ARMOR

Mounted Maneuver Journal

Summer 2025

Blocked and Bloodied:

Lessons from the Combined Arms Breach During the 2023 Ukrainian Counter-Offensive

ARMOR

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Departments

Features

By Order of the Secretary of the Army:

RANDY A. GEORGE
General, United States Army
Chief of Staff

Official

MARK F. AVERILL
Administrative Assistant
to the Secretary of the Army
2518203

Armor School Points of Contact

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ARMOR Editorial Office

Supervisory Editor
Robert Ositis (706) 545-9503
Email: james.r.ositis.civ@army.mil DSN 835

Harding Fellow
CPT Nate Green (706) 545-8701
Email: nathaniel.k.green.mil@army.mil DSN 835

Art Director
Jody Harmon (706) 545-5754
Email: jody.a.harmon.civ@army.mil DSN 835

Military Assistant
1LT Kaden Schmitner
Email: kaden.schmitner.mil@army.mil

U.S. Army Armor School

Commandant (ATZK-DF)
BG Chad C. Chalfont (706) 545-2029
Email: chad.c.chalfont.mil@army.mil DSN 835

Deputy Commandant (ATZK-DF)
COL James M. Modlin (706) 545-2029
Email: james.m.modlin3.mil@army.mil DSN 835

Armor School Command Sergeant Major (ATZK-CSM)
CSM Ryan W. Roush (706) 545-3815
Email: ryan.w.roush.mil@army.mil DSN 835

194th Armored Brigade (ATZK-BAZ)
COL Allen B. Carroll (706) 626-5899
Email: allan.b.carroll3.mil@army.mil DSN 620

316th Cavalry Brigade (ATZK-SBZ)
COL Justin D. Harper (706) 626-8111
Email: justin.d.harper.mil@army.mil DSN 620

Office, Chief of Armor (ATZK-AR)
George DeSario (706) 545-1352
Email: george.desario.civ@army.mil DSN 835

Army Capability Manager-Armored Brigade Combat Team and Reconnaissance (FCFC-CM-ABC)
COL Robert (Ken) Furtick (706) 545-2208
Email: robert.k.furtick.mil@army.mil DSN 835

Army Capability Manager-Security Force Assistance Brigade (FCFC-CM-SFA)
COL Paul R. Davis (706) 626-5054
Email: paul.r.davis8.mil@army.mil DSN 835

Army Capability Manager-Infantry Brigade Combat Team (FCFC-CMA-I)
COL Shaun S. Conlin Jr. (706) 545-3911
Email: shaun.s.conlin2.mil@army.mil DSN 835

Army Capability Manager-Stryker Brigade Combat Team (FCFC-CMA-S)
COL Jason M. Wingeart (706) 545-7751
Email: jason.m.wingeart.mil@army.mil DSN 835

Army Capability Manager - Robotics Requirement Division (FCFC-CMR)
LTC Joshua I. Wiles (706) 545-5275
Email: joshua.i.wiles.mil@army.mil DSN 835

CHIEF OF ARMOR'S HATCH

BG Chad C. Chalfont
Chief of Armor/Commandant
U.S. Army Armor School

Armor and Cavalry Leaders: We're Built Different

In this article, I thought I would offer some thoughts about what it means and what it takes to be a leader in our Armor and Cavalry formations. Armor and Cavalry will always be essential to the U.S. Army's fighting and winning our Nation's wars. But to be clear, this has nothing to do with the tanks and Bradleys that we bring to the fight. Instead, I would argue that we Armor and Cavalry leaders are built different. And we will always be needed because of how we think, how we act, and how we fight as part of the Combined Arms Team.

We Think Differently

Armor and Cavalry leaders do not think like the rest of the Army.

We are big map people, not small map people. Others may move one kilometer in an hour. We move one kilometer every three minutes. That kind of speed and tempo forces us to think further ahead: not just about our next move, but the one after that, and the one after that. We do not simply react to what the enemy presents to us; instead, we move fast and strike hard so that we dictate the terms of the fight to the enemy.

We multi-task and we are comfortable with that. We fight the tank. We fight the section. We fight the platoon. All at the same time. We operate on multiple radio nets: giving direction, executing reporting, and conducting cross-talk. We are constantly developing the situation and driving action at distances and at a tempo that others do not.

Most importantly, we have a bias for trust. Micro-management just isn't in our DNA. The pace and distance of the fight forces us to trust our crews, our sections, our platoons. We rely on disciplined initiative because at 40 miles an hour, and with weapons systems that reach out and destroy the enemy at kilometers, not meters, we just don't have time to spell out to our teammates how to accomplish the mission. We trust our training and we trust each other. And through that trust we unleash a terrible force and violence that overwhelms our enemies.

