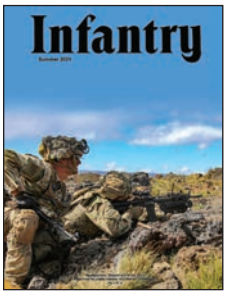
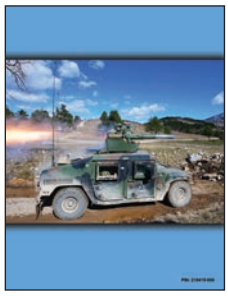


FRONT COVER:

A team leader with 1st Battalion, 27th Infantry Regiment, 2nd Infantry Brigade Combat Team, 25th Infantry Division, coaches one of his Infantrymen during a squad live-fire exercise on 24 February 2021 at Pohakuloa Training Area, HI. (Photo by SSG Thomas Calvert)

BACK COVER:

A U.S. Army Paratrooper assigned to the Dog Company, 1st Battalion, 503rd Infantry Regiment, 173rd Airborne Brigade, fires a Tube-launched, Optically tracked, Wire-guided (TOW) missile system as part of Exercise Eagle Sokol 21 at Pocek Range in Postonja, Slovenia, on 21 March 2021. (Photo by Paolo Bovo)



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Commandant's Note

MG DAVID M. HODNE

Preparing our Infantry Soldiers to Close With, Destroy Enemy Remains Key

I am a proud product of the Infantry School and am deeply appreciative of the talented NCOs and officers who first coached and trained me here many years ago. Having now served in the U.S. Army Infantry School, I am even more appreciative of today's talented NCOs and officers who invest in the future of tomorrow's Army.

Our fundamental responsibility remains to prepare our Infantry Soldiers and leaders to close with and destroy the enemy in close combat. Instilling and inspiring the Spirit of the Bayonet remains essential to all that we do. The final yards that define close combat always have, and always will, represent the most dangerous place on the planet. The importance of these final yards can't be ignored... and our ability to close in these final yards can never be assumed. In addition to the obvious danger inherent here, these final yards are both unimaginably horrible... and intensely personal. These final yards also remain essential to winning our Nation's wars.

Tomorrow's battlefield, and the final yards necessary for victory, will be more brutal and more dangerous than ever before. The luxury, and potentially the illusion, of standoff afforded by new capabilities never relieves the Infantry of closing the final yards. Our Army retains experience in small unit action following two decades of operations in Iraq, Afghanistan, and Syria. However, this experience is neither uniform across formations nor is it uniform across the cohorts of NCOs and officers. We've been here before. Throughout our Nation's history, our Army always relied on Fort Benning to teach, train, maintain, and in some cases, restore, individual, collective, and leader tasks. These three categories of tasks are equally important. You can't achieve collective proficiency without first achieving proficiency and confidence in individual tasks. Leaders can't achieve proficiency without units and Soldiers proficient in both their individual and collective tasks. Future leaders and entire formations will never realize their full potential if their leaders don't set the example in mastering their leader tasks. Throughout our training here, two key ingredients to all that we achieve at Fort Benning are the winning combination of a "capable instructor" and a "willing student." While GEN Marshall didn't include "dedicated staff" in his formula, I know he, like I, absolutely recognized the value of our committed Soldiers and Civilians as a third key ingredient who enables every aspect of our mission.

Lastly, while we boast proficiency in small unit action, we have much work to do in this area, and also have much work to do in the realm of individual skills. I recall certifying my formation bound for Iraq in our "Individual skills in a counterinsurgency (COIN) environment." Our Combat Training Centers (CTCs) even modified the training path to support this. Today, CTCs appropriately refocus on fighting at echelon, but we still need to apply the same urgency to ensuring proficiency in the individual skills necessary to survive, fight, and win in large-scale combat operations. Decades ago, our Army trained in similar context following Vietnam in the Cold War. Throughout that period, we understood we would have to fight outnumbered and win.

Together, we need to produce Soldiers and leaders who intuitively understand that failure to properly camouflage self and individual equipment, poor noise and light discipline, poor radio discipline, amateurish use of hand and arm signals, lack of familiarity with constructing fighting positions, etc., leaves our formations vulnerable when facing any adversary. When facing peer or near peer adversaries, these vulnerabilities are potentially catastrophic. These skills will also evolve with the contemporary battlefield environment. For example, we no longer own the night... we share it... and in this shared space, today's lasers are yesterday's parachute flares. Poor discipline in designating targets, directing fires, or marking locations (friendly or enemy) creates easy target reference points for our enemy. In understanding skills necessary to fight outnumbered and while in unfamiliar terrain, look no further than the standing orders of Rogers Rangers to remind us of the basic principles that still apply.

I have faith in the efforts of dedicated professionals across our Army modernization enterprise in our endeavor to restore overmatch across warfighting functions. However, our Army's source of overmatch always rests with our people (our Infantry Sergeants in particular), and we should be able to trade our equipment with the enemy and still beat them (one of my favorite quotes from GEN Paul LaCamera). I also have faith that if the U.S. Army Infantry School earnestly produces leaders and Soldiers proficient in individual, collective, and leader skills we will defeat any enemy, anytime, anywhere, and under any conditions.

Lastly, I am proud of you, and prouder to serve with you. Again, we invest in meaningful and necessary work. In the words of Medal of Honor Recipient COL (Retired) Ralph Puckett, "Be proud, but never satisfied."

"Wherever brave men fight... and die, for freedom, you will find me. I am always ready... now and forever. I am the Infantry! Follow me!"

Infantry Week 2021

Best Sniper Competition
12-15 April

Best Ranger Competition
16-18 April

(Clockwise from top left) A sniper team competes in the live-fire stalk event during the final day of the Best Sniper Competition at Fort Benning, GA, on 15 April. (Photo by Patrick A. Albright)

1LT Vince Paikowski and 1LT Alastair Keys, assigned to the 75th Ranger Regiment, emerge from Victory Pond as part of the helocast event of the 2021 Best Ranger Competition on 18 April. (Photo by SPC Lucas Wenger)

A sniper team competing in the Best Sniper Competition runs to the next objective of an event on 14 April. (Photo by Markeith Horace)

Best Ranger competitors drop into Victory Pond during the helocast event on 18 April, the third and final day of the competition. (Photo by SGT Kelson Brooks)

2021 Best Sniper Results

1st: Special Forces Sniper Course

2nd: 3rd Battalion, 75th Ranger Regiment

3rd: 19th Special Forces Group, Utah Army National Guard (ARNG)

4th: Coast Guard

5th: 7th Special Forces Group

6th: Colorado ARNG

Ironman Award:
U.S. Marine Corps School of Infantry West
Field Craft:
Utah ARNG (19th Special Forces Group)
Top Pistol:
Special Forces Sniper Course
Top Coach:
SFC Daniel Horner, California ARNG

(Clockwise from above) A sniper team prepares to engage a target on the second day of the Best Sniper Competition at Fort Benning on 13 April. (Photo by Patrick A. Albright)

A sniper team completes the Red Ants event of the Best Sniper Competition where competitors patrol and engage targets while executing a casualty evacuation. (Photo by Markeith Horace)

The winning team (1LT Vince Paikowski and 1LT Alastair Keys) crosses the finish line of the Best Ranger Competition on 18 April. (Photo by Patrick A. Albright)

A Best Ranger competitor completes a portion of the Combat Water Survival Assessment on the last day of the competition. (Photo by Patrick A. Albright)

2021 Best Ranger Results

1st: 1LT Vince Paikowski and 1LT Alastair Keys, 75th Ranger Regiment

2nd: GYSGT Joshua Kovar and SFC Mitchell Martinez, Airborne and Ranger Training Brigade

3rd: SGM Eric Echavarria and SFC Charles Gonzalez, U.S. Army Special Operations Command

4th: 1LT McKenzie Dougherty and PFC Reed Schaaf, 173rd Airborne Brigade

5th: CPT Edward von Kuhn and 1LT Michael Singer, 101st Airborne Division

6th: 1LT Joseph Schoer and 1LT Corey Zinc, 25th Infantry Division

Retired Ranger Receives Medal of Honor for Korean Battle

DEVON L. SUITS

A retired officer who led fellow Rangers and Korean Augmentation to the U.S. Army (KATUSA) Soldiers across frozen terrain under enemy fire to seize and defend Hill 205 in the vicinity of Unsan, Korea, received the Medal of Honor on 21 May.

COL (Retired) Ralph Puckett Jr. received the award for going above and beyond the call of duty as the Eighth Army Ranger Company's commanding officer during an operation that began on 25 November 1950.

Just a few months prior, then-2LT Puckett, a recent graduate of the U.S. Military Academy, was tasked to stand up and lead a provisional Ranger company at Camp Drake, Japan. The Eighth Army Ranger Company relocated to then-Pusan, Korea, where the Soldiers began what was expected to be seven weeks of specialized training at the Eighth Army Ranger Training Center. The needs of the Army reduced the company's training to five and a half weeks in early October 1950, and the company was activated and redesignated as the 8213th Army Unit. It was then attached to the 25th Infantry Division to help lead the unit's advance to the north.

Hill 205

Days before 25 November 1950, the 25th ID with the Eighth Army Ranger Company, under operational control of Task Force Dolvin, were pursuing North Korean forces as they retreated northward toward the Yalu River and the border of China.

On 24 November, Puckett and his company seized and occupied Hill 222, suffering several casualties. The following morning, after enduring a night of near zero degree temperatures and no sleep, Puckett received orders to secure Hill 205 and defend the critical position overlooking the Chongchon River.

Riding on the tops of Sherman tanks from the 89th Tank Battalion, Puckett and his 57 Rangers and Korean soldiers maneuvered toward the hill. A half-mile from Hill 205, the force encountered enemy mortar, machine-gun, and small-arms fire. The Rangers dismounted the tanks and prepared to attack.

Puckett took his company across 800 yards of frozen rice paddies under heavy enemy small-arms and mortar fire. At one point, Puckett crisscrossed the open expanse three times so his Rangers could locate and eliminate a concealed enemy machine-gun position.

After they reached the base of the hill, Puckett ordered his Rangers to fix bayonets and led them up the slope to secure the top. Six Rangers were wounded during their assault. Once Hill 205 was secured, Puckett had his Rangers prepare

their defenses against an enemy counterattack they knew would be coming.

"We began to put in a perimeter defense," Puckett said. "We always defended 360 degrees because we were always alone. We had our individual weapons, machine guns, rocket launchers, and hand grenades — that was it."

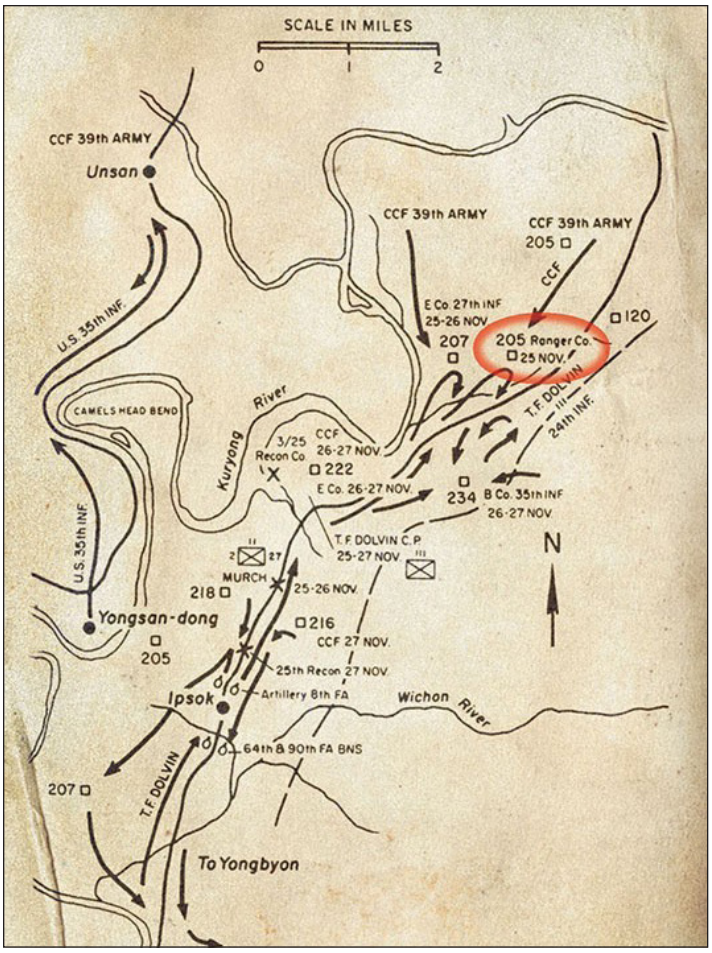
As they made their final preparations, Puckett and a handful of Rangers crossed back over the open field to battalion headquarters. While there, he procured another radio and supplies and coordinated artillery fires.

Shortly after Puckett arrived back at Hill 205 around 10 p.m., the Rangers came under heavy mortar and machine-gun fire as Chinese forces entered the Korean conflict against U.S. and U.N. forces. It would be the first of six battalion-sized attacks against Puckett's unit.

Puckett directed a strong defense against the aggressing force, all while calling in "danger close" artillery fire to keep them at bay. Though he sustained a wound to his right thigh from a grenade, Puckett refused to be evacuated. Severely outnumbered nearly 10 to one, Puckett continued to direct his company and waves of artillery support through additional counterattacks. He would leave his foxhole during each counterattack to observe the enemy's movement, motivate his Rangers, and call in artillery where it was needed the most.

As ammunition started to run low, the number of casualties on both sides continued to grow. After being wounded a second time, Puckett pushed through the pain to lead his force while the Chinese drew even closer to their location. He eventually ordered his unit to fix bayonets as they fought through another wave of the assault.

During the final counterattack in the early hours of 26 November, the battalion-sized Chinese force overran Hill 205. Heavy mortar fire inflicted heavy casualties as Puckett commanded his Rangers to withdraw to safety.



Hill 205 Battle Map

Severely wounded, Puckett ordered his Rangers to leave him behind to ensure their safety. Disobeying their commander's orders, two Rangers fought back against the Chinese force as they crested the hill and dragged Puckett down to safety.

Of the Rangers on the mission, 10 were either killed or missing with another 31 wounded. Puckett was initially awarded a Distinguished Service Cross for his heroic actions and devotion to duty that day. He received a second Distinguished Service Cross for his actions in the Vietnam War and later retired from the Army in 1971.

Editor's Note: *This article is a compilation of two Army News Service articles by Devon L. Suits. (Read more at https://www.army.mil/medalofhonor/puckett/).*

Photo courtesy of Puckett Family

Then-1LT Ralph Puckett Jr. led fellow Rangers and Korean Augmentation to the United States Army soldiers across frozen terrain under enemy fire to seize and defend Hill 205 in Unsan, North Korea.

Devon L. Suits writes for the Army News Service.

What's Wrong with the IBCT?

COL RYAN J. MORGAN

The Army is undergoing change. Current modernization efforts are the largest since the introduction of the "Big 5" and AirLand Battle. Every part of the Army enterprise is pursuing upgrades in equipment, technology, and force design. Central to the majority of these efforts is the return of the division as the primary tactical unit of action, moving away from the brigade combat team (BCT) as that formation. If the future of combat is moving from the counterinsurgency (COIN)-centric operations of Iraq and Afghanistan to large-scale combat operations (LSCO) in either the European or Indo-Pacific areas, is the infantry brigade combat team (IBCT) the right formation for the missions?

The Infantry has been the center of formations and operations for the armies of the world for centuries and certainly in the U.S. Army over its relatively short history. Infantry companies, battalions, regiments, and divisions have led the charge into battle over the course of our country's history and across the globe. For the purposes of this discussion, we will start by looking back to the early 1980s.

Then Army Chief of Staff GEN John Wickham commissioned a White Paper to "provide direction for the development of the finest light infantry division the U.S. Army can field."[1] This paper clearly outlined the need for light infantry. The study argued that having light infantry forces provides a strategic demission of mobility by being able to rapidly reinforce forward-deployed U.S. forces in NATO or in the "Far East." Moreover, they are a force that can be employed in areas that lack developed infrastructure. GEN Wickham believed that a light infantry formation could "rapidly deploy to crisis areas before conflict begins… to show U.S. resolve."[2] The "Division '86" study, as well as the designs that followed, took into account both threat and modernization to create these formations, specifically the 2nd, 7th, 9th, 24th and 25th Infantry Divisions. This division formation's operational concept called for the division and its maneuver brigades to be tactically mobile and to be able to attack to destroy enemy

Infantrymen assigned to 2nd Battalion, 35th Infantry Regiment, 3rd Infantry Brigade Combat Team, 25th Infantry Division, conduct squad live-fire training during a rotation to Pohakuloa Training Area, HI, on 27 April 2021.

Photo by SSG Alan Brutus

infantry forces, seize terrain, defend, delay, or disrupt heavier enemy forces, especially in "close terrain."[3] Efforts by later Army Chiefs, such as GEN Eric Shinseki, who commissioned the creation of the interim brigade combat team, and GEN Peter Schoomaker, who began the change to modularity, moved Infantry formations away from this "light" concept and produced a brigade-centric Army consisting of the three current brigade formations.

Photo by SSG Alan Brutus

Soldiers assigned to the 3rd Infantry Brigade Combat Team, 25th Infantry Division conduct mounted live-fire exercises at Pohakuloa Training Area on 23 April 2021.

So where are we today? IBCTs are designed for combined arms offensive operations in restrictive or complex terrain against conventional or irregular threats.[4] The design of the IBCT is such that it has all of the necessary capabilities to allow it to operate autonomously or semi-independently. The central capability of the IBCT resides in its lethality provided by the two or three infantry battalions and their ability to bring additional combat power to bear on an enemy force. The IBCT is the Army's most strategically deployable brigade combat team (BCT); however, it does take a significant amount of lift to deploy the entire formation with all of its organic equipment. Additionally, while it is the most strategically mobile BCT, at the operational and tactical levels the IBCT loses this distinction. In fact, the formation's mobility exists almost completely outside of its infantry formations. The IBCT was well designed and equipped for the missions of the Global War on Terrorism (GWOT) and a COIN environment; however, with the shift to a division-centric Army, there may be a need to rethink the design.

The question that force designers are trying to answer now is: In order to meet threats and operational challenges of the future, how does the infantry formation continue to be the most strategically deployable formation, increase tactical and operational mobility, and maintain sufficient lethality to compete with, deter, and defeat enemy forces in dense or restrictive terrain? This is reinforced with a recent article highlighting a strategy paper from Army Chief of Staff GEN James McConville. This article explains that Army forces employed inside enemy missile ranges would have the ability to "disrupt the PLA's [People's Liberation Army's] plans."[5] Recent design efforts are exploring two maturations of the IBCT: a mobile or motorized brigade combat team (MBCT) and a light brigade combat team (LBCT).

The MBCT concept provides organic tactical and operational mobility to higher echelon commanders, giving them flexibility in the employment of highly trained infantry formations to conduct operations to seize or control key and restrictive terrain. The LBCT concept provides a strategically deployable and more robust infantry capability to these same commanders, giving them flexibility in employing highly trained infantry formations to conduct and also control key and restrictive terrain. Both of these designs would also support and reinforce heavier formations such as armor or Stryker brigades. As radical as this may sound, it is actually a throwback to the time of GEN Wickham's White Paper from the early 1980s.

In the mid-1980s, a future infantry brigade commander wrote about his ideas on the role and purpose of the modern infantry formation. In his 1985 article, "Three Kinds of Infantry," COL Huba Wass de Czege described the need for the Infantry to adapt to the new threat.[6] His idea called for three types of infantry, each designed and organized to address a specific Soviet threat. COL Wass de Czege explained that the Infantry has three main responsibilities, accomplished by armored infantry, regular infantry, and light infantry.

In his description of armored infantry, he wrote: "Armored infantry orients on the advance and protection for the main battle tank. It keeps up with the fastest tanks, gets through close terrain safely, overwatches and secures tanks during movement, clears... obstacles..., and in static positions provides close-in security and protection for the tanks…"[7] This general description is very close to our mechanized forces of today and the role they play in heavy force maneuver.

The next infantry formation very closely resembles the current MBCT concept in purpose and capability. The regular infantry, as described by COL Wass de Czege, would conduct operations supported by tanks. He saw the regular infantry mounted in vehicles that could move infantry squads quickly over long distances. At the appropriate point, Infantrymen would dismount from vehicles to conduct the mission. He stressed the belief that this formation fought

dismounted: "...to do its job, regular infantry rides. But it fights dismounted — *always*." His explanation of the type of vehicle necessary was one of "great cross-country load-carrying capacity" and being able to move the formation rapidly to achieve an objective.[8] The MBCT's mission and design resemble this idea very closely. Its advantage lays with the tactical mobility inside an infantry battalion, giving it the ability to independently maneuver across the battlefield to key terrain or positions of advantage.

The final infantry formation COL Wass de Czege described is, of course, light infantry. He wrote that light infantry is designed for rapid insertion into rugged terrain, infiltration, and raids. While raids and infiltration are not part of any brigade combat team's task list, his light infantry idea can accomplish attack, movement to contact, and either airborne or air assault operations. The light infantry's ability to quickly deploy and be employed through air-mobile means gives this concept great flexibility in the areas it may operate. Its ability to also operate in complex terrain gives it a distinct advantage.[9] (Note: Complex terrain is defined as a geographical area consisting of an urban center larger than a village and/or of two or more types of restrictive terrain or environmental conditions occupying the same space.[10]) The LBCT is COL Wass de Czege's light infantry concept. The LBCT is capable of fighting in dense, restrictive, urban, or isolated terrain, especially useful in areas that has islands, dense vegetation, or significant urban areas. The LBCT would be ideal for this environment.

The IBCT's strength was its modularity. An IBCT could operate mostly independent of a parent organization. Over the past 15-20 years, the Army has learned many lessons with regard to force design and many point to the IBCT's design as the center piece to recent combat success. However, as the role of the Army moves away from the fight of the last 20 years and towards competition/conflict with peer and near-peer enemies and the division as the tactical maneuver formation, does the IBCT have a place in that formation or does it also need to evolve?

While the MBCT and LBCT concepts display many advantages over the current IBCT, they do have a downside. While being more deployable and responsive, their designs lack some of the key capabilities of the current IBCT such as fires, protection, and sustainment. While the new BCT concepts would retain limited reconnaissance, the parent division would have to provide the larger reconnaissance capability. Both the MBCT and LBCT will be dependent on their parent divisions for direct or general support of some or all of these capabilities, whereas the IBCT currently retains these abilities. Additionally, the role of the division in LSCO must be to command and sustain its subordinate formations. These division formations "must have reconnaissance and security, aviation, fires, maneuver enhancement, and sustainment formations" to enable its maneuver brigades.[11] For this to happen and the division to establish these capabilities, its maneuver infantry brigades must divest of the same capabilities. The MBCT and LBCT are designed to and can very effectively "end the firefight" at the close tactical level. However, it is incumbent on the division and possibly the corps to get the maneuver BCTs to that close tactical fight.

Notes

[1] GEN John A. Wickham Jr., "Light Infantry Division," Army White Paper, 16 April 1984, 1.

[2] Ibid.

[3] John L. Romjue, "A History of Army 86, Volume II, The Development of The Light Division, The Corps, and Echelons Above Corps," U.S. Army Training and Doctrine Command Historical Monograph Series, June 1982.

[4] Field Manual (FM) 3-96, *The Brigade Combat Team*, January 2021.

[5] Sydney J. Freedberg Jr. "'Land Forces Are Hard To Kill': Army Chief Unveils Pacific Strategy," *Breaking Defense*, 23 March 2021.

[6] COL Huba Wass de Czege, "Three Kinds of Infantry," *INFANTRY* Magazine (July-August 1985): 11-13.

[7] Ibid, 11.

[8] Ibid, 12.

[9] Ibid, 13.

[10] Army Techniques Publication 3-34.80, *Geospatial Engineering*, February 2017, 1-5.

[11] LTG Michael D. Lundy, "Meeting the Challenges of Large-Scale Combat Operations Today and Tomorrow," *Military Review* Special Edition (September-October 2018): 118.

COL Ryan J. Morgan currently serves as the director of the Army Capability Manager-Infantry Brigade Combat Team, Maneuver Capabilities Development and Integration Directorate, Fort Benning, GA.

Photo by 1LT Ian Fischer

Soldiers from the 3rd Brigade Combat Team, 82nd Airborne Division load onto a CH-47 Chinook in Estonia on 8 May 2021 as part of Swift Response 21.

Posture to Get More Arms into the Combined Arms Fight

CPT BRANDON SHORTER

Our rifle company had advanced through wooded terrain enroute to our objective rally point. From there we planned to stage our attack on a key village in the brigade area of operations. While we were deliberately crossing a linear danger area (LDA) four kilometers from the objective, we began receiving accurate enemy artillery fire. We plunged forward into the wooded terrain between the LDA and the objective to move out of the effects area. The cost was nearly a platoon's worth of Soldiers.

We consolidated, made slight adjustments to our plan due to the losses, and proceeded to our assault position. Just as we were preparing to commence our attack, the enemy's mortars opened a deluge on our assault position, wreaking havoc amongst our remaining squads. A cursory glance upwards identified the agent of our destruction — a small unmanned aircraft system (SUAS) orbited our location, audibly undetectable. How long had it been watching us?

This short vignette reflects a common experience for units training in a decisive action training environment (DATE) rotation at the Joint Multinational Readiness Center (JMRC) in Germany. I have witnessed this tendency firsthand over the course of a five-year assignment at JMRC, first as a member of the opposing force (OPFOR) and now as an observer-coach-trainer (OCT). After participating in more than 20 DATE rotations from 2016 to present, I am convinced our rifle (really, all maneuver) companies, and by extension, our battalions/squadrons, need to be better trained and equipped to deal with the threats on the modern battlefield and those likely to emerge on the horizon.

One need only to look at the pictures and videos coming out of the Nagorno-Karabakh conflict between Armenia and Azerbaijan to appreciate this assessment.[1] As an Army we must reanalyze how we are preparing and posturing for combined arms maneuver at the tactical level given armed SUAS and electronic warfare (EW) capabilities, as these can reasonably be expected to characterize the next battlefield on which we will fight. We should consider SUAS and EW capabilities as "arms" that must be combined in the combined arms fight and make adjustments with those implications in mind.

Looking at the Present

For the most part, rotational training units (RTUs) arriving for a Combat Training Center rotation at JMRC (generally a brigade in size and always containing some multinational allied or partnered formation) need to be better prepared to effectively employ their organic SUAS and counter the enemy's. Units often arrive with few or no SUAS master trainers in their formation, and their training programs may barely keep their SUAS operators mission-qualified and able to fly, let alone remain proficient in operating in a DATE. Further, brigades may not have developed adequate airspace coordination and deconfliction procedures for SUAS operations within the brigade airspace or issued clear guidance on how to request that airspace. When procedures have been established, they are generally unwieldy and too restrictive to support the battalion-and-below fight (e.g., requiring requests 48 hours prior to use). Frustrations regarding the inability to obtain restricted operating zones (ROZs), limitations on frequencies available for use, inability or delays in receiving replacement parts, operators breaking equipment from crashes or failed launches, and a litany of other challenges encountered in trying to operate SUAS may have discouraged their use. This results in some commanders questioning the value of SUAS, and what's more, lacking the knowledge and experience to develop and resource a sustainable and effective training program to achieve efficient use from their systems and operators; thus the SUAS programs they are responsible for may never get off the ground.

These challenges may compound to such a level that it leaves SUAS operators undertrained and underemployed; thus the RTU misses fleeting opportunities from information obtainable by effectively employed SUAS. Since SUAS is often underutilized in training, our leaders may lack the critical knowledge and experience necessary to effectively employ SUAS, resulting in units failing to understand and account for the enemy's ability to use SUAS against them. This can lead to formations underappreciating exposure to enemy SUAS, to include enemy indirect fires, which leads to catastrophic results for the RTU.

An Example

In July 2020, during the Saber Junction 20 exercise, the infantry company I was observing was tasked with moving six kilometers and establishing a support-by-fire (SBF) position in order to facilitate the battalion's clearance of an objec-

Figure 1 — A view from the opposing force small unmanned aerial system operator's mission computer of the rotational training unit consolidated on their side of the obstacle awaiting the breach to be opened.

tive, with a follow-on mission for the company to seize a village. The company coordinated with engineers to breach an expected enemy obstacle prior to their SBF position. The company began movement just before midnight with the intent of being set in their SBF positions by sunrise.

Around 0300 the company identified an unobserved enemy obstacle and called forward the engineers to conduct a breach while they pulled local security. Little did the company or battalion know, OPFOR SUAS had been observing their movement since 0200 and was currently loitering undetected over the formation (see Figure 1). After a 20-minute period of observation, the OPFOR SUAS operator requested and received accurate indirect fires through his battalion, causing numerous casualties to the RTU.

By 0600 a breach of the obstacle was affected, and the company moved into their SBF positions overlooking the objective. The delay at the breach and desynchronization in the battalion from the indirect fires resulted in the assaulting company having already cleared the objective prior to the SBF positions being occupied, making them unnecessary. The company then paused awaiting further instructions as the sun came up over the horizon.

A cursory glance upward was enough for the OCT to observe an SUAS orbiting the company at 450 feet above-ground-level (AGL). The OCT inquired with the commander if the SUAS was friendly and received a response to the negative. The OCT then asked the commander where the "DroneBuster" was located and received the reply: "It's in the truck." The device was moving with the company in a manner that it could not be rapidly employed nor was any effort made to retrieve the device after becoming aware of the enemy SUAS overhead.

Recognizing their location was compromised, the company consolidated into a column formation with minimal spacing and attempted to move expeditiously towards its follow-on objective. Within moments enemy indirect fire was landing amongst the now consolidated company, causing casualties and disrupting the formation. As the company started to run out of the effects area, Soldiers began to bunch up. After 200 meters they were surprised when they ran into an enemy tank section overwatching a key intersection along their avenue of approach (the tank section having been alerted and directed to an effective position by the SUAS operator). The company was not in an effective posture to deal with this threat and continued to take casualties.

