General
Gordon R. Sullivan
1937-2024

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BG Michael J. Simmering
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Continuous Transformation of Armor and Cavalry

On Feb. 27, 2024, the U.S. Army published the Army Structure (ARSTRUC) which will transform our Army from 2025-2029. The effects of this decision will reverberate throughout our Army for the next decade as we transform into a more capable force designed specifically for large-scale combat operations. While standing up additional long-range fires, air defense, and multi-domain units, the U.S. Army made the difficult choice to stand down engineer, military police, and light cavalry units along with many more.

Understandably, some will feel uneasy about these decisions. However, we should all acknowledge the ARSTRUC reflects an analysis of the Army's available resources coupled with a prioritization of requirements to succeed in future combat. The ASTRUC also reflects the hard decisions every leader must make going forward in a continuing era of constrained resources to ensure we are capable of fighting and winning future wars – to include standing up four mobile protected firepower battalions of M10 Bookers within light units for which the Armor School serves as the proponent. While the loss of 14 light cavalry squadrons among our infantry and Stryker brigades is not ideal, this decision reflects the evolving character of war and a prioritization of the requirements necessary for our Army to respond in crisis and prevail during competition.

To ensure the remaining armor and cavalry formations maintain warfighting capable personnel readiness levels, the Armor School worked with Headquarters Department of the Army G-1, Human Resources Command, U.S. Army Forces Command, and the operational force to ease the burden on commanders and military occupational specialty (MOS) 19D Soldiers during this period of transition. As CSM Waylon D. Petty, Thunderbolt 7, discusses in "From the Gunners Seat," despite the inactivations, the Armor Branch and the Army requires the skills and knowledge in the armor and cavalry force. On March 11, 2024, the Armor School published the decision to forego the 19K MOS transition course requirements for MOS 19D skill level I and II Soldiers. Additionally, the Armor School published the decision to forego the 19C MOS transition course requirements for MOS 19D skill level I, II and III Soldiers. This action serves as a temporary easement of requirements to allow MOS 19Ds within inactivating cavalry squadrons to quickly transition to other CMF 19 MOSs should they desire. Upon arrival at their new armored brigade combat team (ABCT), transitioning MOS 19Ds will encounter the same risk mitigations already in place among operational units. These Soldiers will be under the supervision of an experienced non-commissioned officer. They will progress in this learning environment until they successfully complete an entire gunnery progression and obtain a valid operator's license in accordance with current Army regulation. At the same time, the Armor School has established the 19C and 19K MOS transition classes for other MOSs to provide them a method for quickly transitioning into CMF 19 should they desire to reclassify. Combined, these actions will enable operational commanders the ability to quickly restructure formations while moving MOS 19D Soldiers from inactivating formations into new positions. It will also prioritize spaces at the Armor School for non-CMF 19 Soldiers at the schoolhouse as they pursue reclassification as MOS 19C or 19K.

To the leaders and Soldiers of the Armor force of today, this ARSTRUC marks another in a consistent note in the melody of changes underpinning the character of war. Standoff and the ability to engage at extended ranges is becoming increasingly important on the battlefield. Current conflicts show that attacking first with lightly armored, unprotected formations and inducing high casualty rates in an environment where artillery evokes payment in blood isn't a viable option for an expeditionary Army. Finding the

enemy on current and future battle-fields occurs at greater distances than previously through more technical means rather than by means willing to sacrifice blood for first contact. Seeing first in this environment implies being able to persistently see well over the horizon. If conditions merit, and we are forced into an offensive movement to contact, then those forces must be well protected and capable of absorbing any punch the enemy can throw. We simply can't plan on meandering across a 25-30 kilometer killing field with unprotected Soldiers while hoping for the best. Places like Nagorno-Karabakh, Ukraine and Gaza have consistently reminded us of these facts. These hard lessons, currently being paid by others, give us much to seriously consider about how we will really fight these future fights with America's sons and daughters.

The ARSTRUC also directed the end of the Armored Division Cavalry Squadron pilot and the return of the 1st Cavalry Division to the standard ABCT structure. Since Army forces will always need to conduct reconnaissance, surveillance, and security operations during all phases of multidomain operations, we are working with partners across the Army enterprise to address the continued need for specialized, organic reconnaissance, security, and surveillance capability within our formations to gain decisional advantage at echelon. We are on track to start experimentation of the initial concept this spring through the Maneuver Battle Lab. Critical to the success of this effort is the integration of partners across Army Futures Command and other Centers of Excellence to ensure we remain nested with and contributing to the Army's Future Warfighting Concept. All weather reconnaissance, security, and surveillance are operations all close combat formations must successfully undertake, and at the Armor School we have a vested interest in leading a combined effort to develop an integrated way ahead for our formations.

As we move forward, the Army leadership recently established their transformation in contact initiative designed to allow the U.S. Army to transform and integrate new capabilities more rapidly. Placing small Unmanned Aircraft Systems down at lower levels, incorporating robotic capabilities, and enabling lower echelons with longer range fires capabilities constitute just a few of the experimentation initiatives our Army will see moving forward. At Armor branch, we will posture the armor formations of today to be prepared to experiment with, accept, and integrate these new capabilities into our formations as they mature. The ARSTRUC only constituted the first step in this critical movement forward into the future. Incorporating future combat vehicles into the force will likely be more technologically complicated and allow for fewer Soldiers as crew members resulting in an increased in cognitive load. The Soldiers of today will be the leaders of tomorrow who rise to this challenge. Along the way, we must maintain the platform expertise that will allow our formations to win today, tomorrow, or at any point in the future.

For the foreseeable future, the U.S. Armor Force retains an unchanged number of ABCTs. These ABCTs will continue to bring with them an unparalleled capability close with and destroy our nation's enemies on whatever ground they decided to stand upon in future fights. Maintaining that capability, today and well into the future, constitutes the sole reason Armor exists. We are the mounted combat arm of decision. We are the greatest and most visible expression of American resolve. When America's armor forces deploy to a fight, enemy armies don't just react – those armies fall in battle. And the whole world knows it. Losing has never been an option for the U.S. Army armor force, and it never will be. In our world today, and well into the future, there is no prize for second place.

Forge the Thunderbolt!

GUNNER'S SEAT

CSM Waylon D. Petty
Command Sergeant Major
U.S. Army Armor School

Focused and Lethal Post Army Structure 25-29

The recent release of Army Structure (ARSTRUC) 2025-2029 will set the conditions for the Army to not only right-size its formations but enable the proper capabilities at echelon during the next couple of decades. There is some concertation with arguably the largest structure change since the introduction of modularity. Change is difficult for most of us, but we have an opportunity to increase lethality at the tactical level that we have not seen since pre-modularity. For Armor specifically, Career Management Field (CMF) 19 will primarily train/operate within armored brigade combat teams (ABCT) minus the few outside the contiguous U.S. cavalry squadrons and the new Mobile Protected Firepower units. Cavalry scouts will no longer be required to be jacks of all trades, but rather focused on reconnaissance and security within armored formations; tank companies will see their manning improve and readiness increase; and platform proficiency will increase for the Bradley Fighting Vehicle with the new 19C military occupational specialty (MOS).

For these benefits to come to fruition, the Army must decide where to place Soldiers (faces) in authorized positions (spaces) and with that comes the inevitable MOS reclassifications. To set conditions for the Army of 2030 and beyond, we need to address the shortages and gaps that we have today to sustain true readiness and meet force requirements. With reductions in authorized MOS 19D positions and shortages in authorized MOS 19K (and soon MOS 19C), the answer is clear for CMF 19 — fix yourself. This will have to be done through reclassification, whether voluntary or involuntary.

The first priority for CMF 19 is to fill the manning gaps for MOS 19K across the 11 ABCTs. Within ABCTs, Abrams and Bradleys are priority to man first over squads. Due to priorities and MOS 19K shortages, there are upward of 500 MOS 11Bs (infantryman) on tank crews. It is not that the infantry Soldiers make bad tankers, it's what they are not doing, which is individual, team, and squad infantry tasks.

From a retention perspective, we will need approximately 600 reclassifications into MOS 19K, and a large portion of that number will need to come from MOS 19Ds. A point to highlight is MOS 19K accessions is one of the few MOS' on glidepath to make mission this fiscal year, which will assist with maintaining a steady state along with reclassifications. Bottom line, we have an opportunity to properly man our tank crews this year and maintain a high state of readiness for years to come.

MOS 19D cavalry scouts are still the largest MOS within CMF 19 even with the structure reductions. In other words, scouts are alive and well, but their expertise is needed within the ABCTs. Like our tankers, we have manning gaps with our scout positions within the ABCTs. The scouts who do not reclass from the light divisions will need to make a permanent change of station move to installations with ABCTs to fill these gaps. Nothing increases readiness faster than being manned appropriately. Cavalry squadrons will train from the same mission essential tasks which overtime, with sets and reps, will translate into higher expertise at the tactical level.

Most are familiar with the old 11M Bradley crewmember MOS that was removed more than 20 years ago. MOS 11M Soldiers were experts employing and fighting the Bradley. Mechanized infantry companies saw that expertise atrophy quickly after losing the 11M MOS. But the need to have expert Bradley crewmembers and infantry squads remain to have truly lethal mechanized infantry companies. Armor makes perfect sense to own the Bradley crewmember MOS (19C) since Armor Soldiers operate within ABCTs where mechanized infantry companies reside and are expected to be platform experts. 19C will be an official MOS for the Army starting Sept. 2, 2024, but reclassification into the MOS is now in progress. Armor Branch has received multiple reclassification requests for MOS 19C from Soldiers and NCOs with years of experience on the Bradley Fighting Vehicle. Additionally, One Station Unit Training for MOS 19C will kick off in October 2024, where the newest Soldiers will be assigned to a mechanized infantry company as MOS 19C. With experienced NCOs and recently trained Soldiers, MOS 19C will bring a

higher level of lethality back into the Bradley Fighting Vehicle and infantry Soldiers can focus on training progression within their teams, squads, and platoons.

This is the first time in more than two decades that all MOS' within CMF 19 will primarily operate within ABCTs, which means more focused and lethal Armor formations, but we've got to get the manning right first. Readiness starts with appropriate manning and with ARSTRUC 2025-2029, the Army has the opportunity to fill the gaps within our ABCTs, specifically the tank crews, cavalry squadrons, and to jump start MOS 19C Bradley crewmember. This will also enable the appropriate manning for ABCT infantry squads by lifting the burden of infantry Soldiers manning tanks and Bradleys. This can only be done through reclassification and MOS 19Ds will play a big role.

Essentially manning CMF 19 appropriately during the next year will allow accessions and retention to focus on future Army priorities, while delivering combat-ready formations within maneuver.

Forge the Thunderbolt!

Establishing the Foundation of Success
The Gunnery Training Program

by LTC Chuck Bies and CSM Gary John Kurtzhals

In his contribution to the 1992 *Military Review* issue focused on the impact of leadership, Lewis Sorley wrote his article on GEN Creighton Abrams. He highlighted the positive changes Abrams made in the 3rd Armored Division as the assistant division commander, specifically: "The primary training activities in an armored division are field maneuvers and tank gunnery."[1]

The same can be said today of our armored brigade combat teams (ABCTs), and more specifically the combined arms battalions (CAB) within them. The central purpose of a CAB is to meet the enemy on any ground and destroy it. If the CAB cannot effectively and efficiently destroy the enemy in contact, then little else the CAB does matters. The building blocks of this lethality for the CAB are tank and Bradley crews and infantry squads. While field maneuvers, maintenance, and other readiness drivers always remain relevant, for the purposes of this article, we focus our discussion solely on Abrams tank and Bradley Fighting Vehicle lethality.

Since the central purpose of a CAB is to maneuver and destroy the enemy with direct fires, it therefore stands to reason that all the CAB's efforts must be directed towards supporting the gunnery training program. A gunnery training program and successful gunnery are not events that occur in isolation; rather they are the output that highlights the efficacy of a unit's supporting activities. If a command cannot maintain its warfighting and supporting equipment at a high state of readiness, the result will be evident in gunnery performance. If a command cannot synchronize staff and leader efforts to plan and resource training, the result will be evident in gunnery performance. The highest operational readiness rate and effective maneuver means little if crews cannot hit what they are shooting at. Gunnery is the dipstick that we can use to effectively measure the readiness of a CAB.

By executing a focused gunnery training program detailed in this article, the 1st Battalion, 68th Armor Regiment "Silver Lions" out of the 3rd ABCT, 4th Infantry Division, experienced dramatic success between 2021 and 2023. This article highlights the best practices used by the Silver Lions as a recommended way forward for the armor force as we seek to increase our lethality and proficiency in preparation for future large-scale combat operations.

Background

The fall 2021 gunnery density had not gone well for the Silver Lions. The first tank company to go through the gunline was plagued with problem after problem. On the maintenance side, the company dead lined five tanks by the time it completed Gunnery Table (GT) III, had dropped to just one full mission capable (FMC) tank for the last day of GT VI, and by the end of the gunline the company had no FMC tanks remaining. The second tank company fared only slightly better Both companies discovered widespread deficiencies and failures in their tank fire control systems. By the time both companies were through, 12 of the 27 firing crews were "Q2 (status)," or unable to achieve seven of 10 qualified engagements with a total score more than 700/1000. The infantry company experienced more success, but the volume of issues on the bushmaster guns kept the few master gunners and armament repairers up for days on end. Though the battalion was able to claim the top Bradley crew in the brigade, six of the 20 firing crews were also Q2.

This poor performance required introspection and a thorough postmortem to identify why the battalion had performed so badly. There were several causes that were long festering left of execution that caused the battalion to fail, but in short, the battalion did not have a culture of lethality or a coherent gunnery training program to unite its activities. Therefore, creating an effective gunnery training program became the battalion's number one priority as we prepared to deploy to Europe in support of Operation European Assure, Deter, and Reinforce. We identified several supporting lines of effort to "turn the ship around." Those lines of effort were platform preparation, skill training, simulator usage, and Master Gunner development. Essential to this was defining success and understanding what metrics and activities are critical to success.

Through deliberate execution of the identified lines of effort, the Silver Lions experienced a dramatic turnaround of its Gunnery Training Program and success in gunnery as seen below. The number of tank crew Q2s dropped from 12 in October 2021 to
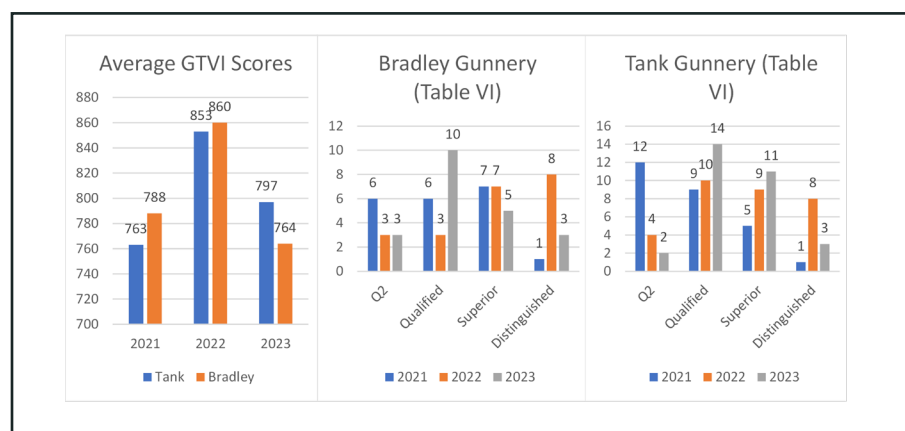

Figure 1. 1-68 Armor Gunnery Performance from 2021 through 2023. *(U.S. Army graphic by LTC Chuck Bies and CSM Gary John Kurtzhals)*

four in June 2022 and two in July 2023. Similarly, the number of Bradley crew Q2s dropped from six in October 2021 to three in June 2022 and July 2023. In total, the number of qualified (Qualified, Superior, and Distinguished) increased by 87 percent for tank crews and 29 percent for Bradley Crews.

Platform Preparation

You can't mass against the enemy when you are slant zero. In short, it is more important to be 10/10 qualified with a score of 901 than it is to be 9/10 with a score of 969. Similarly, it is more meaningful for a combat formation to have 0/29 Q2 crews and 1/29 distinguished crew than it is for a formation to have 12 distinguished crews and 1/29 Q2 crews.

The single most important indicator of a crew's capacity to achieve high scores, which translates to the ability to kill on the battlefield, is the ability to achieve first round "target" sensing. Conduct of fire trainers (COFTs) like the Advanced Gunnery Training System (AGTS) and Bradley Advanced Training System (BATS)/Conduct of Fire Trainer – Situational Awareness (COFT-SA) both measure crew performance measures, specifically time to target identification, time to fire, and system management. However, the key metric that commanders need to pay attention to is the percentage of first round targets. With this metric in mind, armament accuracy checks (AACs) on the tank and prep to fire checks (PtFCs) on the Bradley take on supreme importance.

In many CABs, AACs and PtFCs are typically only executed immediately prior to a gunnery density. Unfortunately, doing so fails to exercise the fire control system and line replaceable units/line replaceable modules routinely, increasing the probability of faults going undetected. Additionally, there is less time available for unit maintenance to remedy failed AACs and PtFCs, putting platform readiness at risk for training.

In 1-68 Armor we found this to be deficient and implemented a standard of AACs and PtFCs to be executed and reported monthly. This requirement was tracked and monitored by bumper number and reported at battalion training meetings. After initially implementing this practice, we identified several platforms that were deficient. We also identified a training and education gap throughout the formation from private through sergeant first class. The practice of executing AACs and PtFCs every month increased crewmember proficiency and understanding of their platforms.

In terms of guaranteeing accuracy, AACs and PtFCs are essential and require routine execution. The tank AACs consist of six checks that ensure the fire control system is fully operational and verifies special inputs to the ballistic solutions are implemented properly for all fire control components and main gun ammunition. A tank that fails any one of the six AACs may fire erratically, may require a discrete computer correction factor, and it loses the probability of sustained accurate fire regardless of a correct boresight.

The Bradley PtFCs are less intensive but important nonetheless in terms of ensuring that the sights and the gun remain aligned, reducing sight backlash, and ensuring key components of the fire control system, such as the equilibrator, are functioning properly. What we found was that most Bradley crews were following the instructions in the Bradley Commander's Display but were unaware of the additional tasks found in Appendix B of Field Manual (FM) 3-20.21, **Heavy Brigade Combat Team (HBCT) Gunnery**.

Ensuring that crews are executing AACs and PtFCs regularly and to standard requires command emphasis. This is not a master gunner problem, it is a command problem, and it requires engagement from commanders at echelon to correct.

Skill training

"Everyone doing his best is not the answer. It is first necessary that people know what to do," said W. Edwards Deming.[2]

In terms of preparing crews better for live fire training and combat, 1-68 Armor took a two-prong approach centered largely around how feedback is provided during training coupled with basic crewmember skills. In practice, this forced the team to re-evaluate our execution of Vehicle Crew Evaluator (VCE) certification, and Gunnery Skills Testing (GST).

The first issue we attacked was -VCE training and certification. Previously, VCEs were trained and certified only prior to gunnery densities using the VCE Exportable Package (VCEEP) from the Maneuver Center of Excellence. While the VCEEP remains an effective teaching tool and we were meeting the standard of annual recertification, we found that the frequency of instruction was too low to maintain proficiency for certified VCEs to provide quality feedback and ensure consistent scoring. Further, the challenges with scheduling ranges in Poland often resulted in training being scheduled and conducted on relatively short notice (two weeks out as opposed to six or more weeks out). To provide flexibility to respond to training opportunities and sustain VCE proficiency, 1-68 Armor adopted a quarterly VCE recertification model.

The battalion's VCE certification and recertification process was maintained at the battalion level in which the battalion master gunners executed the program. All gunners and vehicle commanders were required to be VCE certified on their respective craft; tanks, IFVs, and mounted machine guns. The program of instruction was held and maintained at the battalion level, executed by the battalion master gunner team. The program of instruction matched the VCEEP and candidates were held to the VCEEP passing standards; there was no check the block. In addition to the practical exercises provided with the VCEEP, additional scoring practical exercises using actual range footage from previous battalion gunneries were included to increase the rigor of the course.

To improve the value of the feedback provided by our VCEs, the battalion master gunner team also built a unique after-action review (AAR) slide deck for use in every AAR for gunnery tables III through VI. The deck was built to outline overall tasks, conditions, and standards for each engagement and clearly state the targetry, ranges and modifiers for each engagement of the table. Each engagement's video was embedded to allow viewing on projector or

television before showing a digital version of the engagement score sheet. Hyperlinked throughout the slide deck were links to a directory of reference slides that provided details on various elements of gunnery. They included scanning techniques, methods of target engagement, processes and penalties, and master gunner tips for each crew position. Having this library equipped the VCEs and the crews with immediate access to references to facilitate discussion and provide solutions to solving problems in the vehicle.

By executing a challenging program of instruction every quarter and building our own AAR slide deck, we found that our VCEs were more confident and competent in the feedback they provided on gunnery tables III through V. We also noticed better performance within crews as they progressed from table to table, and that performance was reflected on our Table VI scores and distribution.

In terms of preparing the crews themselves for training, GST (Gunnery Table I) is non-negotiable. All personnel on the crew, regardless of rank and experience, must execute GST to standard and execute all tasks within GST to standard with no tasks omitted due to time or convenience. To ensure this happened in 1-68 Armor, we made GST a battalion-level training and certification event. The S-3, supported by the master gunners, planned, and resourced GST as a full training event. Lane evaluators were selected, trained, evaluated, and certified weeks prior to the main GST event. The battalion commander, command sergeant major,

and S-3 personally validated each instructor and the setup of the testing to ensure all stations and evaluators were prepared and certified for testing.

In terms of the execution of GST, three days were allocated for training and two days were allocated for testing. To ensure throughput, we scoped the number of vehicles to be higher for tasks that tend to take longer, allocating three platforms for dropping breach on the M1 and M242 disassembly/reassembly on the Bradley. All machinegun tasks were executed on the vehicle platforms, not on folding tables. Finally, two tanks and two Bradleys were set aside as retraining stations as crewmembers cycled through testing.

The result of this deliberate effort was evident on the gunline. On the Bradley ranges crews were expected and able to remedy gun malfunctions on their own without having to pull master gunners from the tower to assist. On the tank ranges we saw the near elimination of range downtime due to prolonged machinegun malfunctions and misfires.

Simulator usage

"There is an epidemic failure within the game to understand what is really happening … People who run ballclubs think in terms of buying players. Your goal should not be to buy players, your goal should be to buy wins. And to buy wins, you need to buy runs … what I see is an imperfect understanding of where runs come from … Baseball thinking is medieval, and they are asking all the wrong questions…," said Peter Brand, *"Moneyball" (2011).*[3]

While in Europe, the battalion took a hard look at the use of BATS/COFT-SA and AGTS and how we provided feedback to crews. The BATS/COFT-SA and AGTS are a finite resource and are even more finite and constrained in deployed environments such as Europe. Currently, the 7th Army Training Command does not have enough simulators to provide the same level of coverage as home station for multiple ABCTs in theater. In practice, this means that some units may have to "commute" to send Soldiers to execute Gunnery Table II, and others must share a single simulator with other organizations. Simulation time becomes a precious commodity.

Effective use of the AGTS and BATS/COFT-SA will result in better performance in combat and on the range. The Army standard for simulation utilization is four hours per crew per month. While this metric is a good start point, it neglects the relative value of each hour spent in the simulator. Conventional wisdom suggests that more time spent in the simulator yields better performance, however time is a limited an irreplaceable resource. This is particularly true in Europe as previously discussed, so generating more time in the simulator outside of minimum requirements may not be a feasible course of action. Therefore, the question we sought to answer was "How do we increase the value of the time spent in the simulator by crews?"

Our hypothesis was that while time spent in the simulator grows expertise, professional and in-depth feedback will amplify the value of that time. In essence, provide better feedback so

	1st rnd hit % in AGTS	Live GT VI Score	AGTS GTVI score	Average Time to ID (AGTS)	Average Time to Fire (AGTS)	Average Time to Kill (AGTS)	Reticle Aim Error Average (AGTS)	Avg Engagement Time (Live GTVI)	Main Gun Avg Engagement Score (x/100)	Sum of Live Main Gun Engagement Scores (GTVI)
Crew 1	100%	905	943	7.82	10.44	15.73	0.35	6.73	87	953
Crew 2	100%	936	939	8.90	9.16	16.18	0.42	2.55	94	1039
Crew 3	91%	910	930	10.12	14.46	17.91	0.54	-1.27	97	1071
Crew 4	82%	700	918	15.16	14.78	27.90	0.62	15.91	68	748
Crew 5	100%	970	929	11.75	11.46	18.27	0.44	-0.82	99	1087
Crew 6	100%	920	927	11.70	12.40	18.83	0.43	3.27	94	1030
Crew 7	92%	924	914	15.99	13.18	25.17	0.37	3.82	93	1026
Crew 8	83%	942	913	9.30	10.38	17.00	0.36	-3.36	100	1096
Crew 9	100%	957	974	9.97	11.49	15.17	0.38	3.00	95	1040
Crew 10	100%	789	944	9.24	14.26	19.18	0.40	16.73	67	742
Crew 11	92%	758	941	11.08	12.28	19.18	0.75	5.55	87	956
Crew 12	92%	791	735	15.17	23.16	27.18	0.43	6.73	88	973
Crew 13	100%	927	957	9.65	10.99	13.64	0.41	12.64	75	822
Crew 14	92%	760	957	10.03	10.29	18.00	0.32	3.45	90	985
Crew 15	91%	760	945	9.15	15.02	18.36	0.44	5.55	88	969

Figure 3. Raw Data Set of Gunnery Performance. *(U.S. Army graphic by LTC Chuck Bies and CSM Gary John Kurtzhals)*

that four hours in the simulator has the effect of six or more hours in the simulator. Looking at how 1-68 Armor was executing AGTS and BATS/COFT-SA in August 2021, we found the current standard of training to be deficient. While our crews were spending the required four hours in the simulator every month, the quality of feedback varied greatly. Some crews had seasoned platoon sergeants and master gunners working as instructor operators, while others had young Soldiers (drivers, loaders, etc.) with limited platform experience running the simulator. These younger Soldiers were generally incapable of providing detailed feedback and did little more than run scenarios and move the vehicle in and out of battle positions; we immediately elevated the requirement for instructor operators to experienced vehicle commanders only, while we delved into the challenge of certifying instructor operators through the MCoE.