Finally, we develop an intuitive feel for the battlefield. We think fast. We think over distance. We develop a knack for rapid pattern recognition and quick tactical judgments. We decide faster than the enemy, and that is why we win.

We Act Differently

But we don't just think differently, we act differently.

We are disciplined. The sheer destructive power of our weapons systems forces us to operate with a different level of responsibility. A single tank platoon has more firepower than other battalion-sized formations. That power demands discipline, rooted in a spirit of trust that we develop by proven competence over time.

We value maintenance and logistics. Our fight does not start with just pulling triggers. We keep our machines running. We fight to get into the fight. If your tank is not moving, it is a target. And if your logistics are not planned and executed, you are out of the fight before it even begins.

And for sure, we have a strong, distinct culture. We honor our history, our traditions: Stetsons, Spurs, Tanker Boots. But you do not get those things for free. You earn them. You are awarded your Spurs through hard work and shared hardship. You have to qualify your tank first before you have the right to wear Tanker Boots. And you

earn the right to say, "If you ain't Cav, you ain't ____," not because it's a catchy phrase, but because you've lived the discipline and training to back it up.

Us acting differently is serious business. Just like how we think … how we act is part of our DNA. It defines how we train, how we lead, and ultimately how we win as part of the Combined Arms Team.

We Fight as Part of the Combined Arms Team

But let's be clear. Victory on the battlefield is not won alone, and it is not just about the tank's overwhelming firepower. It is about forcing the enemy to fight in multiple directions against multiple forms of contact, breaking the enemy, and taking away his ability to respond in the fight. And combining arms is what makes us lethal in combat … it is what allows us to win wars.

For sure, the Armor provides the mobility, firepower, and shock effect to close with and destroy the enemy. But we almost never do this alone. We need the Infantry to clear terrain, seize buildings, and fight in the complex terrain where tanks cannot go alone. We Armor and Cavalry leaders always bring the Infantry into the fight as part of the Combined Arms Team.

Fire support and attack aviation are essential to suppressing the enemy, forcing the enemy to keep his head down as the Armor and Infantry close the distance between their last covered and concealed positions and the enemy's line. We Armor and Cavalry leaders always bring the Artillery and Aviation into the fight as part of the Combined Arms Team.

We do not go anywhere without the Engineers. The Sapper's ability to breach obstacles under fire, fortify our positions, and emplace obstacles are essential to all of us. We Armor Leaders always bring the Engineers into the fight as part of the Combined Arms Team.

Today's wars are also showing us just how important air defense and electronic warfare capabilities are to the Combined Arms Team. And our Logistician brothers and sisters are always at the forefront of our thinking as we plan, prepare, and execute the fight. We Armor Leaders always bring these capabilities into the fight as part of the Combined Arms Team.

Make no mistake about this. The Armor Branch and its leaders have spearheaded the Army's thinking about the Combined Arms Team for the last 90 years. It is us tankers and cavalrymen who think first about fighting as a synchronized force – playing what General Patton called the Symphony of Mars – not just our own french horn. Our commitment to the Combined Arms Team makes us different because we think with rigor about how it fights, how to train it, and how to keep it ready.

In closing, I think that it is important that from time to time we remind ourselves that we all belong to a branch that is unlike any other. We demand that our leaders fight faster, fight harder, and fight with a kind of discipline that our adversaries both envy and fear. Armor and Cavalry leaders will always be essential to our Army and the Joint Force. Not because of our machines, but because we think differently, we act differently, and because we fight as a Combined Arms Team.

We Armor and Cavalry leaders are built different.

The Z-Pattern

by 1SG Michael D. Stephens

The coaxially mounted machine gun enhances the lethality and versatility of armored vehicles, allowing crews to engage targets effectively and contribute to the success of combined arms operations. Its integration with the main gun's fire control system also ensures coordination and synchronization of firepower, maximizing the vehicle's combat effectiveness on the battlefield. Training and proficiency in gunnery techniques like the z-pattern are essential for armored vehicle crews to maximize the effectiveness of the coaxial machine gun in combat situations. Regular practice and simulation exercises help develop the skills and muscle memory needed to employ the weapon system accurately and decisively on the battlefield.