This example is a regular occurrence at JMRC. First, the RTU could have identified the enemy tank section located at the key intersection described had it effectively employed its own SUAS. Second, the RTU could have defeated the enemy SUAS observing its position and calling for fire on them if it had accounted for that threat in planning and had equipment readily available for employment. These two failures are directly attributable to more than 30 casualties during the operation.

In addition to SUAS, the OPFOR at JMRC effectively employs EW systems. Using equipment fielded to them for threat replication purposes, the OPFOR is able employ organic man-portable electronic warfare support (ES) tools to locate RTU elements across the battlefield. They then pass this information to an SUAS operator who is co-located. The SUAS operator then flies towards the enemy's general location to identify the source of the signal intelligence (SIGINT),

Figure 2 — Another OPFOR SUAS operator view. This time the company is moving towards the follow-on objective after realizing they are under enemy observation. Enemy artillery began impacting shortly after this picture was taken.

invariably identifying the RTU element. This technique has been used numerous times with decisive results and is made possible by the right mix of trained personnel and equipment.

Looking Towards the Future

It is important as an Army that we begin to look at SUAS and EW as "more arms" in the combined arms fight.[2] Consider the following:

- How well are U.S. formations prepared to deal with suicide unmanned aerial vehicles (UAVs)/drones, such as those observed in use by Azerbaijan?
- Perhaps our formations can defeat one or two UAVs with current equipment; how about a swarm of small suicide drones?
- Is it possible to create a protective umbrella over a formation that denies UAVs access to engage our forces?
- If so, how big an umbrella is possible, and should that capability be organic to the formation being defended or as an attachment from a higher echelon on an "as needed" basis?

In the fighting in Nagorno-Karabakh, the Azerbaijan military has successfully employed armed UAVs in a peer conflict with Armenia. Some of these UAVs are designed as suicide drones, which identify their target and then fly into them, destroying the target. Armed UAVs have provided the Azerbaijani forces with a decisive advantage at the tactical level despite similar legacy equipment on both sides across the other arms of the combined arms fight (i.e., tanks, artillery, etc.).[3]

To deal with this and the threats currently emerging or projected to emerge on the horizon, we should:

- Immediately invest in a robust and sustainable SUAS/counter-UAS(C-UAS)/EW program at the battalion and company level; and
- Reconsider the design and equipment of our rifle companies to include a dedicated SUAS/C-UAS/EW element.

Companies and battalions need to be more proficient at employing SUAS and countering enemy SUAS. A full complement of SUAS master trainers for the battalion and companies, along with a bench of qualified operators, should be pursued. Additionally, operator training must go beyond currency flights and delve into employment tactics, techniques, and procedures (TTPs) beyond simple orbits, as well as an understanding of the enemy they are expected to encounter, enhancing employment and reporting. Training should not be limited to operators; leaders must understand the capabilities of their organic systems so they can plan to employ these assets to maximize the information they can provide, while appreciating the enemy's capabilities and the potential threats to friendly formations. C-UAS training should be conducted across the battalion to prepare Soldiers to operate in environments with enemy UAS. The training needs to prepare Soldiers how to respond, and if adequately equipped, defeat enemy UAS within their capability. When collective training is conducted, the associated OPFOR element should be equipped with a SUAS capability to adequately replicate the SUAS threat. We should be treating SUAS/C-UAS as an arm to be combined and be as proficient in its use as we are with our other weapons.

An Example

The current SUAS master trainer in the 1st Battalion, 4th Infantry Regiment (OPFOR) — SSG Christopher Curley — is arguably the best SUAS operator/master trainer in U.S. Army Europe (USAREUR) and quite possibly the best in the Army.[4] He has operated SUAS during more than 12 DATE rotations at JMRC, supporting both company and battalion operations. He is the epitome of a well-trained and experienced operator. As his company commander during six of the rotations, I benefited from his expertise and came to understand that a highly competent and experienced SUAS operator is a substantial combat multiplier.

We were able to employ SSG Curley in a number of

Photos courtesy of author

An OPFOR company commander and SUAS operator observe an RTU attack that was developing in real time during a rotation at the Joint Multinational Readiness Center.

(Left) A Soldier launches a Puma from a concealed location. (Center) The SUAS section works with a joint terminal attack controller to identify targets for close air support. (Right) A battalion commander keeps the Puma hand controller close at hand for real-time intelligence.

interesting ways due to his proficiency. In one instance, after receiving SIGINT of an enemy counterattack staging to hit us in the flank, he quickly launched a quadcopter to identify the forces as they staged, rapidly attacked the opponents in their staging area, and destroyed the enemy counterattack forces. In another instance, he used a Puma to identify an enemy hasty defensive position consisting of a Stryker vehicle and its dismounts, coordinated directly with a friendly squad on the ground, and then maneuvered those Soldiers undetected to within 50 meters of the enemy by telling them when and where to move, thus positioning the squad to surprise and destroy the enemy. In yet another example, SSG Curley disrupted an enemy attack by flying a quadcopter at eye level and in plain view of a tank commander's (TC's) head while the tank was stationary in an SBF position (certainly a disconcerting experience for the TC) and proceeded to chase the tank across the field as it fled obvious enemy observation. He was particularly effective when paired with a fire support officer (FSO) and some engagement criteria; on multiple occasions the pair would destroy enemy formations with particularly accurate indirect fires, reporting the battle damage assessments (BDA) as they went.

In July 2020, SSG Curley and a small section augmented a Polish mechanized battalion acting as the OPFOR during the Allied Spirit XI wet gap crossing exercise in Poland. He combined SUAS operators and intelligence analysts into a combat support element working directly for the battalion commander. The battalion commander used the information he was receiving from the section to call for fire and decide where to commit his reserve elements. This was a highly effective approach to integrating SUAS within a maneuver battalion and severely challenged the training unit. It is a model that we should consider for use elsewhere.

SSG Curley is unique in our Army, but creating capable and motivated SUAS operators like him should be our goal. The process to train someone to his caliber takes time and experience, something that is difficult to achieve when these skills are only an additional duty for the operators. Under the current Army construct, operators are selected from within a formation to receive training and employ SUAS as an extra duty, taking them away from their primary responsibilities. In SSG Curley's case, he is an 11B with the SUAS master trainer schooling who was filling a rifle team leader and later a squad leader position. We prioritized his time as an SUAS operator during DATE rotations instead of his assigned responsibility for the simple fact that it was more valuable to employ him in that manner than as a small unit leader on the battlefield. As a SUAS operator/section leader, his value to the organization was paramount and decisive, but it came at the cost of SSG Curley's development as a team/squad leader. What's worse, his future promotion in the Army is based on his performance and growth as an 11B and not what he is exceptionally talented at doing — SUAS operations.

With regards to EW, my knowledge is admittedly limited. I don't recall discussing EW in any kind of breadth or depth at the Maneuver Captains Career Course. Additionally, there aren't many opportunities to be exposed to EW activities as an infantry leader in training, short of a CTC rotation when EW capabilities are employed by the OPFOR. What little knowledge I do have comes from dabbling with the Versatile Radio Observation and Direction (VROD) as an OPFOR commander, and it only gives one the sense of scratching the surface of what's possible.

There will undoubtedly be things that emerge in the near future that will be important for company commanders to know. For instance, the ability to "see and hear" in the elec-

tromagnetic spectrum will be of tremendous value, indeed indispensable, and they will need eyes and ears to do so. Systems with this ability already exist and are certainly in the process of getting better. Their impact on the battlefield can reasonably be expected to be significant. All of this would imply that commanders must understand at a minimum the capabilities and limitations of the systems available to them, as well as those of their enemy.

One example of an EW capability that is not well understood is in defense against UAVs. Current methods tend to focus on electronic attack (a form of EW) from handheld or stationary devices that break the link between the UAV and the control station/operator. When available, they are generally employed by Soldiers who have received limited training on the device. In this manner, EW is an extra duty (just like an SUAS operator) and likely not wholly understood or appreciated by the leaders who seek to employ it.

We see this gap in leader knowledge in other areas and in different magnitudes. Unless officers were fortunate to attend the Mortar Leader's Course or serve as a mortar platoon leader, they likely only have a passing knowledge of all the intricacies of effective mortar employment and are not subject matter experts (SMEs). This isn't a problem for most rifle company commanders as they have a mortar section sergeant who is the SME within their formation. There is no similar (and consistent) equivalent SME in the rifle company for SUAS and EW. "Additional duty" personnel, such as an SUAS master trainer (if you are lucky to have a Soldier receive the training), do not wholly meet the intent of an SME in this case (while they may have the training, they very often lack the experience). One obvious reason is that a mortarman is a Military Occupational Specialty (MOS) — the other positions are not.

The action in Nagorno-Karabakh presents visceral examples of the opportunities and threats on today's battlefield. We do not treat SUAS and EW as arms in the combined arms fight, when it appears ever more evident that we must.

An Option for the Future

One way we might address these challenges and enable flexibility in our formations for the future battlefield is to reconsider the design of our rifle company (and by extension all of our maneuver companies). To that end, adding a combat support section to the rifle company would add the backbone of SUAS/C-UAS/EW capability organic to the infantry company (see Figure 3). This section would function in a manner similar to a mortar section. Where the mortars provide the indirect fire arm, the combat support section provides the SUAS/C-UAS/EW arms, with the section leader acting as the SME to inform and advise the company commander on capabilities, limitations, and effective employment. Also, like mortars, a special MOS should be implemented to staff these sections.

Such a section has several foreseeable advantages for the future development of the SUAS/C-UAS/EW arms across the force:

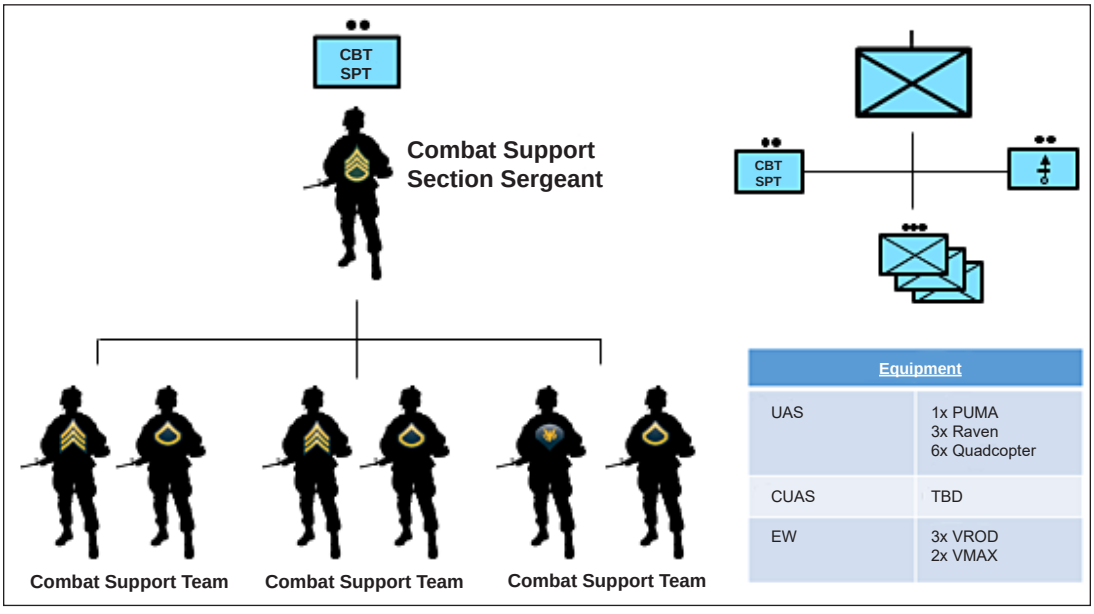
- Equips company formations with devices and operators that are significant combat multipliers to the force, both offensively and defensively;
- Creates the conditions for a burgeoning population of Infantrymen mastering skillsets necessary for success on the future battlefield;
- Establishes a foundation within the force to add emerging capabilities and equipment for immediate implementation into our formations, rather than a bolt-on capability; and
- Provides for SMEs within the companies who will inform and train leaders at the lowest level, growing the knowledge base on how to employ and defend against the SUAS/C-UAS/EW arms.

How might this look in practice? Let us reconsider the vignette from the beginning:

One hour prior to start point, we launched the decoy drones. Once over the objective, the leading drones dove against suspected enemy positions, their payloads exploding on impact. Within minutes the enemy's jamming device began to knock our remaining drones out of the sky, but by doing so had revealed its position, as intended.

The combat support section was split into three two-man teams; Team 1 positioned 1 kilometer north of the company, Team 2 with the lead

Figure 3 — An Example of a Possible Combat Support Section



platoon, and Team 3 with the section leader and FSO located near the mortars. Teams 1 and 3 were waiting with their EW surveillance devices and immediately detected the jamming device, whose position they were able to triangulate. The grid was rapidly fed to the mortars, and within two minutes rounds were on the way. The jammer signal ceased immediately following the mortar impacts, and we assumed it had been destroyed, giving us a short-term advantage.

Teams 1 and 3 launched Pumas, with Team 1 surveilling the avenue of approach and Team 3 observing the objective; conditions were set and the company started movement. Shortly after stepping off, Team 2, which was moving with the lead platoon, identified an enemy UAV and brought it down with handheld jamming devices, denying the enemy observation of the company. Several more enemy UAVs followed with the same result, some clearly armed as they exploded when they hit the ground.

Shortly after the enemy UAVs were defeated, Team 3 identified with its Puma an enemy fire team moving in the company's direction, likely a patrol, as well as the enemy position the patrol had just departed. Team 3 passed this information to Team 1, which took up observation with its Puma. The FSO, observing Team 3's Puma feed, worked up a target on the enemy position for the artillery. Team 1 observed the patrol moving through the woods and halting at the LDA the company had to cross before reaching the assault position. Team 1 now launched a weaponized drone, and when the rounds from the artillery started impacting on the objective, used the confusion to attack the enemy patrol, killing two and driving the others back. The way was now clear for the company to the objective.

The company rapidly crossed the LDA and entered the assault position while preparatory fires were placed on the objective. Team 2 gathered the Soldiers it had cross-trained and equipped with additional UAV jammers and placed them according to plan, establishing an anti-UAV screen. Once set, Team 2's NCO gave the thumbs up to the platoon leader. Fires onto the objective were shifted, and the assault commenced with Team 1's weaponized drones overhead in support while the commander patiently observed the operation through Team 3's Puma feed.

The lead platoon's attack quickly provoked the enemy's key defensive weapons to open fire. Team 1's drones observed a machine-gun position 200 meters to the lead platoon's front that was causing the attack to stall. A few seconds later, Team 1's drone crashed into the machine-gun position, disabling it; the platoon could now get moving.

Just as the lead platoon seized a foothold, an enemy drone swarm appeared from beyond the objective deeper in enemy territory. The Team 2 NCO, alert to the possible threat, identified the enemy drones and gave the signal to activate the jammers, causing the swarm to come apart and collapse; few made it to the infantry and detonated.

The action in Nagorno-Karabakh presents visceral examples of the opportunities and ***threats on today's battlefield. We do not treat SUAS and EW as arms in the combined arms fight, when it appears ever more evident that we should.***

Several additional friendly drone attacks on key enemy assets, combined with the weight of the infantry assault and accurate artillery fires throughout the enemy's depth, dismantled the enemy defense at a very low cost. The company commander shuddered to think about the losses his company would have suffered if the enemy had been able to observe their approach to the objective and bring the full weight of their fires and weaponized drones to bear.

A scenario such as this is plausible given the current advances in technology and the tactics already emerging, whether observed through the outcomes achieved by the Azerbaijan military in the Nagorno-Karabakh conflict or by the SUAS master trainer at JMRC. Each rotation that I observe makes it more apparent that treating SUAS/C-UAS/EW as additional arms to be combined in the combined arms fight will be necessary to succeed on today's battlefield.

Notes

[1] Stijn Mitzer, "Losses on the Sides of Armenia and Azerbaijan," Oryx Blog, 3 November 2020, accessed from https://www.oryxspioenkop.com/2020/09/the-fight-for-nagorno-karabakh.html.

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Brigade and Battalion Mobile Tactical Operations Centers

MAJ JONATHAN BUCKLAND

The Army's new operating concept, multi-domain operations (MDO), requires forces to be more mobile and less static within the operational environment (OE). However, the Army's current command and control (C2) nodes, which remain large and stationary, are those from the wars in Afghanistan and Iraq. This type of design places a unit's survivability at risk, especially when confronted with the current precision technology U.S. adversaries possess to target with indirect fires. The Army cannot continue the current practice of utilizing static C2 nodes if it wants to maintain survivable and precise C2 of the OE when targeted by the enemy's indirect capabilities.

Photo by SGT Anita VanderMolen

The 2nd Squadron, 116th Cavalry Regiment readies its tactical operations center to begin training operations on 14 August 2015 at the National Training Center at Fort Irwin, CA.

The Army currently does not have a mobile platform tactical operations center (TOC) that provides the ability to C2. If the mobility issue is not addressed, it will lead to the targeting and destruction of command nodes on the battlefield due to their lack of mobility and large operational footprint. A solution is the acquisition and distribution of the M1087n Family of Medium Tactical Vehicles (FMTV) expansible vans to be utilized as mobile TOCs for tactical battalions and brigades.

The recent conflict between the Russian and Ukrainian armies which began in 2014 has demonstrated the Russian ability to target Ukrainian army C2 nodes and proves there is an urgent need for mobilized C2 nodes. "Army leaders have been concerned about the survivability of command posts that are placed close to battle zones since Russia invaded Ukraine in 2014. During that conflict, Russian forces were able to quickly find and destroy Ukrainian command posts by using a combination of unmanned aerial vehicles [UAVs] and electronic signature detection."[1] The Russians' demonstrated ability to rapidly identify enemy C2 nodes through signaling interception or UAVs and subsequently target them with accurate indirect fires is the primary reason to advance from the old-style tent TOC to a more mobile and expeditionary style concept.

The U.S. Army Training and Doctrine Command (TRADOC) outlined the extension of the close area fight in TRADOC Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations*. It states: "The Close Area includes land, maritime littorals, and the airspace over these areas. The new operational environment and improved enemy and friendly capabilities have expanded the Close Area. Operations in the Close Area require tempo and mobility to overcome these enemy capabilities through sufficiently integrated and concentrated combat power at the critical time and space."[2] The statement clearly acknowledges that within the close area fight, tempo and mobility will be two critical factors that ensure U.S. forces can overcome the enemy's capabilities. Providing the commander the ability to integrate all warfighting functions and make timely decisions to enable warfighters to destroy the enemy is the key to success in the future OE.

C2 mobility offers survivability by denying the enemy the ability to target key C2 assets with indirect fires while simultaneously providing the commander a clear picture of the operational environment. Commanders and staff within maneuver brigades and battalions remained mired in the era of wars in Iraq and Afghanistan with the use of forward operating bases (FOBs) or combat outposts (COPs) instead of recognizing the need to adjust to the maneuver warfare of large-scale combat operations. Any recent visit to a Combat Training Center (CTC) can prove that the "TOC-mahal" or

"tent city" is still the norm within the military. The focus for battalion and brigade C2 nodes needs to shift to a more mobile and expeditionary TOC. This new mobile concept will ensure that the Army can be more mobile while still maintaining the operational picture.

A solution can begin with the acquisition and distribution of M1087 FMTV "expando vans" by moving these platforms from the forward support companies' (FSCs) assigned modified table of organization and equipment (MTOE) to brigade and battalion headquarters and headquarters companies' (HHCs) MTOE. The second part of the solution would be the Army developing prefabricated interior kits to configure and secure all necessary equipment to operate a TOC.

The reorganization would require an update to MTOEs that would authorize HHCs to have the expansible van on their property book. This action would be the fastest way to immediately provide the capability at the battalion and brigade levels. Currently, most FSCs use these platforms as small weapons repair locations. This service repair location could easily locate with the battalion combat trains command post (CTCP) or field trains command post (FTCP) at the battalion support area (BSA) in a static position farther from the forward line of own troops (FLOT) utilizing a palletized load system (PLS).

Using the M1087 in the C2 mode would also require fielding prefabricated kits for the interior to properly secure all necessary equipment appropriately instead of having units make their own. Without these standardized kits, units would have unsecured items and equipment within the vehicle's interior, which could potentially become a hazard and slow down their ability to relocate rapidly. Prefabricated kits would ensure that there was a standard concept across the Army.

U.S. Army photo

A tactical command post based on a Light Medium Tactical Vehicle with expandable van is pictured at Fort Bliss, TX, during Network Integration Evaluation 14.1.

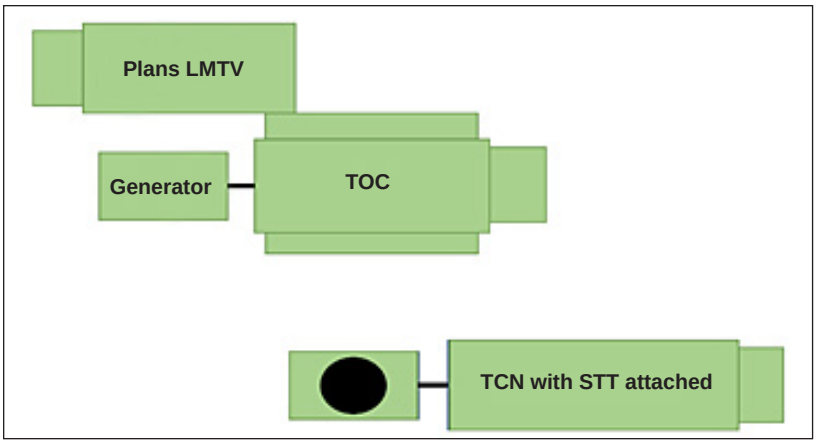
Mobility is the essential key to the platform. It will allow staff to continue operations, break down and move if compromised, or "jump" the TOC to a better position where it can quickly reestablish itself and continue the fight.

The mounts and racks for sensitive items would need to be strong enough to secure all equipment properly and not hinder the van's ability to expand and close.

The expandable van's interior is the key factor in removing the gap between a fast-maneuvering main element and a static tent-style TOC. The FMTV platform is important, but it is the equipment located within the back of the vehicle that will further expand and enhance the commander's capabilities. It is envisioned that the expandable van's interior will have installed prefabricated radio racks, tables, and chairs already fastened to the walls and floor. Wiring will be in place for all expected equipment, and additional wiring will be provided for access to any other screens or technology needed. This design will allow the TOC to move rapidly and deploy its operation immediately upon occupation of the newly established TOC location.

Mobility is the essential key to the platform. It will allow staff to continue operations, break down and move if compromised, or "jump" the TOC to a better position where it can quickly reestablish itself and continue the fight. Through multiple repetitions, staff from my former unit (the 2nd Battalion, 325th Airborne Infantry Regiment) was able to get emplacement and displacement down to 30 minutes. This capability would give the commander time on the battlefield to make decisions while allowing the staff to operate and continue feeding necessary information into the decision-making process.

The expandable van would tow a generator to ensure that when the TOC location is determined the interior can immediately have power, and if the TOC must displace quickly, the generator will already be attached. In addition to the expandable van, the mobile TOC would require two other vehicles. The second required vehicle could be either another FMTV or an M1078 Light Medium Tactical Vehicle (LMTV) that would serve as the plans center. It could park next to the expandable van with a platform connecting the two while still providing a separate area between current operations and future operations. The third vehicle to complete the mobile TOC would be the FMTV Tactical Communications Node (TCN) towing a Satellite Transportable Terminal (STT), which would provide instant connectivity to the TOC. However, the TCN/STT could be removed to decrease the overall footprint, and the TOC could



Core Layout to the Mobile TOC Concept

just operate on an analog configuration, giving commanders options to tailor their TOC package to their specific mission. These vehicles would serve as the core elements of the TOC. Additional vehicles could move with the TOC but would not be required to park next to it. As a result, the overall footprint of the TOC would be reduced.

Additional modifications would be needed to complete the expando van's exterior for rapid emplacement and displacement. Quick erect antenna mast (QEAM) systems should be welded to the van's sides to prevent wasting time unpacking and having unsecured antennas on the top of the TOC. The QEAMs would allow for antennas to be expanded in height as soon as the vehicles come to a stop. To limit the visual signature of the van, camouflage awnings could be mounted on its four corners to cover the front cab and generator while providing a covered area for staff to store gear outside the limited interior and an area for commanders to meet with their whole team. The van also has a door light kill switch so if the door is not closed properly all white lights in the interior will not turn on. All these modifications enable the TOC to rapidly establish in a fraction of the time for a normal "tent" TOC.

The proposed capability of the mobile TOC will be useless without a staff developing the ability to quickly occupy a location and establish TOC operations. A staff would need to train on the process of occupying a location and commencing operations routinely. A recommendation for conducting such training would be that the core package of the TOC be established after Monday morning maintenance; staff operations could then be conducted within the platform for the remainder of the day.

Some leaders have leaned forward with this concept, including my former battalion commander (LTC Stewart Lindsay, 2-325th AIR), who formulated this original plan during my time as one of his company commanders. However, the entire Army needs to pay particular attention to the lessons being learned from the conflict between Russia and Ukraine and fully understand that our forces will be targeted and engaged with indirect fires within large-scale combat operations if remaining static for too long. Standardizing this process across the formation with resources will mean having a durable command platform and not a "Mad Max"-type modification that is paid out of pocket from proactive leaders.

In the future, U.S. land forces will continue to require massive amounts of information but will need to enhance their ability to receive it while being mobile and maneuvering with their elements. Unit C2 nodes cannot be tethered to the ground and take hours to unpack, pack, and reestablish their TOC. Tactical battalion and brigade TOCs must be mobile while maintaining the capability to maintain a clear operational picture for their commanders.

Notes

[1] Stew Magnuson, "Army Looks to Disperse Command Posts to Boost Survivability," *National Defense* (22 October 2020), accessed from https://www.nationaldefensemagazine.org/articles/2020/10/22/army-looks-to-disperse-command-posts-to-boost-survivability.

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Photo courtesy of the Joint Readiness Training Center

Soldiers with 1st Battalion, 12th Infantry Regiment, 2nd Infantry Brigade Combat Team, 4th Infantry Division, work inside their mobile tactical operations center at Fort Polk, LA.

Special Forces vs SFAB:

It's Not a Competition

MAJ CHRISTOPHER R. THIELENHAUS

On 8 February 2018, the 1st Security Force Assistance Brigade (SFAB) officially activated on Fort Benning, GA.[1] This event signified a substantial shift in the way the Army intended to meet its overwhelming advising requirements evident over 16 years of war at that time, not to mention the numerous requests from nations all over the globe to conduct combined training. Unfortunately, what should have been a celebration of a new Army capability quickly mired into a series of high profile iconography faux pas: The new unit's beret color was conspicuously similar to the green shade of the Special Forces (SF); the unit patch resembled an inverted "recondo" badge (a Vietnam-era award for passing a rigorous SF-led reconnaissance school); and even the unit name, "Legion," was reminiscent of the 5th Special Forces Group's "V Legion."[2] To settle the controversy, Pentagon leaders designated a new color of beret, altered the unit's patch, and even changed the unit's name. It was an inauspicious start, but it didn't stop there.

Questions persisted from veterans' groups and the greater U.S. Army enterprise focusing on the purpose of this unit: Was this the Army's attempt to supplant the Green Berets with a more conventional force?[3] From a cursory look, it appears that SF and SFABs have a similar mandate, but a more thorough examination into what the SFAB concept really is shows that nothing could be further from the truth. SF and SFABs are completely and utterly different in their unit organization, purpose, and desired effects. As a force entirely dedicated to, and dependent on, partnering with and building conventional foreign security forces, the SFAB is neither designed, equipped, nor trained to execute the kind of irregular warfare and special operations missions that have defined the lineage of the Special Forces. Instead, SFABs fill a capability gap that the Department of Defense has been struggling with since the earliest days of the Global War on Terrorism: how to train, advise, and assist large-scale conventional foreign militaries over the long term. In comparison, the U.S. Army Special Forces are a force designed for maximum flexibility across the spectrum of indigenous-focused special operations, oriented towards smaller footprints and outsized effects. This article seeks to define these differences for a wider audience, informing decision makers and the general public of what these formations really do in the modern era. Those differences start in the fundamental building blocks of each organization.

UNIT ORGANIZATION

U.S. Army SF Structure

The U.S. Army Special Forces' unit of action is the operational detachment–alpha (ODA). This formation of 12 Special Forces Soldiers forms the building block for all SF operations.[4] The ODA is organized with a captain as the detachment commander, with a subordinate warrant officer and a senior enlisted advisor as leadership. The rest of the ODA is composed of an intelligence sergeant and two Soldiers of each occupational specialty — weapons, communications,

U.S. Army photos

From a cursory look, it appears that Special Forces (left) and Security Force Assistance Brigade (right) units have a similar mandate, but a more thorough examination into what the SFAB concept really is shows that nothing could be further from the truth.

engineer, and medical. Due to its unique structure, the ODA is able to split into two separate elements for better dispersion or to gain greater battlefield awareness. As per Field Manual (FM) 3-18, *Special Forces Operations*, "all other SF organizations are designed to command, control, and support the ODA."[5]

Due to the unique capabilities and expectations of SF Soldiers, the SF ODA can operate either with an indigenous force or independently as the mission dictates. An ODA's primary functions consist of:

- Plan and conduct SF operations separately or as part of a larger force.
- Infiltrate and exfiltrate specified operational areas by air, land, and sea.
- Conduct operations in remote or denied areas for extended periods of time with a minimum of external direction and support.
- Develop, organize, equip, train, and advise or direct indigenous forces up to battalion size.
- Train, advise, and assist other U.S. and multinational forces and agencies.
- Plan and conduct unilateral SF operations.
- Perform other special operations activities as directed by higher authority.[6]

Key to this widely varying list of functions is that the ODA must maintain flexibility. This concept is the bedrock of SF operations, which is the fundamental purpose behind the long Special Forces training pipeline. SF Soldiers and teams must be able to perform ALL of those listed functions, often in remote or denied areas with minimal direction and support, to meet the requirements of an SF mission.