Unfortunately, the Simulation Instructor Operator (SI/O) Course for the Abrams platform is no longer a program of record at Fort Moore, GA. The Army National Guard (ARNG) maintains an Instructor Operator Course at Fort Moore but that course is limited to the Bradley platform only. With the sunset of the Abrams course, proponency for instruction and certification was moved to the divisions, however not every division has a program in place at this time.

To remedy this shortcoming the battalion master gunners developed an SI/O Course to train and certify AGTS and BATS/COFT-SA instructor operators at the battalion level. We modeled the course after the ARNG Instructor Operator Course at Fort Moore, with the program of instruction extended to cover AGTS as well. The battalion SI/O course provides detail on the structure of the AGTS and BATS/COFT-SA matrix progression system, baselined standards for AARs following exercises in the simulators, and provided instruction on how to better coach vehicle crews and gunners to improve performance.

Next, we sought to understand what skills to focus on while in the AGTS and BATS/COFT-SA. On the battlefield, first round targets underwrite a CAB's success. At the crew level, a first round target coupled with low target identification and time to fire ensure that the enemy platform is destroyed before the U.S. crew can be identified. A first round target reduces the time of the Detect, Identify, Decide, Engage, and Assess (DIDEA) cycle, and the ability to execute multiple DIDEA cycles faster than the enemy allows U.S. crews to fight outnumbered and win. Failure to hit a target on the first round increases the time of the DIDEA cycle and exposes the U.S. crew to enemy fires. At the collective level, more first round targets decrease the number of enemy guns pointed at you, increasing your formation's survivability.

To better understand the correlation between engagement times and performance, we turned to statistical analysis of main gun performance data in AGTS for tank main gun. We assessed the performance of 15 tank crews in AGTS GTVI by taking a mix of six crews who scored below 800 on GTVI (Live) and nine who scored above 900 on GTVI (Live), and specifically looked at average times to identify a target and average times to fire in AGTS.

We identified that the crews that shot over 900 had an average time between identification and firing of .98 seconds with an average main gun engagement score of 93. Crews that shot below 800 had an average time of 3.33 seconds and an average engagement score of 81. The difference in time to kill from identification for both categories respectively was 6.97 seconds and 10 seconds. Statistically, there was a strong correlation coefficient of -0.84 between the crew's average time to fire and the AGTS Gate score within AGTS. In short, the better gunners are the ones who can quickly achieve a proper center mass reticle lay and quickly establish a good track before quickly squeezing the trigger.

When it comes to gunnery, success is rooted in the number of qualified versus unqualified crews. Scores do matter, as do distinguished and superior ratings, however the benchmark of success is first time qualification. This is tied to how the standard for qualification of seven of 10 qualified engagements and 700/1000 points is developed. The goal should be to have no crews Q2 as opposed to having several

	1st rnd hit % in AGTS	Live GT VI Score	AGTS GTVI score	Average Time to ID (AGTS)	Average Time to Fire (AGTS)	Average Time to Kill (AGTS)	Reticle Aim Error Average (AGTS)	Avg Engagement Time (Live GTVI)	Main Gun Avg Engagement Score (x/100)	Sum of Live Main Gun Engagement Scores (GTVI)
1st rnd hit % in AGTS		0.50	0.27	-0.41	-0.29	-0.56	-0.35	0.05	0.05	0.05
Live GT VI Score	0.50		0.20	-0.24	-0.45	-0.53	-0.44	-0.57	0.61	0.61
AGTS GTVI score	0.27	0.20		-0.58	-0.84	-0.66	-0.04	0.00	-0.05	-0.05
Average Time to ID (AGTS)	-0.41	-0.24	-0.58		0.58	0.90	0.26	0.16	-0.10	-0.10
Average Time to Fire (AGTS)	-0.29	-0.45	-0.84	0.58		0.71	0.20	0.26	-0.21	-0.21
Average Time to Kill (AGTS)	-0.56	-0.53	-0.66	0.90	0.71		0.30	0.29	-0.26	-0.26
Reticle Aim Error Average (AGTS)	-0.35	-0.44	-0.04	0.26	0.20	0.30		0.18	-0.22	-0.22
Avg Engagement Time (Live GTVI)	0.05	-0.57	0.00	0.16	0.26	0.29	0.18		-0.98	-0.98
Main Gun Avg Engagement Score (x/100)	0.05	0.61	-0.05	-0.10	-0.21	-0.26	-0.22	-0.98		1.00
Sum of Live Main Gun Engagement Scores (GTVI)	0.05	0.61	-0.05	-0.10	-0.21	-0.26	-0.22	-0.98	1.00	

Figure 4. Correlation Matrix of Data Set. Values approaching denote no statistical correlation; values approaching -1 or 1 denote perfect correlation; values approaching -0.5 or 0.5 denote moderate correlation. *(U.S. Army graphic by LTC Chuck Bies and CSM Gary John Kurtzhals)*

Q2s alongside crews with higher scores.

The 7/10 engagement and 700/1000 is derived from combat analysis. Gunnery assumes the U.S. force is fighting against an enemy force at 70 percent manning, 70 percent readiness and 70 percent morale. An unqualified engagement, or an engagement with a score less than 70 points, means that the U.S. tank was destroyed by the enemy during that engagement. A Q2 crew isn't just a crew that had to fire additional engagements to get over the 700-point threshold, in real terms it is a dead crew. A Q1 crew is a crew that most likely survived. A 10/10 crew is a crew that survived to fight again another day: a land ace.

In summary when looking at a distinguished rating, it is more important to be 10/10 qualified with a score of 901 than it is to be 9/10 with a score of 969. Similarly, it is more meaningful for a combat formation to have 0/29 Q2 crews and 1/29 distinguished crew than it is for a formation to have 12 distinguished crews and 1/29 Q2 crews. The first formation will likely have no dead crews, whereas the second will have one.

Therefore, a gunnery training program must attack development as a progression. Step one is to train to eliminate all the incidences of Q2. Once that foundation has been achieved, step two is to train to get all crews to 10/10 qualified engagements. It is only once you have reached 10/10 that the end score is worth talking about.

We identified another correlation that drove training focus after looking at training and gunnery scores. When main gun performance is assessed against GTVI scores, there is only a moderate correlation of 0.61. The ability to hit with main gun isn't a great predictor of success on the range; the complication that causes this, and is also difficult to measure, is proficiency with the coaxial machinegun. The difference between a distinguished crew and a merely qualified crew is the gunner's ability to hit targets with the machinegun, which introduces considerably more variables for consideration. Does the crew have the gas port on the correct setting? Is there any play with the mounting with the machinegun? How old are the barrels? Is the coaxial port perfectly straight? Is the ammunition belt cleaned, lubricated, and fed properly? Whether or not machinegun engagements count for too much in scores on a platform with the mission to destroy enemy armored vehicles is a separate and philosophical discussion. Rather there are two important takeaways about machineguns. First, machinegun engagements are more dependent on crew maintenance and equipment preparation than main gun engagements; this is something that cannot be assessed in AGTS. Second, given an FMC coaxial machinegun, the gunner's fine motor control of the power control handles is essential in engaging small troop targets; something that can be developed and assessed in AGTS.

Therefore, while training in the AGTS, SI/Os must focus their coaching on improving the gunner and tank commander's ability to perform fine manipulation of the controls to achieve center mass lay and track. That's fine for the AGTS, but with limited simulator time, how can crewmembers develop those motor kills outside of the simulator? Moreover, live performance introduces multiple variables such as machinegun maintenance and vehicle maintenance status that frustrate statistical analysis. The path to improvement depends on practice and muscle control on the actual platform, and the best way to practice that muscle control is through use of worm/snake boards.

1-68 Armor also identified that the "worm boards" or "snake boards," that used to be commonplace are largely absent from gunnery ranges and motor pools (see figure below). These boards should be procured and used more than crews have become accustomed to in recent years. In terms of Abrams statistics, there is a moderate correlation between first round target performance in AGTS and live Table VI performance.[4] Many installations' Training Support Centers only carry very rudimentary tracking boards, if at all. However, we found that the Training Support Center at Fort Knox, KY, is
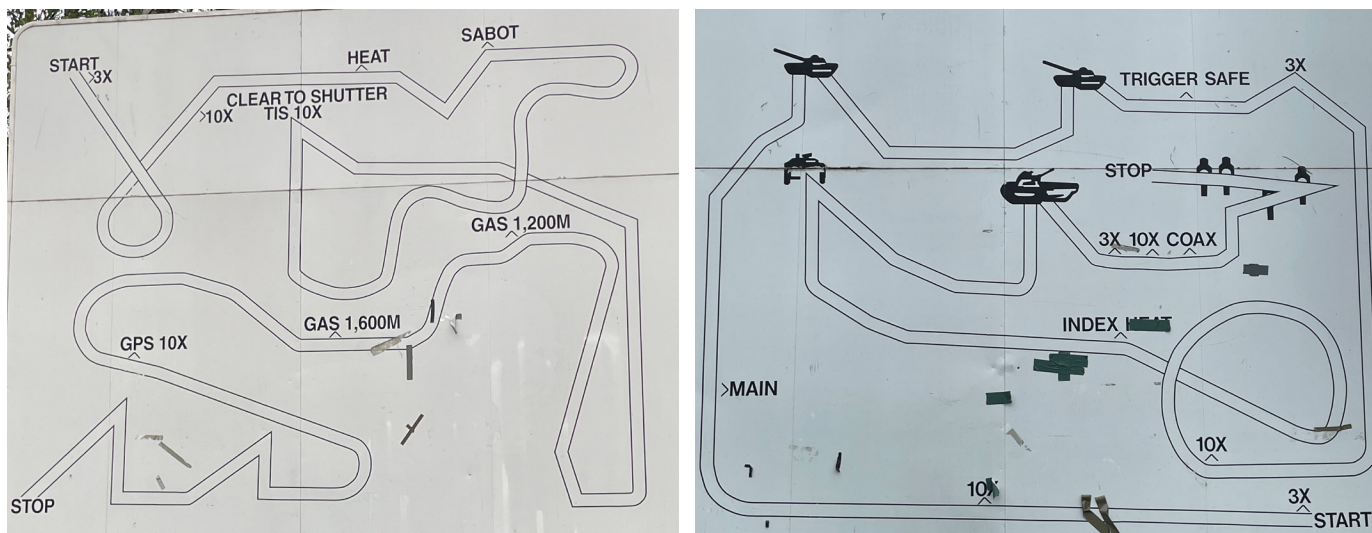

Figure 5: Photos of worm boards located at Range 132, Grafenwohr Training Area. *(U.S. Army graphic by LTC Chuck Bies and CSM Gary John Kurtzhals)*

still capable of producing field deployable canvas worm boards. Units may purchase them by request. Until these boards become permanent fixtures in motor pools and at gunnery ranges, we recommend units procure sets of worm boards for each company to use at home station, in the field or while deployed.

Master gunner development

Master gunners are the keepers of lethality in the ABCT community … period! The true success of a gunnery training program hinges on buy-in and the hard work of our NCO Corps, and those NCOs depend on the leadership and knowledge of our master gunners to guide their efforts. Moreover, officers require their expert counsel in planning and executing training and managing crews.

In the fall of 2021, 1-68 Armor was not in a good place with its master gunner population. The guidance from IIIC was for units to reach a 100 percent fill rate of master gunners; for tank (K8) that meant three master gunners and for Bradley (J3) six master gunners for a total of nine in the battalion. The Silver Lions had two K8s, one being a first sergeant and the other being the new command sergeant major, and one J3, who was serving as the battalion master gunner, with one NCO in school for J3. In short, we had less than half of what we needed. We had a problem.

Exacerbating the problem was that many NCOs within the formation were reluctant to attend Master Gunner School. What they saw were good NCOs being sent up to battalion to be the battalion "Mike Golf," where they were relegated to the menial tasks of requesting land and ammo. At gunnery, they saw one NCO who spent days without sleep, bouncing between running the radio in the tower and fixing deficiencies (particularly with the Bushmaster) out on the line. Soldiers saw the Mike Golf as a competent but overworked NCO who hated his/her thankless job. Who in their right mind would want to leave their platoon and go to a notoriously difficult school for such a "reward?"

The culture had to change, and fast.

We had to generate a lot of master gunners quickly. In the Airborne community, the analog to the master gunner is the jumpmaster, and I witnessed several similarities. When a unit didn't have a robust jumpmaster population, the few that it did have become overtasked; paratroopers saw that and became reluctant to attend that challenging school. When units had an excess of jumpmasters, duties were easily shared and none of them had to put in too much extra work. Finally, there was the mindset that if you had to be a jumpmaster to be a leader, otherwise you were "just another jumper." Our task was to create the culture where to be a mechanized leader, you had to be a master gunner, otherwise you were just another crewmember. We did so through three efforts.

- **We incentivized the position.** Any NCO who passed "gun school" but was not a vehicle commander would be immediately moved into a vehicle commander position. For platoon sergeant billets, master gunners to include promotable staff sergeants would jump the queue and be slotted in platoon sergeant billets ahead of other sergeants first class. All master gunners would receive unfettered access and no-knock/no-appointment/walk-in privileges to both the command sergeant major and battalion commander at any time and for any reason. Within the battalion headquarters we established a lounge area, off limits to all personnel except for master gunner and Ranger qualified personnel.

- **We removed some of the onerous tasks associated with being a master gunner.** The battalion master gunners would no longer be the land and ammo NCO. Land requests and Range Facility Management Support System would be managed by an assistant S-3 officer, with the master gunners retaining access. Master gunners would assist with identifying ammunition requirements, but the burdensome task of ammunition requests and documentation would be handled by an assistant S-3 officer. Instead of performing menial administrative tasks, the master gunners were broadly empowered to prepare NCOs for Gun School and to

plan and build maneuver live fire training scenarios given training objectives issued by the battalion commander.

- **We established policy and targets.** Every quarter, each company was required to have at least one NCO in Master Gunner School. Companies were required to look at their population, project their four candidates for the year, and allow the battalion master gunners to start their preparation. The scout platoon and each tank and infantry platoon were to have at least one master gunner. Each company was to have a company master gunner serving in the headquarters, and there would be both a tank and Bradley master gunner at battalion.

Our efforts bore fruit, not just for the battalion but for the armor community and the Army. Between fall 2021 and the summer of 2023 the Silver Lions created 11 master gunner graduates. Exceeding the standard of nine, the Silver Lions had 7/3 K8 and 7/5 J3 master gunners. On the range, the effects of a healthy master gunner population were readily apparent beyond the improvement in gunnery scores. The battalion master gunners were able to assume a supervisory and mentorship role for crews and VCEs rather than be wedded to the radio. Instead of common delays during Bradley gunnery where crews wait for a master gunner to diagnose gun faults, we were able to post a master gunner at the ready line to quickly assess gun malfunctions. On tank ranges, we had sufficient master gunners to run the tower as well as run Live-Fire Accuracy Screening Test, oversee VCE operations, and spot check equipment. In short, life for the master gunners became a lot easier, and the rest of the formation was able to gain more benefit from their expertise and counsel.

At the time of this writing, the Army doesn't have enough master gunners in the force to man both the schoolhouse and U.S. Army Forces Command deploying units. Our advice to the force is to continue to send quality NCOs to Master Gunner School, and when the time comes to pay the bill to the generating force, send them to Fort Moore to run the Gun School and

continue to build the bench across the force.

Conclusion

The 1-68 Armor Silver Lions experienced a 12-percent improvement in crew gunnery performance in less than a year through the execution of fundamentals and education. While we had many talented crewmembers in the battalion, the battalion's systems and training were not correctly oriented to prepare platforms and train fundamental skills. Once in Europe, units that do little more than "shoot the range the Army gives them" will find their training to lack rigor.

For our precision systems to deliver precision results, it is imperative that our vehicle commanders understand the connection between AACs/PtFCs and lethality. Regardless of how good a boresight is, if a crew does not regularly execute AACs and PtFCs, that crew will struggle to live up to its potential. Similarly, crews need quality coaching to improve and develop; that quality coaching requires VCEs and SI/Os who have the training and in-depth knowledge to provide expert feedback.

Lethality is central to what a CAB is and does. Given this importance, commanders need to assess their formation and take steps to ensure that certifications are held at the level commensurate with that importance. 1-68 Armor experienced success in holding GST certification at the battalion level and executing VCE certification on a quarterly basis. With limited AGTS and BATS/COFT-SA resourcing in Europe, certifying SI/Os to maximize value of simulator time is key. Commanders, command sergeants major, S-3s, and master gunners must push hard to gain the most value from training prior to movement to the range.

Nothing that the 1-68 Armor Silver Lions did to prepare for gunnery or turn their gunnery training program around in Europe was revolutionary. Commanders will find that they can maintain an effective gunnery training program through exercising fundamentals and holding the line on standards.

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Panther Team, Operations Group, National Training Center, Fort Irwin CA. His previous assignments include battalion commander, 1-68 Armor, 3/4 Infantry Division, Fort Carson, CO; Senior Military Advisor, Army Science Board, The Pentagon, Washington D.C.; brigade S-3, 3/4 Infantry Division, Fort Carson; battalion executive officer, 1st Battalion, 8th Infantry Regiment, 3/4 Infantry Division; and G-3 Chief of Training, 4th Infantry Division, Fort Carson. LTC Bies military schools include Command and General Staff College, Fort Leavenworth, KS; Red Team Member Course, Fort Leavenworth; Bradley Commander and Gunner's Course, Fort Moore, GA; Maneuver Captain's Career Course, Fort Knox, KY; and Jumpmaster Course, Fort Liberty, NC. He has a bachelor's of science in engineering degree in mechanical engineering and materials science from Duke University and a master's of arts degree in diplomacy and military studies from Hawaii Pacific University. LTC Bies awards include Patton Award – Command and General Staff College; Legion of Merit; Bronze Star Medal with V device and two oak leaf clusters, and the Purple Heart with

Armored Fighting Vehicles of the World

Type 05 Amphibious Fighting Vehicle
ZBD-05 / ZTD-05

Chinese amphibious fighting vehicle, major versions are the IFV (ZBD-5), and a light tank variant (ZTD-05). First publicly seen in 2009. Crew: 3 (IFV), 4 (light tank), and 8 fully equipped soldiers. Weight: 26.9 tons. Primary weapons: (IFV) 30mm ZPT-99 cannon and 9M14 ATGM launcher, (light tank) 105mm L7 rifled gun. Secondary armament: (both) 7.62 machinegun. Aluminum alloy armor. Max. speed is 65km/h on land, 28km/h on water. In service with the Chinese PLA Navy Marine Corps, Venezuelan Marine Corps.

one oak leaf cluster.

CSM Gary J. Kurtzhals is the brigade command sergeant major, 3rd ABCT "Greywolf," 1st Cavalry Division, III Armored Corps, Fort Cavazos, TX. His previous assignments include battalion command sergeant major, 1-68 Armor, 3rd ABCT, 4th Infantry Division; squadron operations sergeant major, 5th Squadron, 7th Cavalry Regiment, 1st ABCT, 3rd Infantry Division; NTC live fire NCO in charge "Dragon 40," Operations Group, NTC; first sergeant, Company D, 2nd Battalion, 7th Infantry Regiment, 1st ABCT; and brigade master gunner, 4th ABCT, 1st Armored Division. CSM Kurtzhals' military education includes the Warrior Leaders Course, Advanced Leaders Course, Unit Antiterrorism Advisor, Force XXI Force Battle Command Brigade and Below/Blue Force Tracking instructor, Combatives Level 1, Senior Leaders Course, Hazmat Family and Safety, Total Army Instructor, Drill Sergeant School, Commanders Safety Course, M1A2 Master Gunner Course, UCOF Senior Instructor Course, First Sergeant Course, Combat Lifesaver, Observer Controller Academy, Joint Firepower Course, Cavalry Leaders Course, and the Sergeants Majors Academy Class 70. CSM Kurtzhals enlisted in the army in August 2001 as a military occupational specialty 19K, M1 Armor Crewman. He attended One Station Unit Training at Fort Knox, KY. CSM Kurtzhals holds a master's of science degree in management from Excelsior College, a bachelor's degree in leadership and workforce development from CGSC, and a bachelor's of professional studies degree in business and management from Excelsior College. His awards and decorations include the Meritorious Service Medal (5th award), NATO Medal, Master Gunner Identification Badge, Drill Sergeant Badge, Combat Action Badge, and the Drivers Badge for track and wheeled. He also holds the German Schützenschnur (Gold) and the German Armed Forces Proficiency Badge (Gold). CSM Kurtzhals deployed to Iraq three times and Afghanistan once for combat operations, and he completed four regionally aligned forces rotations to Europe and one to Korea. He has served in every leadership position from tank gunner through battalion command sergeant major.

Notes

Lewis Sorley, "Creighton Abrams and Levels of Leadership," *Military Review,* August 1992.

[2] Deming, W. Edwards, *Out of the Crisis,* Cambridge: MIT Press. 1982.

[3] Jonah Hill, *Moneyball*, Directed by Bennett Miller. Sept. 23, 2011.

[4] We found that the correlation coefficient between AGTS Table VI and Live Table VI is weak, only 0.20 on a scale of -1 to 1. While AGTS is essential to developing proficiency with the conduct of fire and the platform, building confidence, and developing individual skills, the scores in AGTS in themselves are not good predictors of actual gunnery performance.

The Integration of Commercial SUAS Quadcopters in MOS 19D OSUT Training

by CPT Nathan Kraemer and 1LT Gregory Brookover

The Russia-Ukraine war clearly indicates the importance of small unmanned aerial systems (SUAS) on the modern and future battlefield. As the U.S. Army gathers lessons learned from the European conflict and shifts its own priority to preparation for large-scale combat operations (LSCO), SUAS integration at all echelons is a top training priority.

Though the U.S. Army pioneered the early use of SUAS systems, we failed to mass and implement the technology at the same rapid rate as the Russian and Ukrainian Armed Forces. We cannot effectuate our immense emphasis on and need for SUAS integration at the strategic and operational levels without acquiring and training on the relevant platforms at the tactical levels. An average cavalry troop often possesses one or two Ravens (drones) and a few Black Hornets (drones). These quantities are insufficient and require remediation.

Buying commercial SUAS

A few months ago, the 194th Armored Brigade, a military occupational specialty (MOS) 19D/K One Station Unit Training (OSUT) Brigade, possessed a few platforms — one of which was operational. This lack of equipment drastically limited training opportunities for the Army's future cavalry scouts and armor crewmen. To alleviate this shortage, 5th Squadron, 15th Cavalry Regiment, a subordinate squadron in the 194th Armored Brigade, leveraged a recent Army-approved policy for the selective purchase of commercial SUAS systems for training purposes.

These off-the-shelf products have: (1) enabled MOS 19D Cavalry Scout trainees to learn to operate with and react to SUAS, and (2) afforded cadre members the opportunity to experiment with the advantages of SUAS in reconnaissance and security missions. The 5-15 Cavalry's practice of purchasing commercial SUAS platforms, and

Figure 1. Drone operators within 5-15 Cavalry Squadron incorporate small-scale quad-copter SUAS drones into OSUT training. *(U.S. Army photo by LTC Mitchell A Payne)*

associated lessons learned, should be replicated and disseminated across the force to yield maximal training output and preparation for LSCO.

While the Army stands by for the recent Department of Defense (DoD) initiative to develop and mass produce SUAS systems to come to fruition, commercial purchases offer a feasible solution for training. Regardless of unit or command type, changing a unit's modified table of organization and

equipment can be an arduous and time-consuming process.[1] Commercial-off-the-shelf (COTS) SUAS purchasing circumvents this problem and enables rapid equipment acquisition to train this critically important task.

The 5-15 Cavalry purchased several COTS SUAS drones. Each item — purchased via the unit's Government Purchase Card (GPC) – was employed in training within three months of initial order submission. Each of the five

troops within 5-15 Cavalry now has a dedicated drone for training and the squadron headquarters retains a reserve as well.

Training operators, maintenance

Even with the acquisition of the drones, 5-15 Cavalry needed to certify operators to fly the SUAS safely and within appropriate polices. Squadron and brigade SUAS master trainers ran a multi-day certification course. One day focused on classroom learning of SUAS and how to conduct minor repairs on drones (how to replace blades, motors and fix hard stops). Another day focused on hands-on flight training, and the last day was flight certification day. After completing the brigade course, operators had to complete an online course ran by the Air Force SUAS Manager (SUASMAN), the system of record for documenting SUAS training. The Air Force SUASMAN teaches more flight restrictions. The 5-15 Cavalry was able to train a 19D10 Cavalry Instructor (a recent graduate of 5-15 Cavalry OSUT) to become our primary drone operator in a few days.