During the 2024 Sullivan Cup competition, vehicle commanders and gunners generally engaged vehicle targets with vehicle-mounted machine guns effectively. However, troop target presentations presented the crews with unique challenges. During the competition, crews did not demonstrate correct machine gun engagement techniques when firing the coaxial machine gun at a troop array, failing to hit the targets. The competition crews engaged the target correctly by firing an initial burst at one of the troop silhouettes using the coaxial machine gun (coax). However, their subsequent actions indicate a lack of proper adjustment techniques. Proper adjustments involve elevation (up and down) and azimuth (left and right). The crews only adjusted elevation, which means they failed to account for any lateral movement, z-pattern, needed to cover the width of the target array.

The firer must consider factors such as target acquisition, reticle lay, and correct engagement techniques to successfully engage the target. Scan and search techniques such as rapid scan, slow scan, and detailed search will aid the firer to identify the target quickly. Once the firer has identified the target, the firer must correctly place the reticle on the target or at its base, depending on the target array presented to further posture the system for effective use. To effectively use the coaxial machine gun against a troop array (targets with width and depth) the firer (often the gunner) must show an understanding of machine gun theory. The gunner's knowledge of the machine gun is not complete until they learn about the action and effect of the projectiles when fired. The following terms help the vehicle commander and gunner understand the characteristics of fire of the coaxial machine gun: line of sight, the burst of fire, trajectory, cone of fire, beaten zone, the effect of range on the beaten zone, and effect of slope on the beaten zone.

They must also demonstrate the ability to execute correct engagement techniques such as correct reticle lay, using bursts of fire, and the "z-pattern." Once the firer has appropriately placed the reticle and determined an appropriate range for the target, the firer should begin firing a burst at the front right silhouette and deliberately move the impact of the rounds, the beaten zone, from right to left and work in a "z-pattern" back to the right. The "z-pattern" is a tactical maneuver commonly used by armored vehicle crews to engage enemy dismount teams transitioning between primary and secondary fighting positions. This maneuver involves tracing a pattern resembling the letter "Z" with the fire of the coaxial machine gun, covering the potential routes enemy dismount teams might take during their movement. By employing the Z-pattern, crews can effectively suppress and engage enemy personnel as they move, preventing them from reaching their secondary positions or conducting offensive actions. This tactic maximizes the firepower of the coaxial machine gun, utilizing its capability to lay down suppressive fire along specific routes of enemy movement.

Overall, the z-pattern is an effective strategy for armored vehicle crews to

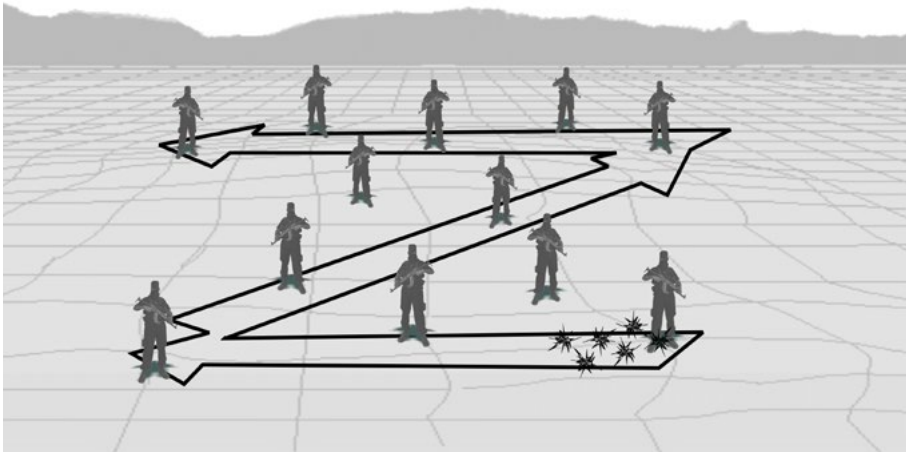


Figure 1. Proper z-pattern as described in FM 3-20.21, *HBCT Gunnery*

disrupt and neutralize enemy dismount teams, enhancing the vehicle's defensive capabilities and contributing to overall mission success. Each burst of fire should be approximately 10-15 rounds, allowing the gunner to use 2-3 tracers for sensing as well as the "splash" of the rounds being fired as they impact the ground near the target. The firer will deliberately move the beaten zone across the target array by slowly and smoothly using the control handles to manipulate the reticle placement during the engagement. Abrupt movements can disrupt accuracy and make it challenging to maintain effective fire on target. Throughout the engagement, the firer should keep a clear sight picture to accurately assess the placement of the reticle and the impact of rounds. This ensures that the firer adjusts with precision and in response to real-time feedback. By systematically moving the beaten zone across the target array, the firer can effectively engage each target or cover a designated area with suppressive fire. This technique is particularly useful in defensive or area denial situations where the goal is to prevent enemy movement or limit their ability to return fire.