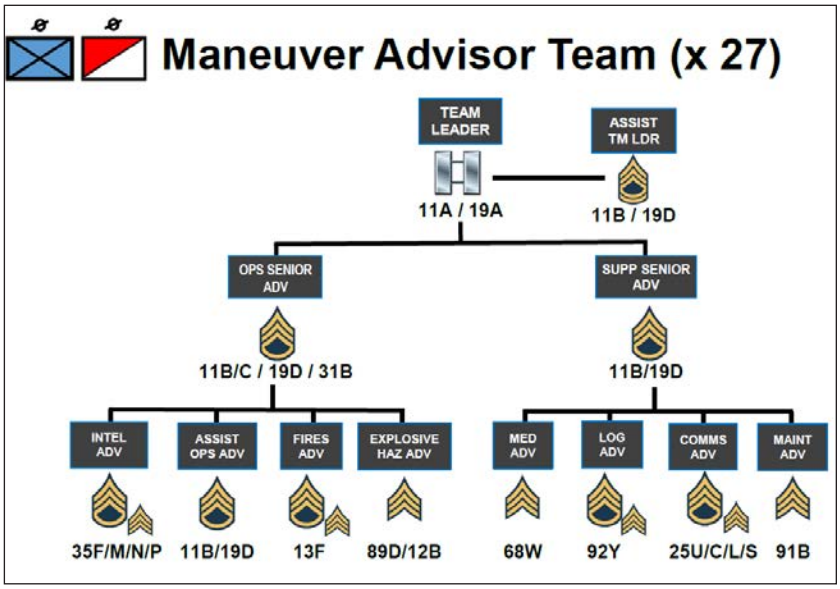
This concept of flexibility permeates through the Special Forces groups' structure at echelons above ODA as well. The Special Forces company headquarters, also known as the operational detachment–bravo (ODB), provides an intermediate level of mission command that is able to coordinate the significant amount of available resources from an SF battalion to the ODA level. Composed of 15 personnel organically, the ODB often takes on additional attachments to build out a mission command node while deployed and is able to coordinate with indigenous forces up to regimental size. This small size allows the ODB to rapidly respond to crises and establish a mission command node quickly, in contrast to the battalion, which is a much larger organization. Composed of the battalion support company (BSC) and the forward support company (FSC), the SF battalion maintains more than 200 personnel between the two, providing sustainment and mission command capability to highly dispersed ODAs and ODBs. Although not usually an advising or partnering element, the SF battalion headquarters nevertheless enables the flexibility of the ODAs and ODBs through the establishment of a special operations task force (SOTF), providing a wide range of enablers. This stands in stark contrast to an SFAB formation, which is much smaller and very tailor-made for its specific missions.

SFAB Structure

In contrast to SF formations, SFAB advisor teams are structured in such a way to support specific warfighting function requirements for a conventional partner force. The fundamental advising unit in the SFAB is the maneuver advisor team (MAT), composed of 12 Soldiers, which is the only true similarity to an SF ODA. Specifically designed to advise a conventional maneuver partner force battalion or higher, the MAT is composed of two sections, one focused on maneuver and the other focused on sustainment. Because of this, the MAT is not capable of performing split-team operations since there is no redundancy between operational specialties. A MAT also cannot operate independently, as the required sustainment and support structure simply does not exist within the SFAB construct. Lastly, MATs are not capable of operating in a denied area, which requires special training. The strength of the MAT lies in the conventional expertise of its individual Soldiers in their Military Occupational Specialty (MOS) skills, tempered in their previous Army assignments, which means that SFAB personnel do not go through the lengthy training pipeline required to train an SF Soldier.[7] A new advisor arriving to an SFAB formation is already assumed to be skilled at his or her MOS, and therefore the training focus for MATs is to sharpen the skills already there and learn techniques for training a partner on those skills.

In addition to the MATs, SFAB formations contain advisor teams of other specialties and echelons intended to advise more specific types of formations and conventional echelons. Within the brigade, the 4th, 5th, and 6th Battalions are home to specialty advising teams focused on fires, engineering, logistics, military intelligence, and signal. Each separate SFAB command echelon is also primarily an advising organization, with company advisor teams (CATs)

Figure 1 — Maneuver Advisor Team Organization



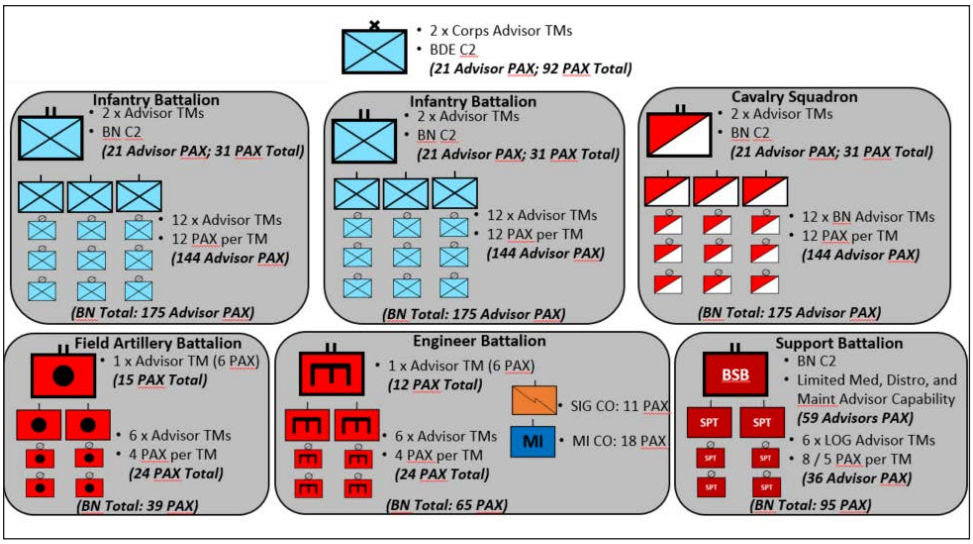


Figure 2 — Security Force Assistance Brigade Overall Organization

commanded by majors and advising brigades and above, and battalion advisor teams (BATs) commanded by lieutenant colonels intended to advise divisions and above.[8] As with the MATs, each of these echelons is less flexible than its SF equivalent but has a more specific purpose and intent. Also in contrast to SF organization, company and battalion headquarters advisor teams in SFABs lack the personnel to provide mission command at the scale of an SF battalion. For example, an SFAB maneuver battalion's headquarters company comprises only 31 personnel in comparison to an SF battalion's combined FSC and BSC count of more than 200 personnel.

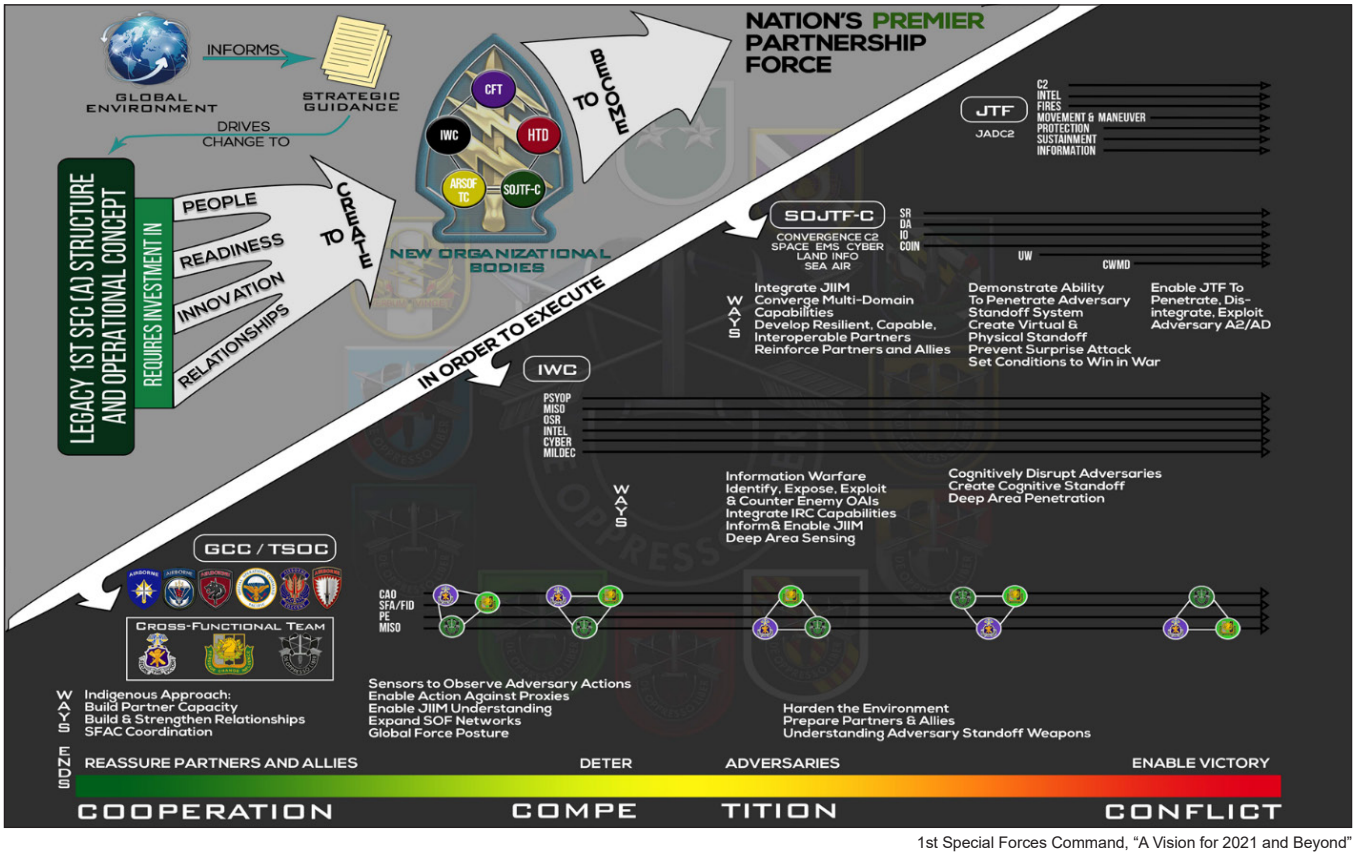
UNIT EMPLOYMENT METHODOLOGY

Special Forces for 2021 and Beyond

In early 2020, COL Ed Croot, chief of staff for the 1st Special Forces Command, published a paper highlighting how the Special Forces community has responded to adapting requirements from the nation over the last two decades of war. His thesis detailed how Special Forces have shifted missions from the influence-based approach in the 1980s-90s, to counterinsurgency and high-intensity combat operations during the Global War on Terrorism, and now towards Great Power Competition in the modern era. He wrote that this has resulted in a force that has separated along three distinct "identities" based on each of those approaches. His paper recommended immediate action to rectify this within the 1st Special Forces Command to support morale, modernization, and readiness.[9]

As a result of this study, MG John Brennan, commanding general of the 1st Special Forces Command (Airborne)

Figure 3 — 1st SFC(A) Future Operating Concept



1st Special Forces Command, "A Vision for 2021 and Beyond"

(SFC), crafted and published his vision in October 2020 with an eye towards the future. This vision document defines Special Forces as "the Nation's experts in the indigenous approach who specialize in supporting or defeating resistance movements."[10] Furthermore, it identifies 1st SFC's priorities along five efforts:

1) Creating an Information Warfare Center;

2) Establishing a Special Operations Joint Task Force for Contingencies (SOJTF-C);

3) Normalizing cross-functional teams;

4) Re-designating Special Forces crisis reaction force companies to hard target defeat companies; and

5) Building a new Army Special Operations Forces Training Center (ARSOF-TC).[11]

All of these priorities are uniquely catered to the strengths of the 1st SFC, but the concept of cross-functional teams is the most significant shift, as it clearly aligns SF operations with Civil Affairs and Psychological Operations (PSYOP) lines of efforts. As per Figure 3, within the spectrum between cooperation to conflict, Special Forces' role shifts according to the position on the spectrum.

In each echelon of the spectrum, these cross-functional teams play different roles. In cooperation, they serve as "strategic sensors and influence networks against those who seek to undermine our partnerships."[12] In competition, they "deter conflict by out-maneuvering our adversaries across multiple domains simultaneously, expanding our physical access and influence."[13] And lastly, in war they "leverage a robust network of JIIM [joint,interagency, intergovernmental, and multinational] partners and surrogates to produce effects against adversaries in complex, austere, and sensitive environments."[14]

Within all of these concepts, two common themes run throughout:

1) Special Forces will refocus on the indigenous approach, utilizing unique technologies and organizations to achieve effects; and

2) The desired effects will be based on the adversary.

This is the primary difference in purpose between the Special Forces' modern employment concept and the SFAB employment concept. Modern SF are oriented towards direct, adversary-based outcomes utilizing an indigenous approach, enabled by cross-functional teams, innovative technology, and a flexible command structure. As will be shown below, the SFABs are different; reliant on the Theater Army Service Component Command (ASCC) and partner force organic support structures, and focused entirely on partner-based outcomes with a more indirect effect on adversaries.

SFAB Employment Concept

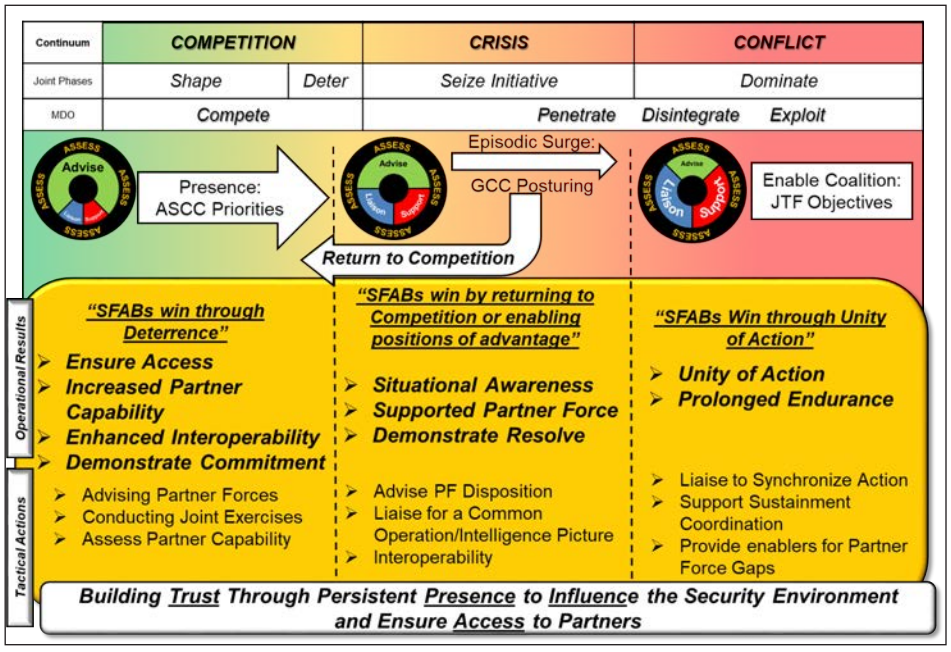
SFABs are small in comparison to brigade combat teams (BCTs) and even in comparison with an SF group. Typically retaining approximately 800 assigned personnel, an SFAB simply does not have the personnel numbers to provide the kind of mission command nodes that a BCT or SF group can field. As a result, the SFAB employment concept is focused on small numbers of senior Soldiers advising at the echelon of highest impact while leaving mission command functions mostly at the ASCC level. In SFAB formations, battalions serve as the lowest level of mission command and are severely limited in terms of personnel to run an operations center. As a result, BATs often partner with either a foreign partner force or U.S. element that already has a mission command node.

In the most recent concept document from the Security Force Assistance Command (SFAC), SFABs have a mission in every phase of the conflict continuum (see Figure 4). Each one of the phases places differing emphasis between the four fundamental SFAB functions of advise, support, liaise, and assess, with an equivalent emphasis on all four only in the conflict phase. The most common phase of this continuum will be in the competition phase, which will require persistent presence.

Persistence is a challenge given the SFABs' small numbers, so each brigade has aligned its subordinate battalions into force packages (FPs) that rotate in and out of theater every six months. These FPs are composed of a maneuver advisor battalion in its entirety and one specialty battalion headquarters with six total specialty advisor teams of each type (see Figure 5).

How these force packages are arrayed within theater is entirely dependent on the ASCC mission and the situation

Figure 4 — SFAB Concept for Winning in the Conflict Continuum



Thomas Shandy, "SFAC — What Does Winning Look LIke in the Continuum of Conflict"

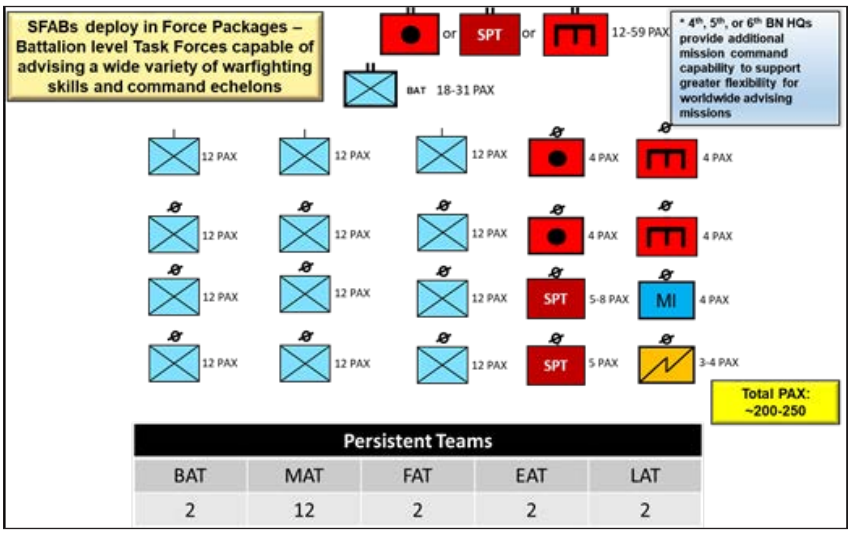


Figure 5 – Example Force Package Graphic

within that corner of the world. Some SFABs are oriented towards persistent presence at all times, while others are far more episodic in terms of how often they can get involved with overseas partners. The employment methodology, partner units, and effects are unique to each theater. The common themes in competition, though, are clearly depicted in Figure 4, which depicts SFAB end results as "increased partner capability," "enhanced interoperability," and "demonstrating commitment."[15] Note also that this partner-based outcome approach applies even in the conflict spectrum, where the end states for crisis and conflict include "supported partner force," "unity of action," and "demonstrating resolve."[16] This is the starkest difference between SFAB and SF, and one that bears out with recent operational experiences.

VIGNETTES

Before 2020, the concepts in this article were only aspirational, as there was little operational experience to provide feedback. Now, with the first 1st SFC cross-functional teams having executed missions and the first SFAB units having advised according to regional alignment, there are now real-world examples from which to draw lessons.

Special Forces Cross-Functional Teams Vignette

Within the "A Vision for 2021 and Beyond" document, there is an excellent vignette that encapsulates the potential of SF cross-functional teams (CFTs). In this example, a Special Forces ODA, Civil Affairs team (CAT), and PSYOP detachment all work in concert to identify and prevent a Chinese influence operation in the fictional country of Naruvu.[17]

The vignette begins with the CAT noticing a billboard with Chinese characters near the local Naruvian port while driving to its Naruvian government contact office. After taking photos of the billboard, the CAT shows them to the SF ODA and the PSYOP detachment to come up with a plan to identify the billboard's origins. Each element utilizes its indigenous contacts and organic assets to gather information. The SF ODA queries one of its regular contacts in the Naruvian commandos, the CAT puts forth the question at a local development meeting, and the PSYOP detachment researches Chinese advertisements on local social media showing interest in the port.[18] Utilizing the information gathered from these meetings, the CFT sends its reports through U.S. Special Operations Command Africa and back to the Fort Bragg-based Information Warfare Center (IWC) for analysis. The enterprise is able to trace the advertisements back to a Chinese construction conglomerate that was preparing to initiate work on the port, a future key node in the Chinese belt and road initiative and also likely future site for Chinese naval activity.

With Chinese activities illuminated, the 1st SFC now implements plans to inhibit development with a multi-pronged approach. Utilizing civil-economic information that the CAT gathered during its development meetings with Naruvian officials, the IWC coordinates with JIIM partners in Naruvu to set up job fairs to provide employment opportunities to disaffected Naruvian workers angry at Chinese hiring and employment practices, reducing the labor pool for the port project by 60 percent.[19] Simultaneously, the SF ODA supports local workers' protest efforts to further highlight Naruvian labor discontent within the news cycle. A week later, Naruvian security officials discover an illegal weapons cache that they are able to trace back to a subsidiary of the Chinese construction conglomerate. Enabled by U.S. Special Forces, the Naruvian security forces surveil and later enter the construction conglomerate's headquarters, discovering a blueprint for Chinese port expansion that included concrete footings specifically designed for CSA-9 surface-to-air and DF-25 shore-to-ship missiles.[20] With all of this information on hand, the Naruvian government seizes the conglomerate's land and ends the expansion plans.

SFAB in Tunisia Vignette

While the SF CFT vignette shows how effective U.S. SOF can be when focusing special operations capabilities on an adversary's actions, the recent experience of the SFAB task force in Tunisia shows how effective U.S. conventional forces can be when focusing efforts on the foreign partner.

The 1st SFAB's Tunisia Advising Team arrived in country in August 2020 with the goal of achieving positive effects and setting follow-on conditions for the next SFAB unit by October 2020. It was a tall order, but one that was achievable with a good plan. The task force commander, LTC Isaac Rademacher, immediately determined that the key to success would be starting with an in-depth assessment of the partner's situation, with follow-on efforts focused on quick wins before the end of the fiscal year.

What BAT 120 discovered was a mismatch between the amount of U.S. investment into Tunisia and the ability of the U.S. Embassy Office of Security Cooperation (OSC) to take advantage of it.[21] In summary, the small OSC staff of six to eight U.S. military personnel did not have the capacity

to address the rapidly expanding U.S. materiel and systems commitments coming in from both U.S. Africa Command and the U.S. State Department. This had resulted in experimental elements like the Tunisian Joint Operations Command Center (JOCC) possessing U.S. technical solutions but lacking both in purpose and in Tunisian military personnel to man it. The BAT further identified a command structure that was stove-piped between three separate Tunisian joint task forces, none of which reported to any convening higher headquarters, which prevented a common operating picture and unity of effort between the three of them. Between these observations and other, more tactical observations regarding air-to-ground integration (AGI) processes, military intelligence education, and counter-improvised explosive device (IED) training opportunities for the Tunisian Groupe des Forces Speciales (GFS), BAT 120 was able to provide a course-correction recommendation to the U.S. Embassy and the Tunisian military.

As a result of BAT 120's efforts, the Defense Attaché (DATT) and the OSC combined efforts to promote a strategic shift for the Tunisian military to achieve "readiness for current and future threats, synchronize investments to achieve optimal return, and cultivate efforts to achieve regional and U.S. interoperability."[22] The DATT and OSC announced this strategic shift to the Tunisian military leadership on 6 October 2020 at the 34th annual Joint Military Commission. With this announcement, the U.S. Embassy team and Tunisian military charted a new path forward that would build on each other's strengths and make full use of the resources available.

Conclusion

Both of these vignettes show a path to the future where there are ample opportunities for both U.S. Special Forces and SFABs to have significant effects, especially given each force's very distinct sets of capabilities and authorities. The example SF cross-functional team vignette lays out a scenario that an SFAB clearly could not replicate. Likewise, the SFAB vignette in Tunisia highlights a scenario where subject matter experts in a wide variety of conventional military skills, such as military intelligence, mission command, and engineering, can make use of their experiences effectively by applying their already extensive know-how to a foreign partner's problem set. These vignettes also highlight the clear benefits on both sides of the spectrum between adversary-based outcomes and partner-based outcomes. Each offers effects that benefit the strategic situation for U.S. partners, while effecting outcomes in different ways.

In closing, the differences between SF and SFABs are strengths, not weaknesses. The differences in unit organization and methods of employment offer options for policy makers and military commanders that were simply not available in the past. As new employment methodologies continue to evolve across the spectrum of U.S. foreign advising efforts, both SF and SFABs will continue to build their reputations as essential elements of U.S. power in the era of global competition.

...the differences between SF and SFABs are strengths, not weaknesses. The differences in unit organization and methods of employment offer options for policy makers and military commanders that were simply not available in the past.

Notes

[1] U.S. Army, "1st SFAB Hosts Activation Ceremony; Heraldry Announced," Army News Service, 8 February 2018, accessed from https://www.army.mil/article/200244/1st_sfab_hosts_activation_ceremony_heraldry_announced.

[2] Rick Montcolm, "Tabs and Badges and Berets, Oh My! The Big Distraction the Army's New Advisory Unit Really Didn't Need," Modern War Institute, 1 November 2017, accessed from https://mwi.usma.edu/tabs-badges-berets-oh-big-distraction-armys-new-advisory-unit-really-didnt-need/.

[3] The following article is one of many articles online that discuss the question of the SFAB's purpose with respect to the U.S. Army Special Forces. This article, written by a Special Forces officer, provides a structured analysis of why the U.S. Army established SFABs before the operating concepts and doctrine were in place: Tim Ball, "Replaced? Security Force Assistance Brigades vs. Special Forces," *War on the Rocks*, 3 February 2017, accessed from https://warontherocks.com/2017/02/replaced-security-force-assistance-brigades-vs-special-forces/.

[4] Field Manual (FM) 3-18, *Special Forces Operations*, February 2015, 4-19.

[5] Ibid, 4-19.

[6] Ibid, 4-21 and 4-22.

[7] Army Techniques Publication 3-96.1, *Security Force Assistance Brigade*, 2020, 1-15.

[8] Ibid, 1-14 – 1-18.

[9] COL Edward Croot, "There is an Identity Crisis in Special Forces: Who are the Green Berets Supposed to Be?" (Army War College Fellows Strategy Research Project, U.S. Army War College, 2020).

[10] 1st Special Forces Command, "A Vision for 2021 and Beyond," 5.

[11] Ibid, 8-9.

[12] Ibid.

[13] Ibid.

[14] Ibid.

[15] Thomas Shandy, "SFAC – What Does Winning Look Like in the Continuum of Conflict," Security Force Assistance Command, 29 September 2020.

[16] Ibid.

[17] "A Vision for 2021 and Beyond," 12.

[18] Ibid.

[19] Ibid, 13.

[20] Ibid, 13.

[21] Isaac Rademacher, "Winning the Advising Effort in Tunisia," 26 October 2020.

[22] Ibid.

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Employment of MP Companies by the IBCT

CPT MICHAEL DUFFY

The Infantry and Military Police (MP) have historically had a sometimes unfriendly rivalry resulting from the traditionally rambunctious garrison antics of the former and the law enforcement mission of the latter. As such, infantry units have a tendency to avoid working with their MP counterparts in the field until absolutely necessary or directed. During rotations through the Joint Readiness Training Center (JRTC) at Fort Polk, LA, this has unfortunately translated into infantry brigade combat teams (IBCTs) not knowing how to best employ MP companies that are attached as part of their enabler package. Given their large value as a combat multiplier for the IBCT, this cannot continue. This article seeks to provide an Infantryman's view on how an IBCT can best employ an MP (Combat Support [CS]) company. I seek to blend doctrine — as outlined in Field Manual (FM) 3-39, *Military Police Operations*, and FM 3-96, *Brigade Combat Team* — with my experience in working with MP units as a rifle company commander in an IBCT, a company senior observe-coach-trainer (OCT), and as a senior analyst OCT at JRTC.

Most Infantry leaders do not fully understand the organization of the MP (CS) company, what it brings to the fight, the fact that there are multiple types of MP companies, or that there is an MP officer on the IBCT staff. MP (CS) companies are organized so that they can operate independently of a battalion staff. Each MP (CS) company has an organic operations section and headquarters section that allows it to operate with wider dispersion than a typical rifle company. The operations section contains as many Soldiers and NCOs as an infantry battalion operations section, including an organic retransmission team. The headquarters section contains a large number of mechanics, allowing the MP (CS) company to be mechanically self-sufficient in the field. These sections support three platoons organized in three squads with a platoon leader, platoon sergeant, and organic medic. Each platoon possesses firepower that rivals even the infantry battalion weapons company. Each MP squad has four gun trucks equipped with two M2A1 heavy machine guns, an M240 medium machine gun, and an MK19 automatic grenade launcher. This allows the MP squads to free up weapons company assault platoons to focus on their anti-armor and support-by-fire tasks in direct support of the rifle companies. Indeed, due to the garrison mission of the MP Corps, MP squads are used to operating independently during their law enforcement shifts. This translates well to small unit actions in support area security missions once they move to the field.

Large amounts of firepower are not all that MPs can bring to the IBCT. MPs are used to conduct security patrols due to their garrison mission. This translates easily to support area security patrols, both mounted and dismounted. In accordance with FM 3-39, MP companies can provide static sight security, mobile security (both through patrols and escort), detainee operations, dislocated civilian operations, and quick reaction forces, amongst other capabilities. Individual MP platoons can defend against Level II threats within the brigade support area (FM 3-96). As mentioned before, the MP garrison mission makes it easy for the MP company to disperse into numerous squad and platoon-sized elements in order to support multiple

Photo by Michele Wiencek

A Soldier assigned to the 529th Military Police Company fires an M249 Squad Automatic Weapon during weapons qualification and marksmanship proficiency training in Germany on 22 January 2021.

missions across the entire IBCT area of operations.