When it comes to maintenance, the SUAS came with a few replacement rotor wings and spare batteries but that is all the spare parts available. Therefore, once we break a SUAS we will have to either figure out a way to fix it or we will have to replace it with the GPC. That is one reason the squadron bought a few extra SUAS to replace ones that will eventually break. The replacing of whole SUAS systems need to become a part of the squadron GPC budget moving forward just like with other consumable items.

SUAS in 19D OSUT

Adaptation for the future of warfare requires both doctrinal changes and new equipment. To facilitate this need, the U.S. Army's Maneuver Center of Excellence recently released a new "React to SUAS" battle drill for both mounted and dismounted units.[2] We now teach and train this new tactical development like any other battle drill. Before 5-15 CAV purchased commercial drones, troops were required to submit usage requests and deconflict training with adjacent units at the

brigade-level. Now, each Troop in 5-15 Cavalry can plan and execute SUAS training to integrate the new battle drill into each field training exercise (FTX). With the new designated drone, we employed it for both offensive and defensive tasks in more than 20 sorties between two FTXs.

Our troop commander traveled in a Humvee with the drone operator during a force-on-force situational training exercise. Sections or platoons of 19D trainees were able to request the asset from the troop headquarters. If approved by the commander, the drone operator moved the SUAS to the requested region and reported the intelligence collected to the requesting unit. When the unit under observation identified the SUAS in their area of operations, they were expected to react in accordance with the battle drill. In maintaining control of the SUAS asset

at the troop-level, trainees were kept on their toes in the defensive and required to think critically about offensive opportunities to request and employ the technology. The SUAS feed also provided the commander with a unique ability to evaluate training from, quite literally, a bird's eye view.

The intent behind the SUAS was for Soldiers to associate SUAS with indirect fire when being observed. Observation posts (OPs) that failed to engage the drone were targeted with indirect fire, while observation posts that engaged the drone and subsequently displaced to a new OP were left alone. Additionally, the SUAS reinforced the fundamentals of reconnaissance in "Gain and Maintain Enemy Contact" with SUAS augmenting dismounted and mounted teams as well as "Do not keep reconnaissance assets in reserve," encouraging Soldiers to think

Figure 2. PFC Jeremy D. Shumpert (5-15 Cavalry) operates a drone during a FORGE FTX to train Soldiers how to react to SUAS while dismounted. *(U.S. Army photo by LTC Mitchell A Payne)*

about all assets available to them. The use of SUAS at our FTXs enabled Soldier's different views of their fighting positions or OPs, which contributed to more beneficial after-action reviews and teaching.

Throughout the course of the FTX, each Soldier had the training opportunity to conduct the "React to SUAS" battle drill in the defense and employ SUAS technology in the offense. The trainees began to understand the importance of overhead cover and concealment in their mounted and dismounted OPs. The new drones allowed the unit to demonstrate and train the importance of overhead cover and concealment to new Soldiers from their first day in the Army. This principle is critical across all skill levels. Training Soldiers to react to SUAS with real SUAS (even if commercial) and to evaluate Soldiers' ability to cover and conceal themselves aerially is a practice that can, and should, be implemented in most unit trainings at echelon.

Things to consider

The COTS drone model purchased by 5-15 Cavalry differs greatly from most models that our cavalry Instructors were familiar with from their previous Army assignments. Most units employ fixed-wing SUAS assets like the Raven and Puma, or small rotary-wing technologies like the Black Hornet. The COTS drone is a quadcopter. Like the Black Hornet (but unlike the Raven and Puma), quadcopters are vertically launched and recovered, which minimizes the amount of space needed for employment and enables greater maneuverability. Quadcopters can hover and move quite slowly relative to other models. This allows a more deliberate information collection process and enables the operator to maneuver the drone between trees below their canopy level. To mitigate the risk of collision in this environment, the COTS SUAS drone is equipped with sensors that alert the operator when objects are too close. On the other hand, a stationary quadcopter, or a slow-moving quadcopter flying at a lower level is easier to identify and destroy than a fixed wing SUAS.

Quadcopters' relatively small size and light weight optimize its role in ground combat formations: Soldiers can easily carry the technology in their ruck while dismounted or store it in a vehicle without occupying much valuable space. While our quadcopter in Troop A, 5-15 Cavalry is not outfitted with a "payload," we could theoretically add one — a capability not possessed by the Black Hornet.

Our adversaries and allies in the Russian and Ukrainian Armed Forces, respectively, are employing several different types of SUAS, including quadcopters. We must develop and acquire similar products and train with commercial contemporaries to ensure preparedness for ensuing conflicts.

Platoon recon/security

In implementing the quadcopter in our platoon-level reconnaissance and security operations in 19D OSUT, one of the greatest lessons to emerge involved the technology's stated versus actual capabilities. The product's advertised maximum distances and flight times are based on ideal conditions. These statistics do not account for wind or signal obstructions between the drone and its remote controller. Realistically, no military unit will ever operate in "ideal conditions:" there will always be suboptimal weather and an unclear line of sight between an SUAS platform and its operator. These obstacles do not render drone technology moot, but simply requires additional training and individual product analysis by the operating units. When we evaluated the drone's capabilities under *our* conditions, we identified a marked difference in its maximum distance in a wooded area versus in an open field or along a road. The drone could only reach about a 500-meter range in the woods despite its manufacturer's claimed maximum distance of 12 kilometers. This reinforces the need for training and individualized assessments in the context of the reconnaissance and security mission sets.

The cavalry Instructors who operated the drone during our troop's FTXs and witnessed its employment, specifically referenced its potential advantages in security over reconnaissance missions. A drone's ability to cover dead space is instrumental in the security context, but the trainees' ability to identify the drone even at 100-feet elevation minimized its usefulness for reconnaissance. Commanders using SUAS technology for reconnaissance must carefully assess whether the asset is worth risking for information collection. If it is flown low enough to gather beneficial intelligence, is the risk of identification too high?
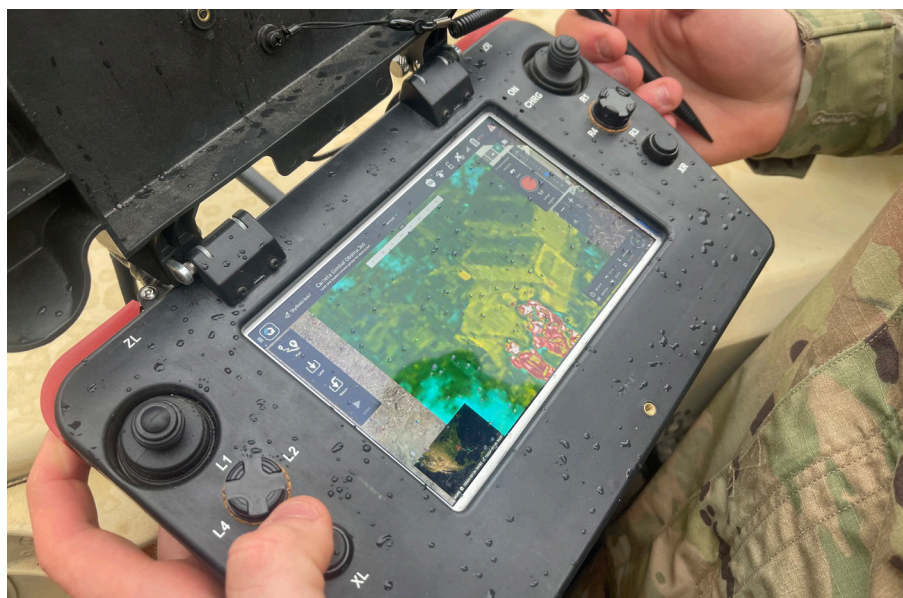
The decision to integrate SUAS

Figure 3. Drone operators (5-15 Cavalry) use thermal imagery to highlight the capabilities of small-scale SUAS quadcopter drones. *(U.S. Army photo by LTC Mitchell A Payne)*

technology in small-unit reconnaissance and security operations is greatly dependent on the commander's reconnaissance and/or security guidance (CRG/CSG) and the type of SUAS. The risk of potential drone identification is much more acceptable under rapid/forceful CRG, but perhaps untenable where stealth is paramount (depending upon the capabilities of the unit's SUAS). For example, under stealthy/deliberate CRG, the SUAS presence might dangerously reveal a scout platoon's location.

For counter SUAS considerations, we recommend commanders give detailed engagement criteria for SUAS systems by SUAS group type and SUAS actions (i.e., is the SUAS transiting the unit or hovering above the unit) in their CRG/CSG. In doing this, commanders enable a shorter decision-making process and shorter execution of the "React to Air" battle drill, which increases unit survivability. An OP, with this detailed guidance, can engage the right SUAS upon identification of the enemy SUAS, or they might displace upon identification. If the OP had to send the report to their platoon and then troop leadership for decisions, the SUAS might have already initiated a fire mission or engaged the OP. Additionally, until the scout platoon has organic counter SUAS capabilities beyond their organic weapons systems, there will be times when the CRG/CSG might preclude the troopers from engaging the enemy SUAS with direct fire weapons systems because it could give away their position. Therefore, a well thought out engagement criteria (or actions on contact), by phase of an operation that includes SUAS considerations will enable platoon level and below success in reconnaissance and security operations. In general, continued training with varied types of SUAS is warranted to truly understand the advantages and constraints of SUAS technology in cavalry formations.

Future of SUAS

The Army, specifically the Armor Branch, should evaluate the potential for SUAS use from an armored vehicle. We know that drones can be launched and recovered from the hatches of a Bradley Fighting Vehicle (BFV), but we have not yet tested if we can control

Figure 4. The Company C, 5-15 Cavalry executive officer, 1LT Daren Pitts (left) coordinates with the drone operator, PFC Jeremy D. Shumpert to incorporate SUAS drones into OSUT training. *(U.S. Army photo by LTC Mitchell A Payne)*

the drone from under armored protection. If this is in fact possible, then scout platoons could employ SUAS to clear intervisibility lines and dead space prior to maneuver during rapid and forceful reconnaissance missions. If not, deployment from a BFV hatch could be preferable to dismounted team deployment to clear terrain prior to maneuver.

Conclusion

The Army's allowance of commercial drone purchases by subordinate units has critically enabled rapid implementation of such technology in support of requisite training objectives. After only a few sorties, SUAS integration has revealed important conclusions about the role of SUAS in cavalry formations and the development of specific tactics, techniques, and procedures based on drone-type.

We liked the quadcopter design and the potential for adding payloads and being able to fly it in restricted terrain. Additionally, this SUAS could be easily thrown into a ruck sack or assault pack and does not add much additional weight. In a future scout platoon, a quadcopter should be one of the SUAS available but maybe not the only one they have. Each SUAS has different

advantages and disadvantages that can only be discovered through training with the equipment. Since the Army has opened some commercial drone usage, the cavalry community should rapidly acquire and use these SUAS in training to help point the way forward for the best SUAS for reconnaissance and security operations.

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Officer Leader Course and Air Assault School. He hold's a bachelor's of science degree in military history and French from the U.S. Military Academy.

Notes

[1] John Grady. "DEPSECDEF HICKS: DoD wants Thousands of Drones to Counter China's Military Mass Advantage." ***USNI News***, Aug. 28, 2023. https://news.usni.org/2023/08/28/depsecdef-hicks-dod-wants-thousands-of-drones-to-counter-chinas-military-mass-advantage.

[2] Task, 07-PLT-D8015 ***React to Aircraft While Dismounted – Platoon;*** and Task,17-PLT-D9515 ***React to Air attack While Mounted – Platoon, Thunderbolt Blast,*** Oct. 2023.

Forge the Thunderbolt!

Tank and Bradley crews from across the U.S. Army and partner nations compete during the 2024 Sullivan Cup Competition in the "React to SUAS and Vehicle ID" event at Good Hope Training Area on Fort Moore, GA, May 2, 2024. In the "React to SUAS and Vehicle ID" event, crews react to enemy drone movements. (U.S. Army photo by Joey Rhodes II, Fort Moore Public Affairs Office)

*Pre*mortem Gets Desired Wargame Outputs with Economy of Effort

by MAJ Scott Dawe and MAJ Anthony Molica

There is possibly nothing more terrifying for a young field grade officer than being informed, while you are leading your new staff members through the military decision-making process (MDMP) during the leader training program (LTP), that the U.S. Army Forces Command (FORSCOM) commander is on ground and coming by to observe your wargame. There is also likely nothing more horrifying than having that FORSCOM commander tell the entire room full of senior leaders as well as your staff that he is "disappointed."

Fortunately for the author, and the reason I am still in the Army writing this today, is that what retired GEN Michael X. Garrett was referring to when he expressed his "disappointment" was that we were executing the wargame in the same fashion he did when he was a junior staff officer. This comment was informative and raised the question, why is it there has been so little development in the execution of the staff wargame?

Further reflection on battalion-level war gaming through multiple LTPs and combat training center (CTC) rotations (as an observer/ coach/trainer, and member of a rotational training unit) suggests the status quo is indeed insufficient. But while my understanding from the rest of GEN Garrett's comments is he would have liked to see more technology incorporated to the existing process to make it more 21st Century, I would like to suggest a simpler alternative to the current battalion-level MDMP wargaming methodology.

When doctrine changes

A rule of thumb about doctrinal development is there are two conditions under which doctrine should change: when something is NOT in doctrine, but it works, or when something IS in doctrine, and it stops working. I suggest today's Army has arrived at the second condition state when it comes

Figure 1. GEN Michael X. Garrett, commanding general of U.S. Army Forces Command from 2019 – 2022 (seated center of photo), observes an LTP wargame in 2019. *(U.S. Army photo by the Fort Drum Public Affairs Office)*

to war-gaming operations at the brigade/battalion and below level.

Controversial hot-take time: In 17 years, I do not believe I have executed a "to standard" battalion-level MDMP war game. We are, of course, taught the doctrine at the Command and General Staff College (CGSC). Everyone can recall terms like "box method," "belt method," "avenue in depth," and "action/reaction/counterreaction," but I would challenge the reader to seriously consider if, given the time constraints of an LTP or CTC rotation, you've ever truly done, or seen it done, as explained in the CGSC classroom. I recall the block of instruction where we watched an out-of-date video of what looked like staff officers dissecting every aspect of a very complex plan in excruciating detail. While it was excellent and informative, and likely completely appropriate for an Operation OVERLORD or Operation DESERT STORM type operation, I just couldn't envision it happening in a swamp at the Joint Readiness Training Center (JRTC). Nor was the demonstration executed in a seemingly time constrained environment. No one in the video even looked tired. It was not like any JRTC,

National Training Center (NTC), Joint Multinational Readiness Center, or Joint Pacific Multinational Readiness Center planning session I have ever seen. But if the schoolhouse answer might not work at the speed of the current fight, what other options are there to execute something approaching a wargame?

Enter *pre*mortem

Enter the world of academia and the concept of the *pre*mortem or (to modify the term to sound more Army like) the before action review (BAR). In his 2007 ***Harvard Business Review*** article, "Performing a Project *Pre*mortem,"[1] the psychologist Gary Klein outlined the *pre*mortem as an incredibly simple mental model for changing the way a project team can identify and assess potential failures in a project. Simply put, the model discards the framing question of "what *could* go wrong?" with a project or plan and instead asks the participant to time warp into a future where failure has already been realized and ask, "what *did* go wrong?" I suggest this simple re-framing could be the perfect solution to the abbreviated battalion-level tactical wargame.

Imagine if instead of a potentially cumbersome and confusing action/reaction/counterreaction dynamic where the operations officer fights the plan against your own battalion S-2, you simply completed the plan then proffered the following thought exercise: "Now that the plan is complete, mentally transport yourself into the future. We have *lost* the battle or *failed* to accomplish our objectives. In two minutes, think through the details of what hypothetically happened and identify *why* we have lost." Then, solicit exact and specific failures from the entire team present. This would allow a holistic look at the entire operation from each warfighting function member of the staff which has the potential to tease out individual shortcomings which could be missed (i.e., missed the forest through all the trees) during the more doctrinally prescribed wargame methodology.

Good mental tool

This is also a mental tool to have the staff conduct as a form of war-gaming when conducting the Rapid Decision Making and Synchronization Process, or when they are gathering the tools to conduct war-gaming during deliberate planning. One of the tools is every participant's *pre*mortem/BAR list. The identified planning lead is then able to execute the *pre*mortem/BAR adjudication as part of step zero of the wargame to establish the start set. Essentially, this forces every member of the planning team to execute an individual wargame to submit their *pre*mortem. Then, the team can execute the wargame as a group to minimize risk and friction thereby ensuring as efficient of an operation as possible. To some readers, this may seem like the Red Team conceptual tools employed to eliminate bias and decision-making pitfalls. This could be the foundation for implementing a "10th Man" rule during planning. Junior field grade officers and senior staff NCOs are consistently asked "how do we ensure we are producing a good product?" The *pre*mortem/BAR is one way to at least show how we are NOT producing a bad one.

Best of all, this process is already being used unofficially in places. Another anecdote from this article's co-author

(who did not realize they were performing a *pre*mortem/BAR at the time), occurred during a rotation at NTC which illustrates the positive impact of the *pre*mortem/BAR on mission accomplishment. Tasked to seize the fictional training city of Razish, the combined arms battalion was to anchor the left flank of the brigade as it wagon wheeled into, and then cleared, the central corridor from east to west.

The battalion commander decided to infiltrate two companies of dismounted infantry through the John Wayne Foothills, with their Bradley Fighting Vehicles (BFV) following in support through John Wayne Pass. The one tank company would conduct a support by fire from Hill 876 and Hill 780. Following the battalion operations order brief, the battalion commander asked where we would fail. I responded that the enemy would conduct a chemical, biological, radiological, and nuclear (CBRN) attack into John Wayne Pass and the surrounding foothills to block the attack. This resulted in all BFVs being task organized to the tank company and all dismounts conducting the attack in mission oriented protective posture 2. Upon first contact the enemy chemically gassed John Wayne Pass. Fortunately, the dismounts were prepared and took no casualties from the CBRN attack. Ultimately the battalion seized its objective as we were able to mass our combat power without suffering CBRN attrition. In this one instance, the saving grace came not from the deliberate war-gaming taking many hours, but from one simple question to one company commander.

To compound the problem, reflect on the following question: How often has a brigade or battalion combined arms rehearsal (CAR) devolved into a second wargame because the outputs of the first wargame proved insufficient? In the *pre*mortem/BAR, the identified failure points could then dictate the scope of the CAR so key leaders spend time reviewing identified critical failure points to resolve instead of redeveloping the plan, which often happens.

Take away

This abbreviated technique of the *pre*mortem or BAR is not meant to replace

the detailed and rigorous war-gaming necessary for larger and more complex operations like an Overlord or a Desert Storm. Given that current war-gaming methodology is not satisfactory for the lower echelon tactical level or in a time constrained environment, the *pre*mortem or BAR is a way to get at the desired conceptual outputs of a wargame in an economy of effort manner.

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Notes

[1] Gary Klein, "Performing a project pre-mortem," *Harvard Business Review*; 2007.

From the *ARMOR* art archive:

"The M26 Pershing in Korea"

ASC Support for CTC Rotations

by COL Larry R. Dean and MAJ Jerad N. Hoffmann

As the executing arm of the U.S. Army Materiel Command's (AMC) equipping mission, the U.S. Army Sustainment Command (ASC) brings together all of AMC's capabilities to make sure Soldiers have what they need, when they need it, based on the Army's priorities. ASC's logistics support elements (LSE) serve to better connect combat formations with the materiel enterprise.

The LSE, supported by Life Cycle Management Command (LCMC) logistics assistance representatives (LARs) and field service representatives (FSRs), plays a crucial role ensuring high equipment readiness in brigade combat teams (BCTs) during their training at combat training centers (CTCs) by integrating and synchronizing key elements of the sustainment enterprise. The effective integration of LSE and LAR support to the brigade sustainment team significantly enhances the training effectiveness and operational readiness of these units. This support is essential throughout the entire training cycle, from pre-deployment preparations through CTC reception, staging, onward movement, and integration (RSOI) operations, and post FoF REGEN activities, as demonstrated by LSE Stewart's LAR/FSR integration during the 2nd Armored Brigade Combat Team (ABCT), 3rd Infantry Division (3ID), National Training Center (NTC) rotation 23-05 at Fort Irwin, CA.

Army BCTs use CTCs to conduct realistic, intensive, and demanding training exercises in a simulated combat environment to validate and improve combat readiness and brigade proficiency in critical tasks such as maneuvering, fire support and logistics operations.

As stated by Army Regulation 350-50, Combat Training Center Program, paragraph 1-5, "The Army's CTC Program remains the cornerstone of an integrated strategy that builds trained and proficient, combat-ready units and leaders to conduct operations as part

Figure 1. CECOM Logistics Information Technology (LOG-IT) LAR assists with trouble shooting an inoperable modem with the units VSAT during the NTC Tactical Enterprise Logistics Systems (TELS) validation during the rotation's RSOI. *(U.S. Army photo)*

of the joint force-ready to win in a complex world."[1]

LSEs enable high equipment readiness for the CTC training brigades by providing essential advice, assistance, and training on assigned equipment. Paramount for success is LAR integration during the home station pre-deployment preparation phase that carries on to CTC RSOI operations and post-FoF REGEN activities. Additionally, the LSE is staffed with highly skilled Army logistic management specialists (LMS) who play a crucial role. These LMS professionals closely monitor and analyze supply trends, ensuring equipment readiness is continuously optimized. Moreover, they establish a vital communication channel with the AMC enterprise, enabling seamless collaboration to leverage the full potential of supply capabilities in maintaining top-notch equipment readiness levels.

Pre-deployment prep

The LCMC LARs provide significant value by seamlessly integrating home station Army Field Support Battalion (AFS-Bn) LAR support with unit training concepts of operation and support. This integration proves crucial during CTC preparation training and extends into rotational exercises, equipping operators and maintainers with essential readiness tools that greatly enhance CTC training effectiveness.

During Phase Zero, before every CTC rotation, BCT gunneries, mission

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command system rodeos, and brigade command post exercises are conducted to validate crews and to ensure equipment is operational before deployment loadouts. Home station AFSBn-Stewart LARs can be valuable in supporting unit training by ensuring that equipment is maintained and operational, providing technical expertise as needed. During 2nd ABCT preparation training, AFSBn-Stewart LAR support was integrated early with their brigade and brigade support battalion partners. The U.S. Army Tank-Automotive & Armaments Command (TACOM) LARs conducted training on maintenance procedures and best practices that helped to ensure the Spartans were equipped with the skills they needed to keep their equipment at the highest levels of readiness.

One such example is how TACOM Ground Combat System LARs assisted the brigade engineer battalion with equipment troubleshooting procedures and maintenance training on their XM1150 Assault Breacher Vehicle (ABV) fleet. The LARs and unit personnel identified more than ten non-mission capable faults, ultimately leading to accurate parts requisitions and repairs. This focused training assisted the battalion to reach 100 percent operational readiness for their ABV fleet by the sixth day of REGEN. Another example was during division and brigade maintenance meeting, the 3ID enterprise identified low readiness rates for the 120mm mortar tube. AFSBn-Stewart partnered with the brigade sustainers to surge U.S. Tank-automotive and Armament Command (TACOM) assistance that ultimately brought back the battalion's mortar tube operational readiness percentage to nearly 100 percent.

By combining the expertise and resources of the LARs with unit training operations, personnel are empowered with the necessary skills to navigate and excel in realistic combat scenarios successfully. This collaborative approach ensures that operators and maintainers are fully prepared and equipped to meet the challenges they may encounter during CTC exercises, thereby maximizing training outcomes and operational readiness.

LSE support during CTC RSOI

The RSOI period for a typical CTC rotation is approximately five days. It is the last opportunity for units to leverage the LSE LCMC LARs before FoF starts. RSOI is the LSE's decisive point to enable readiness, often where units struggle to establish communications. Critical for LSE success was having a nonrestrictive moment in the training box allowing the units to coordinate directly with the LSE for LAR support. During rotation 23-05, Communications-Electronics Command (CECOM) LARs were far more employed than any other LCMC on the LSE team.

During rotation 23-05, the preponderance of CECOM LAR support was troubleshooting battalion and brigade's Joint Network Node Satellite Transportable Terminal (STT) system connections, which enabled upper tactical internet for in-theater communications allowing the brigade and battalions to exchange information. Also, the LARs provided technical assistance in helping the units isolate and resolve the issue that would inevitably impact 2nd ABCT's ability to communicate internally and with the division.

TACOM and U.S. Army Aviation and Missile Command (AMCOM) LARs also leveraged the advantage of units consolidating equipment during RSOI to capitalize on maintenance training with equipment operators and mechanics.

During 23-05, LARs conducted training on maintenance procedures and best practices, helping to ensure that units were correctly maintaining their modernized equipment and providing readiness assessments to the brigade leadership through the LSE team.

2nd ABCT successfully integrated TACOM and AMCOM LARs during their pre-combat checks/pre-combat inspections before occupying their tactical assembly areas to help isolate faults and order the correct parts, minimizing ground and air equipment downtime throughout FoF. LAR integration during RSOI proved valuable, assisting

Figure 2. CECOM Long Haul Transmission LAR assist with software updates on an STT. *(U.S. Army photo)*

the brigade to stay within 82 percent operational readiness during FoF.