Crews can train coaxial machine gun engagement techniques in diverse ways. Simulations provide an opportunity to train correct engagement techniques without the use of a live-fire range. Simulations also provide a safe and controlled environment for crews to familiarize themselves with the operation of the machine gun, practice target acquisition, and refine their aiming and firing techniques. These simulations can mimic various scenarios, including engaging troop arrays in different terrain and weather conditions. The Advanced Gunnery Training System (AGTS) provides a simulated environment replicating real-world scenarios and allows crews to hone their target acquisition, identification, engagement, and target destruction skills.

The AGTS can only be effectively used when training is conducted by certified instructor/operators (I/Os) and certified vehicle crew evaluators (VCEs) for system management and crew evaluation. Certified AGTS I/Os will provide crews with systems management and tracking crew progression through the system's matrix. AGTS can simulate various conditions, terrain, and targets, ensuring that crews are prepared for any challenges they may face in the field. However, the system does not assess incorrect engagement techniques when using the coaxial machine gun against troop arrays.

Certified VCEs will provide crucial feedback to the crews, enabling the crews to be better prepared for upcoming live-fire engagements. Certified VCEs will enable crews to develop correct engagement techniques and best practices following doctrine and unit standard operating procedures. This training not only improves their proficiency but also enhances their ability to react swiftly and accurately in high-pressure situations. The certified VCE needs to be familiar with machine gun theory and correct coax engagement techniques to provide the appropriate feedback to the crew. Using AGTS can significantly enhance a crew's combat readiness and effectiveness. progressing through simulations and live-fire gunnery tables is crucial for crews to build proficiency, especially when it comes to engaging targets such as troop arrays with the coaxial machine gun.

Following the simulation training, live-fire gunnery tables allow crews to apply what they have learned in a realistic setting. This hands-on experience is invaluable for developing muscle memory, improving accuracy, and increasing confidence in engaging targets with the coaxial machine gun under live-fire conditions. Progression through these training stages ensures that crews are thoroughly trained and proficient in using the coaxial machine gun to effectively engage troop arrays and other targets they may encounter in combat situations. It also helps instill a sense of teamwork and coordination among crew members, as they learn to communicate effectively and work together to accomplish their mission objectives.

The crew's understanding of how to apply the coaxial machine gun properly is crucial for their ability to engage and neutralize targets on the battlefield effectively. Crew members must undergo thorough and rigorous training in the operation, handling, and firing of the coaxial machine gun. This includes familiarization with the weapon system's controls, sighting mechanisms, and fire control systems. Crew members need to always maintain situational awareness, continuously scanning the battlefield for potential

threats and opportunities. This allows them to quickly identify and prioritize targets, adjust their firing solutions, and respond to changing tactical situations. Effective communication and coordination between crew members are essential for maximizing the coaxial machine gun's effectiveness. The gunner must effectively communicate target locations and engage commands to the rest of the crew, while other crew members provide support, assist with target acquisition, and ensure the smooth operation of the vehicle. Crews must be adaptable and able to adjust their tactics and firing techniques based on the terrain, environmental conditions, and the nature of the threat. This includes employing different firing patterns, utilizing cover and concealment, and maneuvering the vehicle to optimize firing positions. Maintaining fire discipline is critical to conserving ammunition, minimizing exposure, and maximizing the effectiveness of suppressive fire. Crews must avoid wasteful or indiscriminate firing and focus on accurately engaging priority targets to achieve the desired effects.

By mastering the z-pattern and other principles and applying them consistently in combat situations, armored vehicle crews can leverage the full capabilities of the coaxial machine gun to engage and destroy targets effectively, contributing to the success of their mission and ensuring the safety of friendly forces.

First Sergeant Michael D. Stephens currently serves as the Troop First Sergeant for M Troop, 3rd Squadron, 16th Cavalry Regiment, 316th Cavalry Brigade, Fort Benning, Georgia, following roles as an Abrams Master Gunner Senior Instructor and Gunnery Team Chief within the same unit. Prior to this, he served as the Brigade Master Gunner for Headquarters and Headquarters Troop, 2nd Armored Brigade Combat Team, 1st Infantry Division, Fort Riley, Kansas, and as a Platoon Sergeant with C Company, 1st Battalion, 18th Infantry Regiment, also at Fort Riley. 1SG Stephens' military education includes the Master Leader Course, Maneuver-Senior Leader Course, Abrams Master Gunner Course, and Army Recruiter Course, and he is recognized with the Meritorious Service Medal and the Master Gunner Identification Badge.