In addition to the MP (CS) companies, the MP Corps has military working dog (MWD) detachments, law enforcement detachments, criminal investigative companies, and detention companies. Most BCTs will not see these specialty organizations as full detachments. MWD detachments are extremely small and always in high demand. MWD teams consist of a handler and his or her dog and are trained to detect drugs or explosives. The dogs are also trained to conduct some attacks. These teams can conduct patrols, entry control point operations, or help commanders do drug sweeps. Due to the numbers of MWD teams and commanders' constant demands for their skills, BCTs will not likely receive more than a handful of MWD teams in support.

Photo by Terrance Bell

A 3rd MP Detachment Soldier and his military working dog negotiate a tactical explosives lane during a certification event at Joint Base Langley-Eustis, VA, on 23 November 2020.

Law enforcement detachments contain a wide variety of specialty MPs, such as traffic investigators, crime scene investigators, and security specialists. These detachments are designed to provide garrison specialties in deployed environments, and it is unlikely that BCTs will have direct control over them. It is the same with the criminal investigative detachments. These detachments consist of criminal investigative division (CID) special agents and MPs who are federal investigators. These detachments focus on specific cases and will not attach directly to BCTs. Detention companies are generally attached to divisions and corps and will have some interactions with BCTs during transfer of prisoners but are not generally task organized to provide direct support to a BCT.

The provost marshal, the IBCT's resident MP officer, is often underutilized and seen as just one more staff captain to be sacrificed as an action officer to the ever-demanding IBCT S3. Often, the provost marshal is seen as just being on staff to conduct physical security or anti-terrorism inspections and to be the action officer for anything remotely involving those two focus areas. While these areas are important to the IBCT and provost marshals do have experience in these matters, they also have a very important tactical role to fill as well. As outlined in FM 3-96, the provost marshal, "is responsible for planning, coordinating, and employing all… Military Police assets" under the IBCT's control. He or she is a vital staff officer in the field, helping coordinate support area security and ensuring that any attached MP assets are properly utilized. The provost marshal is also a useful staff officer for making sure detainee operations and displaced personnel are not overlooked during the planning process. A wise IBCT S3 will ensure that the provost marshal is given the time and resources to properly plan for the use of MP assets. Doing so will free up many frontline infantry assets, as discussed below.

IBCTs are traditionally their most vulnerable in their support areas. Locations such as the brigade support area, the brigade main command post (MCP), and supply routes present the highest payoff targets for enemy forces. To combat these threats, IBCTs typically reallocate combat power from the infantry battalions to protect these assets. Rifle platoons are commonly pulled from the fight to defend the brigade support area and MCP. Assault platoons are used to protect convoys instead of providing vital fire support for the infantry battalions. What is even more distressing is the amount of vital anti-armor weaponry, already in short supply, that is being assigned to conduct support area security instead of being used on the forward line of own troops (FLOT). Every rifle platoon sent to the support area brings with it two Javelin launchers and an M3 Multi-Role, Anti-armor, Anti-personnel Weapon System. Every assault platoon removes two TOW (tube-launched, optically tracked, wire-guided) missile launchers and two heavy machine guns that are vital to the success of the infantry battalion.

A single MP platoon, based on number of gun trucks and machine guns, frees up an entire weapons company from support area security duties behind the FLOT. An MP squad, if properly utilized, can free up a rifle platoon. Additionally, since MP companies are completely motorized, they free up transportation assets the IBCT must use to transport rifle platoons to and from their support area security locations, since rifle platoons lack organic transportation. This not only frees up rifle platoons for the maneuver battalions, but also frees up vital transportation assets to either reallocate combat power to other parts of the battlefield or to move needed supplies.

When employing the MP (CS) company, IBCT staff usually commit one of two major errors. The first is underutilization. Due to either lack of familiarity with MP company capabilities or due to MP companies being seen as a vague security asset, MP companies are commonly attached to the brigade engineer battalion and told to conduct security tasks. This error is generally caused by a failure to utilize the provost marshal as an MP subject matter expert. The second error is overspecification. With this error, the IBCT fully understands the usefulness of MP squads in support area security and seeks to task out those squads directly, parceling out all elements of the MP company to specific tasks. Here, the staff bypasses the company commander and the operations section entirely. Both errors are ones of extremes and fail to utilize the combination of the provost marshal and the MP company commander.

Just as the brigade fire support officer and the fires battalion commander have some overlap between their jobs, so too do the provost marshal and the MP company commander. It is important to remember that the provost marshal is a specialized staff officer whose job is to understand the IBCT schemes of support and maneuver and provide input on how MP assets — such as direct support MP (CS) companies, MWD teams, detention centers, and CID assets — can best complement those plans. The provost marshal helps draft the orders tasking attached MP assets, such as the MP company, to execute missions to support the IBCT plan. In keeping with our doctrine of mission command, these orders must task the MP company and provide the IBCT commander's intent. While an MP company can cover a very large area by breaking down into squads, the IBCT staff must not waste time and effort attempting to task individual squads. This not only underutilizes an experienced MP commander with his or her own operations section, but runs the risk of sending squads on missions without the proper support channels. The MP company's operations section is used to rotating squads and platoons in support of garrison activities. Giving the company a task and purpose allows that commander to best employ his or her subordinate elements. Any staff that bypassed a rifle company commander and tried to task platoons and squads directly would soon have an angry infantry officer appear in their tent, so why should staffs treat MP companies any different?

Way Forward

The major impediment to properly integrating MP (CS) companies with IBCTs is the lack of habitual relationships. Many MP (CS) companies do not work with an IBCT before they are paired together for a JRTC rotation. Sometimes, they will get the opportunity to conduct joint operations during a brigade-level exercise before JRTC, but this does not happen as often as it should. Nor do MP (CS) companies usually stay with the IBCT they are paired with much longer than the JRTC rotation. This means that many of the lessons learned between the two organizations die shortly after redeployment to home station. The easiest way to prevent this would be to add MP (CS) companies to the IBCT structure. Including an MP (CS) company in the brigade engineer battalion would enable IBCTs to keep those lessons learned and build on them. This would enable many of the smaller habitual relationships discussed above to develop, in much the same manner that combat engineer platoon relationships currently develop in the IBCT with the infantry battalions. However, this change to the modified table of organization and equipment (MTOE) would cause potential problems with the MP (CS) companies' garrison mission of law enforcement. Transferring MP (CS) companies to IBCTs would reduce the ability of MP battalions to manage the garrison mission effectively. In order to facilitate attaching MP (CS) companies to IBCTs, the MP Corps would need to restructure to either increase the number of MP companies (to allow for dedicated garrison law enforcement and task organization under IBCTs) or transfer the garrison law enforcement mission to Department of the Army civilian police. The latter would allow Soldiers to focus on their combat mission instead of having to regularly switch back and forth between a garrison mission and a combat mission.

An alternative that may not affect the garrison law enforcement mission as much would be to establish the habitual relationships within the division. Currently, MP battalions are aligned with a division from the corps' assigned MP brigade. These battalions, which are stationed with but not directly controlled by the divisions, consist of between two and four MP general support companies, a headquarters and headquarters detachment (which includes the staff found in infantry battalion HHCs and some support sections found in forward support companies), and assorted detachments (such as the MWD detachments and law enforcement detachments). The MP (CS) companies can be further aligned against each of the brigade combat teams in the division. Keeping the MP (CS) companies under the MP battalion allows the battalion to rotate the companies through the law enforcement garrison mission and through deployment and tasking cycles, much as the division will rotate the BCTs through an internal red-amber-green cycle.

While Infantrymen may have jokes aimed towards all branches outside of the Infantry, most are tempered by the understanding that other branches enable the Infantry through visible effects, such as long range fires on objectives, transportation to and from objectives, or logistics support. Infantrymen typically only see MPs as there to ruin the fun in garrison. However, the MP Corps can provide so much more if infantry planners understand how MP units function and what they can bring to the fight. Understanding MP enablers will allow IBCTs to become more lethal.

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Terrain-Shaping Operations

MAJ NICHOLAS CAIN

Current doctrine focuses a brigade combat team's (BCT's) engineer efforts on engagement area development (EA DEV). However, to take full advantage of terrain within the BCT area of operations (AO), units must address terrain forward of the engagement area to reinforce natural and man-made obstacles. This forward obstacle reinforcement within the BCT's close fight has been defined as terrain-shaping operations (TSO).

Aligned with Field Manual (FM) 3-90-1, *Offense and Defense*, these operations support the BCT by:

- Preparing the ground to force the piecemeal commitment of enemy forces and their subsequent defeat in detail at the desired location and time;
- Preparing the ground to force the enemy to fight where the enemy does not want to fight; and
- Allowing units to employ and strengthen obstacles (forward of EAs) and fortifications to improve the natural defensive strength of positions to mass sufficient combat power.

Commanders choosing to execute TSO greatly reduce their risk to mission and risk to force. Allowing enemy forces the space and time to maneuver out of contact in the deep and close fights increases prudent risk. These operations allow commanders to minimize the risk in both areas, requiring the enemy to maneuver where defending forces want, employ reduction assets outside the main battle area, and change their operational tempo. When enemy forces make contact with defending forces in the main battle area, they will arrive when, where, and in a formation that is digestible by the defending force. Friendly forces, as defenders, will have their chances of mission success greatly increased.

Observations from Combat Training Centers (CTCs) indicate that BCTs are focusing their countermobility efforts solely within the EAs. While EA DEV has been improving, there is still a severe lack of effort in the deep and close TSO gaps. Through the lens of a CONUS BCT executing an area defense, we will identify each of the countermobility gaps, apply TSOs to achieve effects in each gap, and propose when each level of TSO can occur in an operational timeline. Employing TSOs within each gap will allow units at echelon to engage the enemy at the desired place, time, and combat formation.

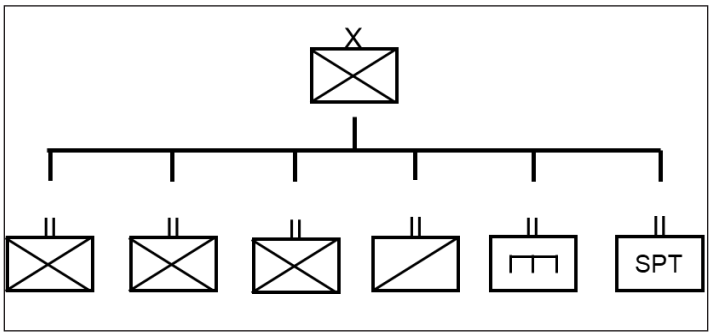


Figure 1 — CONUS BCT Task Organization

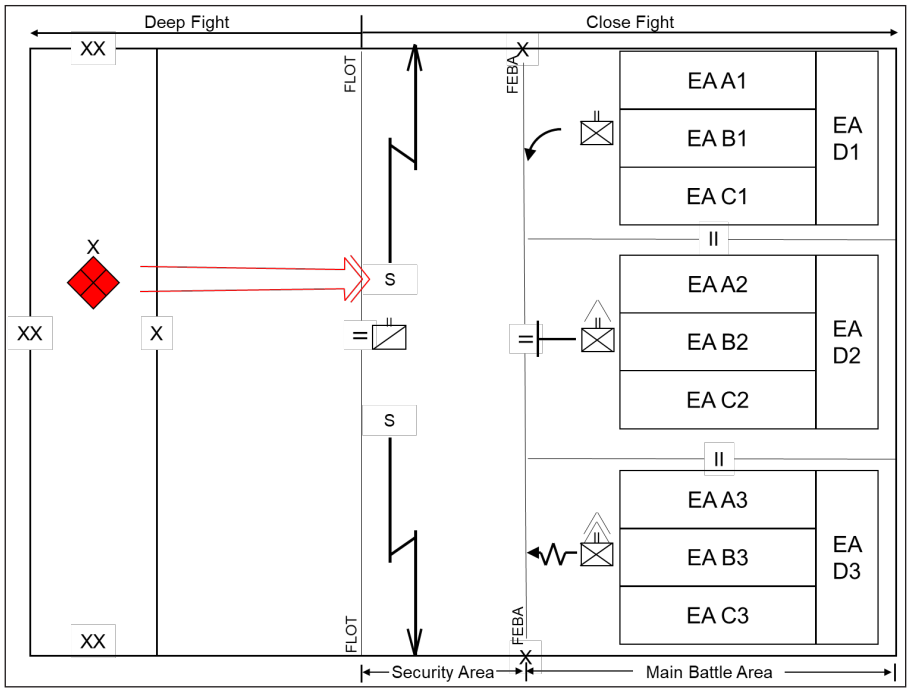
TSO Application

For the purpose of explaining TSO and the impacts to the BCT scheme of maneuver (SoM), I will utilize a CONUS BCT scenario tasked with an area defense (see Figure 1).

Typically, in the area defense the cavalry squadron will be forward security for the BCT defensive operations in a screen, providing time and maneuver space for the infantry battalions to establish their defensive plan.[1] The infantry battalions will be arrayed in a linear defense with supporting tactical tasks. Each infantry battalion then arrays its rifle companies in supporting EAs linearly and in depth.[2] (See Figure 2.)

After understanding the likely enemy concept of opera-

Figure 2 — BCT Scheme of Maneuver



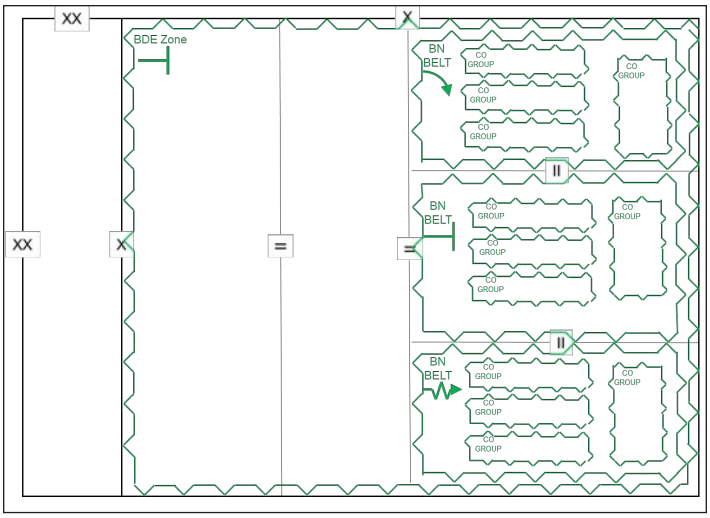
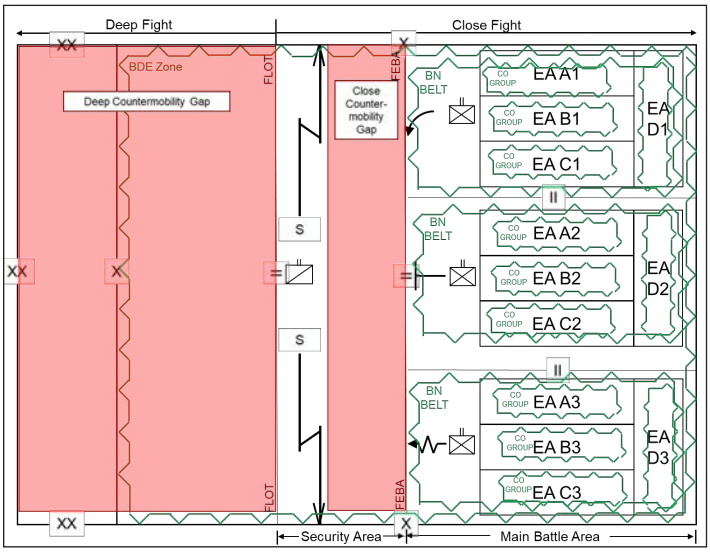


Figure 3 — BCT Obstacle Overlay

tion, likely avenues of approach (AAs), and the SoM, engineer planners at echelon assign obstacle control measures. Each control measure typically is assigned by the next higher echelon and is nested. Zones are defined by the division headquarters for the BCT; belts are defined by the BCT headquarters (HQ) for battalions; and groups are defined by the battalion HQ for companies. Obstacle control measures are assigned nested and supporting obstacle effects at echelon to support the SoM. (See Figure 3.)

When combined, the BCT's SoM overlay and the obstacle overlay identify three areas or gaps allowing enemy freedom of maneuver (see Figure 4). The deep countermobility gap is forward of the BCT screen line. This area would be the enemy's support zone leading to the battle zone where the separate forces maneuver to confirm planned AAs. The close countermobility gap is the area between the screen line and EAs. This is the enemy's battle zone where the fixing, breaching, and exploitation forces penetrate the BCT defense in route to their final objectives.[3] BCTs must apply

Figure 4 — Combined Arms Scheme of Maneuver Overlay with Gaps



obstacle effort to these gaps to prevent enemy freedom of maneuver. The application of effects and resources is TSO.

TSO Explained

In order to best understand how to conduct TSOs at the BCT level, conditions must be set at the division level in the deep fight (see Figure 5). Division deep terrain-shaping operations (D2-TSO) are intended to disrupt enemy forces by changing their formation and tempo, interrupting their timetable, and forcing commitment of breach assets prematurely.[4] Divisions can execute D2-TSO through a use of directed and situational obstacles, ensuring attacking forces enter BCT AOs when and where desired.[5] While initial disruption of enemy attacking forces is the primary intent of D2-TSO, answering priority information requirements (PIRs) and gaining time and space for subordinate commanders can also be achieved with proper employment of assets.

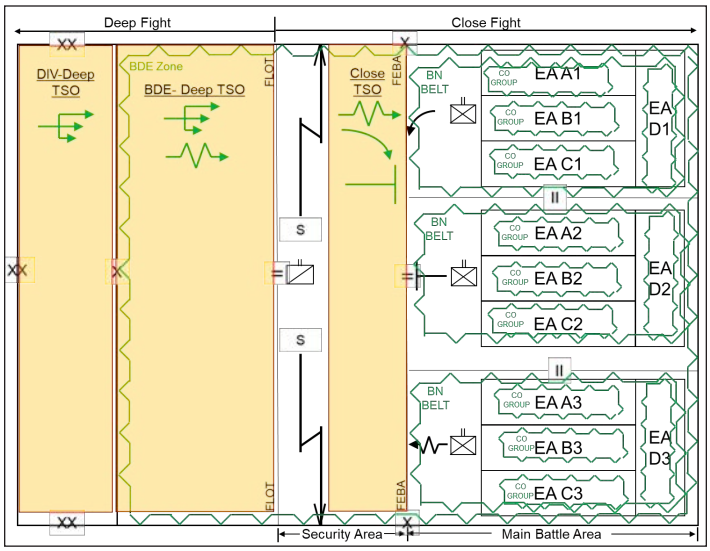


Figure 5 — Combined TSO with Effects

Brigade deep terrain-shaping operations (BD-TSO) are owned by the BCT in the area between the AO boundary (or division-BCT fire support coordination line, whichever is closer) and the cavalry screen line.

The intent for BD-TSO is to disrupt and/or fix the attacking forces forward of the screen line on AAs suitable for joint fires attacks and for cavalry reconnaissance. BD-TSO are not intended to serve as EA DEV for cavalry reconnaissance elements. Engineer reconnaissance teams (ERTs) can emplace local directed or situational obstacles to support the information collection plan (ICP) but not as part of EAs, as troops generally are not to destroy enemy. When executed as a part of the BCT deliberate defense, BD-TSOs are initiated after the BCT issues warning order (WARNORD) 2 and split between deliberate obstacle and situational obstacle emplacement (see Figure 6).

Deliberate obstacles would be emplaced early in the BCT timeline in order to allow rearward elements to establish with obstacle security forward. As the BCT develops the enemy course of action (COA) or as the enemy is confirmed along

AAs, the BCT can employ situational BD-TSO obstacles. Fixing attacking forces would allow the BCT to attrite enemy engineer breaching assets and combat power into a formation that can be defeated in detail at the desired time.

Close terrain-shaping operations (C-TSO) are designed to fill the obstacle gap between the screen line and EAs (see Figure 5). As C-TSO is between maneuver elements, it is owned by the BCT but can be divided and delegated to subordinate battalions. If separated, the C-TSO area must be included in maneuver battalion AOs with BCT directed obstacles and assets aligned. If BCT directed obstacles and assets are not aligned and tasked, maneuver battalions (i.e., assigned engineers) will be overwhelmed with the scope of work. The obstacle intent for C-TSO is fix, turn, or block as it aligns with the BCT's overall intent for tactical effects on the enemy. If C-TSO is divided and tasked to maneuver battalions, the intent should support the battalion's tactical task.

After the cavalry establishes the screen line, the BCT can begin conducting C-TSO (see Figure 6). Constructed, mined, and limited horizontal obstacles can be emplaced to complete directed obstacles. As with any obstacle emplacement, C-TSO obstacles should be emplaced from the enemy to friendly lines. ERTs can begin emplacing obstacles behind the screen moving towards EAs. To gain efficiency, echelon above brigade (EAB) Sappers (not habitually aligned with maneuver) can be tasked to emplace obstacles forward of the EAs. This would allow habitually aligned Sappers and horizontal assets to work in parallel time on maneuver battalion EA DEV. No matter what type of obstacle is emplaced, lane closure must be deliberate and clearly communicated to responsible units. If the cavalry is to retrograde through the C-TSO area and maneuver EAs, ERTs should rehearse primary, alternate, and contingency routes as a part of their final condition checks.

Many units execute effective EA DEV during the defense phase of JRTC rotations. However, it is not in the EAs where the enemy gains momentum and the majority of the seized terrain. The enemy gains momentum and land in the BCT's security area both deep and close. The lack of reinforced terrain allows the enemy to move when, where, and how they want, limiting the effects fires can achieve. Division deep, BCT deep, and close TSOs create reinforced terrain in depth across time. TSOs in all areas will set conditions for subordinate formations to fight the enemy when, where, and how they want as defenders. In conclusion, BCTs that focus their defense from the deep enemy side back through the entirety of the close area will find their subordinate units better prepared.

Executing TSOs will allow each echelon to make use of allotted time and resources to achieve a more lethal defense by controlling who is entering the battle area when and how the defender wants.

Notes

[1] Army Techniques Publication (ATP) 3-20.96, *Cavalry Squadron*, May 2016.

[2] ATP 3-21.20, *Infantry Battalion*, December 2017.

[3] Training Circular (TC) 7-100.2, *Opposing Force Tactics*, December 2011.

[4] ATP 3-90.8, *Combined Arms Countermobility Operations*, September 2014.

[5] **Directed obstacle** — An obstacle directed by a higher commander as a specified task to a subordinate unit; **situational obstacle** — An obstacle that a unit plans and possibly prepares prior to starting an operation, but does not execute unless specific criteria are met (Field Manual 1-02.1, *Operational Terms*).

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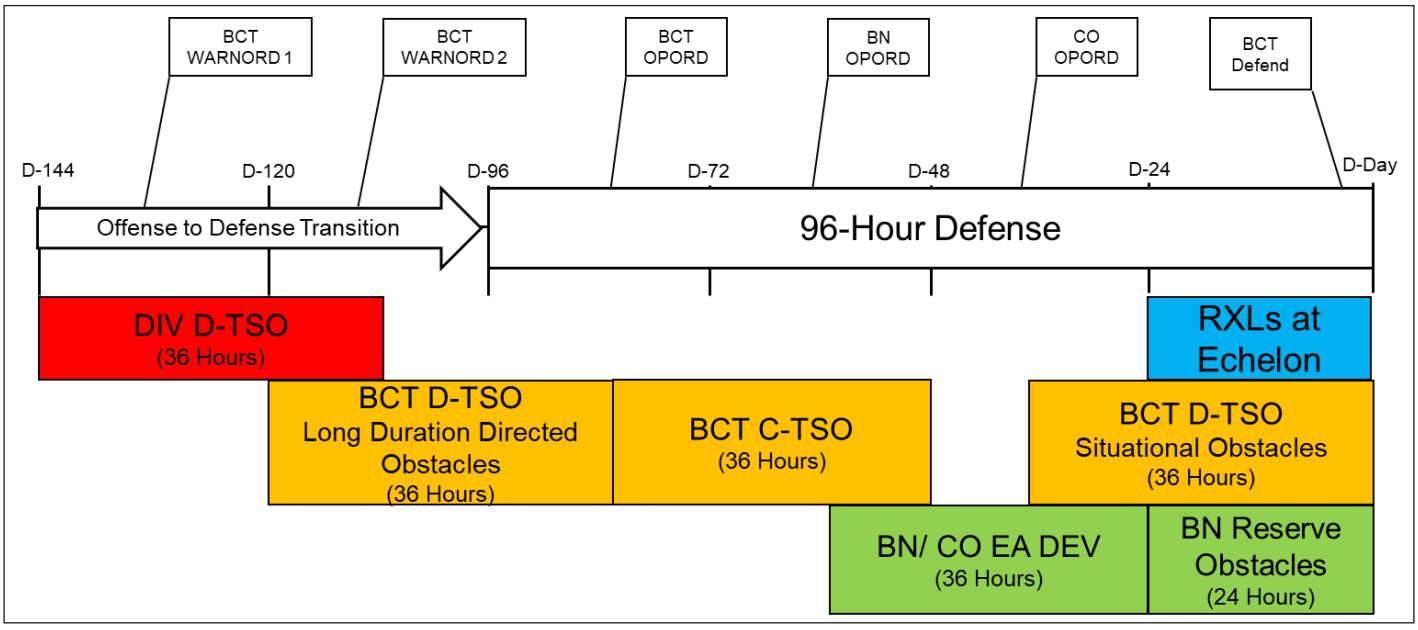
Figure 6 — Deliberate BCT Defense TSO Timeline



Integrating Space Operations at the Tactical Level

CPT WILLIAM S. COOPERIDER

The Army's role in multi-domain operations (MDO) is to "penetrate and dis-integrate enemy anti-access and area denial systems and exploit the resultant freedom of maneuver to achieve strategic objectives (win) and force a return to competition on favorable terms."[1] To assign responsibility for the execution for this role, former Army Futures Commander LTG Eric Wesley oriented MDO as a "tactical" fight, where tactical commanders need to be able to "think, assess, and employ" all domains of war in order to effectively "shoot, move, and communicate."[2] This ability to execute ground combat is the fundamental executive role served by tactical level formations in the Army and therefore requires a robust amount of cross-domain freedom of maneuver.

Yet often neglected by maneuver commanders, the space domain offers maneuver space that if not controlled will directly limit the freedom of maneuver available in ground combat. According to the Defense Intelligence Agency's (DIA's) 2019 report "Challenges to Security in Space," space operations provide ground forces with the space-enabled services of "geolocation and navigation, target identification, and tracking of adversary activities."[3] Position, navigation, timing (PNT) satellites; intelligence, surveillance, and reconnaissance (ISR) satellites; and orbital threat-based counterspace systems provide these services. The most critical among these services are the threat-based counterspace systems. They directly attack and counterattack ISR, PNT, and missile warning satellites critical for providing capabilities on the ground.

While there are tangible outputs tied to successful tactical maneuver from space-based assets, the Army's connection to these enablers are retained at the strategic level via the Army's Space and Missile Defense Command (SMDC). SMDC is a strategic-level Army service component command with the expressed mission to develop and provide "current and future global space, missile defense, and high altitude capabilities to the Army, joint force, and our allies and partners, to enable multi-domain combat effects; enhance deterrence, assurance, and detection of strategic attacks; and protect the nation."[4] Accordingly, SMDC retains how and when ISR, PNT, and counterspace satellites are leveraged to aid the warfighter, not the on-the-ground commander who requires their capabilities.

This creates a gap in MDO. Joint Publication 3-0, *Joint Operations*, defines maneuver to be a "tactical" affair where "component commanders employ their forces in combination with fires and information to gain positional advantage in respect to the enemy."[5] Yet the assets — both offensive and defensive — to introduce this positional advantage in the space domain are strictly retained at the strategic level. Therefore, if actual fire and maneuver within MDO occurs at the tactical level, then tactical-level formations need to retain the assets that create that freedom of maneuver in all domains. LTG Wesley even acknowledged this gap, calling for a need to have "space assets at [the tactical] echelon."[6]

Furthermore, this is not a novel concept. The 82nd Airborne Division has organic and attached Short Range Air Defense Artillery (SHORAD) assets from the 3rd Battalion, 4th Air Defense Artillery that provide freedom of maneuver in the air domain during joint forcible entry operations, enabling more effective ground combat. The 915th Cyber Warfare Battalion, through expeditionary teams, "provides a scalable capability… to deny, degrade, disrupt, destroy and influence cyberspace effects for Army maneuver [tactical] commanders."[7] Their efforts in turn create tactically focused maneuver space in the cyber domain that is directly responsible for more freedom of maneuver for ground combat.

As proposed in the 2021-2022 Key Strategic Issue List published by the Army War College, the Army must flex organic SMDC assets of directed energy weapons (DEWs) and kinetic energy weapons (KEWs) to the tactical level to enable land-based forces to conduct cross-domain fire and maneuver during multi-domain battles.

Background

In 2018, the U.S. Army Training and Doctrine Command (TRADOC) published Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations 2028*. As stated by then Army Chief of Staff GEN Mark Milley, the very "character of war" has changed for two reasons.[8] The first are "emerging technologies" whose military applications have changed how we conduct war to a degree that the scope of what constitutes a battlefield needs a complete redefinition.[9] The second is that strategic competitors (Russia and China) have "synthesized" these new technologies with their "analysis of military doctrine and operations" to fight the U.S. in all domains — air, land, sea, cyber, and space.[10] This creates a "military problem" of having to not only defeat our strategic competitors in all domains, but nest these efforts across domains to enable land-based forces to conduct cross-domain fire and maneuver.[11] Yet what does this look like? How do we operationalize this concept?