LSE support during
CTC REGEN

During 2nd ABCT's 12-day REGEN schedule, Spartan Brigade's pacing fleet achieved a higher operational readiness rate (ORR) by REGEN + 6 than any other heavy training Brigade in the last two years. For tanks, Bradley Fighting Vehicles, and Paladins, 2nd ABCT's ORR ranged 20-25 percent higher than the average of the last eight rotations.

The LSE has a critical role in providing support during CTC REGEN operations, helping the supported brigade's maintenance trouble shooting, material resources, and technical guidance needed to rebuild combat power.

LSE Stewart and assigned LCMC LARs and FSRs worked closely with brigade and battalion maintenance personnel to provide additional technical expertise and support, ensuring that all pacing equipment was fully operational and ready for redeployment. Also, remaining engaged with maintainers and understanding the maintenance priority ensured the LARs provided the proper assistance for equipment fault verification and accuracy for long lead part requisition across the enterprise.

Relationships important

Additionally, essential to LSE support is the close relationship with the 916th Support Brigade (SBDE) located on Fort Irwin to synchronize the national level and the local enterprise for materiel solutions and economy of support. The 916th SBDE ensured that the available parts were delivered from the depots, arsenal, and installation supply support activities (SSAs) to each unit maintainer through the Fort Irwin installation SSA.

As explained in Field Manual 4-0, *Sustainment Operations*, paragraph 2-52, ASC coordinates the delivery of critical classes of supply from the strategic level down to the tactical level.[2] ASC's forward capability, the LSE, works closely with the 916th SBDE on Fort Irwin to ensure that essential materiel reach tactical formations.

The 916th SBDE not only plays a vital role in setting up the operational theater at NTC but also manages the division distribution and sustainment to keep our units ready. Through strong partnerships and coordinated efforts, the LSE and 916th SBDE ensure that parts are efficiently delivered from depots, arsenals, and installation SSAs to each unit's maintenance teams through phases of the CTC rotation.

Take away

Understanding and leveraging the capabilities of the LSE and the supporting LCMC LARs will vastly increase equipment readiness and material support before and during combat training rotations. The division supporting AFSBn/division logistics support element providing the LSE is the training brigade's operational link to the AMC enterprise, enabling division and brigade combat lethality anywhere – anytime.

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Notes

[1] Army, U. S. Army Regulation (AR) 350-50, **Combat Training Center Program**, para 1-5; May 2, 2018. https://armypubs.army.mil/ProductMaps/PubForm/AR.aspx.

[2] Army, U. S. Field Manual (FM) 4-0, **Sustainment Operations**, para 2-52; July 31, 2019. Army Publishing Directorate.

From the *ARMOR* art archive:

"Conduct of the Assault"

Notes from Field: Practices for Enhancing Your Rotational Deployment

by LTC Timothy W. Decker and MAJ Alexander Boroff

Rotational deployments are not new experiences for our Army. Nevertheless, each one is different enough that it warrants its own special considerations. This article describes several best practices for units to consider as they embark upon a rotational deployment to the eastern flank of the North Atlantic Treaty Organization (NATO). While our own experiences were derived from a unique mission set in NATO Battle Group - Poland, they are applicable across most of the Baltic states and many other European countries. Specifically, given our experiences to date, we believe there are four topics that incoming units should consider in their training philosophies to best position themselves while forward: interoperability with allies, tailoring training events, land and range usage, and cultural exchanges.

Figure 1: U.S. Army tank crews with Alpha "Animal" Company and Bravo "Barbarian" Company, 2nd Battalion, 69th Armor Regiment, 2nd Armored Brigade Combat Team, supporting 3rd Infantry Division, fire rounds from M1A2 Abrams tanks at Bemowo Piskie Training Area, Poland Sept. 12. *(U.S. Army photo by Alex Soliday)*

Interoperability with allies

It goes without saying, working with allies is hard. But, as former Defense Secretary James Mattis reminds us, "A nation with allies thrives. Nations without them die." Indeed, nurturing relationships with our allies is one of the primary reasons we are deployed to Eastern Europe.

Early in our rotation, our outgoing unit scheduled a "NATO Road Show" to introduce the incoming commander, the command sergeant major, and the operations officer to their adjacent units and higher headquarters. This proved especially invaluable for two reasons. First, it allowed face-to-face introductions between commanders and primary staff officers.

These connections and relationships proved important in the coming months as we navigated our new environment. Sometimes a phone call to the right person is the lever required to make training happen! Second, it allowed us to see, in very real terms, how our tactical actions had strategic effects. Receiving commanders' intents

in-person enabled us to better scope our training objectives to nest with NATO strategy in the Baltic states.

As we planned and executed this tactical training, we quickly learned of both the importance and limitations of interoperability. Interoperability is vital to ensuring unity of purpose and command. In an ideal world, NATO allies should be able to assemble in multinational formations and communicate securely using organic equipment. Our experience showed this is a very high bar to clear. In practice, we succeeded through deliberate placement of liaison officers (LNOs). For day-to-day activities, our LNO to our higher headquarters, the Polish 15th Mechanized Infantry Brigade, simplified coordination and made communication much more responsive than relying on NATO-Secret email systems or our tactical satellite link. In tactical exercises with our foreign sub-units, we found the technical interoperability solutions to be less effective than placing radio telephone operators with an organic

radio at command-and-control nodes to "swivel chair" information from U.S. to foreign systems, and back. Due to these personnel and equipment requirements, as well as technical limitations, the lowest level at which true interoperability occurred for us was the battalion.

Tailoring training events

Upon arrival to our Forward Operating Site (FOS) in Poland, we established a "campaign plan" covering the duration of our rotation, which looked very similar to a standard armored brigade combat team training strategy. We discovered Polish training, in practice, is more geared towards collective live fire events rather than the situational training exercises more familiar to U.S. Soldiers. As such, their training land is designed almost exclusively for live fire use. While this may be somewhat out of the ordinary for a "normal" training progression, it made collective live fire training very easy to conduct. Leaning into this opportunity made us

uncomfortable due to the usual restrictive nature of live fire training and our normalized experiences of conducting live fire exercises only after completing situational training exercises. On the other hand, live fire exercises were significantly easier to execute when incorporating allies, given that our training simulation devices (e.g. MILES) were rarely one-for-one matches with those of other nation's armies. Tailoring the unit's training events to the specific environment and constraints will yield better results than attempting to force a U.S. training strategy into an incompatible foreign training architecture.

Land, range usage

Range scheduling and usage at our FOS was not something that looked familiar to a U.S. audience. While there is a very rigid system akin to the Range Facility Management Support System (RFMSS), it takes more interaction to function properly and more detailed planning than we were used to. While a unit can simply reserve land in RFMSS and then cancel it as necessary, Polish ranges require regular meetings and confirmations to ensure their ranges are used properly and supported in accordance with Polish range regulations. The Training Support Activity Europe is a great enabler which can help units who are new to theater use foreign ranges effectively. With time and practice, these systems became familiar and did not limit our training opportunities.

Perhaps the most notable difference between U.S. and Polish range scheduling is the difference in planning horizons. Many Polish units finalize their scheduled training land within two weeks of execution after roughly "locking" the land three months prior. While we adhered to a self-imposed six-week horizon, even as the NATO Battle Group, we were second in priority to Polish Army units when it came to land allocation. We found tremendous value in coordinating cordially with these units, which enabled us to achieve our training objectives through co-use agreements or incorporation of multinational elements.

Training, cultural exchanges

As alluded to earlier, situational training exercises at the company level and below face technical interoperability limitations that constrained our junior leaders' direct interaction with our allies. Nevertheless, our junior leaders had numerous chances to train individually with our allies. We had direct liaison authority with two Polish sister mechanized infantry battalions, and the Polish Territorial Defense Forces were always willing to execute training with us; we interacted with both regularly. While this most often amounted to simple individual weapons training, we incorporated these forces into our platoon collective events as well. Rarely do U.S. units have the opportunity to face real BMP-1s as an opposing force, or to receive in-depth briefings and hands-on training with these systems while executing live fire training.

On the civilian side, towns near Polish military installations are somewhat akin to those in our own country. We received regular invitations from town mayors, local churches, and other representatives to participate in community events. In our case, we had so many communities interested in mutual support that we assigned each company, battery, and troop commander responsibility for at least one town. This provided opportunities for our junior leaders to engage with local key leaders, and for our Soldiers to conduct cultural exchanges. The Polish National Foundation, Morale Welfare and Recreation, and our own Building Strong and Resilient Teams events were a further boon to our ability to expose Soldiers to Polish culture. These experiences allowed Soldiers to interact with foreign cultures in unique ways and were a tremendous source of

Figure 2: Polish tank fires during the Iron Spear exercise in Adazi, Latvia, Nov. 13, 2023. U.S. Army Soldiers with Bravo Company, 2nd Battalion, 69th Armored Regiment "Panther Battalion", 2nd Armored Brigade Combat Team, 3rd Infantry Division supporting NATO's enhanced Forward Presence Battle Group Poland, joined multinational troops from Canada, Germany, Italy, Latvia, Lithuania, the Netherlands, Spain, and the United Kingdom representing NATO enhanced Forward Presence Battle Groups from Latvia, Lithuania, Estonia, and Poland for the exercise. *(U.S. Army photo by Capt. H. Howey)*

stress relief and restoration in between training events.

Conclusion

The U.S. Army has been conducting rotational deployments for generations, and there are many lessons learned during the years that remain applicable for today's officers and leaders. Nevertheless, each deployment is unique in time and location, and each will have its own variables to consider when planning. Our own rotational deployment to NATO's eastern flank provided us with useful insight into contemporary U.S. European Command missions.

Considering working with allies and the challenges of interoperability will allow better integration early. Tailoring training events to the environment at hand while remaining flexible with country-specific systems and customs will also allow units to maximize the training opportunities available to them, some of which might not be feasible at home station. Finally, leaders

and Soldiers should engage with their local communities to embrace cultural exchanges as a means of professional development and personal fulfillment. Deliberately addressing these topics early in the rotation will place units in a position of relative advantage and create meaningful memories for Soldiers and leaders throughout the formation.

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executive officer, 6th Squadron, 8th Cavalry Regiment, 2nd Infantry Brigade Combat Team, 3rd Infantry Division, Fort Stewart. LTC Decker's military schools include Command and General Staff College, Fort Leavenworth, KS; Joint Firepower Control Course, Fort Leavenworth; Ranger School, Fort Moore, GA; Faculty Development Course, Fort Moore; Maneuver Captain's Career Course, Fort Knox, KY; Armor Officer Basic Course, Fort Knox, KY; and Air Assault School, Fort Smith, NY. He has bachelor's of science degree in computer science from the U.S. Military Academy and a master's of business administration degree from Kansas State University. LTC Decker's awards include the Bronze Star Medal with two oak leaf clusters, the Meritorious Service Medal with three oak leaf clusters, the Joint Service Commendation Medal, and the Combat Action Badge. He has two combat deployments to Afghanistan, two combat deployments to Iraq, and has been part of a dual military couple during his entire career.

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Figure 3: A U.S. Army Soldier with 2nd Battalion, 69th Armored Regiment "Panther Battalion," 2nd Armored Brigade Combat Team, 3rd Infantry Division, walks beside a Romanian Soldier down a snowy path during the land navigation portion of the Croatian "Winter Challenge" at Bemowo Piskie Training Area, Poland, Jan. 5, 2024. The Croatian "Winter Challenge" is a 15-kilometer competition consisting of seven events: land navigation, small arms firing, wall climbing, obstacle course while wearing a gas mask, rope crossing, low-crawl and obstacle climbing, and a hand grenade toss. U.S., Polish, Romanian, and Croatian troops representing NATO's enhanced Forward Presence Battle Group Poland participated. *(U.S. Army photo by Dan Yarnall)*

Military Academy, a master's of science degree in systems engineering from Johns Hopkins University and a master's degree of policy management from Georgetown University. MAJ Boroff's awards include the Bronze Star Medal, Meritorious Service Medal with one oak leaf cluster, and the Combat Action Badge. He has one combat tour: Operation Enduring Freedom with the 3rd Infantry Division, rotation 12-13. MAJ Boroff also participated in one U.S. European Command rotation in Poland, rotation 23-24, serving as the enhanced Forward Presence Battlegroup – Poland Operations Officer. He also co-runs a military professional writing web log named "Thought to Action."

Acronym Quick-Scan

FOS – forward operating site
LNO – liaison officer
NATO – North Atlantic Treaty Organization
RFMSS – Range Facility Management Support System

Figure 4: U.S. Army Soldiers with Golf "Gambler" Forward Support Company, 2nd Battalion, 69th Armored Regiment, 2nd Armored Brigade Combat Team, 3rd Infantry Division, with residents during a holiday festival in Mikołajki, Poland, Dec. 3, 2023. *(U.S. Army photo by Sgt. Cesar Salazar Jr.)*

ADAZI, LATVIA – A Polish tank moves into position to join NATO Allies from Canada, Germany, Italy, Latvia, Lithuania, Netherlands, Spain, the United Kingdom and U.S. Army Soldiers with Charlie and Bravo Companies, 2nd Battalion, 69th Armored Regiment "Panther Battalion," 2nd Armored Brigade Combat Team, 3rd Infantry Division supporting NATO's enhanced Forward Presence Battle Groups from Estonia, Poland, Latvia, and Lithuania, for exercise Iron Spear in Adazi, Latvia, Nov. 13, 2023. The 3rd Infantry Division's mission in Europe is to engage in multinational training and exercises across the continent, working alongside NATO allies and regional security partners to provide combat-credible forces to V Corps, America's forward deployed corps in Europe. *(U.S. Army photo by Capt. H Howey)*

What's Missing in Your Leader or Self-Development Program? The Answer is Probably Military History!

by MAJ Shameek De Lancey

"Let him read and meditate upon the wars of the great captains: It is the only way to learn the art of war," said Napoleon.[1]

Military professionals have debated the usefulness and value of studying military history for centuries. The debate within the U.S. Army has ebbed and flowed depending on the Army's operating tempo (OPTEMPO) or on senior leader emphasis and beliefs about the "practicality" of studying military history for the average military professional. I believe the study of military history is critical and mandatory for the development of well-rounded and effective Army professionals.

The study of military history informs the long-term development of military professionals in three ways. First, studying history nurtures and cultivates critical- and creative-thinking skills. It is imperative that military professionals possess these skills, especially as military operations become more complex, and the time available for leaders to make decisions decreases. Second, the study of military history allows military professionals to develop, adapt, and evaluate current doctrine. Lastly, military history develops military professionals by exposing them to prior examples and experiences before they are personally tested in combat.

The positive benefits of exploring military history allow leaders to learn the art of war and learn from others' experience, which is critical for the military profession and the success of our force in future conflicts. Michael Howard described the nature of the military profession and the frequency with which a military professional might exercise his or her duty in war as it "is almost unique that he may have to exercise it only once in a lifetime, if indeed that often. It is as if a surgeon had to practice throughout his life on dummies for one real operation; or a barrister appeared only once or twice in court towards the close of his career; or a professional swimmer had to spend his life practicing on dry land for an Olympic championship on which the fortunes of his entire nation depended."[2]

Future wars rarely go as predicted, but as military professionals we owe it to our organizations and the nation to be ready when called upon. No other army trains as often, as realistically, or as demanding as our Army or even the joint force. In addition to training, one missing or often neglected element of our preparation for future war is deeper and richer understanding of military history in our Army professionals and within our Army organizations. What follows is an argument for including the study of military history in the operational force to build leaders' mental preparation to execute future military operations.

Critical and creative thinking skills

Our Army should use the study of military history to challenge and develop officers, over the length of their careers, in these three areas. Without a doubt this initiative should be driven by the institutional Army. However, individual military professionals should strive to improve in these areas through their own self-development plans as well. An easy way to begin this journey is to start with your current unit's organizational history. We owe it to our Soldiers to tie their current service to that of those who came before us, and knowing, teaching, and exploring our unit history is a way to make those connections. This builds pride in the force and inspires Soldiers to live and work to the high standard of those who served in their unit before them.

Knowing and talking about unit lineage is an excellent way to discuss military history in the operational force. History in the institutional Army is also a difficult subject to teach and study. Many professional military educational (PME) programs superficially cover military history and miss the mark on truly gaining the benefits of deep military history study. Military history in PME usually consists of disjointed and brief wave-top discussions of battles, campaigns, and military leaders focused on data and information. This approach that covers decades and centuries in minimum classroom blocks of instruction does not allow students to truly understand historical events or the full context in which the events take place. Additionally, students do not have the time or opportunity to make meaning of what they are learning.

In "Military History, Is It Still Practicable," Jay Luvaas lists several prominent military leaders who believe that military history needs to be studied deeply. Luvaas cites Field Marshal Earl Wavell as saying, "the real way to get value out of the study of military history is to take particular situations, and as far as possible get inside the skin of the man who made a decision and then see in what way you could have improved upon it."[3] Wavell's approach takes time and a deliberate effort, but it allows students to truly exercise their critical- and creative-thinking skills. These skills are required to develop successful commanders and staff officers capable of winning on the modern battlefield.

Wavell's approach should be implemented at every PME by every student attending the course. Techniques such as requiring students to conduct a thorough battle analysis like the requirement at the Maneuver Captain's Career Course (MCCC) are excellent opportunities that require students to study the decisions and actions made by prior commanders to learn from those experiences. Additionally, conducting staff rides is another opportunity to learn from military history and get firsthand context to the conditions previous commanders experienced as they participated in a military operation. These techniques exist in our modern PME system but should increase to allow students more opportunities to participate in these educational events. Additionally, focus on the self-development domain

regarding military history should be a requirement for leaders in the operational force. This requirement would ensure these skills are continuously developed throughout the length of an officer's career and not just occur while the Soldier is a student enrolled in PME.

Develop, evaluate doctrine

The consistent and deep study of military history equips military professionals to better understand, implement, evaluate, and develop U.S. Army doctrine. In the shadow of our wars in Iraq and Afghanistan and as we shift to large-scale combat operations (LSCO), it is the perfect time for the Army to reflect, learn, and review our current doctrine. In 2010 Robert Scales warned against the failure to maintain a learning organization by stating, "my sense is that the military has begun to circle X its officer seed corn. A bias toward active service in our protracted small wars is making our military an institution too busy to learn."[4] Scales warned against an emphasis on action over education and offered ways the Army could promote and reward scholarship for military professionals. The continuous exploration of military history will equip military professionals to develop more effective doctrine and provide leaders with additional lenses to view the effectiveness of our current doctrine.

Studying the evolution of our military doctrine will provide context for military leaders currently trying to understand the Army's new operating concept – multidomain operations (MDO).[5] Military history will equip leaders with an appreciation of the historical consistencies within MDO and better illuminate what is new and different in the doctrine. This understanding will allow leaders to better analyze if and how our MDO concept addresses the current operational environment or the challenges our pacing threats pose to our ability to conduct successful military operations.

This could require military professionals to progressively work on a thesis project throughout their career, periodically publish in professional journals, or require top performers to teach, observe-coach, or develop doctrine periodically throughout their career.

The need to evaluate and develop better military doctrine is not the sole responsibility of Combined Arms Doctrine Directorate doctrine writers and developers. All Army professionals owe it to their units and the force to evaluate doctrine's effectiveness when conducting home station collective-level training or a combat training center (CTC) rotation. Feedback from the force of doctrine applied to training or while operating allows leaders to strengthen our doctrine by understanding what does and doesn't work. Additionally, CTC observer/coach/ trainers (O/C/T) and PME instructors should be heavily grounded in military history to better assist them in their official duties and should actively promote historical examples as a way of relating and connecting experiences of their training audience to the greater historical legacy their operations originated from.

Learn from others

Lastly, and more commonly, military history is a great tool to train military professionals without having to conduct military operations. This benefit can be implemented as an annual training type requirement or like the mechanisms discussed in previous paragraphs. Military professionals should have an area of expertise that assists them in better understanding the complex character of warfare and exercises their judgement by replicating future situations they may find themselves in.

Clausewitz's concept of coup d'oeil, or inward eye, refers to the "quick recognition of a truth that the mind would ordinarily miss or would perceive only after long study and reflection."[6] All Army professionals should develop and cultivate their individual coup d'oeil regardless of their duty position as a commander, staff officer, or functional area officer. Deep and deliberate study of military history is one of the best ways to develop your individual coup d'oeil. Studying military history and exploring what others have done in similar situations builds your ability to recognize "the truth" in any military context. It is important that Clausewitz highlighted "long study and reflection" as the means to develop coup d'oeil and not training or practical experience. Long study and reflection can come after training and personal experience, but the unlimited opportunity to learn from others through the study of military history is what the great theorist was referring to.

Conclusion

The study of military history to empower the current Army professional is an underappreciated tool that should be emphasized and leveraged in every unit's leader development program and in individual self-development programs. Studying history can be intimidating for some who may not know how to begin their journey or may be hesitant in not wanting to draw the wrong lessons or insights from historical experience. Antulio Echevarria II expertly cautioned against some of the troubles and pitfalls of studying military history in his article titled "The Trouble with History."[7] However, his warning is no excuse not to incorporate deep and meaning study of military history in PME. Nor does Echevarria's warning abdicate our leaders' responsibility to leverage the benefits of studying military history throughout their careers.

The long-term study of military history will benefit military professionals by improving their critical- and creative-thinking skills, improving their ability to evaluate, implement, and develop doctrine and act as a training and education tool during periods of low OPTEMPO. The study of military history is greater than the ability to recall historical facts or extrapolate solutions from previous historical examples to solve current military problems. The prominent professor Michael Howard said it the best: "It must never be forgotten that the true use of history, military or civil, is, as Jacob Burckhardt once said, 'not to make men clever for the next time: it is to make them wise forever.'"[8]

MAJ Shameek De Lancey is an Infantry officer who is currently a student at the Command and General Staff College. His previous assignments include serving as a rifle platoon leader and company executive officer in the 1st

Battalion, 21st Infantry Regiment, 25th Infantry Division at Schofield Barracks, HI; battalion assistant operations officer and company commander in 4th Battalion, 31st Infantry Regiment, 2nd Brigade Combat Team, 10th Mountain Division (Light Infantry), Fort Drum, NY; aide-de-camp for the 10th Mountain Division commanding general; small group leader at the Maneuver Captain's Career Course at Fort Moore, GA, where he instructed two seminars of future company commanders. He earned instructor of the cycle honors, and his passion for teaching inspired him to start Kansas State University's certificate for Adult Learning and Education. Advanced Military Science Program student at the School of Advanced Military Studies at Fort Leavenworth, KS. MAJ De Lancey's military schools also include U.S. Army Ranger School, Cavalry Leader Course, Stryker Leader Course, Pathfinder School, Air Assault School, and Airborne School. He earned a bachelor's of arts degree in history from Old Dominion University and a master's of arts degree in international relations from the University of Oklahoma. MAJ De Lancey's awards include the Bronze Star Medal, Defense Meritorious Service Medal, and the Meritorious Service Medal with one Oak Leaf Cluster. MAJ De Lancey completed two deployments to Afghanistan in support of Operation Resolute Support.

Notes

[1] Jay Luvaas, "Military History: Is It Still Practicable?" *Parameters 12* (March 1982).

[2] Michael Howard, "The Use and Abuse of Military History," *Parameters* 11/1 (1981).

[3] Luvaas, "Military History."

[4] Robert Scales, "Too Busy to Learn," *Army History*, No. 76 (Summer 2010).

[5] Field Manual 3-0, *Multidomain Operations*; October 2022.

[6] Carl von Clausewitz, *On War*, translated and edited by Michael Howard and Peter Paret (Princeton, NJ, 1976).

[7] Antulio Echevarria, "The Trouble with History," *Parameters 35* (Summer 2005): 78-90.

[8] Howard, "The Use and Abuse of Military History."

From the *ARMOR* art archive:

An M1IP Abrams in Korea

Minimizing Blast Overpressure Exposure: Enabling Lethality by Reinforcing Safety and Recommitting to Standards

by CPT Leah Foodman

On Dec. 11, 2023, the U.S. Army Training and Doctrine Command's Ranges Proponent Office issued guidance for "Managing Brain Health Risk from Blast Overpressure." The memorandum, crafted for installation range managers, is intended to "provide guidance for minimizing exposure from blast overpressure until information can be added to Army Regulation 385-63, *Range Safety*." The Department of Defense has current standards that aim to limit blast overpressure exposure in order to prevent "lung injury, eardrum rupture [... and other] potential health impacts," yet, there is sparse information — and thus, limited data driven guidelines — pertaining to blast overpressure and brain health.

The U.S. Army Engineer School (USAES) recently conducted research related to overpressure exposure and neurotrauma for personnel executing breaching operations. Their findings begin to bridge the aforementioned knowledge gap of the impact of over-pressurization exposure impacts on the brain. Despite USAES' research emphasis on breaching operations, the implications of its results are largely applicable to the Armor community. Most notably, USAES concluded that overpressure exposure results in negative long term health consequences, but also imminently compromises lethality. Per the USAES study, "Soldiers [who are exposed to blast overpressure] will be slower to react and unable to identify sounds and directions from enemy threats [during and after breaching operations]; this is a reduction in overall combat capability and efficiency."

As the large-scale combat operations fight looms and preparations intensify, Armor leaders at all echelons must recommit to standards adherence and risk mitigation for blast overpressure injuries.