Notes

[1]Headquarters, Department of the Army (2009, September). FM 3-20.21 Heavy Brigade Combat Team (HBCT) Gunnery.

[2]Headquarters, Department of the Army (2017, April). TC 3-22.240 Medium Machine Gun.

[3]Headquarters, Department of the Army (2005, August). FM 3-20.12 Tank Gunnery (Abrams).

From the ARMOR Art Archives:
An M1IP Abrams In Korea

TRAINING CIRCULAR 3-20.31-120 Gunnery: ***HEAVY TANK***

Editor's Note: *In keeping with the traditions of Armor and Cavalry and the Profession of Arms, the C92-series of articles contain a focus on crew gunnery, training, resources, and general information that will be useful and informative to the Mounted Maneuver Community.*

C92 was selected as the name of this column as it will be written from the tower's perspective. For decades, the tower has typically been referred to as "Charlie-Niner-Two" or simply written "C92." The origins of the callsign C92 are not in official publications. The legendary use of C92 as the tower's callsign are from the 1970's where units used a Signal Operating Instructions (SOI) to determine their daily or weekly callsigns. While at gunnery, a unit identified the tower as "C92," wrote it down on the scripts for gunnery, and handed the standardized scripts off to the follow-on units. That callsign continues its long history as the authoritative voice during direct-fire gunnery operations

by Weapons and Gunnery Branch

The Evolution of Tank Gunnery

It has been ten years since the last revision of the tank gunnery manual. In the coming weeks the 2025 version of the Abrams gunnery manual will be authenticated and formally published through the Army Publishing Directorate (APD).[1] This manual has a great number of changes from its predecessor, TC 3-20.31, *Training and Qualification, Crew*.[2] Change is inevitable. Change can be good. According to C92, these are the key changes every leader should be aware of. As the Armor force focuses on large-scale combat operations (LSCO), the evolution of tank gunnery must refocus to more complex, longer-range engagements and appropriate techniques.

The changes to the gunnery manual will be discussed over three articles. This initial article will discuss the most impactful changes at the unit level. It will be followed by the "nice to know" and "why did that change" topics. The last article will include an introduction and overview to Table Charlie: Complex Engagements.

The Big Changes

The largest changes in the manual are found on Tables IV, Basic, Table V, Practice, and Table VI, Qualification.

Return to Platform Gunnery Manuals

As a recommendation from leaders stemming from the III Corps Lethality Report[3], each platform type should have their own separate gunnery training publication (gunnery manual) for simplicity. TC 3-20.31, Training and Qualification, Crew, included multiple platform training and qualification standards. From that recommendation an updated gunnery manual structure was developed similarly to that used in 1957 through 2005. The basic structure is shown in Figure 1 below. Although not all the manuals in the set, those specific to gunnery on the range are shown for simplicity.

TC 3-20.31, Training: Crew Platforms

The core publication remains TC 3-20.31 with a more refined focus on unit training plans, range requirements, scenario development, and key planning considerations. That

publication will include a series of checklists for units to build their own gunnery standard operating procedures (GUNSOP) and leader certification programs based on Army policy, regulatory requirements, and best practices.

There are three primary gunnery publications for ABCT formation use:

- TC 3-20.31-120, ***Gunnery: Heavy Tank***
- TC 3-20.31-25, ***Gunnery: Bradley Fighting Vehicle, 25mm***
- TC 3-20.31-404, ***Gunnery: Crew-Served Weapons.***

The publication number from the previous 2015 manual was used as the "root" number – with the addition of "-120" or "-25" to describe the caliber of the platform's primary armament.

The "-120" and "-25" are awaiting authentication and official publication. TC 3-20.31-404, Gunnery: Crew-Served Machine Guns, is undergoing staffing through the remainder of FY25.

The gunnery manuals follow a common outline structure to provide a common operating picture for the user.

Chapters 1 through 6 provide an overview of the training event, the training event definition, the purpose, method, and end state of the training, and a guide to plan, prepare, execute, and assess each event. Chapter 7 details methods to manage crews once they achieve proficiency.

Prescriptive Engagement Conditions

The "Required Performance Measures" TC 3-20.31, ***Training and Qualification***, *Crew*, *2015*"[4] from the previous gunnery manual are rescinded. This allows a far more consistent standard for all engagements in the manual. It removes the ability of a unit to create scenarios with minimal thresholds for training and qualification.