Thankfully, the Department of Defense has already done the leg work by producing what it calls "required capability sets."[12] Among these capability sets, the Space Capability Set must be able to use "operations in space" to complement land operations by supporting the "opening of and exploitation of windows of superiority that create dilemmas for the enemy while protecting the ability to conduct friendly operations…"[13] SMDC is the strategic component of the Army that fills this role. Specifically, the 1st Space Brigade within SMDC "conduct(s) space operations to deliver decisive combat power in support of the Army and joint warfighting communities."[14] The 1st Space Battalion owns the delivery of this decisive combat and conducts space technical operations.[15] Fundamentally, the execution of these technical operations during the global war on terrorism was operationalized through enhanced situational awareness provided by ISR, PNT, and cyber warfare satellite operations. Yet, there is a fundamental need to shift how we prioritize space operations. DIA's report "Challenges to Security in Space" highlighted two major conclusions.

First, strategic competitors Russia and China view the space domain fundamentally differently than we do. They view the capabilities provided in the space domain as an avenue to reduce U.S. effectiveness in all domains.[16] This is evidenced by both threats entirely restructuring their forces in 2015.[17]

Secondly, the capabilities flexed by Russia and China surpass our present capabilities. Both have satellite capabilities that can provide superior space situational awareness and are ahead in the developmental race for mobile DEW systems and ground-based anti-satellite missiles.[18]

In 2015, China established the Strategic Support Force (SSF) which integrates cyber, space, and electronic warfare (EW) enterprises into the joint fight.[19] The integration of the SSF with decentralized private competitors to drive civil-space technology and the China National Space Administration (CNSA) have seen China outpace the United States in the development and implementation of ground-based DEWs that are effective as far as low earth orbit (LEO) — the primary orbit where ISR satellites operate. This marked advantage in the space domain disables friendly ability to effectively use ISR and PNT. This reduced situational awareness on the ground provided by a space asset is an example of how China has more enhanced cross-domain fire and maneuver than current U.S. capabilities allow.

Also in 2015, Russia created the Aerospace Forces as part of a deliberate restructuring effort. This re-focus on space operations placed all space enterprises under state control.[20] These focused efforts have resulted in Russia becoming the dominant state in on-orbit counterspace systems.[21] Dual-purpose satellites have proximity orbit capabilities that outpace the United States. Russian satellites can adjust course and orbit where their new trajectory brings them close enough to U.S. satellites to cause a permanent damaging effect.[22]

Given this context, I will accomplish two objectives in this article. First, since space technical operations is how we create freedom of maneuver in the space domain, I will examine current U.S. capabilities in DEWs and KEWs. Secondly, I will provide a recommended framework for how these assets can be implemented at the tactical level for ground-force maneuver commanders.

Directed Energy Weapons

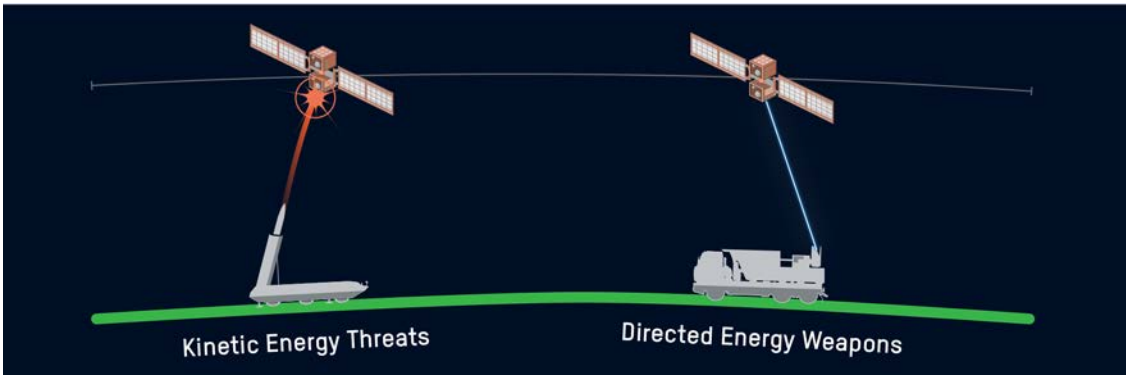
DEWs use directed and concentrated focused energy beams to "disrupt, damage, and destroy enemy equipment."[23] DEWs can be space based or ground based.

Space-based DEWs are strategically positioned satellites in specific orbits armed with weaponized directed energy variants. While the satellite is in orbit, these energy variants are focused on an enemy satellite to disrupt its capability or destroy it. Effects are limited to the range of the directed energy variant. Typically, maximum effectiveness is reached where satellites target an enemy satellite in the same orbit. For example, LEO DEWs target and/or destroy enemy satellites that are also in low earth orbit.

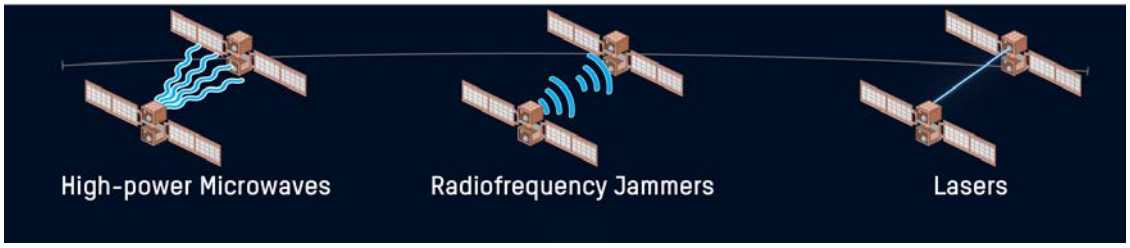
The use of space-based DEWs turned space into a warfighting domain, a battlefield of its own with effects reaching forces on the ground. When used, U.S. space-based DEWs target and destroy enemy satellites in satellite-on-satellite combat. This combat in the space domain creates cross-domain freedom of maneuver in the land domain due to a categorically massive reduction of enemy capabilities. Reduced enemy capabilities in PNT and ISR directly hinder enemy ground movement and situational awareness. This tactical advantage consequently provides enhanced freedom of maneuver for friendly forces on the ground. At end state, the control gained in the space domain enables freedom of maneuver for ground-based fire and maneuver.

While the theory above is nested with MDO as a war-

Figure 1 — Ground-Based Kinetic Energy Weapons and Ground-Based Directed Energy Weapons



Challenges to Security in Space, Defense Intelligence Agency



Challenges to Security in Space, Defense Intelligence Agency

Figure 2 — Space-Based Directed Energy Weapons

fighting discipline, in practice there is a massive disconnect. Presently, SMDC and the 1st Space Brigade retain all space assets at a strategic echelon, including space-based DEWs. Consequently, tactical maneuver commanders have to request the use of space-based DEWs from the strategic level to achieve their desired battlefield effects on the enemy. This is operationalized as Functional Area 40 - space operations officers requesting the achieved battlefield effects on behalf of their maneuver commanders at specific time windows. This may have been adequate during the Global War on Terrorism, where the threat had a nonexistent space capability and the timing of combat was more permissive. However, given current Russian and Chinese space capabilities, current maneuver commanders require a real-time connection to the space domain if they want to be able to both counter threat space capabilities and achieve offensive cross-domain freedom of maneuver simultaneously. This requires maneuver commanders to have a real-time flexible connection to the space domain.

Looking to the air domain for inspiration, the connection of cross-domain fire and maneuver is not a novel concept. For cross-domain fire and maneuver in the air domain, maneuver commanders are assigned an attached U.S. Air Force (USAF) joint terminal attack controller (JTAC). A JTAC directs the action of USAF aircraft on the battlefield to enable ground-based maneuver through close air support, rendering control in both the air and land domains. Essentially, JTACs give maneuver commanders real-time solutions to battlefield problems presented by a cross-domain discrepancy. Just as JTACs enable options for maneuver commanders in the air-land relationship, maneuver commanders should also have an attached space-based DEW specialist or JTAC equivalent that can provide space-land solutions. This warfighter can be from the 1st Space Battalion or from the U.S. Space Force as it begins to absorb more of the SMDC workload. Regardless, the addition of a JTAC-like space enabler to maneuver commanders is critical to bridge the obvious gap between strategic space assets and the tactical level of warfighting.

Additionally, the role of a space enabler-JTAC equivalent would not just be relegated to only controlling and executing DEW space technical operations. By serving as the inherent link between the land and space domains, these enablers could also provide maneuver commanders with real-time space situational awareness for the entire space domain as it directly affects conditions on the ground. This would include real-time threat satellite and capability updates and refined friendly ISR and PNT windows.

Unlike space-based DEWs, land-based DEWs are ironically more complicated. Theoretically, land-based DEWs achieve the same effects through the same medium as space-based DEWs but require a kilowatt (kW) output strong enough to achieve the same effects at a much greater distance. This means land-based DEWs have to create a focused energy variant strong enough to penetrate the atmosphere and destroy an enemy satellite yet with a beam control that's small enough to not cause widespread collateral damage.[24] Current operational land-based DEWs only yield a 50 kW output, which is strong enough to neutralize only enemy artillery, let alone satellites. In 2022, the Army aims to have these lasers mounted on a platoon of four Strykers and implemented at the tactical level.[25] The U.S. Army aims

U.S. Army photo

A U.S. Air Force joint terminal attack controller enables freedom of maneuver in the air domain during an exercise in Hohenfels, Germany. Space Force JTACs can also be assigned to Army formations and provide the same freedom of maneuver in the space domain.

for the next step to be fielding a 300 kW land-based DEW variant by 2024.[26] Even so, such an energy output would only be strong enough to at most destroy a cruise missile, let alone penetrate the atmosphere and affect enemy satellites.

Advanced simulations conducted by space physicists with the *Journal of Physics* have demonstrated that the wattage threshold to effectively neutralize satellites in LEO is 3 mega-watts (MW), 1,000 times the current U.S. fielding.[27] Yet the same study stated the U.S. Army currently has ground-based lasers with a ceiling of 10 MW.[28] Therefore, while the technology for the required energy output may be present, there are several technological leaps that must occur before maneuver commanders will have mobile anti-satellite land-based DEWs in their formations.

Luckily, the U.S. Missile Defense Agency has already commissioned the Ballistic Missile Defense System Laser Scaling Project to meet these inadequacies. The Laser Scaling Project aims to produce a smaller, lighter, and portable 10 MW laser.[29] However, project completion is still seven years away.[30] Therefore, the implementation of a portable 10 MW laser platform with the capability of serving as a land-based counter-satellite DEW could follow the same implementation protocol as the 50 kW Stryker-mounted anti-artillery DEWs that will reach the force by 2022.[31]

Kinetic Energy Weapons

KEWs are conceptually the easiest to understand and employ of counterspace systems. KEWs destroy enemy satellites without placing anything into orbit.[32] They accomplish this by delivering a kill vehicle to the enemy satellite via a rocket and/or missile launch that gives a kill vehicle enough velocity to penetrate the atmosphere and destroy the enemy satellite. KEWs typically consist of a fixed or mobile launch system, the atmosphere piercing missile, and the actual kill vehicle payload that destroys the satellite. Since this entire engagement happens outside of the atmosphere at incredibly high velocities for both the targeted satellite and the kill vehicle, the kill vehicle payload is quite small.[33] Yet the simplicity of implementing KEWs stops there. Albeit, the practice of using KEWs is tested and viable, there are two major logistical concerns when using KEWs to destroy satellites.

First, due to the destruction of the satellite being entirely contingent upon timing and positioning of the kill vehicle, the physical destruction of the satellite from such a highly energetic interaction causes a large amount of orbital space debris. These orbital debris particles can take on trajectories of their own, where the resultant vector can damage friendly satellites or even create entire fields where planned orbits are no longer feasible. These unpredictable second-order effects make actual KEW implementation to destroy satellites the least preferred method.[34] In 2007, China deliberately destroyed a Chinese LEO weather satellite with a ground-based KEW as a proof of concept. The resultant orbital debris from the damaged satellite actually struck a Russian satellite in 2013.[35] It is not public information if the satellite was permanently damaged. This unpredictability of trackable space debris from KEWs leaves most states opting for different space-control solutions.

Secondly, KEWs require very specific launch considerations. Atmospheric and meteorological conditions that substantially effect rocket trajectory can prevent the launch of a KEW. Certain KEWs require robust launch sites with mission command nodes similar to non-violent rocket operations. Mobile KEWs still require open areas with a flat and uniform surface to serve as a viable launch pad. Despite these logistical constraints, ground-based KEWs were the first and remain the most common form of counterspace measures by both friendly and adversarial forces. Furthermore, the transformation from states that can already launch satellites to developing KEWs is a minimal leap. Accordingly, the threat analysis for KEWs is substantially more robust and involved than for DEWs.

The People's Liberation Army (PLA) in China not only already has operational KEWs, but they have already initiated integration and training with ground forces.[36] Current Chinese ground-based KEW capabilities can only range ISR and PNT LEO satellites. Yet, it is estimated that the PLA is currently pursuing the development of mobile ground-based KEWs that can target satellites ranging to a geosynchronous orbit. Geosynchronous satellites are responsible for intercontinental ballistic missile warning and detection. Therefore, China is only years away from being able to destroy U.S. capabilities at detecting a nuclear missile while in flight. This cross-domain capability provides not just freedom of maneuver on the ground but can also offer an unconventional strategic advantage.

Additionally, Russia is developing a mobile KEW that can destroy LEO satellites. Russia completed the eighth field test of the PL-Nudol anti-satellite missile — a ground-transportable, mobile KEW that can easily integrate with ground maneuver formations.[37] While not at the geosynchronous altitude capability like its Chinese counterpart, the incredible mobility of the PL-Nudol enables easier integration with maneuver forces and gives Russian maneuver commanders a viable space control measure on the battlefield.[38]

Russia and China are not the only threats with ground-based KEWs. Iran successfully launched an LEO satellite in 2009. With only minor weaponizations to its launch vehicles required, Iran is well within reach of a ground-based KEW.[39] Additionally, North Korea has successfully launched both a ballistic missile and a space vehicle. When coupled, North Korea is only a minor step behind in the development of a ground-based KEW.[40]

Despite increased threat production of ground-based KEWs, the orbital debris caused by KEWs creates operational variables in the space domain that outweigh the cross-domain freedom of maneuver that their successful destruction of satellites provides. Therefore, enabling cross-domain fire and maneuver should emphasize the prevention of enemy use of ground-based KEWs, not the implementa-

tion of them by friendly forces. Luckily, these systems and programs are already in practice.

The Ground-Based Midcourse Defense (GMD) Program is responsible for the development and implementation of anti-ballistic counter missiles designed to intercept enemy intercontinental ballistic missiles (ICBMs) while in mid-flight. The U.S. currently fields 44 of these interceptors with 40 located at Fort Greely, AK, and four located at Vandenberg, CA. At the height of their trajectory, ICBMs leave the Earth's atmosphere. Therefore, the initial thrust velocity between ICBMs and ground-based KEWs are similar enough to potentially intercept enemy KEWs prior to their leaving the atmosphere and causing orbital debris issues.

While conceptually feasible, there are outstanding requirements prior to the conversion of GMD interceptors from ICBM interceptors to KEW interceptors. Technologically, these interceptors would need to be modified to be able to track and intercept KEW trajectories and be able to do so at a faster rate than they currently track ICBM trajectories. Furthermore, a study by the Center for Arms Control and Non-Proliferation determined that the effectiveness of the current fielded interceptors is limited.[41]

Assuming these technological barriers are solved, anti-KEW interception is still retained at the grand-strategic, state level. The implementation of KEW interceptors to enable ground-based tactical maneuver would need to see a paradigm shift in the level of approval for the deployment of an anti-KEW interceptor. Yet again, there is a tactical precedent of cross-domain condition setting by tactical maneuver commanders.

Ground force tactical commanders lead suppression of enemy air defense (SEAD) prior to the infiltration of a ground force by airborne or rotary assault. The ground force tactical commander has the required autonomy for the implementation of SEAD assets to ensure that friendly forces will have superiority in the air domain, enabling their infiltration. The physical assets conducting SEAD are not necessarily collocated with the maneuver commander, but the autonomy to use them in order to set conditions is still given to the tactical level. Therefore, the implementation of anti-KEW interceptors at the tactical level can serve a similar purpose, but in the space domain. Suppression of enemy space weapons (SESW) will need to become another condition to set on the battlefield. In the world of MDO, tactical commanders will need this authority in the event enemy forces launch KEWs during a tactical fight to suppress with an interceptor. Retaining anti-KEW interceptors at the highest level would only prevent the tactical commanders on the ground that need the cross-domain fire and maneuver from being able to directly affect their battle space in real time. GMD and SMDC can retain the physical assets at their level and own the launching procedures. However, giving the tactical maneuver command launch authority in the event it is to counter an enemy's KEWs enables tactical freedom of maneuver in MDO.

Photo courtesy of U.S. Missile Defense Agency

A Ground-based Interceptor is launched from Vandenberg Air Force Base, CA, on 25 March 2019 in the first-ever salvo engagement test of a threat-representative intercontinental ballistic missiles target.

Conclusion

On the modern battlefield, MDO calls for tactical maneuver commanders to affect all domains of war to create the requisite cross-domain fire and maneuver for their forces. While this has yielded a paradigm shift in the air and cyber domains by giving maneuver commanders more influence, the space domain remains a strategic domain where tactical maneuver commanders have

no control. Space-based assets provide ground forces with geolocation, navigation, target identification, and many other services. Yet the offensive mechanisms in the space domain that preserve these satellites — or deny enemy forces the same capabilities — are retained exclusively at the strategic level by SMDC. The reallocation of DEWs and KEWs to the tactical level presents the solution for tactical maneuver commanders to exercise control over the space domain and enable cross-domain fire and maneuver at the ground level.

An immediate solution is to give control and deconfliction of DEWs to a JTAC-like space enabler. This would give maneuver commanders a tangible connection to the space domain where directed energy satellite-on-satellite combat that effects ground maneuver takes place. Long term, the integration of a ground-based DEWs into maneuver formations at the tactical level would give a more timely effect. While the U.S. is only a few years from this capability, Russia and China are already working on the development and tactical integration of ground-based DEWs.

KEWs may be the traditional and preferred form of exercising offensive space control. However, the destruction of an enemy satellite by a KEW creates orbital debris that can dramatically affect the entire space domain. Additionally, with the launching of a KEW being a state-level detectable action, it's not feasible to give physical control of ground-based KEWs to tactical maneuver commanders. However, similar to the current doctrine of tactical commanders owning SEAD prior to airborne and air assaults, tactical maneuver commanders need operational yet contingent control of re-designed anti-ballistic missile interceptors to suppress and destroy enemy counterspace capabilities prior to large-scale operations.

While the nature of war does not change, the character of war does. The prevalence of MDO and increased threat abilities have seen a new importance of giving multi-domain influence to the tactical level. The space domain is the most critical, overlooked, and next in line for this same paradigm shift.

*The reallocation of DEWs and KEWs to the tactical level presents the solution for tactical maneuver commanders to exercise control over the space domain and enable cross-**domain fire and maneuver at the ground level.***

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Ready, Set, Fight:
Expeditionary RSOI Operations

CPT JOHN EATON
MAJ NICHOLAS R. GRECO
COL IKE SALLEE

Reception, staging, onward movement, and integration (RSOI) — just saying it seems laborious. As those of us who have lived it know, RSOI is hard and thoughtful work. For less-experienced leaders, RSOI is generally considered something you just have to suffer through to get on with the mission. However, much like the solid foundation of a building or the core strength of an athlete, RSOI is crucial to setting the conditions for successful combat operations.

We had the good fortune of conducting the Army's first "expeditionary" RSOI at the National Training Center (NTC) at Fort Irwin, CA, in August 2020. The idea — borne from LTG Randy George and realized by BG David Lesperance and COL Mike Simmering — confronts the current unrealistic expectation of deploying into a well-developed sea or air port of debarkation. For many years, this was everyone's experience: a climate-controlled life support area, contracted maintenance, contracted sustenance, and an approved solution from a unit we were replacing. The repositioning of U.S. Army's forces across the globe, however, should make us all pause and realize these are not the conditions we will encounter during large-scale combat operations (LSCO).

To support this vision, our brigade combat team (the 1st Stryker Brigade Combat Team, 4th Infantry Division at Fort Carson, CO) skipped the rotational unit bivouac area (RUBA) and deployed directly into the Mojave Desert — an austere, contested environment — during one of the hottest months ever recorded in California's history. From there, we immediately prepared for combat operations against a formidable enemy. There was no reprieve, shelter, or comfort — and we believe we fought better because of it.

In the following paragraphs, our commanders and staff share their experiences, observations, mistakes, and ideas. We are also sending all of the products we used during expeditionary RSOI to the Center for Army Lessons Learned and sharing our contact information. Expeditionary RSOI requires us to be faster, more capable, more self-reliant, and more focused. Leaders must consider tactical and acciden-

A 4th Infantry Division Soldier conducts rail load operations on 23 July 2020 at Fort Carson, CO, in preparation for a rotation at the National Training Center.
Photo by CPT Daniel Parker

tal risk earlier in their operations. We need forward-thinking, proactive, thoughtful, confident, and competent units across our Army to meet the challenge. We hope you can take our experiences and improve on them for your rotations.

Planning for Expeditionary RSOI

NTC exists to prepare units for the challenges and adversaries they might face while fighting and winning our nation's wars. As those challenges and adversaries evolve, so too must the simulations and missions assigned to the rotational training units (RTUs). In line with the U.S. Army's focus on LSCO, NTC is taking a broader approach to training simulations to challenge units from the moment they arrive. RTUs must plan for and conduct RSOI under austere and contested conditions against an enemy able to disrupt the building of combat power and force projection, testing their ability to establish dispersed tactical assembly areas (TAAs) and build combat power without the traditional infrastructure and support available during previous rotations. Leaders must set conditions during planning for equipment outload, deployment, and the building of the operation's combat power phases to successfully enter a theater under contested conditions and be ready to conduct sustained combat operations. Commanders must synchronize the deployment of personnel and equipment with sustainment assets and maneuver capabilities, leveraging opportunities to enter the training scenario ready to fight and win.

Before other phases of RSOI are laid out, RTUs must identify what equipment is required to accomplish their primary objective: occupying the TAAs as quickly and efficiently as possible. To achieve this, an initial life-support package must include generators; communications equipment; assets for fuel, ice, and water storage and distribution; and shelter for personnel. Anything on the initial train and line haul that is not necessary to establishing TAAs is a missed opportunity to build and strengthen your force.

In addition to life support, a critical requirement of expeditionary planning is force protection. Enemy capabilities will drive what force protection assets are required upon entering TAAs, and these requirements will increase as the RTU's footprint expands. The first force protection assets to arrive should directly correlate to the most likely enemy threats and courses of action (COAs) you will face while building combat power. At a minimum expect TAAs to be probed by small dismounted teams looking to exploit early gaps in security. Frontload crew-served weapon systems can provide adequate security while maneuver assets are downloaded from trains, inspected, and go through communications, electronic warfare equipment, and multiple integrated laser engagement system (MILES) installation. These weapon systems should be line hauled and arrive in conjunction with advanced echelon (ADVON) teams. Additional force protection requirements will be dictated by specific scenarios.

Outside of life support and force protection, 1/4 ID prioritized equipment and personnel for human intelligence

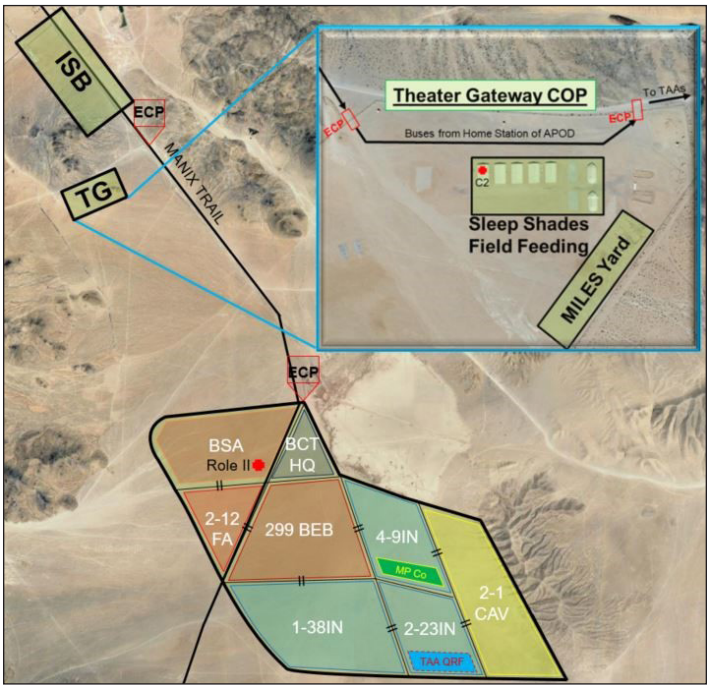


Figure 1 — 1/4 ID RSOI Operational Overlay
(Personnel and equipment flow through the intermediate staging base and theater gateway into their respective tactical assembly areas in a contested environment.)

(HUMINT) and signal intelligence (SIGINT) teams to answer commander's critical information requirements (CCIRs); scout platoons and unmanned aerial vehicles (UAVs) to conduct reconnaissance; and chemical, biological, radiological, and nuclear (CBRN) capabilities. Early requirements will vary rotation to rotation, but all units should consider having these capabilities early in RSOI.

To reduce the strain on logistics assets, RTUs must also determine what non-organic sustainment resources are available during RSOI. Conduct an early draw of refrigeration and water capabilities to augment torch and ADVON. Coordinating early fuel capabilities with NTC's 916th Support Brigade allows the first trains to include more combat platforms. If conducting a summer rotation, draw as many ISU-90s as possible for additional ice storage and distribution. RTUs' support operations (SPO) and S4 sections need to begin planning with the 916th Support Brigade immediately following the Leader Training Program (LTP) to determine exactly what support can be provided during RSOI. Every available resource that can be leveraged early presents opportunities to maximize efficiency in building combat power by freeing up space for other essential equipment and personnel.

Planning what constitutes essential equipment and determining when it arrives is critical to ensuring the proper personnel arrive with it. Personnel who arrive before their equipment waste space and opportunity. Identify equipment requiring specific licensing and personnel to operate and match their arrival in time and space. Cooks, mechanics, fuelers, and drivers need to arrive early with their equipment

to begin critical life-support operations. Efficiently synchronizing the arrival of personnel and equipment allows RTUs to gain every ounce of combat power they can with available forces.

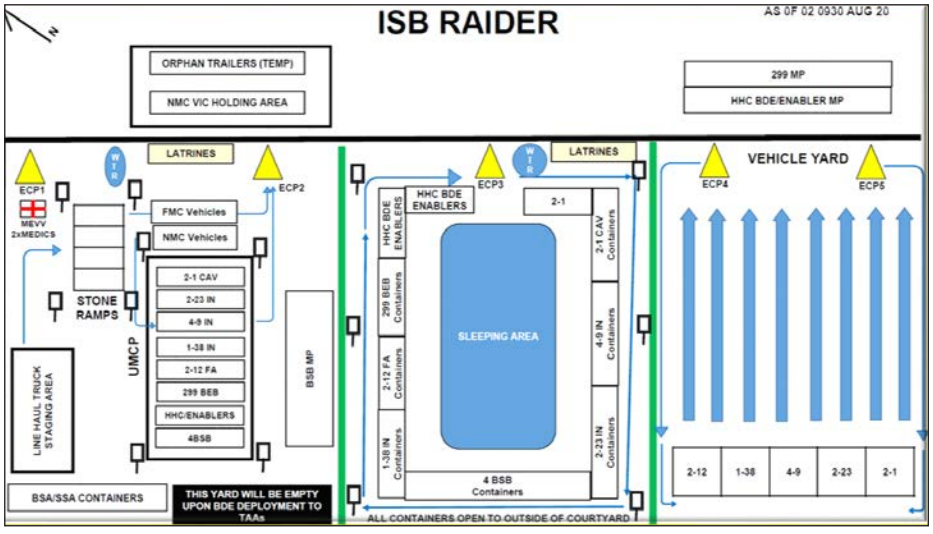
The last factor in planning for an expeditionary RSOI is meeting specific NTC requirements while balancing the demands of establishing TAAs in a contested environment. While executing force protection and building combat power, time and resources need to be allocated to training and validation tasks mandated by NTC. RTUs must be prepared to divert time, personnel, and resources into passing fuel tests, completing weapons calibration, and drawing and installing equipment in addition to attending required safety briefs from NTC personnel. The RSOI timeline developed by the RTU should account for the resources and manpower necessary to meet these requirements.

Outload

While it is tempting to focus on what actions need to be taken upon arrival during the planning phase, success depends upon a well-thought-out and carefully executed packing and outload plan. The most important tool in this process is a detailed time-phased force deployment data (TPFDD) product tailored to transportation capabilities and mission requirements. The TPFDD should include timelines for all methods of movement and account for all personnel on the deployment.

When conducting outload, leaders must prioritize equipment arrival by movement methods. Line haul and air should be used for maintenance packages, communications equipment, sensitive items, and life support for torch and ADVON. The outload process must also balance force protection and sustainment needs. As combat power grows, so will sustainment requirements. One cannot outpace the other, and this balancing act needs to be reflected in the way trains are configured.

Figure 2 — Diagram of 1/4 ID Intermediate Staging Base
(The area includes sections for line haul download, the unit maintenance collection point, container storage, and the vehicle yard)



Deployment

During the deployment phase of the expeditionary RSOI, ADVON and torch parties will have the most significant impact on an RTU's success. The composition and capability of these two teams are essential to setting the intermediate staging base (ISB) conditions. They must clearly understand the commander's intent and specific objectives to be met before follow-on forces' arrival. At a minimum, the torch team should include the culinary management NCOIC, a contracting officer, and the white cell NCOIC. ADVON should consist of a broader mix of leaders, subject matter experts, sustainment personnel, and initial force protection as well as leadership from every staff section, the brigade SPO team, personnel to set up and operate the Yermo node, and transportation and recovery teams.