Leaders must reinforce

Leaders must reinforce double hearing protection for all Soldiers. "Double hearing protection" refers to both external and internal protective mechanisms used conjunctively; for example, traditional issued in-the-ear protection coupled with a combat vehicle crewman (CVC) helmet worn with a buttoned chinstrap. Without a secured chinstrap, the external ear protection offered by the CVC is ineffective—and the helmet is unlikely to remain in place in the event of an accident. Department of the Army Pamphlet 385-63, *Range Safety*, Table 8-20, "Exposure Limits to Hazardous Impulse Noise for Tank Main Gun for Selected Cartridges" lists the number of rounds that a tank crew member may fire from his/her respective position on the vehicle with both single and double hearing protection. In this study informing the data in Table 8-20, single hearing protection refers to "approved earplugs, earmuffs, CVC helmet, or headset," while double protection requires earplugs *and* one of the latter three devices.

Per Table 8-20, an exposed (out of the hatch) vehicle commander firing M829A3 cartridges from the 120mm Abrams Main Gun may safely fire 26 rounds over a 24-hour period with single hearing protection, but up to 256 rounds with double hearing protection. The driver and gunner may fire 104 and 417 rounds respectively with single hearing protection, but up to 1,000 rounds per day with double protection. While a buttoned CVC chinstrap is far from fashionable, when paired with approved earplugs, it can be truly lifesaving: preserving hearing and minimizing blast overpressure exposure thereby enables optimal situational awareness and reaction times both acutely and over long periods. Leaders must set the conditions now (in training) to prevent residual injury and ensure clear dissemination of the standard and its rationale. This will ensure that Armor formations enter conflicts ready to win.

The Range Proponent Office's memorandum said it best: "This interim guidance is not meant to restrict commanders from conducting mission essential heavy weapons training [but to] raise blast overpressure (BOP) risk awareness as DoD continues to better define the relationship between BOP exposure… and potential health effects." Commanders and leaders across the Army must leverage their authority and best judgment to implement training plans that balance two critical objectives: preparing for war and safeguarding the warfighter.

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Acronym Quick-Scan

BOP – blast overpressure
CVC – combat vehicle crewman
DoD – Department of Defense
USAES – U.S. Army Engineer School

Crossing Rivers and Bridging Gaps in Doctrine: Experiences from Remagen Ready 24-01

by MAJ Korey Gaines and MAJ John Kearby

A lone Joint Light Tactical Vehicle (JLTV) idles softly under a camouflage net, nestled into the scrub oak underbrush. The humvee, guided by the JLTV's Joint Battle Command-Platform signature, slides into place – door to door with the JLTV. Passenger side doors open … and the crossing area headquarters *is born. The 2nd Battalion, 8th Cavalry Regiment (Stallion) and the 20th Engineer Battalion operations officers exchange a greeting and get down to the thorny business of sequencing and rafting the Stallion Task Force across Cowhouse Creek. The 1st Brigade, 1st Cavalry Division and the 36th Engineer Brigade recently participated in Remagen Ready 24-01, a division-level gap crossing exercise at Fort Cavazos, TX. The following highlights the advances in thinking gained during that event…*

Recent large-scale wet gap crossing exercises, and the logical implications of a future operational environment on those operations, suggest that significant gaps exist in our published doctrine. The current body of knowledge reflected in Army Techniques Publication (ATP) 3-90.4, **Combined Arms Mobility**, specifically Chapters 4 and 5 – "Gap Crossing in Support of Maneuver and Deliberate Gap Crossing," either lack sufficient detail to be relevant at the brigade and battalion level or present conflicts with what we know to be true about Field Manual (FM) 3.0, **Operations,** styled large-scale combat operations (LSCO) in the age of convergence.

It is apparent that the gap crossing principles – specifically those related to planning, reconnaissance, and command and control, require significant overhauling and improved depth to provide value to our formations in both the current and future operational environments.

The first area to address in the doctrine relates to the planning of wet gap crossing operations and the echelon at which detailed planning must occur. Much of the discussion revolves around operations at the division level – but significant and specific effort is required at the brigade and battalion level to support and enable the detail for division. The gap crossing fundamentals of extensive preparation, flexible planning, and traffic management all reflect clear truths, but they omit the literal requirement of parallel planning and battlefield development at the brigade and battalion level.

The doctrine does not go far enough in describing what a brigade or battalion staff should do to achieve those principles or what their roles might be. The following represents our recommendations.

Maneuver and support force brigade and battalion staffs need to develop basic working relationships and provide each other with capabilities briefings, discuss how they each visualize and understand gap crossing operations, and conduct joint academic sessions to educate each other on the specifics of their functions. Leading up to Remagen Ready 24-01 – 1st Armored

Figure 1. 1/1CD rafting their Armored Cavalry Troop during Remagen Ready 24-01 – An M1 Abrams tank rides on a 43rd Multi-Role Bridge Company (MRBC) raft under the direction of 2-8 Cavalry and the 20th Engineer Battalion. Rafting operations took place after 2-5 Cavalry had seized far-side objectives via air and boat assaults. *(U.S. Army photo by MAJ Garrison Spencer, U.S. Army Corps of Engineers (USACE) Public Affairs Officer)*

Brigade Combat Team (ABCT) hosted Wet Gap Crossing Leader Professional Development sessions, conducted numerous terrain walks with commanders at various echelons, and arranged the participation of support forces in staff training exercises.

The ATP suggests that support forces "must link up"[1] – but we believe that significantly more early interaction is necessary as described above.

The planning for a wet gap crossing requires flexibility be built into the operation, but it also requires tremendous depth and detail that can only be developed at lower echelons. The literature suggests worthy features of a flexible gap crossing plan – such as alternate crossing sites and holding equipment in reserve – but critical details that deliver the flexibility are glossed over. The actual crossing sites, routes, engineer regulating point locations, and exact loads expected on each raft require details that are out of reach of the division. Battalions must execute the focused preparation of the battlefield and generate the graphic control measures for their brigades and divisions. Maneuver and engineer brigades and battalions must design the crossing area so that it achieves flexibility by developing four crossing areas, and the route or corridor network required to access each of them from various waiting areas. A firm understanding of the cross-mobility corridors will be critical, and programming that into the graphics at the outset provides the desired flexibility. The four sites also build opportunities for deception and viable alternatives to the typical two site planning factor for a brigade. Additionally, doctrine prescribes staging, holding, and call forward areas – each marshalling large formations and under the control of a Military Police element. We believe that in practice, in the face of the current and future operational environment, this is no longer a tenable course of action. Large electronic and physical signatures will only invite enemy disruption efforts, and maximum effort should be applied to creating dispersed and concealed formations. With that in mind, we, and others recommend application of staging and holding zones, where units are dispersed and under the control of their brigade or battalion to be directed toward the crossing sites, rather than MP controlled areas. The echeloning or funneling of units based on their size through the crossing site should be maintained.

Figure 2. Multi-Role Bridge Company Raft Construction – The 43rd and 74th MRBCs assemble 7-Float rafts capable of ferrying multiple armored vehicles across Belton Lake. Early trips are conducted using a horizontal rafting style (pictured above), while subsequent iterations employ longitudinal rafting where the Bridge Erection Boats are positioned on both sides of the raft. *(U.S. Army photo by MAJ Garrison Spencer, USACE Public Affairs Officer)*

Beyond the graphics, likely only at the battalion level will there be enough understanding of the scheme of maneuver and the rolling composition of each formation to plan march serials and the individual raft loads they will comprise. In a contested wet gap crossing against a peer threat in large-scale combat operations, it is expected that we would employ rafting operations for most of the crossing. Rafting provides greater survivability, natural dispersion, and improved flexibility while sacrificing the speed at which combat power can be trafficked to the far-side.

Multi-Role Bridge assets are extremely scarce and the less reliant we are on fixed sites the more survivable we can expect to be. For crossings of this type, an execution checklist may be developed at the division level, but the mechanics of moving companies across a gap, raft by raft, is extremely challenging to capture. That granularity exists at the battalion level, and we owe that detailed portion of the planning.

We experienced firsthand how powerful and how fast we could be when equipped with an order of movement containing by vehicle composition information and a desired scheme of maneuver on the far-side. The micro-routing decisions concerning congestion, enemy contact, and inactive crossing sites were natural and well informed. Doctrine, inexplicably, assigns the development of the unit movement and crossing plan to the transportation officer to be executed by the provost marshal section in accordance with their traffic control plan. This design is clumsy, in that neither of those elements are positioned to react to changes and make rapid decisions, and there is considerable risk that they do not understand enough of the nuances of the battalion schemes of maneuver across different crossing sites to recommend decisions that even support the plan. We believe it is far superior to have brigade and battalion staffs devise the crossing plan and provide refinement to the specified tasks from division.

To summarize, brigade and battalion staffs executing wet gap crossing operations should – make every effort to closely integrate and build organizational relationships and trust. They should collaboratively design the crossing area with a network of mobility and cross mobility corridors to create the flexibility to cross at any of four sites from any origin. This crossing area should also feature dispersed staging and holding zones to provide survivability to their formations. And they should recognize that rafting operations are the preferred mode of crossing and that brigade and battalion staffs own the crossing plan – complete with sequence of units to specific locations and high resolution composition of unit crossing element.

Figure 3. The Crossing Area Headquarters – A small control cell, consisting of battalion operations officers and their vehicles, managed the flow of equipment through the crossing area. Each element had clear lines of both communication and control with their subordinate elements throughout the operation. The proximity of these nodes allowed for rapid decision making, tactical flexibility and limited detection. *(U.S. Army photo by MAJ John A. Kearby)*

During Remagen Ready, our key leader rehearsals on the terrain were invaluable. They enabled us to confirm the trafficability of different routes and confirm redundant communication across command posts and nodes. After our rehearsal, we changed the routing from the holding areas to the call forward areas because many of the routes were not traversable due to rain. However, it is unlikely units will be able to conduct the same type of rehearsals during LSCO. Therefore, reconnaissance units must put the same effort into identifying suitable routes through and across zones as they due to the identification of the crossing sites themselves. This emphasis must be added to future wet-gap crossing doctrine.

ATP 3-90.4 affirms the importance of reconnaissance to facilitate a wet gap crossing. However, it does not provide the specificity required to ensure units execute the necessary reconnaissance. For example, ATP 3-90.4 states "a division reconnaissance element moves ahead of the main body to conduct reconnaissance of the near side and pre-determined crossing sites." Therefore, the doctrine must be updated to add three specific reconnaissance requirements to facilitate a wet gap crossing. First, lead reconnaissance efforts must identify suitable locations within the different zones for follow on forces to stage. Secondly, they must validate communications capability at templated C2 locations. Finally, they must identify mutually supporting routes that can support movement to multiple crossing sites. Without these reconnaissance efforts, units will struggle to achieve the gap-crossing fundamentals of extensive preparation, traffic management, and speed.

Reconnaissance must be a deliberate portion of the *extensive preparation*. That enables the traffic management and the speed. A route will inevitably shut down at some point. We had routes shut down due to enemy actions, recovery operations, and degradation of the route due to so much

traffic. Fortunately, we identified decision points throughout the system to redirect traffic to different call forward areas and crossing sites. Furthermore, we had our CPs and RETRANS positioned in a manner that enabled us to communicate throughout the crossing area. As units prepare to execute these operations in LSCO, they must ensure their reconnaissance identify multiple approach routes/cross mobility corridors and locations that provide the best communications throughout the crossing area.

Command post functions

ATP 3-90.4 includes a lengthy discussion concerning command post functions and their activities during a deliberate wet-gap crossing. While these are useful and appropriate actions in general – they offer an unrealistic perspective of echelons where these actions are taking place and imply a physical structure that is infeasible considering the operational environment. The final section to be addressed within this techniques publication, is how and with what structure a wet-gap crossing operation should be commanded and controlled.

The ATP delineates the roles of crossing area commanders and crossing area engineers at both the division and brigade levels. While the descriptions of their responsibilities are generally accurate, the manual either understates or omits crucial details and composition.

At the brigade level, the crossing area engineer assumes the role of the brigade commander unless delegated otherwise. This individual, likely highly mobile, seeks a comprehensive battlefield perspective through personal evaluation and dialogue with battalion commanders. However, due to this mobility, they may not consistently be available to address tactical problems. Like the crossing area commander, the crossing area engineer, who is the engineer battalion commander responsible for the crossing area, circulates the battlefield to gain understanding and shape the larger operation. Periodic contact and decision points facilitate major decisions between these individuals, including when to assault cross, raft, commit to full enclosure, expand

to two-way traffic, or change crossing sites.

Mechanical decisions and those in response to friction must occur elsewhere, leading to the proposal of the crossing area headquarters. Despite the doctrine implying that this should be the brigade main command post (MCP), in practice, this setup appears disconnected and indirect. The brigade MCP, situated on the border of the crossing area, is often too far removed from the sites to have accurate information for effective flow control. The suggested solution is a crossing area headquarters comprising elements from the engineer battalion TAC at various crossing sites and a tactical command post (TAC) element from whichever maneuver battalion(s) are within the crossing area.

This structure offers several advantages. The crossing maneuver battalion possesses an immediate understanding of unit composition, a clear grasp of the scheme of maneuver and open lines of communication with subordinates. This internal control element within a crossing battalion can provide instant agility in rapidly changing conditions. Rafting, the likely preferred mode of crossing, necessitates thoughtful serial design and routing to avoid congestion, and crossing battalions inherently understand this about themselves. Battalions are better equipped to inform engineer headquarters about the details of individual elements, avoiding disruptions to the plan.

Furthermore, battalions understand the scheme of maneuver at the appropriate level, allowing for correct routing of small elements. Rigid march tables and pre-arranged plans, if left to chance, risk too much when things do not unfold exactly as expected. The engineer TAC element, having clear lines of communication with subordinates managing crossing sites, understands real-time conditions and capacities at each site, facilitating anticipation of crossing rate changes and degrading site conditions.

The proposed crossing area headquarters is dynamic and fluid in composition, with a constant engineer battalion TAC element and a presence from

the actively crossing battalion, ensuring proximity to crossing sites while maintaining dispersion, facilitating rapid decision-making, and providing the necessary guidance to maintain tempo.

Conclusion

Unfortunately, ATP 3-90.4 mistakenly describes wet gap crossing operations in high-flying abstractions and fails to appropriately address the mechanics required by the battalions and brigades trying to execute them. The manual must be updated to provide practical and actionable tasks to staffs and units at the appropriate echelon so that they are equipped to confront the modern battlefield and this mission set. Remove the romanticized vision of grand wet-gap crossing maneuvers and reorient on the details that will enable success. With improved guidance regarding planning at echelon, revised reconnaissance objectives, and command and control techniques that consider the modern battlefield the ATP 3-90.4 can be a powerful tool for conducting wet-gap crossing operations.

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Notes

[1] ATP 3.90-4, Combined Arms Mobility, Paragraph 4.25.

From the *ARMOR* art archive:

"The Raid"

The Dilemma of "Tactical" Surrender

by COL David Krynicki, MAJ Christopher Gamble, MAJ Joseph Lambert and MAJ Matthew J. Smith

As the training focus shifts from counterinsurgency (COIN) to large-scale combat operations (LSCO) in the near-peer strategic environment, a different set of dilemmas with legal implications will present themselves to maneuver leaders. Most maneuver leaders are not strangers to conducting detention operations in a COIN environment, and some have recently experienced detention operations associated with a LSCO environment at one of the combat training centers (CTC). However, the concept of a "tactical" mass surrender by enemy forces in the vicinity of the forward line of troops (FLOT) is a dilemma that maneuver leaders should be aware of as they prepare their formations for a LSCO fight.

The concept of the enemy purposefully utilizing their forces to inhibit the maneuver of an adversary's formation is always a planning consideration. However, the idea of the enemy accomplishing this via the execution of a "tactical" mass surrender is an unconventional but distinct possibility. Whether the adversary's decision to execute this course of action (CoA) is due to their enemy organization being undertrained and out of supplies or simply because they believe this CoA is their best option to delay friendly forces, options and implications associated with this CoA should be understood throughout respective formations.

A brigade combat team (BCT) experiencing a "tactical surrender" of an enemy battalion tactical group (BTG) with all their associated personnel, weapons, vehicles, and equipment at their FLOT could extensively impact an operation. This impact could be exponentially compounded if the affected BCT is enroute to a time-sensitive objective that is a critical element of the higher headquarters mission.

*The **dilemma**: a relatively isolated maneuver unit encounters a number of personnel who are willing and able to surrender, which amounts to 25-35 percent of the friendly maneuver force on the ground and that will be on the ground between four to 36 hours (400 personnel surrender to a 1,455 Soldier ground force).*

In a LSCO environment, the options for maneuver leaders posed with this dilemma are extensive thanks to *reasonableness* and the *risk* that must be assumed due to *military necessity*. The initial tactical decision that the maneuver leader must make is whether they detain the surrendering personnel. If the decision to detain is made, ensuring that applicable international law is followed is the next challenge.[1]

What the "detention" of the surrendering personnel will look like over time will be heavily mission and situation-dependent, especially for a relatively isolated unit. Maneuver leaders need to understand their options concerning the detention of personnel in a LSCO environment should a similar

Figure 1. A Soldier in 1ˢᵗ Battalion, 26ᵗʰ Infantry Regiment, 101ˢᵗ Airborne Division (Air Assault), strips a surrendering enemy combatant of weapons during Exercise Southern Vanguard 24 in Oiapoque, Brazil, on Nov. 15, 2023. *(U.S. Army photo by SPC Joseph Liggio)*

situation present itself, and how these options can be tailored with respect to what is required by the applicable law when *military necessity* is factored in. I encourage maneuver leaders to consult their legal teams and explore this dilemma (at scale) during training events, as this is a dilemma that should be experienced and understood as we prepare to fight and win in a LSCO environment.

Traing for what this dilemma could look like

Examining this unique dilemma in an example may offer more context. Through the lens of the 82nd Airborne Division (hereinafter "82nd"), we will explore this dilemma with respect to the joint forcible entry (JFE) operation. The JFE is a significant capability of the 82nd, and due to the nature of these operations, a mass surrender incident occurring during the execution of the JFE could be detrimental to the success of the operation. The JFE doctrinally has five phases: Preparation and Deployment (Phase I), Assault (Phase II), Stabilization of the Lodgment (Phase III), Introduction of Follow-On Forces (Phase IV - situational dependent), and Termination or Transition Operations (Phase V).[2] This article will focus on phase III of the JFE for analysis. Further, the mission of the hypothetical JFE we will analyze includes time-sensitive follow-on objectives intended to expand the lodgment achieved during the assault phase. For the hypothetical JFE, the personnel encountered that are willing and able to surrender is a BTG-minus comprised of 400 combatants and their associated individual equipment and weapons systems (no vehicles). The mass surrender occurs during Phase II (assault phase) of the JFE, while only the *alpha echelon* has reached the objective. The alpha echelon is comprised of approximately a brigade-sized element that arrives on the objective via air drop capabilities.

JFE Phase II (assault): Inserting enemy actions into any plan complicates the execution of an operation. However, this is exacerbated when enemy forces use unexpected non-doctrinal means to cause dilemmas for friendly forces. During the assault phase of the JFE, a brigade minus will be the first wave to reach the objective, doctrinally known as the *alpha echelon*. Alpha echelon's paratroopers and their associated equipment arrive at the objective and begin to establish security on the objective, assemble, and accomplish follow-on tasks to ensure the feasibility for the airland arrival of bravo and charlie echelons of the JFE. Within the first 90 minutes, in the vicinity of the objective, the alpha echelon makes contact with approximately 400 combatants waiving white flags, weapons slung (not in hand), verbally confirming their intent to surrender (for this scenario the 400 combatants surrender is "genuine" and "clear and unconditional").[3] Currently, with roughly 1,200 paratroopers on the ground and the tasks to expand the lodgment and secure/improve the objective for the arrival of the bravo echelon (second wave) in approximately four hours, the commander comes to the staff asking for his/her options for dealing with the dilemma they are now facing. 1,200 Paratroopers on the ground with countless tasks to accomplish for the mission to succeed, no support expected for hours, and now 400 combatants are attempting to surrender in the vicinity of the JFE Objective. As the staff and subordinate commanders begin offering solutions, the BDE CDR asks the Judge Advocate, what are my left and right limits legally? The initial wave of Paratroopers encounters a relatively large number of enemy forces that are attempting to surrender. What is the capability of this finite number of troops to manage detainees and the continued needs of the mission?

JAG: As the Judge Advocate on the ground, what do you advise? In reference to international humanitarian law, is it feasible to accept surrender? If surrender is accepted, what requirements does that trigger?

CDR: As the commander, what are you comfortable doing? Where will you assume risk?

Detention operations: expected challenges during JFE

Detention operations: The implied standard is for U.S. servicemembers *to always treat all detainees humanely*, and a detainee is any person captured by or transferred to Department of Defense personnel pursuant to the Law of War. Detainees' status can vary from combatants (lawful and unlawful) to noncombatants, and civilians.[4] Depending upon their status, detainees are afforded different protections. Of note, the presumption, until proven otherwise, is that all persons taken into custody by U.S. Forces will be provided with the protections of prisoners of war (POWs) under the Geneva Convention (GC). In summary, when detainees are under the control of the United States, the detainees and their property must be protected, and they must be provided adequate food, water, shelter, medical care, hygiene facilities, sufficient clothing, and the ability to exercise their religion.[5]

Detention operations requirements are cumbersome, and the scale of the detention operation can accentuate the associated challenges. In an austere environment with limited assets, what options are available to commanders regarding detention operations, especially when these operations impact the potential success or failure of the mission? There are options, and these will be heavily fact/situation dependent. However, the first time this dilemma is contemplated should not be during a kinetic operation amid a conflict, but rather during a training exercise or professional development discussion.

JAG: As the judge advocate, what are the legal requirements, and where can the requirements expressed in law or regulations be reasonably flexible regarding military necessity?

CDR: As the commander, what is required for the mission, and what risk is willing to be assumed?

Isolated unit with limited assets, supplies

- ***Providing detainees with adequate food, water, and shelter.*** Detainees are to be always treated humanely, inherent to this is an adequate supply of food and water. During the initial phases of the JFE operation, supplies are extremely limited. Paratroopers plan to insert loaded with limited supplies on their person and no

Figure 2. Soldiers with the 2nd Brigade Combat Team, 2nd Infantry Division, watch over a detained enemy combatant during training as part of Decisive Action Rotation 17-09 at the National Training Center on Fort Irwin, CA. *(U.S. Army photo by SPC J.D. Sacharok)*

"shelter" capability. The ability to provide these limited supplies to personnel outside the formation is a risk to the welfare of the paratrooper and the mission. This supply issue pertaining to detainee operations is an area where specific facts/circumstances can lay the grounds for *military necessity* as to the *temporary* abandonment of the requirements for providing detainees with food and water. The time will be limited, and the decision on what can/will be provided should be reevaluated continuously as the operational environment evolves. In the hypothetical JFE, it would be reasonable for the commander of the alpha echelon element not to provide the 400 detainees with food, water,

and shelter during the infancy of the operation; however, this decision should be reevaluated as the operation matures and airland elements arrive. The analysis may be a math problem that will change upon the arrival of bravo and charlie echelons in phase III (stabilization of the lodgment). At this point in the JFE operation, there would be multiple battalion-sized elements on or within the vicinity of the JFE objective to assist with the 400 combatants willing to surrender.

- **Detainees and their property must be protected.** The JFE operation is likely in the vicinity of an airfield or open area that could support the airborne insertion of the assault

force and subsequent airland operations. Until the lodgment is stabilized and improved, there will likely be limited cover and concealment available for detainees. Commanders should protect their detainees reasonably during this phase of the operation. They need not provide the limited battle positions offering cover to these detainees nor construct assets providing cover during the infancy of the operation. However, this decision on protection and what constitutes protection for the detainees should be reevaluated periodically. In the hypothetical JFE, it is reasonable for the commander to not provide the detainees with covered positions during Phase II and Phase III of the

operation as the lodgment is stabilized. However, a prudent legal advisor would recommend that this decision is reevaluated periodically, and that the opportunity and tools are reasonably provided to the detainees to construct their own covered positions (foxholes) to provide themselves protection.

- **What "type" of detainee?** Once a surrender occurs that is genuine, clear, and unconditional, and it's feasible to accept, the ground force commander will have a number of detainees to care for. The first step in understanding the legal requirements tied to caring for these detainees is understanding what type of detainee you have within your control. Generally, the categories of persons detained will be combatants (lawful and unprivileged belligerents), non-combatants, and civilian internees. Each respective classification has nuances for the required rights and privileges associated with their status; when there is any doubt as to the status of the detainee, provide the status with more privileges in the interim (typically POW status). Then, when feasible, use the tools available such as a GC III Article V tribunal to determine the detaine[s] status. However, understand that no matter the classification of detainee or conflict, humane treatment is the minimum standard of care. *Military necessity* can dictate the level of care provided, as practicable consult with your servicing judge advocate when dealing with detainee operations.

Takeaway

This limited analysis of a hypothetical JFE operation was to provide an example and drive the discussion as to what the dilemma of a "tactical mass surrender" may mean to your respective organization. Whether during the execution of a JFE, a Defense in Depth, or a convoy operation. The dilemma of a "tactical mass surrender" can delay and disrupt friendly forces and the mission. Operations encountering a surrender is an operation with a unique legal role. Ensuring our commanders understand their options when dealing with this potential situation is paramount as we shift into the LSCO environment. Commanders have options:

insert this dilemma or similar dilemmas into your organization's training plan.