This manual removes the unit's ability to create scenarios such as:

- One defensive engagement, day and night.
- One offensive engagement day and night.

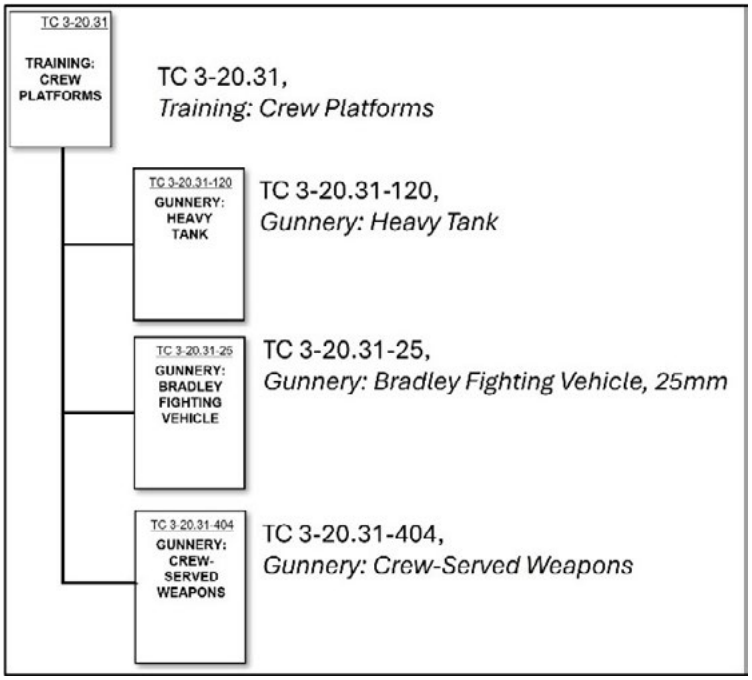


Figure 1. Gunnery Manual Structure *(U.S. Army Graphic)*

- One short-range machine gun engagement (<400m), day or night.
- One long-range machine gun engagement (>600m), day or night.
- One short-range main gun engagement (<400m), day or night.
- One long-range main gun engagement (>1800m), day or night

Commanders may only select the sequence of engagements, the split for day / night based on their environmental conditions and select one chemical, biological, radiological, and nuclear (CBRN) engagement day and night.

This is to enable training and qualification standardization across the force, drive extended range engagements supporting large scale combat operations, and eliminate scenarios that were designed toward the minimum thresholds of proficiency.

Live Fire Accuracy Screening Test

Units must be aware of the changes with zeroing or the live fire accuracy screening test (LFAST) both Abrams and Bradley platforms. For Abrams, the procedures for conducting boresighting and LFAST have changed. First, the boresighting distance recommendation is moved from 1200-meters to 1600-meters, +/- 10-meters. This pushes the boresight panel out to a more tactically relevant distance. The LFAST panel range-to-target also is pushed out to 1600-meters (an increase of 100-meters). This allows crews to align their optics during boresighting procedures and conduct the live-fire accuracy screening checks at a tactically relevant distance in keeping with the Army Calibration Policy and recommendations from the Armor and Engineer Board.[5] Updated standard target number 5 (ST-5) panel dimensions and construction instructions are provided as shown in figure 2.

The procedures for conducting the LFAST have also changed to require the gunner complete a "G" pattern on