One of the primary missions for ADVON personnel is setting conditions for reception areas and ISBs. These areas will be used to download, move, and stage equipment as it arrives into theater. This node facilitates the site where equipment and personnel arriving by strategic lift collect and reconfigure into tactical formations. While establishing these areas, RTUs must account for life support, fuel, maintenance, and force protection requirements. The ability to quickly move equipment and resources from ports and railheads is critical. RTUs must ensure the correct operators with proper licenses are ready to drive equipment from ports of debarkation (PODs) to staging areas. Additionally, the RSOI plan should specify how much equipment needs to be line hauled from Yermo to Fort Irwin and when the RTU takes priority on the routes between the railhead and the TAAs. During the planning phase, the ISB layout should be established with specific areas identified for container staging, the unit maintenance collection point (UMCP), and the vehicle yard. Locating the UMCP near the stone ramps reduces wrecker support requirements. Our brigade assigned specific units to manage Yermo, ISB, and Manix Trail nodes during RSOI and redeployment to simplify manning and equipment requirements and to maintain mission continuity.

The arrival of the main bodies represents the decisive point of the expeditionary RSOI process. If leaders have successfully set conditions during planning, outload, and ADVON, most personnel and equipment will flow quickly and efficiently from PODs to the TAAs. Do not allow clustering in ISBs or in TAA Santa Fe. Keeping main bodies in staging areas also prevents the rapid build up of force protection capabilities in the TAAs, which is essential as unit footprints increase.

Building Combat Power

The rapid deployment of main bodies culminates with the building of combat power. The first crucial step to this phase

Photo by CPT Gregory Walsh

Use of a unit maintenance control point during RSOI allows the rotational training unit to maximize the efficiency of every maintainer on ground.

is creating an "expeditionary mindset" in their Soldiers as they occupy the TAAs. Battle drills should begin immediately, and commanders should emphasize that units are already in a contested area and within reach of the enemy. Battle update briefs, logistics synchronizations (LOGSYNCs), resupply missions, convoys, and other battle rhythm events should all begin while units are in the TAAs building combat power.

While building combat power during expeditionary RSOI, the demands of force protection need to be balanced with sustainment operation priorities. This is the time to focus on maintenance and preventive maintenance checks and services (PMCS). It will be tempting for RTUs to bring not mission capable (NMC) equipment and vehicles to maximize the benefits of ordering parts under a high priority status. Still, RTUs should avoid bringing any equipment they do not believe will be ready to drive off a train and onto the battlefield. Maintenance teams will be busy enough bringing up equipment that goes down during transit, and equipment that travels as NMC will eventually become dead weight pulling resources away from other platforms. Evacuation support from the sustainment brigade is very limited during the rotation, and units must self-transport all NMC equipment forward. RTUs should make every effort to travel "healthy" and leave severely disabled equipment at home station.

While an expeditionary RSOI presents new challenges for units to overcome, it also brings valuable training opportunities that will increase competency and lethality entering a contested theater. The ability to overcome an adversary's attempts to disrupt the building of combat power will be an essential task in LSCO. Through deliberate planning of the outload, ADVON, and main body phases of RSOI, commanders can effectively leverage all available assets and enter the training exercise ready to fight and win.

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MAJ Nicholas R. Greco serves as the S4 for 1/4 ID.

COL Ike Sallee serves as commander of 1/4 ID and is proud to work alongside the tough, smart, and committed Soldiers in the Raider Brigade.

Soldiers from 2nd Squadron, 1st Cavalry Regiment, 1st Brigade Combat Team, 4th Infantry Division, move from the intermediate staging base to their tactical assembly area during NTC Rotation 20-9 at Fort Irwin.

Photo by SPC Brooke Davis

Sustaining the Chaos of LSCO: *FARP Operations*

BG CLAIR A. GILL
MAJ BRIDGET I. DAY

> ***"You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics."***
>
> **— GEN Dwight D. Eisenhower**

Battle of Agincourt

In 1415 during the Hundred Years War, the French Army faced King Henry V's English expeditionary force on home terrain in Agincourt. While France enjoyed interior lines of communication, better equipment, and numerical superiority, they were ultimately defeated. The French failed to adapt to the conditions of the day, they failed to modernize their warfare, and they fought the British using tactics and techniques that had worked in battles past, all ultimately leading to their demise.

As the U.S. Army continues to modernize and shift focus to large-scale combat operations (LSCO), it is critical that we innovate every warfighting function and consider relevance with an eye toward the future of warfare. Specific to the sustainment warfighting function, we must re-look our doctrine, training, manning, and equipping of our brigade combat teams (BCTs) and push logistical capabilities, such as forward arming and refueling points (FARPs), as far forward as possible. Because sustainment was the bill-payer for BCT 2020, units now lack critical organic logistical capabilities, and the echeloned capability cannot keep up with the demand of troop transportation, water purification, refueling, and the list goes on. If we modernize our force without a critical eye toward how we sustain the LSCO fight, history warns this oversight might cause our Army to suffer the fate of the French at Agincourt.

Desert Storm – The "Super FARP"

On 17 December 1990, the 101st Airborne Division rehearsed the "Super-FARP," an innovative fusion of divisional Class III distribution assets (as well as air traffic controllers and pathfinders) capable of refueling a single lift of 66x UH-60s and 30x CH-47s in as little as 43 minutes. This incredible synchronization of capability allowed the 101st to assault two infantry brigades, the division assault command post, and the division support command (DISCOM) forward into Iraq on 24 February 1991, the morning of G-day. With this synchronization, the 101st struck enemy targets in zone and established a foothold for follow-on operations in Desert Storm. At the time, this was the largest air assault in history, but it was against an undisciplined, ill-equipped Iraqi military that proved no match for the U.S. and its allies. While this singular capability proved decisive for the division to project combat power, its utility in today's modern battlefield against peer competitors might not result in such resounding successes. Just because it worked in the past does not necessarily mean it will be repeatable; the Super-FARP concept relevant in AirLand Battle has little chance of survivability in 21st century LSCO. However, just as DISCOM and

Photo by MAJ Robert K. Wright Jr.

Soldiers refuel a UH-60 Black Hawk helicopter at the 101st Airborne Division's rapid refueling point in the Northern Province of Saudi Arabia on 4 February 1991.

the 101st Aviation Brigade spearheaded the Super-FARP concept in the ’90s based on the BCT ground tactical plan, it is critical that the tactical force continues to drive innovation for the future.

Transition to LSCO

Since 2001, the U.S. Army has become quite proficient in counterinsurgency and counterterrorism operations. During the past two decades, however, several of the principle peer state threats to the U.S. and its allies have taken note and modernized their militaries, while the U.S. consumed resources to win decisively in contact. Department of Defense leadership took note of the need for a generational shift when they authored the 2018 National Defense Strategy (NDS). The 2018 NDS focused on future modernization for LSCO against threats such as Russia, China, Iran, North Korea, and violent extremist organizations. Like other U.S. Army divisions, the 101st Airborne Division (Air Assault) quickly shifted the focus of its collective training towards LSCO, while also supporting the Army’s modernization strategy. The 101st is known for its ability to strike from distance using helicopters to execute vertical envelopment, but with the resulting extended operational reach, aviation assets rely heavily on forward sustainment operations.

The 101st Combat Aviation Brigade (CAB) was designed to be self-reliant in terms of extending its operational reach through FARPs established by its organic battalion support companies. FARPs are decisive to the CAB (and the division), but those established by the CAB are also large, cumbersome, slow to move, and generally emplaced rearward in the consolidation area. In an LSCO fight, FARPs are desirable, easy targets for the enemy, and it is widely assessed that killing a FARP is easier and more effective than shooting at low-flying, highly maneuverable aircraft. The aviation brigade does not have enough redundancy to make its organic FARPs enduring and survivable in the battle zone; thus, we need to be innovative, creative, and bold in how we maintain our deep capability for the division. BCT FARPs would naturally be farther forward and would allow aviation assets to continuously fight forward. BCT forward support companies (FSCs) and brigade support battalions (BSBs) are the first to push resupply forward as the ground lines of communication open, and having a BCT FARP extends operational reach and creates multiple dilemmas for the enemy. BCT FARPs must be trained, resourced, and ready in the event the CAB FARP is destroyed or the division needs to extend operational reach quickly. Failure to adapt to the new era of combat will leave FARPs, Army Aviation, and ultimately our ground forces to suffer the fate of the French — too big, too slow, too predictable, and too vulnerable for the modern era of warfare.

One Standard

If the CAB FARP is too large and cumbersome or positioned too far rearward, the LSCO fight will outrun the CAB’s ability to refuel and extend its operational reach, ultimately hindering the air assault capability from the 101st. Identifying this LSCO capability gap, the 101st Airborne adapted and directed its BCTs to purchase the necessary FARP equipment and to certify all of their 92F petroleum specialists to pump aviation-grade fuel. Each BCT was to train and certify its BSB’s alpha companies and FSCs to set up, establish, filter, certify, and execute a two-point Heavy Expanded Mobility Tactical Truck Tanker Refueling System (HTARS) FARP in less than one hour.

Photo by CPT Kristoffer Sibbaluca

The Task Force Shadow operations officer oversees a forward arming and refueling point operation at Bagram, Afghanistan, on 4 August 2018.

It is commonly misperceived that the aviation support battalion’s distribution company and battalion FSCs in aviation brigades have different fueling capabilities than BCT BSBs. The only difference, however, is the filtration standards adhered to by the CABs. In fact, all 92Fs are trained in both ground and air fueling operations during their Advanced Individual Training (AIT), but these skills are perishable. It is imperative that 92Fs continue to train to the standards required of circulating and testing fuel to aviation standards and actively train with aircraft per Army Techniques Publication (ATP) 3-04.17, *Techniques for Forward Arming and Refueling Points*. It will take commander emphasis to ensure that FARP training is an enduring change in BCT sustainment training; and to gain commander-level engagement, FARP operations must be added as a primary mission essential task list (METL) task for alpha companies and FSCs. In the 101st, we are changing the support structure and culture. FSCs are ordering hoses, fittings, nozzles, Aqua Glo test kits, filters, spares, and safety equipment, and BCT Soldiers are getting time and repetitions pumping fuel into live aircraft. In the 101st, EVERY 92F pumps aviation-grade fuel!

Training the BCT Fuel Distribution Team

By certifying every brigade to establish and execute FARP operations in support of aviation operations, the division is expanding options available to commanders. The 3rd BCT, 101st Airborne Division (Air Assault) took the lead on executing training with CAB expertise and oversight to establish a FARP validation program for all of the division's 92Fs. This nested well with their innovative concept of support that challenged doctrine by making the brigade support area (BSA) as small as possible and massing sustainment personnel and capabilities forward to the FSCs. As GEN Mark A. Milley stated during his 2016 Association of the United States Army speech, "The battlefield will be non-linear, compartmented, and units will have non-contiguous battle space with significant geographical separation between friendly forces. This type of battlefield will place a high premium on independent, relatively small formations..."[1] Heeding this sage guidance, the Rakkasans adapted to limited echeloned communications, rapid aggregation and disaggregation, and constant movement to enhance survivability. Keeping the BSA small, augmenting FSCs with personnel and equipment capabilities, and extending the aviation operational reach will not only present additional challenges to the enemy, but will prevent sustainment from being outpaced by the operational demand.

In order to implement its concept of support, the 3rd BCT's 626th Brigade Support Battalion deliberately implemented a training glide path to incrementally train its 92Fs. The training began first with Alpha Company, 626th BSB executing multiple iterations of familiarization and hot refueling operations, and ultimately being validated by the CAB safety officer. Once validated, 92Fs in Alpha Company will then conduct training with the FSC fuel teams until each battalion fuel team is validated to conduct independent FARP operations. Although the training can be as simple as refueling aircraft after an Air Assault School support mission, the 92Fs collaborated with the 101st CAB to provide the FARPs for two aerial gunneries. This provided realistic training that involved rearming, refueling, sling loads, and multiple iterations. In the near future, Soldiers will conduct a validation exercise, where they will be given a date, time, and grid coordinate to tactically convoy to, find cover and concealment, establish communication with the aviators, and expeditiously conduct FARP operations under the security of organic gun-truck crews. This culminating FARP operation will validate that Screaming Eagles outside of the CAB can safely and independently provide FARP capabilities, extending the division's reach throughout the battlefield, giving the commander multiple options while presenting the enemy multiple dilemmas.

LSCO Concept of Support

In response to a fiscally constrained and reduced force cap, BCT 2020 drastically reduced the sustainment equipment and personnel at BSB and FSC echelons. The *Army Sustainment* Magazine article, "BCT 2020 Logistics: Where the Rubber Meets the Road," explains that the BCT 2020 sustainment force structure is not suitable to sustain the support requirements of the BCT, and as a result, a BCT must rely on the division support brigade (DSB) to provide any support requirement gaps.[2] BCT 2020 was designed prior to the transition to the LSCO fight, and the modified table of organization and equipment (MTOE) of the BSB and FSCs has continued to decrease and pull capabilities from brigades. Consolidating sustainment assets in the rear with the DSB cannot reasonably sustain or keep pace with the LSCO fight; the focus must shift to forward sustainment. On a battlefield where lines of communication between echelons will be challenged and the ability to move rapidly every few hours is the difference between life and death, it is necessary to have as many support capabilities forward as possible to keep pace with demand. Adding BCT FARP capability throughout a division supports this concept. BCT MTOEs need to authorize both the personnel and equipment to support ground and air fuel requirements. Although 101st BCTs are experimenting with support structure changes to better support the LSCO fight (and training to execute FARPs), it is imperative that the MTOEs also change for support personnel and equipment to keep pace.

The infantry brigade combat team (IBCT) MTOE has shifted away from M978 Heavy Expanded Mobility Tactical Truck (HEMTT) fuelers in order to account for reduced manning and now authorizes Tank Rack Modules (TRMs). The MTOE for Alpha Company, BSB replaces 5x M978s for TRMs and in the FSC formations, TRMs have completely replaced M978s. Alpha Company, BSB is currently

Photo courtesy of U.S. Army Acquisition Support Center

The Pump Rack Module and Tank Rack Module

From this day to the ending of the world,
But we in it shall be remember'd;
We few, we happy few, we band of brothers;
For he to-day that sheds his blood with me
Shall be my brother; be he ne'er so vile,
This day shall gentle his condition;
And gentlemen in England now a-bed
Shall think themselves accursed they were not here
And hold their manhoods cheap whiles any speaks
That fought with us upon Saint Crispin's day

— William Shakespeare
***Henry V,* 1599**

authorized 5x TRMs, 5x M978s, a HEMTT Tanker Aviation Refueling System (HTARS), and 10x 92Fs. Not only is this not enough personnel to simultaneously resupply FSCs while also executing FARP operations, but TRMs can only provide a FARP capability with an additional pump such as a Pump Rack Module (PRM) or the pump that would come in an Advanced Aviation Forward Area Refueling System (AAFARS); additional pump capability is not authorized in an IBCT. It is clear from the authorization of the HTARS that IBCTs are intended to support FARP operations, but now the LSCO problem set requires the ability to do both ground and air refueling missions simultaneously — for both planned air assaults and contingency situations. The 3rd BCT, 101st Airborne Division recommends an equipment MTOE change for Alpha Company, BSB to 5x TRMs with an AAFARS, 5x M978A2s and 1x M969A3, and a personnel MTOE change to 26x 92F, 1x 92L (petroleum lab specialist) and 1x 923A (petroleum systems tech). These equipment and personnel additions would allow for Alpha Company to execute both air and ground refueling operations. FSCs have also lost their M978 HEMTT fuelers, which have been replaced entirely with TRMs. Every FSC except for Echo Company FSC is MTOE'd 4x TRMs, but Echo Company is only authorized 3x TRMs, which is a significant mismatch to their engineer equipment fueling needs. The 3rd BCT, 101st recommends that each FSC be authorized 4x TRM, 4x M978 fuelers, HTARS, and 8x 92F. The addition of equipping the M978 fuelers back into the FSC formation would allow flexibility at the forward line of troops and would free up the LHS platforms to transport other necessary commodities such as Class V. Again, in order to keep pace and give commanders options, BCTs must be equipped and manned to refuel both ground and aviation simultaneously in an LSCO fight.

Only when the sustainment warfighting function matches its capabilities to the LSCO fight will there be an enduring culture shift. In the meantime, the 101st continues to take a modernized approach to how it extends its operational reach using decisive maneuver and innovative and adaptive logistics to assault the Screaming Eagles into the fight. The Screaming Eagles of 1944 adopted the moniker as a "Band of Brothers" who, like the English of 1415, also jumped into northern France and fought an enemy using adaptive tactics supported by innovative logistics to win the day. Today's air assault troopers stand in the shadows of our forefathers ready for our next rendezvous with destiny. We continue to train new tactics, modernize our equipment, and seek innovative ways to operate from a distance to strike like an Eagle!

Notes

[1] GEN Mark A. Milley, speech during AUSA Eisenhower luncheon, 4 October 2016; accessed from http://wpswps.org/wp-content/uploads/2016/11/20161004_CSA_AUSA_Eisenhower_Transcripts.pdf.

[2] "BCT 2020 Logistics: Where the Rubber Meets the Road," *Army Sustainment* (November-December 2016).

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At the time this article was written, **BG Clair Gill** was serving as the Deputy Commanding General (Support) of the 101st Airborne Division at Fort Campbell, KY, where he previously served as both a company and battalion commander. He currently serves as the director of Army Aviation, Headquarters, Department of the Army G-3/5/7, Washington, D.C.

MAJ Bridget Day is currently the support operations officer for the 3rd Brigade Combat Team, 101st Airborne Division. MAJ Day's previous assignments include commanding the Juliet Forward Support Company in the 1st Brigade Combat Team, 82nd Airborne Division and as a Congressional Fellow with the Office of Congressional Legislative Liaison.

Focus on the Fundamentals:
Proficiency Requires Repetition

MAJ JESSE M. UNDERWOOD
1SG MICHAEL D. GARNER

Leaders at all echelons tell us to focus on the fundamentals. Every echelon provides training guidance that focuses training plans on the few things brigades and battalions/squadrons deem absolutely necessary in order to be successful in executing wartime missions. Most units have a "Big 5" that looks something like: Physical Fitness, Shoot, Move, Communicate, and Medicate (combat lifesaver).

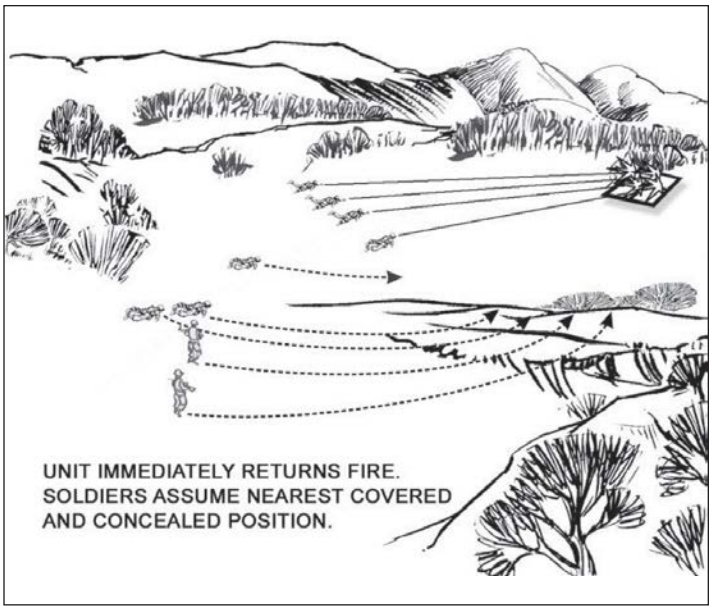
Collectively, we've been observer-coach-trainers (OCTs) at the National Training Center (NTC) at Fort Irwin, CA, for 48 months. We've observed and coached at both the battalion/squadron and company/troop levels. Most units come to NTC after completing a rigorous training cycle consisting of gunnery, live-fire exercises (LFXs) at echelon, battalion/squadron situational training exercise (STX), and brigade STX. However, units that come to NTC are commonly destroyed by the opposing force (OPFOR) despite the rigor of a seemingly complete training cycle. We've observed entire companies/troops decimated by the OPFOR, dismantling battalion/squadron and brigade plans. Units' inability to conduct battle drills (BDs) leaves them vulnerable to a waiting enemy force.

BDs are listed and described in Appendix J of Army Techniques Publication (ATP) 3-21.8, *Infantry Platoon and Squad*. Though this particular ATP is focused on infantry tactics, BDs 1-4 and 8-11 should be rehearsed, known, and second nature to every formation in our Army. These BDs apply to armor and combat trains formations as much as infantry formations. BD 1, React to Direct Fire Contact, is the fundamental task formations need to focus on to be successful and survive both at NTC and during their wartime mission.

BD 1 builds the foundation upon which the remaining BDs are executed. Formations do not survive and leaders do not make informed decisions without a well-rehearsed and executed BD 1. Units that cannot read a situation and execute BDs instinctively hesitate on enemy contact and

Soldiers assigned to the 1st Brigade Combat Team, 3rd Infantry Division provide security during Decisive Action Rotation 20-04 at the National Training Center at Fort Irwin, CA, on 14 February 2020.

Photo by SGT Dacotah Lane



Army Techniques Publication 3-21.8

Assuming Nearest Covered Position

await orders from leaders who aren't present. During after action reviews (AARs), most Soldiers can describe the basics of BD 1 (seek cover, return fire, report). Sadly, what is articulated well is often poorly executed. Incompetent execution results in formations remaining in enemy engagement areas (EAs) and becoming decisively engaged at a time and location of the enemy's choosing. Soldiers and leaders know the mechanics of the BD but lack the reflexive proficiency born from a relentless training environment. Soldiers lack the ability to violently execute without orders from leadership. Waiting for direction results in hesitation or freezing while in direct-fire contact, costing lives as platoons, sections, and squads remain in enemy EAs.

Units need to focus on the fundamentals, but we believe the current paradigm of understanding that statement is not focused. BDs must be rehearsed to the point of being second nature for small units.

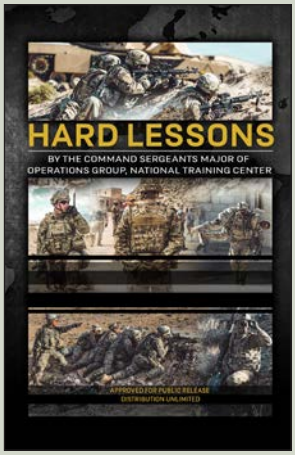
Basic BDs set the foundation for training the rest of our "Big 5." Our physical fitness will improve and be focused on mission accomplishment if we regularly and violently execute BDs. Our marksmanship will improve as Soldiers become more comfortable with their weapon systems and get more "trigger time." Communications skills will improve through the necessity to direct lower echelons and report to higher. Our skills in performing life-saving medical tasks will improve as we inject casualties in our BD training.

The most important potential gain in focusing our training on BDs, however, is our Soldiers and leaders will be more prepared to execute their wartime mission while in direct-fire contact with a lethal enemy. As BDs become second nature, more of our Soldiers and leaders will be prepared to execute at the next level.

MAJ Jesse M. Underwood currently serves as the chief of operations for the National Training Center (NTC) and Fort Irwin, CA. His previous assignments include serving as an infantry company trainer, Operations Group, NTC; G37 training officer, 8th Army, Korea; assistant S3 and company commander with 1st Battalion, 502nd Infantry Regiment, Fort Campbell, KY; rifle and reconnaissance platoon leader with 1st Battalion, 17th Infantry Regiment, Joint Base Lewis-McChord (JBLM), WA; Infantry Basic Officer Leader Course instructor, 2nd Battalion, 11th Infantry Regiment, Fort Benning, GA; Pre-Ranger and Ranger Indoctrination Program, 75th Ranger Regiment Special Troops Battalion, Fort Benning; and rifleman, grenadier, SAW gunner, M240B gunner, fire team leader, rifle squad leader, and weapons squad leader with the 2nd Battalion, 75th Ranger Regiment, JBLM. MAJ Underwood earned a bachelor's degree in psychology from Troy University.

1SG Michael D. Garner currently serves as first sergeant of Blackhawk Company, 4th Battalion, 6th Infantry Regiment, 3rd Armored Brigade Combat Team, 1st Armored Division. He previously served as a task force operations NCO observer-coach-trainer (OCT) with Scorpion Team, Operations Group, NTC. His other assignments include serving as an infantry company headquarters and infantry platoon OCT with Scorpion Team at NTC; assistant operations sergeant with Headquarters and Headquarters Company (HHC), 2nd Battalion, 508th Parachute Infantry Regiment (PIR), Fort Bragg, NC; airborne rifle platoon sergeant with C Company, 2-508 PIR; assistant operations sergeant with HHC, 3rd Battalion, 509th Infantry Regiment, Joint Base Elmendorf-Richardson, AK; and airborne rifle platoon sergeant with A Company, 3-509 IN. SFC Garner earned a bachelor's degree in liberal arts from Excelsior College.

Publication Shares Experiences of Senior Enlisted at NTC



Center for Army Lessons Learned Publication 21-07 - Hard Lessons

Written by the sergeants major (SGMs) of Operations Group, National Training Center (NTC), this handbook was inspired by the book *66 Stories of Battle Command*, where commanders shared their experiences during NTC rotations and provided "a way" to other commanders before they have to make a decision for a specific situation. The NTC SGMs have the same intentions with the publication of this handbook. The stories include experiences as operations SGMs and command sergeants major (CSMs) at the battalion and brigade levels. Some of the stories provided will create differing opinions, but are only intended to share the authors' experiences with those that may face the same or similar situations. In each rotation, NTC leaders observe SGMs who, once exposed to a situation, produce extraordinary results. These stories are not meant to expose any unit; they are meant to unearth possible solutions.

https://usacac.army.mil/sites/default/files/publications/21-07.pdf

The Jungle:

Thinking about the Division's Role in UTM at the 25th Infantry Division

MAJ CHRISTOPHER J. MATTOS

Photo by SGT Valencia McNeal

Soldiers from the 25th Infantry Division conduct jungle penetrator hoist training.

As the Army's premier jungle experts and America's Pacific Division, it is only appropriate that the 25th Infantry Division might think about training management using the jungle itself as a metaphor. The jungles of Hawaii and those that inhabit the United States Indo-Pacific Command (USINDOPACOM) area of responsibility (AOR) are broken down into four structural layers, which we might use a temporal construct to think about training management, readiness, and even leader development. The four layers are: the **emergent** layer (division), the **canopy** (brigade), the **understory** (battalion/squadron), and the **forest floor** (company/battery/troop and below).

The Jungle Metaphor

The emergent layer of the jungle reaches up and out from the canopy in direct contact with the sun's harshest rays, soaking up water with the jungle's most resilient foliage to help the vegetation below survive periods of drought. The trees that extend to the emergent layer are some of the jungle's oldest and strongest, as they are constantly exposed to strong winds and rainfalls. The animals that live in the emergent layer must be agile, able to survive with limited protection from the elements, and able to traverse the jungle's most treacherous heights.

In the canopy, we find a dense network of vegetation that creates a protective layer over the understory and forest floor. The canopy protects the lower two levels from wind, rain, and harsh sunlight, creating the humid and stable environment that allows life to flourish below. The leaves at this layer have adapted to repel water to the lower levels. And while the emergent layer relies on the wind to spread seeds, the canopy level plants rely on fruit to be dropped and ingested by the animals below to regenerate organic matter. These ideal conditions in the canopy create a thriving ecosystem of life across countless species.

In the understory, we find conditions that are even more dark, still, and humid. Plants here are much shorter and larger to help soak up the sunlight and rainfall that has passed through the canopy. Here, food and life are ample; animals enjoy safety from the elements and camouflage from predators.

And finally, on the forest floor, we find the most dynamic conditions in what would appear to be the quietest layer of the jungle. The forest floor is the darkest part of the jungle, making it the most challenging for plants to grow. But the floor is also where a great degree of activities occur that sustain life in the jungle. The foliage that falls to the floor decomposes and regenerates to provide nutrients to the rest of the jungle. Countless species rely on the regenerative processes that occur here to survive and thrive. Here, we see a vast network of interconnected root systems that allows the many plant and fungi species to communicate, adapt to changing conditions, and share resources in a massive symbiotic symphony of regeneration and growth.

Unit Training Management (UTM)

UTM is a universal part of the U.S. Army lexicon. And although the term is frequently used and generally understood, what exactly is training management, and for the

purposes of this article, what exactly do we mean when we talk about training management at the division level? Although the discrete components are explained in detail, you will be hard-pressed to find a concise Army definition of the term in any of the current or former 7-0 series doctrine. *The Leader's Guide to Unit Training Management* published by the Combined Arms Center in February 2014 defines UTM as "the process commanders, leaders, and staffs use to plan unit training and identify the resources needed to plan-prepare-execute-assess training."

At the brigade and below levels, UTM is most often described through explaining its primary component systems and processes: the 8-Step Training Model, the T-week construct, unit training plan (UTP) development, etc. UTM is also described as a parallel planning process that aligns with troop leading procedures (TLPs) at the company and below levels and the military decision-making process (MDMP) at the battalion and above levels. Further, UTM is often, and should be, described as an interconnected system that aligns with both the "plan-prepare-execute-assess" operations framework as well as the commander's activities in the operations process (understand-visualize-describe-direct-lead-assess).

Thinking about Training Management at the Division Level

While this largely scientific approach to understanding UTM is critical and serves our brigade and below echelons well, we must ask if this approach is applicable at the division level. Like the emergent layer of the jungle, we might think about the division's role in UTM as more than just the managers of another planning process.

The division headquarters, to include the command team and staff, has a significant responsibility to shape the training environment for the "canopy" below. The division exercises several critical duties in this model. First, the division shapes the training environment that creates the conditions for mission-essential task (MET) proficiency growth and the overall growth of training readiness. The division is the conduit between the executors of training and the operational environment, which includes higher headquarters' (HHQ) guidance and intent, the physical terrain, the enemy, the information domain, and resources availability, which may include land, ammo, money, facilities, transportation, fuel, and most importantly, time.