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Notes

[1] Applicable dependent upon the classification of the conflict, International Armed Conflict (IAC) or Non-International Armed Conflict (NIAC), the proper provision[s] of the Geneva Convention (GC) and Department of Defense Directive (DoDD) 2310.01E, **DoD Detainee Program**; Joint Publication (JP) 3-63, **Detainee Operations**; and Field Manual 3-63, **Detainee Operations**; are followed; GC III, Article 12, 118 apply to prisoners of war (POW) in an International Armed Conflict (IAC), and GC Common Article III and Additional Protocol II* in a NIAC.

[2] Joint Publication 3-18.

[3] DoD Law of War Manual 5.9.3.3.

[4] Detainee classification will also be dependent upon the classification of the conflict, International Armed Conflict (IAC) or Non-International Armed Conflict (NIAC).

[5] Requirements are nested in Common Article 3 of the Geneva Conventions, and further directed in DoDD 2310.01E and Army Regulation 190-8, **Enemy Prisoners of War, Retained Personnel, Civilian Internees and Other Detainees**.

Figure 3. U.S. Army Soldiers assigned to 2nd Brigade Combat Team, 2nd Infantry Division, detain a simulated enemy combatant during Decisive Action Rotation 17-09 at the National Training Center in Fort Irwin, CA, Sep. 12, 2017. *(U.S. Army photo by SPC JD Sacharok, Operations Group, National Training Center)*

Analysis of Armored Cavalry Troop Performance During Combined Resolve XVIII

by COL Christopher "CJ" Kirkpatrick and CPT Rodric "Cam" Waugh

Since 2014, the War in Ukraine has significantly impacted the thought process surrounding large-scale combat operations (LSCO). The lessons learned from this conflict, as well as Nagorno-Karabakh, have spurred conversation and evolution of militaries worldwide. This evolution includes the U.S. Army, which has begun to implement the Army 2030 Force Design Updates (FDUs). The Army 2030 initiative alters the structure and training of the U.S. Army, down to the individual Soldier level, to create a "division-centric force capable of multi-domain operations under LSCO conditions."[1]

A crucial aspect of this FDU is the creation of a division's cavalry squadron, which provides the division commander the capability to "mass combat power at decisive points."[2] To build this formation, the Army 2030 planners transferred the bulk of the combat power

that formerly comprised the brigades' cavalry squadrons to the respective division cavalry squadrons. In armored brigade combat teams (ABCTs), the remaining combat power was used to establish armored cavalry troops (ACTs). Although this force structure will likely change based on the feed back from this rotation and that of the division cavalry the lessons learned are critical to the professional discourse which will inform the next iteration of the ACT.

An ACT is a new formation based upon the brigade reconnaissance troops of the 1990s. ACTs are designed to provide an ABCT an organic force capable of conducting reconnaissance and security operations in close contact with the enemy, while also enabling the formation of the division cavalry squadron in a zero-growth environment. The troop's tactical mission set aligns with that of the traditional cavalry squadron.[3] Even so, due to the ACT's economy of force role, it lacks many of the

critical capabilities of a cavalry squadron. However, in accordance with Figure 1, it is still a much more potent force than a traditional cavalry troop. The 1st Cavalry Division was the first division to field this concept, as part of its conversion to a reinforced armored division, in accordance with the Army 2030 FDU.

The first ACT to be manned, trained, and equipped was Troop D, 2nd Battalion, 5th Cavalry Regiment, 2nd ABCT, 1st Cavalry Division. This formation was established in June 2022, and it deployed in support of Operation European Assure Deter and Reinforce in early 2023. It was validated at the Army's Joint Multinational Readiness Center during exercise Combined Resolve XVIII (CbR XVIII) in April 2023. This evaluation clearly showed that the ACT is a very capable force. Yet to fill the role of a cavalry squadron in a zero-growth environment, the training, doctrine, and organization of both the ACT and those elements supporting it must be adapted to account for the reduction in capability inherent to the formation's economy of force role. This document will substantiate the necessity of these changes and articulate the steps necessary to implement them.

Doctrine

Limited Capability Requires Limited Objectives and Maximum Support. Doctrinally, an ACT performs the same core security and reconnaissance tasks as a cavalry squadron over a frontage of 10-30 kilometers.[4] Although this is a 30 percent reduction in frontage covered by the ABCT's organic reconnaissance and security force, there is a significant reduction in capability during the transition from cavalry squadron to ACT. This reduction includes the loss of three scout platoons, a tank platoon, two retrains teams and a full staff. The decrease in combat power alone results in a 9- to 15-kilometer reduction in the frontage that an ACT can cover compared to a cavalry squadron.[5] The lack of enablers further reduces the unit's ability to execute the necessary
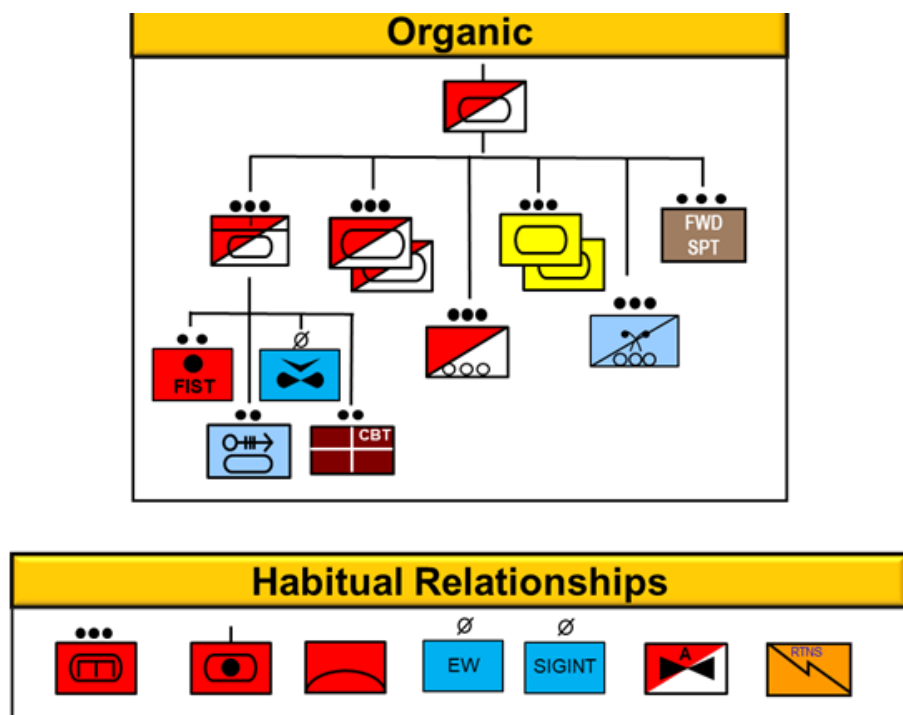

Figure 1: Troop D, 5th Cavalry's task organization circa 2023. Delta Troop 5th Cavalry's task organization circa 2023. *(Produced by CPT Waugh using visual assets from FM 17-97 **Cavalry Troop** (1995); Supplement May 3, 2022.)*

mission sets across the prescribed frontage. In comparison, a traditional cavalry troop can cover a 10- to 12-kilometer frontage. A cavalry troop's ability to cover this frontage is dependent on the support provided by a squadron headquarters that provides access to critical enablers and capabilities such as retrains teams, the ability to surge sustainment assets, and access to products generated by the staff, including S-2 assessments, branch plans, and fire support products. Thus, the ACT's doctrinal employment must be articulated considering these limitations when compared to the cavalry squadron with which they share a mission set and the cavalry troop with which they share organic capabilities.

The operational employment of the 2nd ABCT's ACT during CbR XVIII illustrated the need to properly scope the mission set based on the organization's capabilities and to align the resources necessary to augment the Troop. During CbR XVIII, the ACT was employed across a 9-kilometer frontage with an operational depth of up to 5 kilometers. This battlefield geometry is well within the doctrinal employment of the formation. However, several requirements necessitated Brigade's intervention to enable the operation's success and thus must be accounted for in the doctrinal employment of the formation. The most complex security task executed during the rotation was a guard. This task exceeds the organic capability of a traditional cavalry troop but is within the capability of a Squadron. Thus, it falls within a gray area concerning ACT force employment.

During the rotation, the troop conducted a guard within a limited area. The troop successfully executed a guard when employed in tandem with a troop-sized element from the Belgian Intelligence Surveillance Target Acquisition and Reconnaissance (ISTAR) battalion when given priority of fires.

The Belgian ISTARs provided a motorized element that utilized dismounted observation posts (OPs) and ground surveillance radar to conduct stealthy and deliberate reconnaissance and surveillance. This allowed the ISTARs, positioned forward of the ACT, to cue Brigade assets to shape within the brigade's deep area. As the enemy moved into the close area, the ISTARs were able to cue ACT assets to enable shaping as the enemy moved into zone. Although this method of employment proved to be effective, the lack of a Squadron level mission command node, and accompanying staff, resulted in the long-term desynchronization of the two company sized formations' operations. This asynchronicity occurred due to the preponderance of the troops' inadequate planning capacity being focused on current operations, rapidly developing contingencies, and integrating effectively with the brigade staff which proved to be resource intensive due to the lack of a battalion-level staff. The ACT and IS-TARs were able to affect the enemy utilizing fires, close combat attack, and close air support, thus providing the brigade with a marked advantage over enemy forces. These augmentations were enough to enable the ACT to succeed. However, these augmentations required the brigade to be familiar with the capabilities of the ACT and to limit the scope of the mission particularly due to the lack of an intermediate staff.

Organization

Necessity of all-weather all terrain reconnaissance. M1A2 SEPV3s Abrams tanks and M2A3 Bradley Fighting Vehicles comprise the bulk of the ACT's combat power. This composition lends itself to kinetic security operations and rapid and forceful reconnaissance. However, due to the limitations of the Bradley as a reconnaissance platform and the manning of heavy scout platoons, their utility is limited during stealthy and deliberate operations. The light scout platoon provides an alternate force capable of executing stealthy and deliberate operations in complex terrain with minimal sustainment requirements and a limited electromagnetic signature.[6] Even so, this formation is slated to be replaced by a robotic and autonomous systems (RAS) platoon; composed of 23 troopers, six robotic combat vehicles, and three optionally manned fighting vehicles upon fielding of those systems in 2025.[7] This formation will provide the troop with significantly more combat power than the light scout platoon including 30mm canons, integrated anti-tank guided missile capabilities, as well as the flexibility of the Mission Payload System.[8] However, due to the force's mounted and remotely operated nature, it is not feasible for employment in highly restricted terrain or a battle with a highly contested electromagnetic spectrum. Thus, the light scout platoon, an all-weather all-terrain reconnaissance and security asset, provides a critical capability that the RAS platoon cannot replicate.

In both defensive and offensive operations, during CbR XVIII, the light scout platoon's actions proved to be decisive. As the brigade established its defense, the light scout platoon established in dismounted OPs, in severely restricted terrain, west of Route of the Lion overlooking the northern avenue of approach (AoA), as shown in Figure 2. They initially disrupted enemy operations using both direct and indirect fires. However, the enemy initiated an attack along the northern AoA. After being cued by the Belgian ISTARs, the light scout platoon identified the enemy's lead column and confirmed that they were conducting an armored attack along the northern AoA. Upon identification of a second armored column using the same AoA, they were then able to confirm the enemy was executing their most dangerous course of action, an integrated attack. This allowed the brigade to allocate the necessary resources to blunt the enemy attack and regain the initiative. The platoon also proved to be decisive during offensive operations. During this battle period, it was tasked to execute an infiltration to establish dismounted OPs overwatching two critical crossing points. Once established, it was to confirm or deny enemy presence and identify possible bypasses for follow-on forces. The platoon executed a 6k infiltration during a storm that prevented armored and wheeled vehicles from moving due to the treacherous conditions, gained observation of both pieces of key terrain, and confirmed enemy presence on-site while remaining undetected. This enabled the troop to execute a diversionary breach in the south that contributed to the successful brigade breach along the northern axis of attack. The platoon's actions enabled the brigade's success and highlighted the need for an all-weather all-

terrain reconnaissance asset.

The successful employment of the light scout platoon illustrates the need for an all-weather, all-terrain, reconnaissance and security asset. The light scout platoon's infiltration of complex terrain, coupled with its ability to maneuver despite unfavorable weather conditions, highlighted the utility of the formation when executing, primarily dismounted, stealthy and deliberate, reconnaissance operations. The mounted nature of the RAS platoon prevents it from filling the same roll. Additionally, this formation can be fielded long-term without allocating additional resources. Thus, it is critical that the light scout platoon be maintained in the ACT's modified table of organization and equipment.

Training

ACT leadership and brigade staff integration. As an ABCT's organic reconnaissance and security asset, the ACT has very similar staff requirements, both administratively and tactically, to a cavalry squadron. These include assisting the commander with their role in the operations process, by extracting relevant data and providing salient analysis, helping subordinate elements understand operational requirements and their capabilities, via staff-assisted visits as well as orders production, and serving as the intermediary between adjacent units and the unit's higher headquarters, via staff-to-staff coordination and regular reporting.[9] Yet the ACT lacks the necessary personnel to fulfill these staff functions and thus must depend upon higher echelons to provide this support. In garrison, a battalion is more than capable of performing the necessary functions with minimal augmentation. However, due to the fluid nature of the modern battlefield, the ACT cannot depend upon a single battalion-level staff to provide the continuity of support necessary to achieve mission success across the breadth of the troop's area of operations in accordance with the troop's accelerated operational timeline.[10] Thus, the brigade staff must provide the required support. To do so, it must have a well-developed understanding of the ACT's capabilities and limitations, the experience necessary to receive and
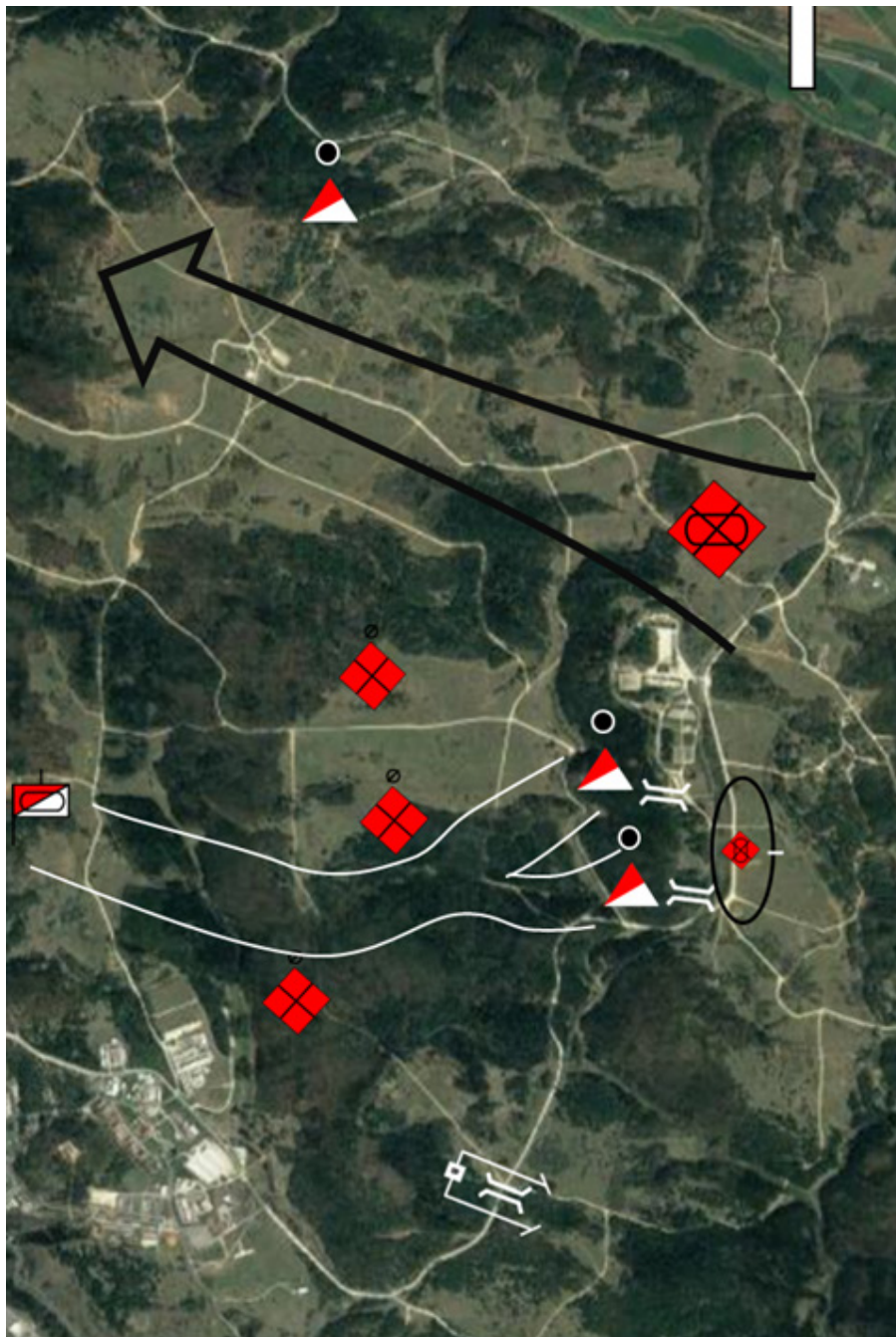

Figure 2: ACT light platoon infiltration CbR XVIII. Infiltration route used by 3rd Platoon, Troop D, 5th Cavalry Regiment, 2nd ABCT, 1st Cavalry Division during CbR XVIII to gain observation of two critical bridge crossings. *(Produced by CPT Waugh using Google Earth)*

rapidly action requests for support, and the communications architecture to transmit information to the ACT in a highly contested environment.

During CbR XVIII, the brigade staff improved their understanding of the operational limitations of the ACT, in a contested and highly kinetic environment, which led to the implementation of more efficient and sustainable

processes and the development of additional capabilities. During the training period prior to CbR XVIII, the brigade staff and ACT leadership participated in two command post exercises (CPXs) that led to the development of the initial SOPs for direct integration of the two elements. These SOPs drove the production and transmission of critical products and information from the Brigade to the Troop level, during

CbR XVIII, primarily via face-to-face engagement due to the non-tactical nature of the initial CPXs. However, as the battlefield geometry became more complex, due to longer ground lines of communication, increased mining of main supply routes, as well as more frequent incursions by enemy forces in the brigade's rear area, face-to-face coordination became untenable. Thus, the brigade staff and ACT leadership were forced to distill their communications into the most basic form to enable the rapid transmission of vital conclusions from complex products and analysis. To further accelerate the two-way transmission of information and requests for support, the ACT leadership established a liaison officer (LNO) at the brigade tactical operations center. Due to the lack of training and equipment, the LNO package proved to be of limited utility; however, its contributions indicated that the LNO package would prove to be of immeasurable value when adequately manned, trained, and equipped. The lessons learned, and steps taken to facilitate the more effective integration of ACT leadership and brigade staff indicates that it is critical to integrate these forces as early as possible and to validate their shared systems in a contested tactical environment in complex terrain at distance.

As the rotation progressed, the brigade staff and ACT leadership were able to adapt to the challenges presented by the highly complex terrain and the frenetic nature of a combat training center (CTC) rotation. Yet, if they had executed an integrated training progression that included situational training and live fire exercises, these two elements would have been able to efficiently communicate information and requests for support despite the kinetic and contested nature of CbR XVIII. These exercises would also have allowed these forces to develop, test, and refine solutions, such as a troop LNO package, prior to employment at a CTC. Thus, as the ACT and brigade staff execute their respective training progressions, each element must ensure it integrates with the other during field exercises and refine the solutions that are developed. This includes ACT leadership and LNO participation in CPXs and brigade staff participation in

troop-level operations through the attachment of support packages and the production of brigade-level products to support troop exercises. ACT participation in brigade CPXs will familiarize the staff with the needs of the ACT leadership and validate the composition of brigade products. Similarly, the troop's situational training exercises and live fire events will allow both parties to validate the means of information transmission and to train the LNO package. These solutions will allow the brigade staff to effectively provide the ACT with the staff outputs and support necessary to maximize its capabilities despite limitations and will help the ACT leadership streamline their reporting processes.

Conclusion

As the ACT concept, armored reconnaissance squadrons, and echelons above brigade reconnaissance force structure is refined or reconsidered as part of the Army's force redesign, D-5 Cavalry's employment in the U.S. European Command area of operations and at CbR XVIII offers important lessons. First and foremost, the ACT is a capable formation but requires deep integration and training with the brigade staff to be effective. Ad hoc mission command, refined communication primary, alternate, contingency, and emergency (PACE) plans, and judicious management of priority intelligence requirements are essential to fighting an ACT in LSCO.

The possibility of attached enablers and potential interoperability challenges with partner or allied forces only heightens the need for thoughtful mission command solutions for the ACT. Second, D-5 Cavalry's employment as the first ACT deployed in a combatant command theater (and at a CTC) reinforces the lesson that all-weather, all-terrain reconnaissance is still vital in LSCO. Future technology and innovations must prove capable of replicating or improving on a scout's ability to occupy complex terrain undetected and provide real-time intelligence to answer the commander's priority intelligence requirements. Until that is possible, the most important reconnaissance and security asset on the battlefield will still be a specialist or sergeant with optics, a functioning radio, and a

clear understanding of the commander's intent.

The doctrine, organization, and training of the ACT proves it is more than capable of providing the brigade commander with the information necessary to mass combat power at the decisive point. Further adjustments in mission command infrastructure and organization at the brigade and division level will only make the formation more capable and lethal, allowing the Army to continue to provide critical reconnaissance and security capability in a zero-growth environment on the modern LSCO battlefield.

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Notes

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[2] How the Army 2030 Divisions Fight (Formerly Known as WayPoint 2028); page 4.

[3] Army Techniques Publication (ATP), 3-20.97 **Cavalry Troop** (troop 1-1); and ATP 3-20.96 **Cavalry Squadron** (squadron 1-1).

[4] Annex C, Appendix 6, ABCT ACT O&O Executive Concept 2020-11-03 (page 8).

[5] ATP 3-20.96; page 51.

[6] ATP 3-20.98; (platoon, page 42/1-24.

[7] U.S. Army Acquisition Support Center, https://asc.army.mil/web/portfolio-item/robotic-combat-vehicles-rcvs/.

[8] Field Manual (FM) 17-97, **Cavalry Troop** (1995), Supplemental Slides 2022-05-03-

1300; page 8.

[9] FM 6-0, **Commander and Staff Organization and Operations**.

[0] ATP 3-20.96, page 34/2-2.

Armored Fighting Vehicles of the World

T-14 Armata 🇷🇺

Russian main battle tank, first fielded in 2015. Unmanned turret, three-man crew. 48 tons weight. 125mm smoothbore main gun, autoloader, advanced ERA armor protection, 55 mph top speed.
In service with: Russian ground forces.

Thinking Outside the Airbox: Creative Ways to Integrate SUAS into Small Unit Training

by COL Gregory W. McLean and LTC Mitchell Payne

While the nature of war – a violent contest of wills between two forces – remains unchanging, the character of war constantly evolves as new technology develops. The reality of small unmanned aerial systems (SUAS) in large-scale combat operations is a relatively immutable aspect of the current character of war. In the current and future fight, all elements on the battlefield must operate under the assumption that they are under observation. The prevalence of SUAS drones is quickly becoming a defining characteristic in the modern fight.

Given this assumption, it stands to reason that military units at all levels must consider ways to train in this new environment. Simply put, Soldiers at every level must internalize the impacts of the prevalence of SUAS on the modern battlefield. While the U.S. Army's acquisition processes may often prohibit the purchase of commercial off-the-shelf SUAS for training, there are multiple ways that unit leaders can creatively "think outside the [air]box" to reach the desired training outcomes. This article discusses some training methodologies that leaders can consider when integrating SUAS into their training guidance. Also, it offers suggestions on ways that leaders can integrate SUAS into their training.

Training considerations integrating SUAS

Before considering integrating anything new into training, unit leaders may consider stepping back and clearly articulating what their desired training endstate is for the training. Put another way, leaders should first ask themselves "What is the training outcome for this training?" Specific to the integration of SUAS, this might be "We want Soldiers who are conditioned to look upwards as well as outwards, and who understand how enemy SUAS relates to the enemy kill chain." Alternatively, however, the integration of

Figure 1: A small, unmanned aircraft system (SUAS) is shown in flight at Dugway Proving Ground. (U.S. Army photo by Becki Bryant)

SUAS into blue operations might produce a training outcome like "We want Soldiers who are confident and knowledgeable in how and when to employ SUAS."

The two differentiated training outcomes – whether considered as "red air" or "blue air" represent two distinct ways that units can integrate SUAS into their training. As the characteristics of the modern battlefield continue to be shaped by changing technology, unit leadership should be challenged to consider both outcomes and determine how best to implement both sets of outcomes. Each distinct training outcome requires a similarly differentiated approach in applying the 8-step training model.[1]

Once the unit commander has established the training objectives, they should employ a training strategy that incorporates the methodologies laid out in doctrine. In October and November of 2023 the Maneuver Center of Excellence published several products that establish doctrine for small-scale (dismount squad and platoon) units reacting to SUAS.[2] Of particular note is that both the battle drill and the entire training support package are available online from the Army training website.[3]

The training support package includes lesson plans, performance checklists, and instructional videos[4] to aid commanders in determining the best approach to developing training to reach their training objectives. While the training material at hand is sponsored by and designed for dismounted infantry, many of the considerations are directly applicable to dismounted cavalry scouts and can be indirectly applied to mounted maneuver forces.

Specific to the Armor community, however, there is further work to be done in the codification of react to SUAS battle drills for mounted forces. While current doctrine and tasks exist that discuss the appropriate actions for lower echelon (i.e., section and platoon) reaction to air attacks,[5] there is nothing that captures doctrine for how

a mounted force should react to SUAS contact. This distinction is important because the nature of the mounted force differs significantly from the dismounted force. For example, scouts in an observation post (OP) along a screen line may not want to engage SUAS with direct fires because doing so could give away their location. Similarly, tanks in a hide position (while conducting a defense) may be better able to survive if they do not engage or disperse, provided their vehicle camouflage is sufficient to the task. Either way, as unit leaders consider how to accomplish the training objectives considering the current doctrine on reacting to SUAS – which is focused primarily on dismounted infantry forces – it bears noting that the mounted force mission brings inherently different focus areas than our light or dismounted infantry counterparts.

Approaches to integrating SUAS into unit training

Considering the two broad uses of SUAS – as either red air (aggressor) or blue air (defense) – suggests several approaches to integrating SUAS into unit level training. It stands to reason that these approaches will be dependent on the size, scale, and type of SUAS involved – one cannot integrate a RQ-11B Raven the same way as a small-scale drone quadcopter.

First, and perhaps the most obvious approach, is simply to get your unit level SUAS into the air. This applies equally to red air or blue air training objectives. While this approach may be the most obvious approach, however, it may not be the simplest approach. To fly SUAS in support of either red or blue training, units must often navigate several hurdles. One of the most difficult hurdles to navigate may simply be the lack of available SUAS. Even if the equipment is on hand, it still requires qualified personnel to operate the SUAS. Even with equipment and operators on hand there is no guarantee that the equipment will work, meaning that units must execute regular maintenance on their SUAS and proper pre-combat checks and pre-combat inspections prior to using it.

Barring equipment, maintenance, and trained operators, other unit leaders must also consider other factors such as airspace requests, land requests, and weather, all of which may detract from a units' ability to effectively employ its SUAS. Once the SUAS is employed, however, units can begin achieving their training objectives, whether it is conditioning dismounted forces to look up and listen while on patrol or validating vehicle "air guard" positions during mounted maneuver.

The second approach applies primarily to use of SUAS in a "red air" context. Often individual Soldiers and unit leaders do not fully appreciate the importance of maintaining movement spacing or basic noise and light discipline. One way to reinforce these fundamental basics is to fly the SUAS over friendly forces and start audio/visual recordings. The unit leadership can then pull aside the training audience and show them the audio/visual recordings to help them understand what an enemy SUAS could have seen. This is a similar practice to what observer/coach/trainers (O/C/Ts) at combat training centers do when they pull unit leadership aside to show them just how far their noise and light signatures travel at night.

Third, if the training, equipment, or weather conditions do not allow for the use of SUAS, units can still achieve some of their training objectives by replicating the audio signatures of SUAS's from a red air perspective. One example of this could include using small-scale gas-powered engines (i.e., weed eaters) or other audio recordings for stationary units. Whether or not the training audience sees a visual SUAS, the audio signature should trigger a similar response and help achieve the training objective.

Fourth, and from a primarily blue air perspective, the continued prevalence of SUAS on the modern battlefield means that blue forces should feel equally comfortable requesting and employing SUAS. This means that SUAS integration into training should not be limited to "react to SUAS," but it also should include "employment of SUAS." Our dismounted cavalry scouts should feel equally comfortable employing an SUAS drone as they do an M240 in a dismounted OP. Vehicles in a concealed position should feel comfortable using SUAS to cover dead space in a defense or screen. If we accept the premise that SUAS is a valid sensor, then mounted and dismounted scouts in a screen should be trained to use SUAS to initiate and observe indirect fire missions. The need to integrate SUAS into this is further exacerbated in urban operations, which present significant challenges to mounted maneuver forces. The integration of small-scale disposable SUAS drones into our mounted forces should be considered to mitigate combat losses

Figure 2. T-Swarm 800 drones, experimental drones currently in a beta phase, undergo testing in a training field for Allied Spirit 24 at the Joint Multinational Readiness Center, Hohenfels, Germany, March 10, 2024. Allied Spirit 24 is a U.S. Army exercise for its NATO Allies and partners at the Joint Multinational Readiness Center near Hohenfels, Germany that develops and enhances NATO and key partners interoperability and readiness across specified warfighting functions. *(U.S. Army National Guard Photo by PFC Ayden Norcross, 153rd Public Affairs Detachment)*

in urban terrain.

Fifth, and lastly, integration of SUAS from a blue air perspective should also consider how SUAS can be used as a diversion or deception operation. Much like individuals can telegraph their movements, the use of SUAS to clear areas can potentially telegraph future movement of mounted or dismounted forces. Based on this, however, the use of small-scale disposable SUAS drones as a deception element can cause the enemy forces to reallocate forces to disadvantageous positions. Similarly, the current doctrine on reacting to SUAS includes the passive measure of dispersal when reacting to SUAS.[6] Blue forces may look at using SUAS to similarly displace entrenched enemy forces as a precursor to direct fire engagement. If we currently have quad-copter drones that can deliver packages,[7] those same drones can drop grenades and other munitions to disrupt or displace enemy maneuver forces.

Conclusion

The unchanging nature of war means that military leaders at all levels must always be able to think creatively and be willing to apply violence in a contest of wills. The continually changing characteristics of war mean that modern military leaders must be willing to remain adaptive in their thinking and continually innovate to provide well-trained forces that can close with and destroy the enemy on the modern battlefield.

Today, the prevalence of SUAS on the battlefield means that military leaders must assume they operate under almost continual visual observation. Those same military leaders have a duty to provide creative and adaptive ways to offer tough realistic training – to do otherwise is to betray the contract of trust they have with the American people.

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Notes

[1] Field Manual 7-0, *Training*, U.S. Army, June 2021.

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ACRONYM QUICK-SCAN
O/C/T – observer/coach/trainer **OP** – observation post **SUAS** – small unmanned aerial system

Bullets or Weapons: Rethinking Army's Approach to SUAS Integration

by LTC Mitchell Payne

At Fort Moore's 2023 Maneuver Warfighter Conference, senior leaders from across the military gathered to discuss the future of maneuver warfighting. GEN Randy A. George, Chief of Staff of the Army, laid out four focus areas, which included the need for continuous transformation. One example he mentioned was how the Army needs to fundamentally reexamine how we think about small, unmanned aircraft systems (SUAS).[1] He asserted that we need to stop thinking about the SUAS as an item in itself, indicating a need to holistically reframe how we look at SUASs at echelon. Along that vein, at the lowest echelon (squad, section, platoon), mini-SUASs should be treated like mortar rounds, not mortar tubes.

Current situation

Currently, the lowest echelon of the Army that has a dedicated SUAS assigned to it is the company/troop level, which typically has an RQ-11 Raven SUAS. The current cost per Raven is upwards of $35,000 per individual drone system, with a per-system cost of more than $250,000.[2]

Other commercial off the shelf (COTS) systems currently in place in training come at a cost of more than $25,000 per unit.[3] Due to those high costs and the current structures in place for airspace management, those SUAS resources are held and controlled at the company or battalion level, which inherently restricts the use of SUAS at the lowest echelons. Furthermore, the high dollar value associated with those items often precludes junior leaders from using the equipment out of fear of losing the SUAS. Concurrently, due to the high costs of each of those systems, the equipment accountability of those systems requires a higher degree of scrutiny. These costs also inherently limit the availability of those systems at the platoon and squad levels; currently, companies or troops are only authorized one Raven System.

Organizations like the Maneuver Center of Excellence are making strides to procure less expensive COTS SUAS systems, with a cost of $1,059 per system.[4] This is certainly a positive step in pushing SUAS to the lowest possible levels. Despite the lower cost per system, however, if the organizational and cognitive frameworks at hand do not change as well, then the Army will still face the same integration and usage challenges. Army leaders at all levels must stop thinking of the SUAS as end-items in themselves.

But what happens if we contrast the current approach with a different approach – a reframed perspective? What dismounted infantry squad thinks twice (or even once) about the cost per round when they engage enemy forces with the dismounted M240b machine gun? What reconnaissance troop commander thinks about the cost per round when directing their Bradleys to engage enemy reconnaissance elements with 25mm in a counter-reconnaissance fight? The U.S. Army fundamentally needs to reframe how we think and treat mini-SUAS at lower levels. Army leaders need to learn to see mini-SUAS as bullets in a weapon system, not as an equipment system itself.

To a large degree, the U.S. Army is behind our pacing threats and military partners in how we look at SUAS. Australia has been sending disposable cardboard drones for use against Russian forces in Ukraine. In late August 2023, Ukrainian forces reportedly used those cardboard drones to attack an airfield in Kursk Oblast in western Russia. The attack damaged a Mig-29 and four Su-30 fighter jets, two Pantsir anti-aircraft missile launchers, gun systems, and an S-300 air surface-to-air missile system.[5]

Recent conflicts between Armenia and Azerbaijan saw the use of armed and unarmed drones as a turning point in the war for better targeting and even the destruction of armored forces.[6] Ukrainian citizens with no previous training are currently using commercially purchased consumer-level mini-SUAS drones to conduct reconnaissance on Russian forces in Ukraine, offering an "unprecedented advantage" to Ukrainian forces.[7] Do we think that anyone in any of those military forces is wasting their time conducting a Financial Liability Investigation of Property Loss for each cardboard drone or commercial mini-quadcopter they lose?

Reframing our perspective

Among other things, there are four steps the U.S. Army can take to reframe our perspective on the accountability and use of drones. If we adopt a "disposable" framework for looking at drones, then the Army needs to reexamine 1) how we supply mini-SUAS drones to the lowest echelons, 2) how we account for mini-SUAS drones, 3) how we incorporate mini-SUAS drones into our lowest echelon (e.g., squad, section and platoon) unit training, and 4) how we enable the use of mini-SUAS drones in our low echelon training.

Supply

If the Army looks at drones from a completely disposable framework, then the Army should reexamine the supply systems at work to get mini-SUAS drones into the hands of squad, section, and platoon leaders. Barring anything else (and operations security aside), remote-controlled quadcopter drones with 1080p camera interfaces are available on online for $49.99 with free two-day shipping.[8]

Alternatively, professional-level 3D printers are available for $4,000 - 10,000 dollars per unit,[9] and multiple designs for 3D-printed drones already exist at a single Web search. With the appropriate design schematics, small-scale drones could be printed for $500-$1,000 in materials and delivered to companies and platoons on daily logistical resupply. Mass-producing small-scale drones at the battalion and below level could produce 250 disposable drones for the cost of one RQ-11 Raven

system. The technology to 3D print drones currently exists – the U.S. Army just needs to rethink its current cognitive and organizational frameworks to implement it.

Accountability

Tied to this are the equipment accountability processes at the unit level. If we keep the machine-gun/ammunition analogy for SUAS, no leader thinks twice about the cost per round when firing 7.62mm rounds. Those leaders are responsible for broad accountability of the ammunition associated with those systems but are not required to account for every single piece of brass or bullet expended in training. Army leaders should treat mini-SUAS drones the same way. The Army should maintain a broad degree of accountability for overall systems, but free up lower-level leaders from property investigations if we lose a "disposable" drone.

Imagine a logistical patrol that resupplies 3D-printed mini-SUAS drones to a company or reconnaissance troop, where that troop first sergeant is not required to account for each drone by serial number but can instead sign for them one batch at a time. How might mini-SUAS usage rates improve if leaders across all levels were no longer concerned about recovering a "disposable" mini-SUAS drone?

Incorporating drones in small unit training

If we consider small-scale drones as truly disposable, then this will inherently increase the capability to incorporate these drones into all aspects of training from the dismount infantry team or squad to the mounted reconnaissance platoon. In all warfighting functions and across all branches, small-scale drones can and should be used. At the 2023 Maneuver conference, GEN James E. Rainey, commanding general of U.S. Army Futures Command, said, "We're kidding ourselves if we think we're going to avoid fighting in cities."[10] Accepting this premise, why should we put our armored vehicles in harm's way when we could identify hazards in the immediate area with one or more small-scale disposable drones? Why should our dismount infantry squads walk into the unknown

when they could contact a squad-level disposable SAUS first?

Alternatively, incorporating small-scale disposable SUAS should be an inherent aspect of reconnaissance operations. When dismount scouts establish a hide site, the first thing they should do is throw the recon squad quadcopter in the air to provide additional situational awareness. If that disposable SUAS identifies a potential target, that can que higher echelon (brigade) unmanned aircraft system assets with GPS capability to support indirect fire missions.

Enabling drones in small unit training roles

The current training requirements to fly the RQ-11 Raven or other COTS SUAS currently in use require multiple degrees of training and certification. This training starts with online training, introductory flights, and subsequent monitored and unmonitored flights, all of which take about two weeks per individual SUAS operator for mini drones. Once the operator is certified, however, using the SUAS still requires a high degree of coordination, including requesting airspace, establishing a restricted operating zone (ROZ), and various training report roll-ups. Airspace requests on Army installations are also limited by civilian airspace management, which requires Federal Aviation Administration (FAA) coordination for every single time a SUAS is flown.[11]

Contrast this with the reality that if one were to leave a military post, any grade-school-aged child can (and does) fly commercially procured drones without filing a flight plan through the FAA. More to the point, it bears asking if the Ukrainian military requires Ukrainian civilian drone operators to file flight plans before they use their disposable commercial drones to identify, target and destroy Russian forces in urban centers.

The main premise of this paper is that the U.S. Army should fundamentally rethink small-scale mini-SUAS drones as inherently disposable. If one accepts this premise, then the Army should also align training practices and structures to better reflect how it will fight. If we treat small-scale drones as

disposable, then the Army should consider placing a blanket ROZ over installations that would allow unlimited small-scale mini-drone operations at low-level altitudes below a reasonable threshold (e.g., 200 feet above ground level). Organizationally, if the Army continues to place multiple requirements for the training and operation of small-scale drones, then the Army will never bridge the cognitive gap between reframing doctrine and actual practice.

Conclusion

On the final day of the 2023 Maneuver Warfighter Conference, the U.S. Army Training and Doctrine Command G-2 gave a brief that discussed the threats that the Russian and Chinese militaries pose. In that brief, he highlighted the importance and relevance of SUAS in the current Ukrainian war and the subsequent observations that both the United States and the Chinese military have been making.[12] Large-scale combat operations in the future will be characterized by the proliferation of SUAS at all echelons. If the Army fails to reconsider how it thinks about SUAS – if we continue to treat all SUAS like a weapon system and not as an expendable round – then we run the risk of falling behind our peers.

Current drone technology is making drones cheaper, faster, and more available to all members of the population. Unfortunately, the Army's antiquated modes of thinking and training requirements for SUAS are causing us to lag behind our peers and competitors. If we do not change our cognitive and organizational frameworks, then Russia's lessons learned in Ukraine will become the U.S. Army's lessons to re-learn in future conflicts.

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Stryker Brigade Combat Team, 25th Infantry Division, Fort Wainwright, AK. LTC Payne's military schools include Armor Officer Basic Course, Fort Knox, KY; Armor Captains' Career Course, Fort Knox; and the Command and General Staff College, Fort Leavenworth, KS. LTC Payne has Ph.D. in organizational leadership and human resource development from Regent University, a master of military arts and science degree from the Command and General Staff College, and he holds a bachelor's of arts degree in philosophy from Wheaton College. LTC Payne's awards include the Bronze Star Medal, Meritorious Service Medal (with Silver Oak Leaf) and the Combat Action Badge.

Notes

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ACRONYM QUICK-SCAN

COTS – commercial off-the-shelf
FAA – Federal Aviation Administration
ROZ – restricted operating zone
SUAS – small unmanned aircraft systems

Figure 1. Dr. Dan Kingsley (left), senior managing engineer at Exponent, tests a drone's tether cable during Allied Spirit 24 at the Hohenfels Training Area, Joint Multinational Readiness Center, Germany, March 6, 2024. Allied Spirit 24 is a U.S. Army exercise for its NATO Allies and partners at the Joint Multinational Readiness Center. The exercise develops and enhances NATO and key partners interoperability and readiness across specified warfighting functions. *(U.S. Army photo by Spc. Micah Wilson)*

Commander's Primer to Combat-Trains Command Post

by CPT Evan Ringel

The combat trains and combat-trains command post (CTCP) are the least understood elements within the battalion. However, they provide the functions critical to ensuring the unit is combat ready. The CTCP is often disappointingly underused, and the personnel are undertrained for the mission.

The CTCP can provide tremendous redundancy for current operations, communications flexibility and adaptability based on the threat environment. These capabilities provide battalion commanders options that often they don't know they have. An empowered CTCP will find the gaps and seams in the unit's readiness and be postured to solve them before they impact the rest of the unit.

The better prepared the combat trains and CTCP are for multidomain operations, the better the unit will perform at combat-training centers (CTCs) and during deployments.

What is CTCP?

The combat trains are the maneuver battalion or Cavalry squadrons' primary node for logistics support on the battlefield. Their function is to generate combat power for the battalion and coordinate maintenance, medical and supply functions for every company within the battalion. The CTCP manages the combat trains.

The unit maintenance-collection point (UMCP) and battalion aid station (BAS), usually with Role I capabilities, are either co-located or within supporting distance of the combat trains.

Mission, enemy, terrain and weather, troops and support available, time available and civil considerations (informational considerations), or METT-TC(i), considerations will help leaders decide to combine or separate the command post (CP) and each of these functions into their node. However, the responsibilities, functions and support the CTCP, MCP and BAS will not change based on geographic dispersion of the combat trains.

The Center for Lessons-Learned pamphlet ***Combining Arms in the Close Fight*** details the small and agile nature of the CTCP and its critical purpose in generating combat power. This contrasts with the field trains and field-trains command post (FTCP), which receives, configures, and delivers all classes of supply by its connection and location within or close to the brigade-support area (BSA).[1]

This article matches closely with the intent and function of the CTCP from that publication but is specific to CTCP users within the battalion.

Challenges of CTCP and combat trains

Well-run combat trains and a CTCP can be challenging for several reasons. First, with headquarters and headquarters company (HHC) and forward-support company (FSC) elements, as well as crews, Soldiers and equipment from other companies within the battalion, it can take a lot of work to have unity of command. Even if a centralized approach is used, communication among the shop office, aid station, CTCP, distribution platoon and FSC CP (if present and separate) can be incomplete and untimely.

Finally, the combat trains, with all its parts, become the most extensive single collection of equipment and communications in the battalion, making security, masking and discipline very challenging.

The keys to overcoming these challenges are humility and practice. HHC and FSC commanders, first sergeants, executive officers and other key personnel such as battalion maintenance technicians (BMTs) and medical officers need to develop clear responsibilities and processes with egos aside to ensure they provide first-rate support to the battalion.

Second, practice exposes flaws in the plan and the execution to rectify for the next iteration. Establishing the CTCP and combat trains at a CTC is not enough. Situational-training exercises and crew, platoon and company live-fire improve armor and infantry proficiency and skill. Similarly, a CTCP must be trained and practiced to codify best practices, reduce the time needed to establish and increase the bandwidth for support.

Roles and responsibilities at combat trains

- **HHC commander:** Usually the most senior commander operating in the CTCP. Exercises command authority over elements at the combat trains and implements the battalion commander's guidance.[2] Clearly defines, understands and solves problems through his/her perspective and experience to provide time and focus for the other CPs and companies.

- **HHC first sergeant:** Enforcer of discipline and standards within the combat trains with the FSC first sergeant. Ensures security and other priorities of work are clearly established and followed. Responsible for ensuring medical, maintenance and logistics support for HHC scout and mortar platoons. May also be responsible for support for the main CP or tactical CP (TAC).[3]

- **HHC executive officer:** Can be located where they best resolve problems for HHC and the battalion. This may be providing direct support to the main CP or TAC, or with the MCP to ensure rigor and adherence to maintenance priorities.

- **Battalion chaplain:** Ensures religious support to the battalion from anywhere on the battlefield. Plans and conducts mortuary affairs for the battalion.[4]

- **FSC commander:** Primary logistics executor for the battalion. Can be located at either the combat trains or FTCP to best facilitate support for the organization. The primary focus is on the movement of classes of supply, recovery assets and maintenance around the battlefield. Either the FSC

or HHC commander can act as the direct liaison to the brigade-support battalion (BSB) to ensure support to the combined-arms battalion.[2]

- **FSC first sergeant:** Enforcer of discipline and standards within the combat trains with the HHC first sergeant or can be located at the FTCP. Usually responsible for logistics support to the combat trains and MCP but can also support the main CP and TAC CP, depending on the ability of the HHC first sergeant to do so.

- **FSC executive officer:** Can be located where they best solve problems for the FSC. The best location may be at the BSA, FTCP, CTCP or forward with a forward-logistics element. Tracks and supports all FSC operations from their location and provides relevant reports to the BSB.

- **Distribution-platoon leader/platoon sergeant:** Officer-in-charge (OIC) or noncommissioned-officer-in-charge of logistics packages (LOGPACs) from

the BSA forward to the logistics-release point. Ensures LOGPAC has appropriate supplies, methods of marking, communications and understanding of each mission. Must enforce the battalion standing operation procedures (SOPs) for LOGPAC duration and plan for subsequent draw of Classes I, III, IV, V and IX.

- **Battalion maintenance tech:** Maintenance subject-matter expert within the MCP or at the FTCP. Along with the battalion executive officer and battalion maintenance officer (BMO), sets maintenance priorities for the battalion and facilitates parts flow.

- **Battalion motor sergeant:** Manages placement and operation of FSC elements with the CTCP, including the unit maintenance-collection point, recovery section and field-maintenance teams (FMTs). Helps manage non-mission-capable vehicle placement, distro-platoon assets and overall traffic flow within the CTCP.

- **BMO:** Primary liaison between the battalion S-4 and the FSC maintenance elements wherever they might be located.[1] With the BMT and battalion executive officer, establishes and enforces maintenance priorities and facilitates parts flow from the Supply-Support Activity (SSA). Can be the release authority for recovery and maintenance missions.

- **Battalion S-4:** Primary logistics planner for the battalion and usually the CTCP OIC.[5] Primary focus is generating combat power for the battalion through maintenance, medical, supply and personnel replacement. Inherent in that focus is understanding the current and projected status of each and advising the battalion commander, executive officer and S-3 on the mission readiness of the formation.

- **Battalion S-1:** Force manager for the battalion and alternate CTCP OIC. The S-1's primary focus is personnel tracking and requesting replacements to maintain combat power.
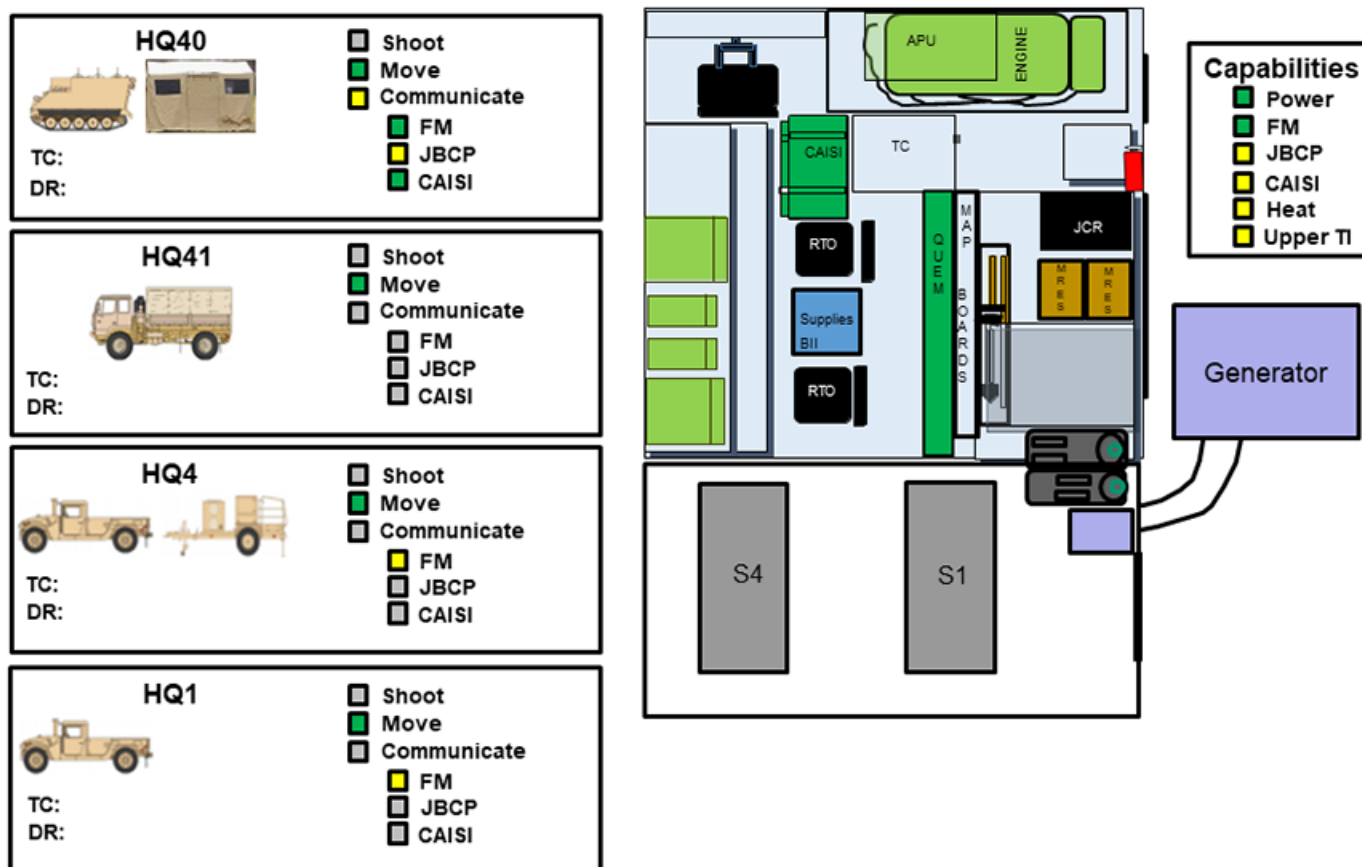

Figure 1. CTCP layout and load plan.