As it would in a tactical operation, the division performs as the shaping mission command node, providing guidance and intent, controlling the deep fight, defining the battle space, providing enabling assets, managing operating tempo (OPTEMPO), weighting efforts, and synchronizing activities. The division leverages its whole-of-staff capacity and its relationships with both HHQs and adjacent units to create the conditions in which UTM can be conducted efficiently. Further, the division is responsible for change management, finite resource prioritization, and clearly defining and communicating requisite training end states in order to build and sustain training readiness. The division protects the lower echelons from the naturally occurring known and unknown changes in the environment.

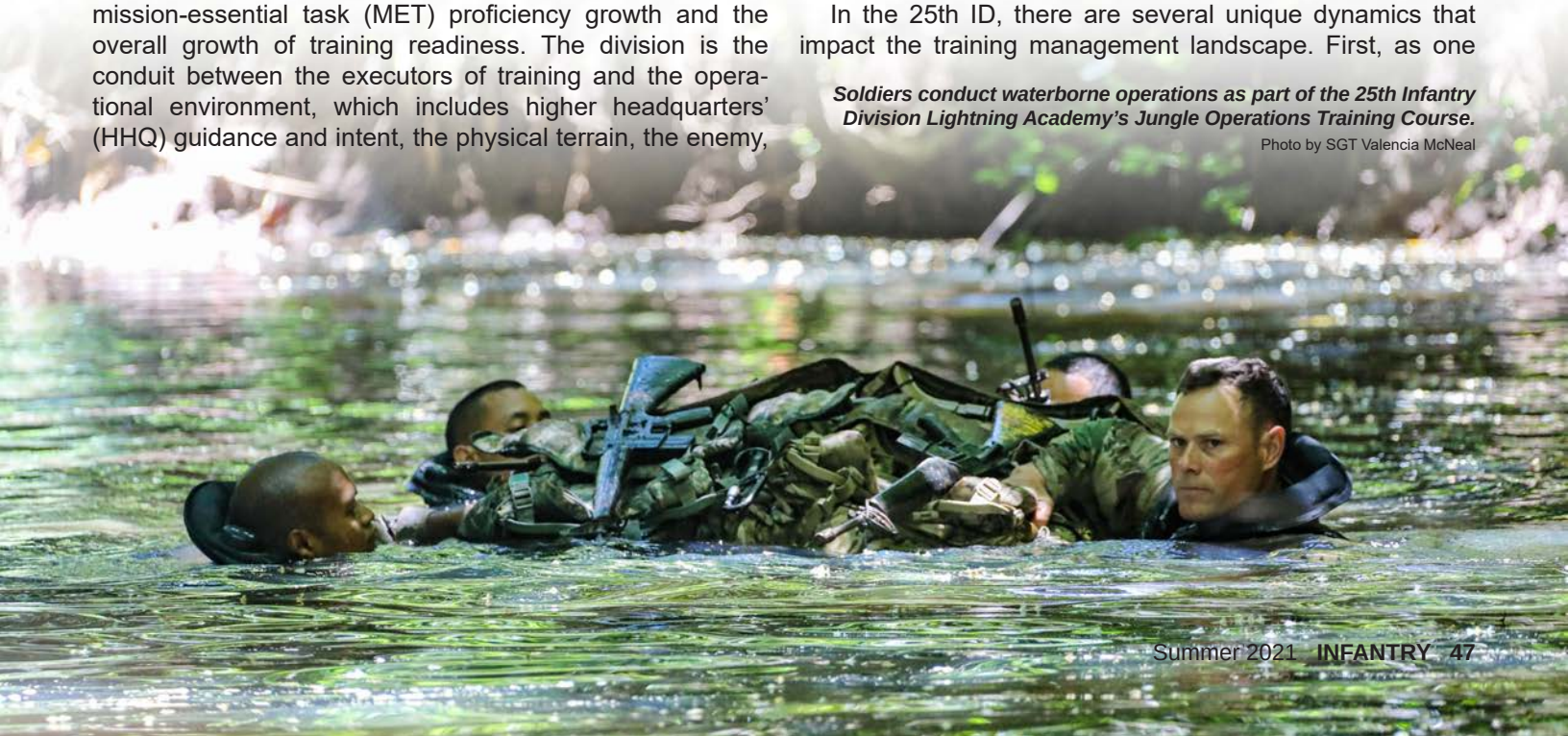
While the division shapes the training atmosphere through annual training guidance, policy, and long-range synchronization, the brigades — or the canopy layer — are focused on multi-echelon and multi-formation prioritization, resourcing, and deliberate planning. The brigade fits within the division's vision and guidance to provide direction and an explicit description of the desired capability end states for each subordinate element within each of the relative event horizons that drive their UTP. Battalions — or the understory layer — take this framework and provide specific focus and direction for each of the companies' unique requirements. Where the brigade generally plans and allocates resources, the battalion prioritizes and delivers those resources, including time, to the companies. The company and below — or the forest floor layer — forecasts, requests, and consumes those allocated resources in order to meet unit training objectives under the direct supervision of company-level leaders.

Unique Training Management Dynamics in the 25th Infantry Division

In the 25th ID, there are several unique dynamics that impact the training management landscape. First, as one

Soldiers conduct waterborne operations as part of the 25th Infantry Division Lightning Academy's Jungle Operations Training Course.

Photo by SGT Valencia McNeal



of the Army's outside the continental United States (OCONUS) divisions, we are task organized with two infantry brigade combat teams (IBCTs), each with two infantry battalions and a cavalry squadron, as opposed to a continental United States (CONUS) infantry division (ID) which is typically organized with three IBCTs, each with three infantry battalions and a cavalry squadron. In addition, in the last several years, the 25th redesigned its two Stryker brigade combat teams (SBCTs) to IBCTs. With the loss of the Strykers also came changes to our security cooperation partnerships in the Pacific. Some of our primary partners were in the process of fielding Stryker variants in their own armies, making other Stryker-capable formations a more preferred partner to those nations. When this change in the security cooperation landscape occurred, the 25th's role in major annual exercises like Pacific Pathways also changed. These strategic-level shifts had several down-trace impacts on how our two-IBCT division could maintain training readiness in a given fiscal year.

Photo courtesy of the 25th Infantry Division

Soldiers from the 25th Combat Aviation Brigade conduct a mission.

In one training year, the 25th ID conducts a collective training exercise (CTE) called Lightning Forge that serves as a brigade external evaluation (EXEVAL) in preparation for an annual Combat Training Center (CTC) rotation to the Joint Readiness Training Center (JRTC) at Fort Polk, LA. The division also supports a several-month rotation to the Pacific in support of Pacific Pathways in which a large part of one IBCT as well as a portion of the division staff, the combat aviation brigade (CAB), the division artillery brigade (DIVARTY), and the division support brigade (DSB) all deploy to multiple Pacific countries to conduct partnered training. This means that every year one IBCT conducts three back-to-back major events (the CTE, the CTC rotation, and the Pathways rotation) in order to allow the other IBCT to build training readiness through home-station collective training in preparation for the following year, where it becomes the primary training audience for the next iteration of those same three events. Regardless of which IBCT is the focal unit, the CAB, DIVARTY, and DSB continuously support these events in addition to their routine unit training requirements like aerial gunnery, sustainment gunnery, and artillery gunnery tables. Many of these events occur in parallel with and simultaneously to Pacific Pathways in order to ensure the division continues to build readiness across all metrics versus atrophying during our major engagements in the Pacific.

In addition to these three major events, the division also conducts Expert Infantryman Badge, Expert Soldier Badge, and Expert Field Medical Badge training/testing; participates in multiple joint and multinational command post exercises (CPXs); and conducts multiple additional partnership engagements that fall outside of the Pacific Pathways umbrella. All of this occurred on top of normal steady state home-station training requirements like mandatory Army Regulation (AR) 350-1 training; marksmanship qualification densities in accordance with the Integrated Weapons Training Strategy; individual warrior skills training; and collective training like situational training exercises (STXs), field training exercises (FTXs), and live-fire exercises (LFXs) at the team-through-battalion echelons. All the while, units are tasked to modernize, conducting multiple new equipment training and fielding events. And if that were not enough, at all times multiple units in the division are on standby to support crisis response requirements in the AOR, requiring a host of emergency readiness deployment exercise drills.

The second unique dynamic is derived from our command relationships to our HHQs. The 25th ID is the only non-Forces Command (FORSCOM) division in the Army. We have a Combatant Command relationship to USINDOPACOM, are assigned to the U.S. Army Pacific Command (USARPAC — which is the Army Service Component Command to USINDOPACOM), and have an operational control relationship to I Corps. This command relationship dynamic is unique to the 25th ID and expands our support requirements to multiple stakeholders.

The third dynamic unique to the 25th is a function of our role as the U.S. Army Hawaii (USARHAW) command as well as our physical geographic location. The commanding general of the 25th Infantry Division simultaneously serves as the USARHAW commander and is administratively responsible for multiple Army entities located in Hawaii to include U.S. Army Garrison Hawaii, the 9th Mission Support Command, 8th Theater Sustainment Command, 18th Medical Command, 500th Military Intelligence Brigade, 94th Air and Missile Defense, and 311th Signal Command (Theater). Further, the 25th also has habitual relationships and supports external training requirements for adjacent units such as the Hawaii Army National Guard, University of Hawaii Reserve Officer Training Corps (ROTC), Special Operations Forces, U.S. Air Force, and U.S. Marine Corps. These relationships bring with them a host of additional training support requirements as well as unique training opportunities.

Lastly, the island itself creates unique training management challenges. Transportation to the mainland for CONUS-based training exercises like JRTC typically incurs several additional weeks of movement for rolling stock and equipment. This also requires utilization of limited logistics support vessel capabilities. The relatively small size of Oahu, as well as the high demand for limited range and training facilities, makes land resource forecasting and allocation uniquely cumbersome. Not unlike many other Army training areas, but certainly more so in Hawaii, there are a multitude of environmental, cultural, and community-based considerations that our training planners must also account for. Finally, our largest training area — the Pohakuloa Training Area (PTA) — resides off-island some 200 kilometers across the Pacific Ocean on the Big Island, again increasing logistical and transportation planning factors for our brigades and battalions.

Approaching Training Management Hurdles

These challenges (and often opportunities) make long-range training planning and synchronization unique in the 25th ID. Without proper forecasting, these factors have the potential to overburden our two IBCTs as well as the limited support capacity of the DIVARTY, CAB, and DSB. As part of the comprehensive effort to prioritize people and to increase the overall readiness of the force, the Army is helping divisions achieve this predictability.

In the past several decades, we have witnessed the Army transition across several readiness models, to include the Army Force Generation Model, Regionally Aligned Forces, Objective Training Assessment, and the Sustainable Readiness Model. Recently, the Army has unveiled the Regionally Aligned Readiness and Modernization Model (ReARMM) as the marquee readiness model that will guide the Army into the future. The model aims to synchronize training, mission requirements, and modernization efforts while aligning forces to specific geographic combatant commanders in order to maximize readiness and predictability. The model will be driven by the universal implementation of the Army Synchronization Toolset that will serve as the Army-level system of record to input, track, project, and synchronize training, mission, and modernization requirements across the force.

At the division level, we have also begun to transform, refine, and improve our systems and processes to execute the division-level training management philosophy previously outlined and set the conditions for a transition to ReARMM. The first step was defining what we wanted our two-year training model to look like for the division. Given the two-IBCT set and the multitude of requirements defined above, we created a predictable doctrinal template that uniformly laid out in time and space when major events should occur in order to give subordinate units maximum planning predictability.

Secondly, we developed annual direction of attack plans that pre-identified and forecasted known friction periods in order to allow the staff to begin shaping and mitigating risk much earlier in the planning cycle. Using event-based planning horizons and critical mission drivers (like CPXs, CTEs, CTC rotations, warfighting exercises, force modernization windows, and crisis response missions), we were better able to account for recurring high-risk periods, especially those centered around periods of transition. Further, it was clear that as a division planning efforts were generally stove-piped both within the operations enterprise as well as across the staff. We implemented a routine operations synchronization event and a semi-annual division-level resourcing conference aimed at synchronizing efforts across the organization.

These events have been designed to nest and feed into a routine division-level training management process like our annual training guidance publication, semi-annual training briefs, and training resources integration conferences. In addition, they nest and feed into the Army Synchronization and Resourcing Process, which most notably includes the semi-annual Army Synchronization and Resourcing Conference and Army Modernization and Equipping

Soldiers from 1st Battalion, 21st Infantry Regiment, 2nd Infantry Brigade Combat Team, 25th Infantry Division, conduct training at Kahuku Training Area on Oahu on 13 March 2020.

Photo by SPC Jessica Scott

Photo by SPC Jessica Scott

Soldiers with the 3rd Battalion, 7th Field Artillery Regiment fire an M777 Howitzer during training at Schofield Barracks, HI, on 19 October 2020.

Conference. These efforts, as well as our endeavors to reform our orders process and develop a company-battery-troop training meeting handbook and division digital training guide, have significantly assisted the division in performing more as the "emergent" layer in service to the canopy and below layers. They have better allowed us to shape the future training environment by substantially improving predictability, prioritizing and synchronizing efforts, and allocating precious resources efficiently and effectively. All of this is in the pursuit of improving the lethality of the force through building and sustaining readiness.

As we look to the future of the division under both ReARMM and the new "People First" strategy, we are also beginning to ask some hard questions about what the future of our JRTC rotations may look like for the 25th Infantry Division. First and foremost, in line with the Army Senior Leader Message to the Force, we are thinking about the cost benefit of sending an IBCT from 25th ID to JRTC at all. Our primary mission is to conduct persistent engagement with regional partners to shape the environment and prevent conflict across the USINDOPACOM region. Thus, we must consider the extent to which we can build training readiness during collective training at home station with Joint Pacific Multinational Readiness Center (JPMRC) support and during Pacific Pathways. This allows for the potential to train and certify units in a jungle environment; gives us more flexibility to conduct force modernization; and significantly reduces the financial cost, equipment readiness risk, and high OPTEMPO effects to our Soldiers and Families associated with conducting a JRTC rotation, CTE, and Pathways deployment in the same year. If FORSCOM looks to reduce the echelon at which it focuses training at JRTC, it may be possible to accomplish many of training objectives here in the Pacific that we would otherwise accomplish at JRTC, all the while saving a lot of time, resources, and stress on Soldiers, Families, and equipment.

However, given the assumption that the 25th ID will continue to execute JRTC rotations as planned, there is the potential to allow brigades to conduct platoon LFXs and company combined arms live-fire exercises (CALFEXs) at home station, whereas LFX days at JRTC could be used as force-on-force contingency training. FTXs are where organizations build multi-echelon mission command and tactical proficiency. Training proficiency (to include live-fire confidence) can and should be focused on squad and platoons, culminating at most with company STX and CALFEX prior to attending a CTC rotation. Battalion and brigade-centric proficiency can be exercised and assessed using home-station CTEs, virtual or constructed mission command exercises, Pacific engagements, and mobile external evaluation (i.e., JPMRC). Brigade EXEVALs do not necessarily need to be JRTC prerequisites, although that training time should still be used to train and certify at least to the company level prior to any given JRTC rotation. In the potential absence of a JRTC rotation, that CTE window should be used to build repetition at the appropriate echelon in accordance with upcoming Pacific Pathways requirements and as nested with the annual training guidance.

The last paradox we are trying to reconcile is the tension between the Army's transition to preparing for large-scale combat operations (LSCO) against potential near-peer competitors and the Army's shift toward focusing on the company level and below lethality while assuming risk at the battalion and above levels. In the LSCO environment, as well as in ReARMM, the division is the central maneuver unit. Thus, it could be argued that from an operational perspective we should be focusing on brigades and division across all warfighting functions (WfFs) and mission-command competencies.

Further, it could be posited under this paradigm that divisions should also be the central focal point as the rotational unit (RTU) at JRTC. This position, however, does not meet the intent of the current "People First" strategy that aims to simultaneously increase small unit lethality while decreasing OPTEMPO and reducing stress on Soldiers and Families. Because of this seemingly competing dynamic, as a division, it is becoming even more important that we are able to do both well. Our ability to understand this new operating and training environment, shape guidance accordingly, and synchronize activities in time and space have become all the more critical. We need to find creative ways to build and retain strategic overmatch, both in our technological capabilities as well as in our tactical and operational proficiency, while simultaneously meeting the Army's guidance to build readiness by truly putting our people first.

Readiness

Depending on the venue, reference, or discussion topic, we all tend to think and talk about readiness in very different ways. In AR 525-30, *Army Strategic and Operational Readiness*, readiness is defined as the ability of U.S. military forces to fight and meet the demands of the National Mission Strategy (NMS), with unit readiness being defined as the ability of a unit to perform as designed. In the 25th ID, we are thinking and talking about readiness as an essential component of the commanding general's operational approach, which is comprised of four primary lines of effort (LOEs): people, partnerships, readiness, and innovation/ modernization.

The readiness LOE is defined as the ability to sustain an agile and ready force capable of maintaining persistent engagement with regional partners to enable a free and open INDOPACIFIC that is prepared to rapidly deploy, fight, and win LSCO anywhere in the world. The LOE is divided into four sub-LOEs:

1) Operational readiness: Assigned forces are capable of deploying regionally and worldwide with little notice.

2) Training readiness: Units are trained, certified, and ready to execute their mission-essential task list (METL) tasks.

3) Manning readiness: Units are sourced to meet training and deployment readiness objectives.

4) Equipment readiness: Our equipment, property, supply stocks, and management processes enable units to maintain constant operational readiness.

The ultimate end state of this line of effort is that every Light Fighter in the 25th ID is physically fit, mentally tough, and highly trained as jungle operations experts to deploy, fight, and win in LSCO anywhere in the world. This framework has served as an essential primer to assist the division in thinking about readiness, but it is also clear that these definitions do not completely encapsulate the intangible essence of readiness that we are also aiming to improve upon.

We believe that readiness is more than just projected P,S,R,T ratings. Although these projections may serve as reliable indicators of readiness, true readiness resides in our organization's ability to perform as a cohesive team in austere conditions, resting firmly upon a foundation of trust as the fundamental bedrock of the Profession of Arms. In practice, we are talking about putting a Soldier and his or her fire team onto a faraway objective in all conditions on short notice with the maximum opportunity for success.

This means that both Soldiers and their parent organizations must be "ready" across a host of domains. And those readiness conditions must exist prior to those Soldiers stepping onto that hypothetical objective because it will be far too late to build readiness once their boots hit the mud. Those Soldiers must be physically and mentally prepared for the rigors of the operational environment; they must be emotionally and spiritually healthy, resilient, and capable of overcoming the challenges of combat; and they must be personally ready, to include their personal finances, awards, records, evaluations, and personal affairs. They cannot have anything hanging over their heads when they step onto that objective. They must know that their Families are safe, taken care of, and happy. Their equipment must be in top-notch condition; they must have faith in their equipment — not only knowing how to use it but that it works and they can rely on it when it counts. They must be trained and proficient in all of the skills and expertise they will need when they encounter the enemy. And perhaps most importantly, they must have faith in each other. This leads us to the critical discussion on the most important component of readiness that the division, as well as the Army, has been aggressively focused on — trust.

We need to find creative ways to build and retain strategic overmatch both in our technological capabilities as well as in our tactical and operational proficiency while simultaneously meeting the Army's guidance to build readiness by truly putting our people first.

People and Trust

Although the components of readiness described above are certainly essential elements of organizational and Soldier combat readiness, we understand that all of this is meaningless without trust. Trust is the intangible equalizer that makes or breaks organizational effectiveness and readiness. In many ways, our high OPTEMPO and overemphasis on training readiness have allowed a gap in trust to develop across the Army as we seemingly lost sight of a simple truth — that our people are our greatest asset.

In line with the Army's efforts to reestablish people as our first priority, the 25th ID has taken great strides to reconnect with our Soldiers in order to continue to cultivate a culture of trust that will indelibly increase our lethality and operational readiness. If our formations are stricken with corrosive diseases like sexual assault and harassment, racism, and suicide, how can we really be ready to fight tonight, even if our P,S,R,T ratings look good on paper? If we do not have faith in each other, if we do not truly know each other and really care for one another, how can we really perform as a cohesive team when it counts?

In the past several months, leaders at all levels have placed a renewed sense of urgency on tackling this concept. We have directed leaders at all levels to find ways to not only better manage OPTEMPO in pursuit of properly burdening lower echelon leaders in order to reduce stress on Soldiers and Families, but we have also aggressively pursued leader-to-Soldier engagement. This is more than just performing counseling or getting to know our Soldiers; it is

about reestablishing the right culture. A culture where every Soldier, every leader, every family member feels equally accountable to our greatest mission of achieving zero sexual assaults/harassments, zero equal opportunity incidents, and zero suicides.

In line with our HHQs and the Army-wide cultural change effort, we have implemented monthly readiness days and annual readiness weeks. These events aim to provide safe spaces for healthy and open dialogue, guided discussion facilitation, and improved leader-Soldier engagement. The normal stresses of Army life, taken together with the constant bombardment of social crisis in the past few months, have taken a toll on our formations. These events have helped to begin to open up critical dialogue and have had a major impact on our formations. Leaders at all echelons continue to leverage creative solutions to provide quality engagements in their units. And while we recognize that these events alone cannot change the Army culture, they have helped serve as a catalyst for change. Small unit leaders across the division recognized during these events that their Soldiers need more of this type of engagement on a more routine basis; they helped all of us remember in the midst of all of these training requirements that our most important commitment is to each other.

In February, the division also conducted an inaugural Squad Leader Forum. This event spanned several weeks and provided a full day of activities for all of the squad and section leaders from each battalion in the division. During these forums, squad leaders worked together to better understand what putting people first really means. They worked to better understand how we can better care for our Soldiers, how we can build and maintain cohesive teams, and how we can overcome the identified impediments to be successful in those first two endeavors. This event served as a powerful opportunity for the division command team and leaders at echelon to hear the perspectives of our junior NCOs who have the most profound direct impact on our Light Fighters. Moving forward, the division is taking the feedback received during these forums and building a long-term certification process to better assist, educate, and enable squad leaders to better care for their Soldiers.

Photo by 1LT Ryan DeBooy

Soldiers perform a traditional warrior dance during the 25th Infantry Division change of command ceremony on 5 November 2019 at Schofield Barracks.

Leader Development

A significant part of our effort to change culture is leader development strategy. In Field Manual 6-22, the Army defines leader development as "the deliberate, continuous, sequential, and progressive process — founded in Army Values — that grows Soldiers and Army Civilians into competent and confident leaders capable of decisive action. Leader development is achieved through the lifelong synthesis of the knowledge, skills, and experiences gained through the training and educational opportunities in the institutional, operational, and self-development domains." And while this definition certainly captures leader development as a process, we again ask: How can we think about leader development as a mindset? In his article "Leadership Development: A Review in Context," David V. Day separates leader development and leadership development.[1] He describes leader development as an investment in human capitol, teaching-coaching-mentoring subordinates to prepare them for their current and future jobs. But he also takes an interesting approach to thinking about leadership development, in which we might think about the effort in terms of investing in social capitol. Meaning, we focus on establishing a cultural mindset of growth instead of purely focusing on individual skills and attributes. In this model, the organization becomes a leadership factory where subordinates are empowered and intrinsically motivated to add value to the development of their subordinates, peers, and superiors alike without being formally directed to do so. In this model, the community of practice is the central focal point — not the individual. The organization as a whole becomes an environment in which growth and development are core values that supersede routine task accomplishment.

This new leadership development framework requires us to also distinguish between the manager and the leader. Managers are focused on transactional task accomplishment, organization performance, and meeting the routine demands of the job. In contrast, leaders are transformational; they drive their teams to achieve a culture of peak performance through idealized influence, intellectual stimulation, individualized consideration, and inspirational motivation. They are true role models of the espoused values of the organization, they stimulate growth in their followers, they deeply empathize and care for their people, and they inspire those around them to achieve excellence. They rely firmly on the referent power earned though trust, strength-of-relationship, and rapport rather than the power granted by their rank, expertise, or ability to reward and punish. These leaders see leadership as a negotiated social contract

between themselves and their followers, rather than a mandate afforded by their position.

As a critical component of our effort to prioritize people in pursuit of attaining true readiness as described above, we again ask: How does the division serve as the "emergent" layer to help shape this culture of leadership development? Like this upper layer of the jungle, the division cultivates the soil for regeneration; it provides the sunlight, water, and nutrients that enable life to flourish, and it creates the ideal conditions for the layers below to do the same.

Photo by SGT Mitchell Ryan

Soldiers assigned to 1st Battalion, 27th Infantry Regiment, 2nd Infantry Brigade Combat Team, 25th Infantry Division, conduct operations during Lightning Forge 20 on 15 July 2020.

In the 25th, the division has unequivocally placed people as our number one priority, with leadership development as a significant part of that effort. From the commanding general down, leaders at all echelons have provided enormous command emphasis on their leadership development programs. This shift in culture has manifested itself across the operational, institutional, and self-development domains. Our Light Fighters enjoy countless operational growth opportunities while conducting partnership engagements in the Pacific and in Hawaii. Our multinational training exchanges, training events, and exercises routinely provide our Soldiers with high-impact and unique experiences. In addition to CONUS-based schools and online training, our Hawaii-based Lightning Academy provides our Soldiers with ease of access to a multitude of institutional development opportunities such as the Small Unit Ranger Tactics, Jungle Operations Training Course, and Air Assault School.

Further, staff training programs and leadership professional development series at echelon have significantly improved tactical-level expertise and operational/strategic-level awareness. Leaders are sharing developmental readings, initiating professional dialogues, and teaching-coaching-mentoring their junior leaders. But what is most encouraging is that Soldiers and leaders alike are taking the initiative to do the same through self-development and developing their subordinates without HHQ direction. This infectious culture of leadership development and growth mindset have steadily become a foundational pillar of this division. As a learning organization, we continue to re-think how we are truly prioritizing our people to help our units and the Army remain ready to meet the increasingly complex demands of the future operational environment.

Conclusion

The rapid pace of disruption in the modern era has taught us one critical lesson: You must change to survive. As the Army continues to adapt to the demands of the operational environment, like the jungle continuously evolves, we too must endeavor to deliberately change in order to maintain our operational relevance and capability. We have to change the way we train and fight, the way we think and plan, and the way we act and treat each other. At the 25th Infantry Division, we are inviting new innovative approaches across all formations and practices to help our division remain the premier fighting force in the Pacific theater and the Army's foremost jungle experts.

Notes

[1] David V. Day, "Leadership Development: A Review in Context," *The Leadership Quarterly* 11(4) (December 2000): 581-613.

MAJ Chris Mattos currently serves as the G3 Training of the 25th Infantry Division at Schofield Barracks, HI. His previous assignments include serving as a rifle and a reconnaissance platoon leader with 1st Squadron, 2nd Cavalry Regiment, Rose Barracks, Germany; assistant S3, 1-2 CAV; maneuver planner, G5, 101st Airborne Division, Fort Campbell, KY; assistant S3 and company commander with 1st Battalion, 187th Infantry Regiment, 3rd Brigade Combat Team, 101st Airborne Division; and tactical officer, U.S. Military Academy (USMA) Preparatory School at West Point, NY. MAJ Mattos graduated from the following military courses: Ranger School, Airborne School, Sniper Employment Leader Course, Javelin Gunner Course, Stryker Leader Course, Reconnaissance and Surveillance Leaders Course, Basic Officer Leader Course, Infantry Basic Officer Leader Course, Maneuver Captains Career Course, Command and General Staff Officers Course, Army Security Cooperation Planners Course, and a Strategic Broadening Seminar on Dense Urban Studies. He earned a bachelor's degree in operations research from USMA and a master's degree in organizational psychology from Teacher's College, Columbia University, NY.

Care and Maintenance of Our Most Dangerous Weapon

LTC (RETIRED) CHARLES D. HENRY

The most dangerous weapon on the battlefield is the individual warfighter. With or without a specific weapon system, there is nothing more potentially dangerous than a fit, trained, motivated, and focused warfighter in action. To create, shape, and enhance the individual into a warfighter, we start with the generic Mark 1, Mod 0 human being. We must understand our innate capabilities and limitations to attain and sustain optimal performance and not to waste such a prize finished asset.

There are many factors that influence warfighters' physiology and performance. The human body is very adaptive, but it has definite limits and can only adapt so far on its own. It is behavior — what we know and do — that allows us to survive and act in all environments. With all the possible interactions in any environmental change, our answer to the question of our survival and success is always "it depends." This is where we, as warfighter leaders, earn our pay by evaluating the changes and directing and supporting the necessary behaviors and actions to help preserve the physical and emotional potential of individual warfighters.

We must remember that human beings are not machines. We sometimes need "warm-up" or "start-up" times to adapt and fully engage our physical potentials, and we do have some vulnerabilities. Sometimes we need time to recover from efforts, to recharge our batteries or let our body's systems come back into balance for optimal performance. Sometimes we need to change the pace of our operations to maintain that optimal performance. To attain and then sustain optimum physical performance in our warfighters, we must be aware of how our bodies work and where any vulnerabilities might exist.

The following is an outline of "rule of thumb" knowledge and guidance for warfighters and their leaders. It is hoped this understanding of our bodies' innate capabilities and limits will enable warfighters to always safely succeed in their tasks.

We Always Sweat

Humans are the most prolific sweaters in the entire animal kingdom. At all times we are losing water in part because water evaporation is the best way for us to lose heat, and this is something we must do as warm-bodied animals. In a neutral thermal environment, obvious sweating does not occur except where ventilation is restricted around the feet, groin, waist band, neck band, and armpits; and this evaporation accounts for only 15-25 percent of our total heat loss. Of the total, slightly more than half is the result of evaporation from the respiratory tract as we breathe, with the remainder coming from the water that passively diffuses through the skin and evaporates. Except when in the cold, we always produce excess waste heat that we must lose to remain healthy. In the cold, we are not well equipped by nature

Photo by PVT Lawrence Broadnax

A Soldier with the 25th Infantry Division's Lightning Academy pulls security for his team during an exercise as part of the Jungle Operations Training Course at Schofield Barracks, HI, on 18 June 2020.

to prevent the crippling continuous heat loss that threatens our lives. We must supplement our physical capabilities with behavioral actions to sustain and support ourselves. Understanding the nature of these threats helps us refine our behaviors to best sustain warfighters.