- **BMO:** Medical planner for the battalion.[6] Tracks patients across the battlefield from program of instruction to Role III as necessary. The medical officer directs the setup and break down of the BAS and any attachments and ensures rigorous reporting to the battalion S-1 and brigade medical officer.
- **Battalion medical-platoon leader:** Manages the operations of the battalion Role I and treatment of patients.

Functions

The general functions of the CTCP are the same as any CP:[7]

- Conducting knowledge management and information management;
- Building and maintaining situational understanding;
- Maintaining running estimates in support of the commander's decision-making;
- Controlling operations;

Figure 2. CTCP operational capacity.

- Assessing operations;
- Coordinating with internal and external organizations; and
- Performing CP administration.

The functions specific to the CTCP that enable it to support the battalion are:

- Monitors current operations and prepares to assume the functions of the main CP;
- Provides sustainment representation to the main CP for planning and integration;
- Net-control station for the administrative and logistics net;
- Monitors main and alternate supply

Recovery								Medical/CBRNE							
Co	Bumper #	Current location	Final location	Issue	Assets assigned	Depart	Arrive	Co	Bumper #	Current location	Final location	Injury	Assets assigned	Depart	Arrive

Table 1a. CTCP mission tracker.

Table 1b. CTCP mission in/out tracker.											
Type of mission	Assets	Destination	Convoy commander	Freq / call sign	SP time	L/U time	RP time	# vics	# pax	Special equipment / instructions	Comments

Table 1b. CTCP mission in/out tracker.

SLANT	A COMPANY		B COMPANY		C COMPANY		HHC		FSC		TOTAL	
	FMC	TOTAL	FMC	TOTAL	FMC	TOTAL	FMC	TOTAL	FMC	TOTAL	FMC	TOTAL
M1A2 TANKS												
M2A3 BRADLEY												
M3A3 BFiST												
M1064 MORTARS												
M88 HERCULES												
M984 WRECKER												
M978 FUELER												
M113												
M113 AMBULANCE												
M577												
M1068												
M1151A1												
VSAT/ISA												
STT												
CK												
MTRCS												
RAVEN												

Table 2. Combat-slant tracker.

UMCP POL + BATTERY STOCK				RECOVERY MISSIONS						
TYPE	QTY OH	UOM	QTY REQUESTED	RECOVERY ASSET	BROKEN VIC	BROKEN VIC ISSUE	GRID	RECOVERY NCO	ESCORT VIC	SPECIAL INSTRUCTIONS
15-40		GAL		H88R1						
FRH		GAL								
TURBO		QTS		H88R2						
GREASE TUBES		TUBE								
GAA		GAL		H88R3						
ANTIFREEZE		GAL								
DEX XI		QTS		H88A						
BRAKE FLUID		GAL								
WD-40		CAN		H88B						
BIO STAT		CAN								
80/90		QTS		H88C						
PARTS CLEANER		CAN								
O-20W		QTS		H844						
HAWKERS		EA								
BA5590		EA		H845						
AA batteries		EA								
AAA		EA								

Table 3. Recovery-mission tracker.

A COMPANY		B COMPANY		C COMPANY		HHC		FSC	
A66		B66		C66		HQ66		H88R1	
A65		B65		C65		HQ63		H88R2	
A11		B11		C11		HHC202		H844	
A12		B12		C12		HHC205		H845	
A13		B13		C13		HHC207		H431	
A14		B14		C14		HHC301		H860	
A21		B21		C21		HHC302		H863	
A22		B22		C22		HHC303		H866	
A23		B23		C23		HHC304		H870	
A24		B24		C24		HHC201		H871	
A31		C31		B31		HHC203		MTRCS	
A32		C32		B32		HHC204		CK	
A33		C33		B33		HHC206			
A34		C34		B34		HHC208			
ABFiST		BBFiST		CBFiST		HHC74-A			
A90		B90		C90		HHC75-A			
HHC78-A		HHC79-A		HHC77-A		HHC76-A			
H88A		H88B		H88C		H88R3			

Table 4. Maintenance-fault tracker.

Figure 3. Personnel tracker.

routes and controls sustainment traffic within the battalion's area of operations;

- Coordinates evacuation of casualties, equipment and detainees;
- Plans, coordinates and controls sustainment for tactical operations;
- Prepares to shift support if the main effort changes;
- Maintains personnel status and logistics status (LOGSTAT) reports on all organic and attached units;
- Establishes the MCP;
- Ensures personnel accountability of all assigned or attached battalion personnel; and
- Provides essential personnel services.

While some of these functions are inherent in daily operations, most are outside the scope of normal duties for Soldiers in the CTCP. S-1, S-4, Supply and FSC personnel are not usually familiar with CP operations that enable situational awareness and decision-making at the same level of proficiency as the main CP.

Shifts in duties from administrative or garrison operations to tactical operations must be specified and practiced well in advance.

Figures 1 and 2 are products that can be used to facilitate shared understanding and fuel decision-making within the CTCP.

Figure 1 provides an example CTCP layout and load plan using a M1068 platform with Modular Command-Post System tent. Figure 2 is an operational-capacity example that shows how the CTCP can be configured based on METT-TC(i) considerations.

Tables 1a and 1b are mission trackers that synchronize understanding of assets in and out of the CTCP. Table 2 is a combat-slant tracker to help understand current combat power across the battalion.

Table 3 tracks recovery missions to help triage missions and allocate the recovery section or specify if an FMT needs to recover the vehicle to a maintenance exchange point. Table 4 tracks maintenance faults by bumper number to enhance understanding and help the BMO, BMT and battalion S-4 project readiness and provide estimates for upcoming missions.

Figure 3 is an example personnel tracker that helps S-1 track personnel status (PERSTAT) and casualties through treatment roles. Figure 4 is a basic logistics status (LOGSTAT) that enables the S-4 and FSC project requirements for the next 72 hours. The FSC should use this information to create its logistics-synchronization (LOGSYNC) matrix to align inflow and outflow of classes of supply with the higher headquarters concept of support.

Table 5 provides a method for nesting battle rhythm, reports and other critical events into a cohesive timeline. This method ensures that all tasks are assigned to a specific lead, have a specified audience and are deconflicted with other key events. By creating this product with all stakeholders, leaders can generate buy-in and can ensure task completion.

Physical design

The physical design of the combat trains and CTCP are METT-TC(i) dependent. CTCPs will function like a large patrol base or company assembly area and use the same site-selection criteria. However, CTCP elements must be

Battalion LOGSTAT	A Co PAX:				B Co PAX:				C Co PAX:				HHC PAX:				FSC PAX:				Battalion Total PAX:				
	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	Average
CL I																									
Hippo																									
Buffalos																									
Ice																									
MREs																									
CL II																									
CL III																									
Bulk																									
POL (by type)																									
CL IV																									
C-wire																									
Pickets																									
CL V																									
AB56																									
A131																									
A557																									
CL VIII																									
CL IX																									

COMBAT SLANT																										
M1A2		M2A3		ABV		BFIST		Mortars		M88		Fueler		Wrecker		M113		M1068		LHS/PLS		LMTV		HMMWV	
FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total

Figure 4. LOGSTAT example.

able to conduct their mission while maintaining communications, security and protection considerations while belonging to different companies.

Also, as the largest collection of equipment and personnel in the battalion, inflow and outflow from each of the subordinate elements is critical. For example, a clear entrance and separate exit route to and from the aid station that facilitates patient drop off and pick up is crucial to ensuring timely treatment of injuries. Space must be allocated to each of the FMTs to ensure that they can troubleshoot faults and make repairs while maintaining reasonable distancing of vehicles.

Security considerations are as critical as functional considerations. Using a triangle method for security, like a patrol base, can ensure three well-prepared apexes with effective fires around the combat trains. Make use of combat platforms in the combat trains for repairs by integrating them into the security plan.

A successful standard practice is to always maintain the most devastating vehicle with functional fire-control

systems at the entrances to the combat trains.

The following are some considerations for the site, layout and security of the combat trains:

- Pick terrain that masks the combat trains from likely enemy positions and away from high-speed avenues of approach. Valleys or depressions work well if the surrounding terrain allows establishment of security positions with good observation and fields of fire.

- Do not have an entrance or exit immediately off an avenue of approach. Dirt tracks must not seem to lead right to the combat trains. By taking a route with several turns to get to a concealed combat train, the risk of compromise will be decreased.

- Allow minimum 50 meters spacing between vehicles, even with an influx of vehicles for maintenance. Vehicles should be concealed to the best of Soldiers' ability and pre-marked with pickets during establishment.

- Apexes or other security positions should be covered and concealed, and constantly improved. Integrated mounted and dismounted positions

are preferable.

- Antennas should be kept to as few as possible and as low as functional. By placing the CTCP close to the shop office with very-small-aperture terminal (VSAT) / inflatable satellite antenna (ISA), there is no need for a Combat Service Support Automated Information System Interface (CAISI) between the two positions. Similarly, not every element of the combat trains needs to monitor every net, which reduces the number of antennas up and emitting.

- Field-feeding and ammo sections can be located within the combat trains but will require more space and element-specific requirements for their operations. Flat racks, pallets, concertina wire and fire extinguishers must be considered for ammo operations. Gray water, meals-ready-to-eat pallet space and thermal masking must be considered for field feeding.

- Light and sound considerations during daylight and nighttime must be considered. Use reconnaissance and security (R&S) patrols for more security and to observe the outside of the combat trains.
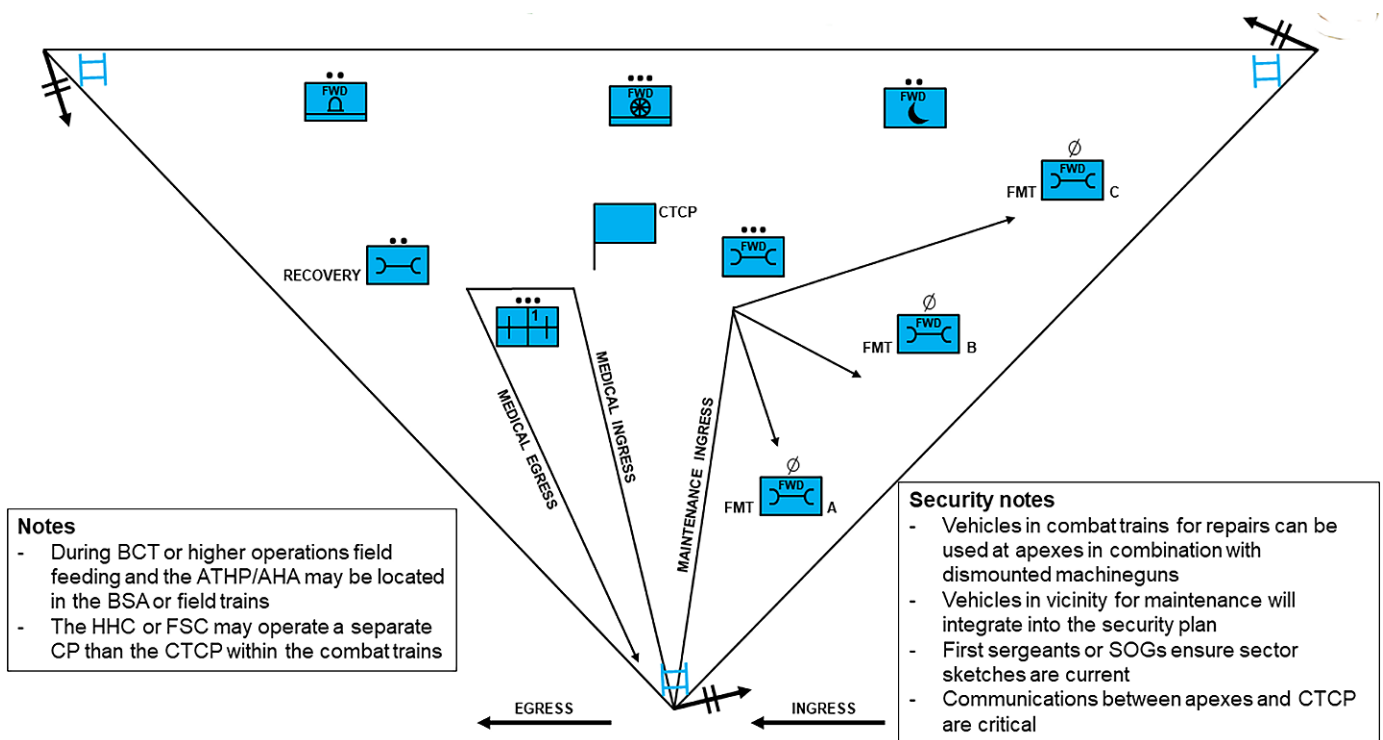

Notes
- During BCT or higher operations field feeding and the ATHP/AHA may be located in the BSA or field trains
- The HHC or FSC may operate a separate CP than the CTCP within the combat trains

Security notes
- Vehicles in combat trains for repairs can be used at apexes in combination with dismounted machineguns
- Vehicles in vicinity for maintenance will integrate into the security plan
- First sergeants or SOGs ensure sector sketches are current
- Communications between apexes and CTCP are critical

Figure 5. Combat-trains layout example.

Figure 5 shows an example of a triangle-style combat trains that uses machinegun and combat vehicles for security at the apexes.

This example shows traffic control through the 6 o'clock position, establishing clear lines of sight to vehicles entering and exiting the combat trains. Using this layout aids in effective communication between the entry-control point and the CTCP.

CTCP and combat-trains training

Training the CTCP and the combat trains can be challenging. Deploying all the assets within the combat trains will almost certainly disrupt daily operations and have impacts on other battalion training and events.

Much more emphasis is put on training the battalion staff in the military decision-making process and current operations through CP exercises and other training events. An efficient and progressive method for training the combat trains and CTCP must consider the time and impact of deploying while meeting CP training objectives.

The CTCP needs multiple iterations to refine products and processes. There are no standard products that must be used. Using resources on-installation

Battalion LOGSTAT	Company A PAX				Company B PAX				Company C PAX				HHC PAX				FSC PAX				Battalion total				
	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	O/H	Next 24	Next 48	Next 72	Average
Class I																									
Hippo																									
Buffaloes																									
Ice																									
MREs																									
Class II																									
Class III																									
Bulk																									
POL (by type)																									
Class IV																									
C-wire																									
Pickets																									
Class V																									
AB56																									
A131																									
A557																									
Class VIII																									
Class IX																									
Combat slant																									

M1A2		M2A3		ABV		BFiST		Mortars		M88		Fueler		Wrecker		M113		M1068		LHS/PLS		LMTV		Humvee	
FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total	FMC	Total

Table 5. Combat-trains task-assignment matrix.

Crawl →	Walk →	Run →
CP operations class (2-3 days) -CP battle drills -Trackers -CUOPS tracking -Military symbols and graphics -Practical exercises of likely significant activities **Physical CTCP preparation (1-60 days)** -Vehicle configuration / load plans -Build trackers, common operating picture products -Comm systems -Camo nets and other masking -Prepare Class II, IV, etc. -Tables, chairs, printer, etc.	**CP exercise** -Conduct prolonged operations with simulated or real injects in mission-command training center or in training area -If in training area, build as much of the combat trains as possible -Integrate security and masking -Develop wake-up, commander's critical information requirements / essential elements of friendly information criteria -Practice sharing information between CPs (beneficial to setup as well) -Execute battle rhythm -Refine products and processes -Codify in SOPs	**CTCP support to operations** -Conduct concurrent with battalion training such as gunnery or combined-arms live-fire exercise; real battle rhythm -Full integration of distro and maintenance elements, field feeding and ammo if possible -Conduct 24-hour operations -Conduct more injects as necessary if operational tempo permits (CBRNE, recovery, etc.) -Plan and execute emergency resupply as needed -All operations conducted "at combat speed" to strain systems and expose gaps -Refine products and SOPs

Table 6. CTCP training progression.

the impact of placing key administrative functions like S-1 and S-4 into a potentially austere training environment. Also, Soldier burnout can lead to diminishing returns on training time.

Table 6 is an example of a crawl-walk-run progression that could be used to structure a training plan. Fortunately for HHC and FSC commanders, CTCP and combat-trains operations tie directly to two of the three mission-essential tasks (METs) for an HHC and five of six METs for an FSC. They are also high-payoff tasks.

Conclusion

The combat trains and CTCP provide unrivaled impact on battalion readiness. Seamless operation due to targeted and effective training ensures that the battalion generates and maintains combat power and extends operational reach.

The CTCP's nature allows commanders to identify the most effective staff to generate return for the battalion.

Commanders often want maximum staff participation at all events in the main CP. This is not always feasible and often not recommended in this age of pervasive surveillance and precision-strike capabilities.

Task, purpose and trust must be given to the right people at the CTCP to facilitate the battalion's readiness. This relationship and decentralized decision-making must be practiced often during home-station training.

With the right trust, people and training, the combat trains and CTCP are combat-multipliers to the formation and will facilitate unfettered operations, enabling success on the battlefield.

Promotable CPT Evan Ringel is a student at the Command and General Staff Officer Course, Fort Leavenworth, KS. Previous assignments include observer/coach/trainer at National Training Center Operations Group, Fort Irwin, CA; commander, HHC, 2nd

Battalion, 8th Cavalry, 1st Armored Brigade Combat Team (ABCT), 1st Cavalry Division, Fort Cavazos, TX; commander, Company B, 2-8 Cavalry, 1st ABCT, Fort Cavazos; operations officer, 2nd Battalion, 12th Cavalry, 1st ABCT, Fort Cavazos; and executive officer, Company D, 1st Battalion, 26th Infantry, 2nd Infantry Brigade Combat Team, 101st Airborne Division (Air Assault), Fort Campbell, KY. He has served exclusively in armor and infantry formations, deployed to Iraq from 2016-2017 and has conducted two regionally aligned forces missions to Poland and Lithuania. His military schooling includes Basic Airborne Course, Air-Assault Course, Pathfinder Course, Ranger Course, Cavalry Leader's Course and Army Reconnaissance Course. CPT Ringel holds a bachelor's of arts in communications from the University of Illinois Urbana- Champaign and is in progress in obtaining a master's of science degree in finance and economics from West Texas A&M University.

Notes

[1] Center for Army Lessons-Learned; **Combining Arms in the Close Fight**; Nov. 4, 2022.

[2] Army Technical Publication (ATP) 3-90.5; **Combined Arms Battalion**; July 2021.

[3] Ibid.

[4] Ibid.

[5] Ibid.

[6] Ibid.

[7] ATP 6-0.5; **Command Post Organization and Operations**; March 2017.

[8] ATP 3-90.5.

ACRONYM QUICK-SCAN	
AHA – ammunition holding area	**LOGPAC** – logistics package
ATHP – ammunition transfer holding point	**LOGSTAT** – logistics status
ATP – Army technical publication	**LOGSYNC** – logistics synchronization
BAS – battalion aid station	**LRP** – logistics-release point
BCT – brigade combat team	**MCP** – maintenance-collection point
BFiST – Bradley fire-support team	**MET** – mission-essential task
BMO – battalion maintenance officer	**METT-TC(i)** – mission, enemy, terrain and weather, troops and support available, time available and civil considerations (informational considerations)
BMT – battalion maintenance technician	
BSA – brigade-support area	
BSB – brigade-support battalion	
CAISI – Combat Service Support Automated Information System Interface	**MTRCS** – Multi-Temperature Refrigerated Container System
CBRNE – chemical, biological, radiological, nuclear and explosives	**NCO** – noncommissioned officer
	OH – on-hand
CK – containerized kitchen	**OIC** – officer in charge
CP – command post	**PAX** – personnel
CTC – combat-training center	**PERSTAT** – personnel status
CTCP – combat-trains command post	**POL** – petroleum, oil and lubricants
CUOPS – current operations	**QTY** – quantity
DR – driver	**R&S** – reconnaissance and security
ESR – equipment-status report	**SoG** – sergeant of the guard
FM – frequency modulation	**SOP** – standard operating procedures
FMC – fully mission capable	**SPO** – support-operations office(r)
FMT – field-maintenance team	**SSA** – Supply-Support Activity
FRH – fire-resistant hydraulic fluid	**STT** – Satellite Transportable Terminal
FSC – forward-support company	**TAC** – tactical command post
FTCP – field-trains command post	**TC** – tank commander
GAA – grease, automotive and artillery	**Upper TI** – Upper Tactical Internet
HHC – headquarters and headquarters company	**UMCP** – unit maintenance-collection point
ISA – inflatable satellite antenna	**UOM** – unit of measure
JBC-P – Joint Battle Command-Platform	**VIC** – vehicles
	VSAT – very-small-aperture terminal

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Remembering the Late GEN Gordon R. Sullivan

GEN Sullivan died Jan. 2, 2024, at 86. With his foresight, wisdom, and professionalism, he helped shape the Army we now know today. He is beloved by the Armor community and is the namesake of the Sullivan Cup biannual international tank competition.

He was born in Boston Sept. 25, 1937, and grew up in nearby Qunicy, MA. He was commissioned in the U.S. Army as a second lieutenant of armor in 1959. After a tour in Korea from June 1961 to August 1962, he volunteered for Vietnam. He was first sent to the Military Advisor Training and Assistance course at Fort Bragg (now Fort Liberty), NC, and he also received Vietnamese language training at the Defense Language Institute, at the Presidio in California. In January 1963, he arrived for his first of two tours in Vietnam.

He later commanded the 4th Battalion, 73rd Armor and the 1st Brigade, 3rd Armored Division, followed by an assignment as 3rd Armored Division's Chief of Staff and the VII Corps Operations Officer. He then served as the assistant commandant of the Armor School at Fort Knox, KY from November 1983 to July 1985. He went on to be the deputy commandant, U.S. Army Command and General Staff College at Fort Leavenworth, KS from March 1987 to June 1988.

GEN Sullivan commanded the 1st Infantry Division (Mechanized) at Fort Riley, KS from June 1988 to July 1989. He next served as the deputy chief of staff for operations and plans and Vice Chief of Staff of the U.S. Army from 1990 to 1991. He culminated his Army career as the 32nd Chief of Staff of the U.S. Army from 1991 to 1995.

As the 32nd Chief of Staff of the U.S. Army, GEN Sullivan led the Army's complex transition from its Cold War posture, a period that saw the downsizing of the Army by 600,000 Soldiers, while striving to maintain readiness, morale, and a sense of purpose. He helped pave the way for the integration of fast-moving technological advances across the Army. He also saw the Army deploy for contingencies to Somalia, Rwanda, Haiti, and the Balkans, and for disaster assistance operations in response to Hurricane Andrew.

In August 1993, President Bill Clinton assigned the duties and responsibility of acting Secretary of the Army to Sullivan while he continued to serve as Chief of Staff. GEN Sullivan retired from the Army in July 1995 after more than 36 years of service.

From February 1998 through June 2016, he was the president and chief executive officer of the Association of the U.S. Army (AUSA). He saw his time at AUSA as an extension of his Army service, "I saw my work here as a continuation of my 36 years in the Army, building leaders, supporting the troops, facing whatever challenges the world creates," said GEN Sullivan. In 2016, he received the GEN George Catlett Marshall Medal, AUSA's highest award, for his lifetime of selfless service to the Army and the nation.

Following his time at AUSA, Sullivan continued to serve, as board chairman of the Army Historical Foundation. During his time as chairman, he led the campaign to build the National Museum of the U.S. Army at Fort Belvoir, VA. This important museum opened in November 2020.

Sullivan earned a master's of arts degree in political science from the University of New Hampshire.

His professional military education includes the U.S. Army Armor School's basic and advanced courses, the U.S. Army Command and General Staff College, and the Army War College. In addition to his numerous military awards and decorations, he also received the prestigious West Point Association of Graduates' Sylvanus Thayer Award, and he was a member of the Sergeants Major Academy's Hall of Honor.

GEN Sullivan also co-authored a book titled, *Hope Is Not a Method*, which chronicles the enormous challenges encountered in transforming the post-Cold War U.S. Army through the lens of proven leadership principles and a commitment to shared values.

U.S. Army art by Jody Harmon

124th CAVALRY REGIMENT

GOLPEO RAPIDAMENTE

A lion grasping the astrological symbol for Mars commemorates the unit's participation in the Central Burma and India-Burma campaigns in world War II. The lion is taken from the seal of Burma (now called Myanmar), while the sign of Mars—the god whom Romans saw as the protector of Soldiers, is a reference to the Mars Task Force which the unit was part of during World War II. The crest is the seal of Texas, famously known as the "Lone Star State." The unit motto, GOLPEO RAPIDAMENTE, translates in English as "I Strike Quickly."