Envelopes of Performance — Temperature and Humidity

The temperature range of our indefinite living environment with adequate food, shelter, rest, and water is 40-95 degrees Fahrenheit (F). However, we must always remember that it is the intensity of our physical work that creates the heat that incapacitates and sometimes kills us. We can create fatal heatstroke at as low as 76 degrees. As it is the combination of intensive activity and behavior that creates these harmful conditions, we must remember that the British Army has reported heat injury and illness in trainees at 50 degrees. One of the worst cases reportedly occurred when overdressed Norwegian marathoners, who had been misinformed about weather conditions, suffered heat illnesses and injuries at 32 degrees.

As increasing humidity slows down our protective evaporation, our internal heat burden can grow with any physical activity or labor that can create heat faster than the body can lose it when the relative humidity is more than 50 percent. The effects of humidity on our work capacity apparently depend on the intensity of the work we are doing by creating the heat load we generate internally.

Photo by SGT Lauren Harrah

Soldiers from the 3rd Infantry Division conduct a dismounted water crossing during joint training at Zagan Training Area, Poland, on 24 August 2016.

In the low range of humidity, prolonged exposure to 10-15 percent humidity threatens eye and skin damage as well as faster dehydration that threatens our whole body.

Time Needed for Adaptation to Heat

The research of Lawrence Armstrong, Ph.D., has revealed the following facts for heat acclimatization:

- A minimum of three days is required for our initial adaptations to heat to take place to create the foundation of our new basic physical stability. To act aggressively before this time is simply begging for rapid exhaustive failure.

- A minimum of 10 days under best conditions is required for all our physical adaptations to heat to become complete, while 14 days is normally expected in stable heat conditions.

We cannot speed up these processes by forcing water and electrolytes, as these only create chemical imbalances that our body has to take additional time to sort out. The U.S. military treats approximately 100 cases of hyponatremia (low body salt) each year as troops drink too much water and then collapse into convulsions and nervous dysfunction. So far, at least two Army deaths from this cause have been reported.

Adaptation to Cold

The challenge of cold is to behaviorally adapt to the threat of continuous excessive heat loss as the temperature drops below 40 degrees. Can we insulate and feed ourselves well enough to prevent our decline because of the continuous degradation caused by the cold? If the cold is moderate enough and stable, there are indications that a plateau of adaptation can be attained in approximately two to four weeks as compared to the two weeks generally needed to adapt to a hot environment. Whenever and however those adaptations occur, both are absolutely dependent on the continuous maintenance of the new supportive behaviors. We must remember that while we can protect ourselves from excess heat with just shade, water, and rest, protection from cold requires additional food, water, warm shelter, insulating clothing, and the ability to stay dry.

The Dangers of Being Wet

Water conducts heat away from the body 25 times faster than air. According to Technical Bulletin (TB) 508, *Prevention and Management of Cold-Weather Injuries*, "Wading in streams or working in the rain substantially increases a Soldier's susceptibility to hypothermia because water has

a high thermal conductivity." The TB states that the core temperature cooling rate depends on both water temperature and the immersion depth. TB 508 also states: "Soldiers who have low body fat and a high surface-area-to-mass ratio are more susceptible to faster cooling rates. Also, Soldiers who have not eaten in over 24 hours are more susceptible, as are those who are fatigued because of physical exhaustion or sustained operations."

The Dangers of Wind Chill

Wind increases our rate of heat and moisture loss. NATO employs the wind chill temperature index (WCTI) to determine environmental cold stress. The WCTI integrates wind speed and air temperature to provide an estimate of the cooling power of the environment and the associated risk of peripheral cold injury. The wind chill temperature is the equivalent still air (i.e., no wind) temperature at which heat loss through bare skin would be the same as under windy conditions. Note that warfighters riding in open vehicles or exposed to propeller/rotor-generated wind can be subject to dangerous wind chill, even when natural winds are low. Ambient dry bulb and contact surface temperatures (exposed skin) are used to determine the risk of frostbite. There is no risk of frostbite when the ambient air temperature is above 0 degrees Celsius (32 degrees F) even though the WCTI may be below freezing due to strong winds. Wet skin will not freeze if the air temperature is above 32 degrees F, but wet skin below this temperature will freeze faster than dry skin. Temperatures, wind chill, and risk of cold injury increase at high altitudes as air temperature is about 3.6 degrees F lower with every 0.3 kilometers (1,000 feet) above the site at which temperature was measured.

Water and Caloric Needs

Depending on the environmental temperature, three to eight days without water will kill a human.

A minimum average of 2.5 liters of water per day is needed to sustain inactive humans.

A fit, acclimatized human can sweat up to three liters per hour but can absorb no more than 1.3 liters per hour which means that rest, food, and water breaks are absolutely required to allow the body to rehydrate.

With increasing dehydration, all the benefits of fitness and acclimatization for physical performance and protection are lost. A fit but dehydrated warfighter is no more capable than an unfit, unacclimatized adolescent.

Without food, inactive humans take four to six weeks to die; having to be active shortens this time.

Without eating, no one can fully rehydrate as the body cannot fully absorb water without solid food.

When we start shivering to create extra warmth for our body in the cold, we start burning extra fuel and then need extra food to replace these energy reserves as we start to burn ourselves out.

In the cold, warfighters need 25-50 percent additional food per day to survive and work. That's generally the daily equivalent of four standard meals, ready to eat (MREs) if nothing else is available.

A National Guard Soldier from Bravo Company, 1st Battalion, 297th Infantry Regiment, provides cover fire with his team during Arctic Eagle 2018 outside of Fort Greely, AK, on 2 March 2018.
Photo by SPC Michael Risinger

The daily caloric requirement record that I know of is warfighters consuming an estimated 7,400 calories per day cross-country skiing with 45-kilogram packs in the Arctic. This was possible only because they had hours of warm, protected rest and plenty of food each day helping their bodies to recover from the daily efforts. This effort was limited to three days and 51 kilometers.

The current Greenland Sledge Patrol member depends on the consumption of 7,000 calories per day and 5,000 calories per dog per day for their two-to-five-month patrols. This is currently the greatest endurance effort that I know of.

It is no coincidence that military training programs around the world that minimize food, water, and rest as part of tests of stamina and performance usually curtail the program after five to six days as thereafter exhaustive failure, injury, and death occur.

Effect of Altitude

Operations in the mountains present three possible hazards: the diminishing oxygen with altitude, the frequent cold, and an often wet environment.

Above 4,900 feet the air gets thin enough to begin to diminish the oxygen we need for energy.

Our maximal oxygen uptake begins to decrease significantly above an altitude of 1,600 meters (5,249 feet). The altitude limitations in total body oxygen transport begin to appear above 2,000 meters (6,562 feet). For every 1,000 meters (3,281 feet) above that the maximum oxygen available to our body drops by approximately 8-11 percent.

It takes approximately two weeks to adapt to the changes associated with the hypobaric conditions at 2,268 meters (7,500 feet). Every 610 meters (2,000 feet) above that requires an additional week of acclimatization to altitude.

What Starts Failing First

Our brain is the most vulnerable component in our body. It is the first of our systems to begin failing under the environmental stresses of heat, cold, and fatigue. As we fatigue, we become distracted and slower to see and think. Our accident rates climb as the temperature either climbs or lowers to extremes. Continuing physical and mental toughness is absolutely required for warfighters to continue to perform. Training, discipline, experience, and mind/body toughness can counteract much of the effects of stress, but these must be combined with continuous clear-headed planning and adequate supporting resources. A failure of the leadership to protect their ability to continually think and act clearly can quickly lead to chaos and mission failure. All experienced warfighters can remember missions and exercises that drifted and whimpered to an end rather than surged across the finish line as the wear and tear of the effort wore down the chain of command.

Summary

What I have tried to present are nine sets of factual rules of thumb to describe with general accuracy the boundaries of normal human health and performance for warfighters who are almost always pushing the human performance envelop in pursuit of their mission in often stressful environments. Each human being is unique, so it is always a mistake for leaders to assume that everyone in a unit will react to the environment in the same manner and be able to withstand the applied stress for the same duration. Leaders must always watch the whole unit for signs of someone failing, as this can act as a barometer of stress for the whole unit.

Understanding how we can be physically challenged by and then respond to the environment allows us to fully apply the knowledge of how we should behave in that particular environment that we have accumulated with experience. That tested knowledge of how to behave is found in our professional warfighter publications listed in the references below.

Virtually every day we approach some of our normal healthy limits, but we are protected by our unconscious behaviors (stop working when tired, take a drink when thirsty, and eat when we are hungry). As warfighters, our missions and tasks often take us beyond those safe limits — sometimes very far beyond. We become rightfully proud of our learned abilities to “suck it up” — to endure. But we must be aware of the price we are potentially paying and the rate at which we pay it. If we can understand what may be threatening to tear us down, we may then be able to prevent, wherever possible, the likely exhaustive failure, injury, and death. When we reach our objectives, we want and need to be able to stand tall, ready, capable, and alert without also being exhausted, stumbling, distracted, and vulnerable.

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LTC (Retired) Charles D. Henry’s career has allowed him to earn both the Expert Infantryman Badge and the Expert Field Medical Badge. His service included operations in the Andes, the Alaska Range, the Huachucas, the Rockies, and the Sierras — all over 5,000 feet. He was inducted into the “Below 50 Club” at the Northern Warfare Training Center for training in the field at temperatures measured below -50 F. His service included winter operations in Korea, Alaska, Europe and the Eastern and Northern United States. He also experienced operations in South and Central America and the Southwestern and Southeastern United States. He has earned a master’s degree in Physiology.

Modernizing for Victory:

U.S. Army Fires at the Battle of Palo Alto, 1846

MAJ NATHAN JENNINGS

On 8 May 1846, a small American field army under General Zachary Taylor won a decisive victory over the Mexican army at the Battle of Palo Alto in the opening engagement of the Mexican-American War. While the U.S. Army's infantry and dragoon branches would go on to earn renown at fabled places like Monterrey, Cerro Gordo, and Mexico City, the day at Palo Alto, along the north bank of the Rio Grande, belonged to the artillery corps. Positioning ahead of the front lines with innovative tactics and new field guns, Taylor's batteries smashed the Mexican infantry at the onset of the fight and then continued to disrupt further Mexican attempts to close with Taylor's lines.[1] The resulting victory preserved United States' control of Texas and set conditions for further American invasions of Mexican territory.

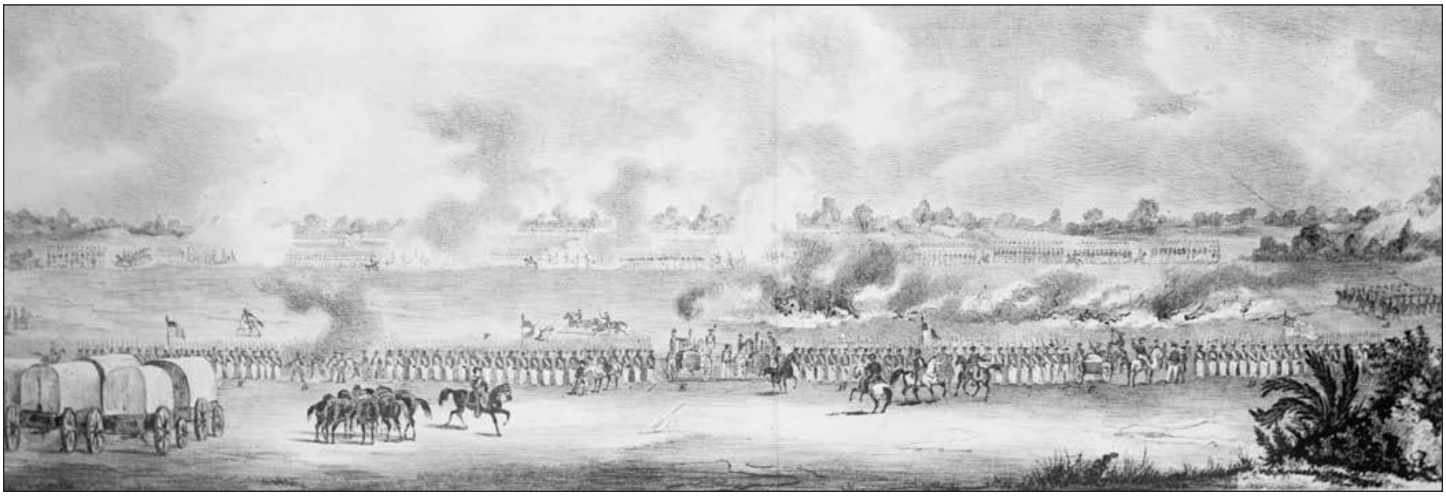
The degree of fires overmatch achieved at Palo Alto by Taylor's batteries can be attributed not only to the skill of the engaged artillerymen but to events that occurred before the war. Over the previous decade, despite having no expectation of an imminent war, the U.S. Army had implemented an ambitious modernization program designed to revitalize its artillery arm in preparation for potential conflicts. This program included establishing a light, mobile field artillery arm that could move quickly and engage at longer ranges with the latest advances in cannon technology.[2] The resulting evolution, which required a reinvention of the artillery corps between 1838 and 1844, provided an asymmetric advantage to the U.S. Army just two years later when it marched south to fight in Mexico.

This 19th century modernization program, and its successful combat debut at Palo Alto, holds insights for the modern U.S. Army as it similarly seeks to modernize its arsenal to attain competitive advantage. For Taylor's batteries in 1846, possessing technological overmatch was not sufficient; the real advancement in warfighting capability stemmed from the pairing of the new weaponry with a horse-centric battery organization, tactics that emphasized mobility and rapid fire as well as trained junior and mid-grade officers who understood the new system's potential. This alignment of form and function serves as a model for the current U.S. Army Modernization Strategy's imperative to "develop the next generation of weapons systems and maintain overmatch against near-peer adversaries."[3]

Investment Pays Dividends

The U.S. Army in the middle-19th century primarily comprised a small force of infantry, dragoon, and artillery regiments dispersed along the East Coast and across the young republic's expanding frontiers along the western expanses

Illustration of the Battle of Palo Alto



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of the Mississippi River basin. Even after facing severe challenges during the War of 1812, the institution relied upon volunteer mobilization to expand its combat power for potential wars with nation-state competitors. On the eve of war with Mexico, the U.S. Army's strength stood at just 7,365 men dispersed in scattered companies and battalions across numerous frontier garrisons. Conversely, the Mexican army boasted a far larger force of 18,882 regulars and 10,495 militia in 1846 when conflict erupted along the Rio Grande.[4]

However, the U.S. Army's pre-conflict investment in modernization of its artillery arm, particularly the light field artillery, would in part offset the Mexican army's numerical superiority. This battlefield advantage originated with the War Department's fortuitous realization in 1838 that the U.S. Army drastically needed to modernize its expeditionary fires capability. The program that followed, which was personally led by Secretary of War Joel Poinsett, launched a robust debate over what kind of cannon and units would yield the degree of mobility and versatility required to project force along America's expanding frontiers. While the Ordnance Board of 1838 initially designated iron cannon based upon dated experiences in the War of 1812, Poinsett disagreed and dispatched a research team to Europe to learn about the merits of bronze casting. The survey results revealed conclusively that a bronze-based field artillery system would allow greater range, efficiency, and accuracy.[5]

After two more years of debate over calibers, types of fuses and munitions, and designs for horse-drawn carriages, Poinsett empowered a team of forward-thinking officers to lead the creation of a light field artillery system that consisted of 6- and 12-pound field guns, an array of 12-, 24-, and 32-pound howitzers, and 12-pound mountain howitzers. In 1841, needing a new tactical doctrine to guide employment of the new weaponry, the artillery arm translated and adopted a French army manual, *Instruction for Field Artillery: Horse and Foot*, in order to provide a modern organizational structure and tactical methods. The new field artillery structure, which was designed to support maneuvering infantry and cavalry with forward, mobile positioning, comprised mounted light batteries of six guns each under a captain with each battery then subdividing into three two-gun sections each under a lieutenant.[6]

The selection and training of a new cadre of artillery officers to operate the new systems posed another dilemma. After receiving initial resistance from conservative-minded senior officers of the 1st and 2nd U.S. Artillery Regiments over implementation of the new concept, the War Department first activated a pilot company under Major Samuel Ringgold — a trail-blazing officer who would lead, and die, with distinction at Palo Alto — and then followed with creation of three additional mounted companies as the production of bronze cannon and procurement of trained horses allowed. Realizing the dearth of existing expertise in the regiments, Poinsett also created a centralized camp in New Jersey for individual batteries to rotate through in order to receive specialized training in the new arms. In 1844 the U.S. Army began assigning new lieutenants directly to the mounted batteries, as opposed to detailing them from the artillery regiments, in order to create a depth of institutional expertise.[7]

This 19th century modernization program, and its successful combat debut at Palo Alto, holds insights for the modern U.S. Army as it similarly seeks to modernize its arsenal to attain competitive advantage.

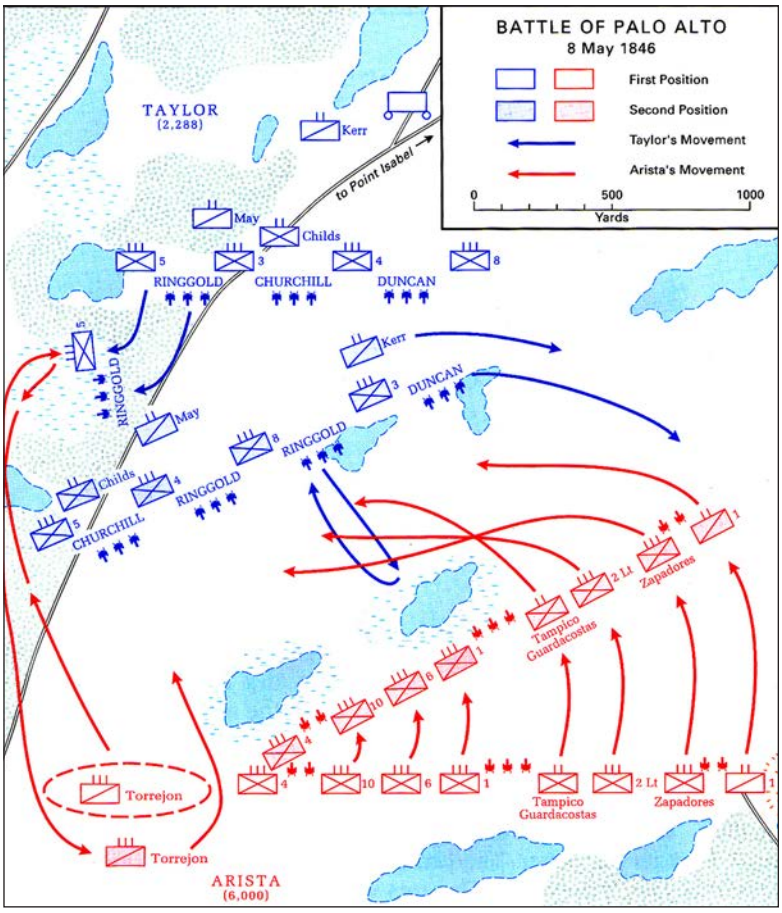
The prospect of war between the United States and Mexico in 1846 thus found the U.S. Army dramatically outnumbered by its Mexican counterpart but in possession of a modernized, superior field artillery arm. When the United States annexed Texas in 1845 and inherited the Texas Republic's assertion that its territory extended south to the Rio Grande, the Polk Administration dispatched Taylor's diplomatically named "Army of Observation," comprising 1,500 Soldiers and including three of the new field artillery batteries, to enforce the claim. The small expeditionary force proceeded to first camp at Corpus Christi and then, as tensions escalated, established a fortified post called Fort Texas in the contested territory across the river from the Mexican city of Matamoros. On the southern bank, Mexico's Army of the North likewise postured to defend land and honor.[8]

Tensions over territorial disputes in South Texas then exploded into full-scale war when Mexican cavalry ambushed and defeated an American dragoon detachment near the Rio Grande. The engagement occurred on the north bank of the river and resulted in the embarrassing capture of two companies of the 2nd U.S. Regiment of Dragoons. President James Polk, learning of the skirmish in Washington, D.C., controversially declared that "American blood has been shed on American soil" — which actually occurred in disputed territory that the Texas Republic had never controlled — and called for the U.S. Congress to declare war.[9] This aggressive policy, which found some resistance in Congress, reflected the Polk Administration's real intent to employ the Texas dispute as a pretext to fulfill visions of Manifest Destiny by seizing New Mexico and California.

However, before Taylor could receive news of the declaration, the pace of events quickened in the Rio Grande Valley as the opposing armies maneuvered for positions of advantage. When the Mexican Army of the North under General Mariano Arista besieged and isolated the small American garrison at Fort Texas, Taylor advanced his main force from its primary logistical base at Port Isabel on the Gulf Coast to rescue the beleaguered defenders. Arista, leading force of 3,702 soldiers, turned to the northeast and established defensive positions across a broad and marshy plain at Palo Alto that blocked the road to Fort Texas. These actions, all reflecting judgements by commanders acting outside of a declared state of war, set the stage for the first major battle of the Mexican-American War.[10]

The Mexican defensive line extended for approximately one mile, with irregular cavalry anchoring the left end, heavy cavalry and several infantry brigades holding the center across the road, and additional light cavalry guarding the extreme eastern end of the line. Arista, who had significant combat experience in previous wars, deployed two 8-pound and six 4-pound cannon along his front. When Taylor's reconnaissance party discovered the Mexican dispositions, he responded by dividing the American force into two infantry wings, with the three batteries and their bronze field guns in front and a squadron of the 2nd U.S. Dragoons held in reserve. The plain's marshy center, clumps of trees, and patches of dense chaparral brush complicated both the defenders field of view and the advancing army's freedom of maneuver.[11]

The battle commenced at approximately 1400 hours on 8 May 1846 when the arrayed Mexican cannon opened fire on the advancing American Army. However, the defenders' dated, copper cannon proved unable to strike Taylor's men who halted one-half mile to the north. Then, in the moment of truth that would reveal the value of the War Department's modernization efforts, Taylor ordered his three batteries under Lieutenant William Churchill, Major Ringgold, and Captain William Duncan — who commanded the American right, center, and left artillery positions respectively — to return counterfire against the Mexican lines. The U.S. Army's updated Model 1840 bronze field guns, with a range of 1,500 yards, proceeded to both suppress the Mexican cannon and pour solid shot and exploding case shot into the ranks of the Mexican infantry.[12]



Guns Along the Rio Grande: Palo Alto and Resaca de la Palma by Stephen A. Carney

Map of the Battle of Palo Alto — 8 May 1846

Realizing his inability to win the artillery contest, Arista ordered a western flank attack by his larger cavalry force under an aggressive officer, General Anastasio Torrejon, who had previously defeated the American dragoons. The 5th U.S. Infantry Regiment, with a two-gun section of 6-pounders in front, countered the assault and compelled the Mexican cavalry to retreat back to their lines with high casualties. Meanwhile, in the center, Ringgold moved his battery forward to increase the deadly pressure on the Mexican infantry. At approximately 1700 hours, Torrejon led another flanking attack on the American right while Arista ordered his own artillery to engage Ringgold's battery, which had closed to within 400 meters of the Mexican lines. The Mexican's fire pushed the American battery back, and in doing so, mortally wounded Ringgold.[13]

Sensing an opportunity, Arista ordered a final flank attack against the American left with a mixed force of light infantry and light cavalry. He hoped to move around the 8th U.S. Infantry Regiment's extreme eastern position to destroy the American wagon train. Fortunately for Taylor, his modernized artillery again proved its worth: Duncan's mobile battery raced to the exposed flank and fired canister shot into the Mexican ranks as they emerged from the chaparral brushline. The 8th U.S. Infantry and the 2nd U.S. Dragoons then provided additional support, ultimately repelling the Mexican assault. Duncan, seeing the Mexican army in distress, completed the day's action by moving his battery to within 300 yards from the Mexican right flank to fire directly into the ranks. Bloodied and exhausted, Arista's soldiers withdrew to the southern edge of the battlefield and camped for the night. Their casualties for the day included 102 dead and 129 wounded in contrast to the five killed and 48 wounded for the Americans.[14]

Modernization Lessons

The American artillery continued its performance the next day at the Battle of Resaca de la Palma, where Ringgold's battery, now under new leadership, again led the way with devastating fire against Arista's battered forces. This continued fires overmatch set a precedent for the remainder of the war where the modernized U.S. Army, and its field guns in particular, won battle after battle as the Polk Administration dispatched additional expeditions into New Mexico, Alto California, Baja California, the Gulf Coast, and finally into the Valley of Mexico to seize Mexico City. While the U.S. artillery's modernized mounted batteries would not achieve such outsized impact in most engagements, they nevertheless proved instrumental in enabling American victory at places like Monterey, Buena Vista, Cero Gordo, Molino del Rey, and Chapultepec.[15]

The U.S. Army artillery arm's remarkable performance directly stemmed from modernization initiatives undertaken by the War Department prior to the outbreak of war. By conducting a rigorous, research-driven program to develop an enhanced long-ranged fires ability with the requisite battlefield mobility, American ground forces, with significant naval and marine support, were able to win repeatedly and decisively in expeditionary settings — almost always against numerically larger forces. This capacity for tactical overmatch enabled the attainment, however controversial, of the Polk Administration's strategic aim to expand U.S. territory to include South Texas, New Mexico, and California. It ultimately resulted in the rise of the United States as the dominant power in North America and provided it access to expansive markets across the Pacific Ocean.[16]

This achievement in combining pre-war modernization with successful combat validation holds several insights for the U.S. Army in the 21st century as it once again seeks to evolve warfighting capabilities in an uncertain world. The first of these centers on the War Department's decision in 1838 — despite institutional resistance — to compel a forward-thinking, process-driven modernization agenda to improve its atrophied ground fires capacity. While no definite adversary presented itself at that time, visionaries like Secretary Poinsett recognized the requirement to increase readiness by incorporating the latest technological advances from Europe and adapting them to the U.S. military structure in order to prepare for a range of potential nation-state and Indian conflicts. This process included overriding senior officers and officials who remained wedded to outdated notions and empowering agents of change to compel modernization.[17]

A second lesson from the U.S. Army's experience with modernization at the Battle of Palo Alto centers on how the institution successfully created new organization and tactics to wield the acquired weaponry. Beginning with a pilot company and then expanding to full capacity, the U.S. Artillery incorporated new organizational structures and doctrine specifically designed to enable an enhanced range of battlefield mobility and long-ranged fires. Poinsett, realizing the subsequent requirement to systematize the newly acquired expertise, rotated mounted batteries through a central training facility to ensure improvement of individual skills and expansion of institutional capacity.[18] This pre-war focus on aligning technology, organization, doctrine, and training paid clear dividends at Palo Alto when the U.S. Army's untried mounted batteries proved their value.

The third insight from the United States' experience with modernization prior to the Mexican-American War pertains to how the War Department allocated, groomed, and trained a new cadre of officers and men to operate the new field guns. By initially empowering men like Ringgold, who could visualize the tactical potential of the fleet and lethal field guns, and then creating an institutional pathway to assign new officers to the units, the War Department professionally developed a cadre of trained and motivated light field artillery officers who mastered the new systems.[19] This alignment of personnel with the new organization and technology again proved its value at Palo Alto and throughout the Mexican-American War, when junior artillery officers repeatedly seized initiative to advance and reposition gun teams in order to forestall defeat and enable victory.

Looking towards a new century of challenges, the contemporary U.S. Army must follow its predecessors' example in modernizing its arsenal to achieve victory. As mandated by its own strategic imperative to "enable multi-domain forces to penetrate and neutralize enemy A2/AD (anti-access/area denial) capabilities while ensuring military overmatch at every echelon," the institution requires leading visionaries to identify necessary evolutions and compel innovative and research-based improvements to its warfighting capabilities.[20] This remains especially true in the contest for superiority of long-ranged fires — which, more than a century later, remains instrumental for shaping operational conditions for all other ground forces. Given this enduring fundamental, the achievements of the U.S. Army's revitalized artillery at Palo Alto, and the modernization process that created it, remain an example to be emulated.

Notes

[1] K. Jack Bauer, *The Mexican War, 1846-1848* (Lincoln, NE: University of Nebraska Press, 1992), 52-57.

[2] Boyd Dastrup, *King of Battle: A Branch History of the U.S. Army's Field Artillery* (Fort Monroe, VA: Training and Doctrine Command, 1992); 67-71.

[3] 2019 Army Modernization Strategy: Investing in the Future, https://www.army.mil/e2/downloads/rv7/2019_army_modernization_strategy_final.pdf.

[4] Stephen A. Carney, *Guns along the Rio Grande: Palo Alto and Resaca de la Palma*, (Washington, D.C.: Center of Military History, 2005), 7.

[5] Dastrup, *King of Battle*, 67-68.

[6] Ibid.

[7] Ibid.

[8] Carney, *Guns along the Rio Grande,* 11-14.

[9] John S.D. Eisenhower, *So Far from God: The U.S. War with Mexico, 1846-1848* (Norman, OK: University of Oklahoma Press, 2000), 66.

[10] Carney, *Guns along the Rio Grande*, 15-18.

[11] Bauer, *The Mexican War*, 54.

[12] Carney, *Guns along the Rio Grande*, 17-20.

[13] Ibid, 20-22.

[14] Ibid.

[15] Bauer, *The Mexican War*, 397-399.

[16] Ibid.

[17] Dastrup, *King of Battle*, 67-71.

[18] Ibid.

[19] Ibid.

[20] 2019 Army Modernization Strategy.

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