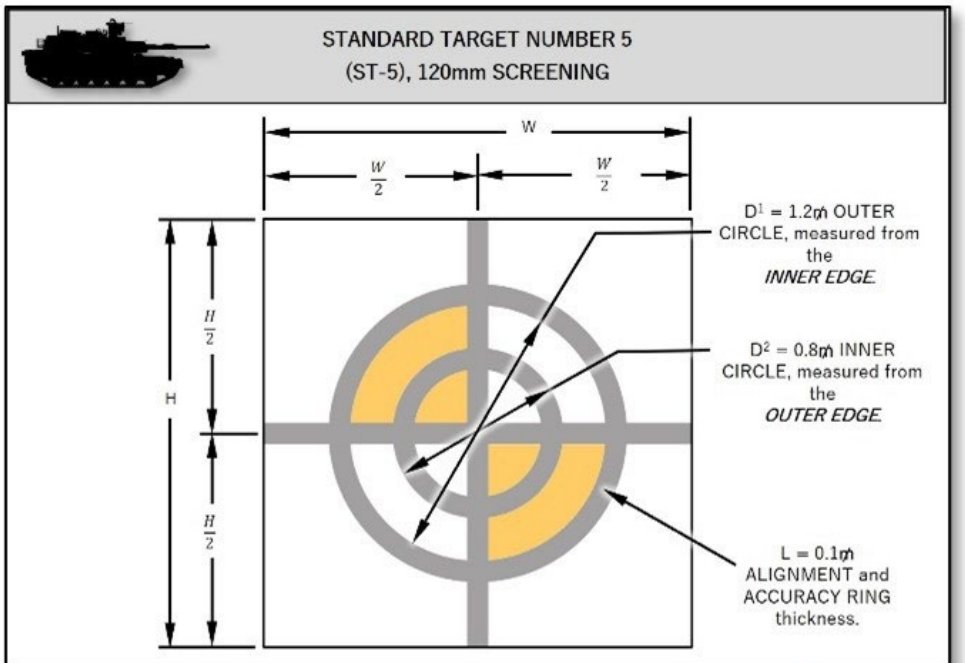
target using manual controls, ensure the appropriate ammunition type is indexed and loaded, lase to the target to ensure the ballistic solution is created, and release the palm switches. Once done, the gunner uses manual controls to refine the lay on target with the last movement up. When prepared-to-fire, the tank commander reports set, and the command of execution is authorized by C92. Using the manual firing mechanism (commonly referred to as the "master blaster") to send the round to target.

Why is that such a big deal?

Our gunners today are relatively inexperienced with no live-fire engagements under their belt. For most, LFAST is the first time a new gunner has ever fired a main gun round with purpose (not including one station unit training or OSUT). Use of manual controls after the ballistic solution is established and then firing with the manual firing mechanism eliminates flinching, jerking, or anticipation movement of the gun firing. It removes gunner lay error and focuses on the fire control system's ability to calculate the ballistic solution, apply it to the main gun, and fire the round in as close to a static firing occasion as possible. The goal of the change is to eliminate crew error as much as possible from the accuracy screening test.

Main Gun Confirmation

Once LFAST and zeroing are complete,



RANGE	OUTER D1 1.2 mils	INNER D2 0.8 mils	DISTANCE BETWEEN INNER AND OUTER D3	LINE WIDTH L 0.1 mils	MINIMUM PANEL SIZE H, W 2.0 mils
2400m	288cm	192cm	48cm	24cm	480cm
2200m	264cm	176cm	44cm	22cm	440cm
2000m	240cm	160cm	40cm	20cm	400cm
1800m	216cm	144cm	36cm	18cm	360cm
1600m	192cm	128cm	32cm	16cm	320cm
1500m	180cm	120cm	30cm	15cm	300cm
1400m	168cm	112cm	28cm	14cm	280cm
1200m	144cm	96cm	24cm	12cm	240cm
1000m	120cm	80cm	20cm	10cm	200cm
800m	96cm	64cm	16cm	8cm	160cm

LEGEND
cm – centimeters
D – diameter
H – height
m – meter
mm – millimeter
mils (m̀) – milliradian
W - width

Figure 2. ST-5 Panel Updated Dimensions *(U.S. Army Graphic)*

the unit may conduct an enhanced fire control system check for main gun engagements. This is not resourced with Department of the Army Pamphlet (DA Pam) 350-38, *Standards in Weapons Training*. To conduct these two engagements, each crew requires an additional six (6) rounds, 3 each M865A1 training sabot and 3 each M1002 training Multi-Purpose Anti-Tank (MPAT) rounds. Reviewing the Army's utilization reports over the past ten years show historically low utilization of main gun resources (below 65% of authorized in most units) and therefore have the ability to self-resource these engagements.

There are three primary tasks within these two engagements:

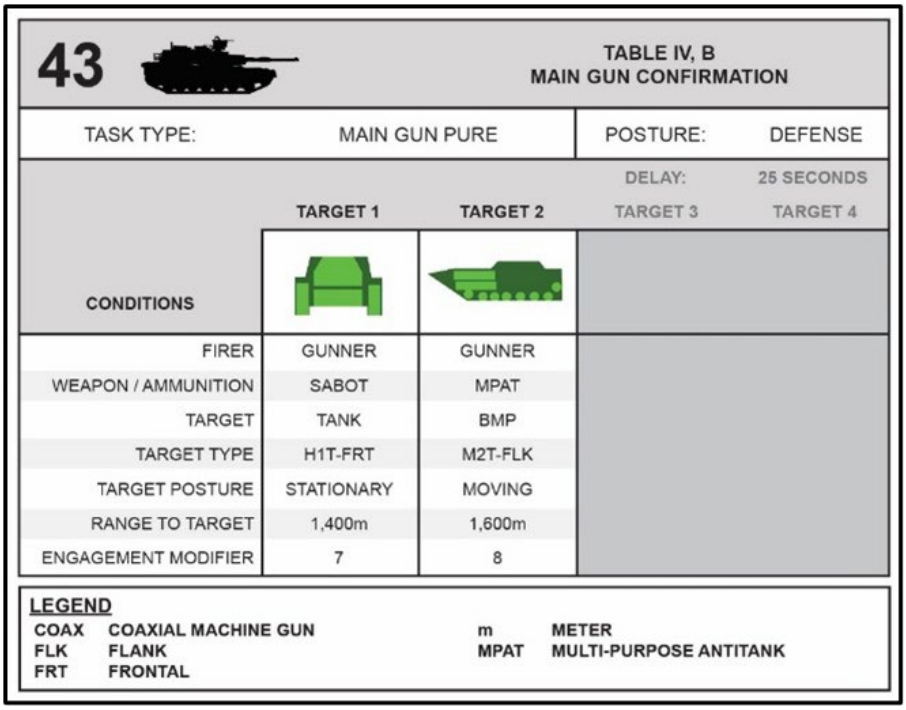
- From a defensive firing position using a fully operational fire control system, the gunner engages one stationary tank frontal with sabot training round, followed by one moving personnel carrier with an MPAT training round.

- Crew conducts a Muzzle Reference Sensor Update per their technical manual (TM).

- From a defensive firing position using a fully operational fire control system, the tank commander engages one stationary tank frontal with sabot training round, followed by one moving personnel carrier with an MPAT training round.

The LFAST coupled with these three tasks provide the crew with confidence in their fire control system, preparation-to-fire procedures, maintenance procedures and processes and conduct of fire. It verifies the lead angle sensor from a stationary platform against a moving threat, amplified by using the slowest main gun round against a moving target.

The crew gains additional confidence in the muzzle reference sensor update by continuing to engage from the tank commander's position. Again, the slower round is used against the moving target to ensure the lead-angle sensor and ballistic computer are functioning properly, as the commander's handle and trigger.



43

TABLE IV, B
MAIN GUN CONFIRMATION

TASK TYPE:	MAIN GUN PURE		POSTURE:	DEFENSE
			DELAY:	25 SECONDS
	TARGET 1	TARGET 2	TARGET 3	TARGET 4
CONDITIONS				
FIRER	GUNNER	GUNNER		
WEAPON / AMMUNITION	SABOT	MPAT		
TARGET	TANK	BMP		
TARGET TYPE	H1T-FRT	M2T-FLK		
TARGET POSTURE	STATIONARY	MOVING		
RANGE TO TARGET	1,400m	1,600m		
ENGAGEMENT MODIFIER	7	8		

LEGEND

COAX	COAXIAL MACHINE GUN	m	METER
FLK	FLANK	MPAT	MULTI-PURPOSE ANTITANK
FRT	FRONTAL		

Figure 3. Engagement 43, Main Gun Confirmation, gunner's power control handles, example *(U.S. Army Graphic)*

These engagements also facilitate the platoon sergeant's evaluation of their crew's conduct of fire during the engagement while serving as the loader.

Basic Machine Gun Engagements

Once complete, the crew continues with the defensive, basic machine gun engagements. These engagements are machine gun pure using both the coaxial machine gun and commander's caliber .50 heavy machine gun. These engagements are designed to assist the crew with identifying any issues with their machine guns, commander's independent thermal viewer (CITV or ITV), and also allow the platoon sergeant to evaluate the crew's basic conduct of fire techniques.

Four-Target Engagements

This table introduces the crews to one offensive and one defensive four-target engagements, which have not been in the live fire training strategy since the "BRAVO-THREE-SWING" or "B3S" from 2001.[6]

The original B3S was introduced to the Abrams fleet in 1998 where a crew fighting from a defensive position, engaged a stationary tank frontal and a moving tank, followed by a defilade tank frontal (15-second delay) and a set of troops (25-second delay). This engagement was a "swing" task, where it could be fired either during the day or night phase of the course of fire.

In general, not including any authorized defilade time, the crew must kill all 4 targets in 52 seconds to pass.

By way of comparison, placing the targetry from the B3S from 1998 in today's threat-based scoring model under the same firing conditions, the crew must kill all 4 targets in under 55 seconds (again, not including defilade or break times.)

In the older scoring model, the crew also could pass the engagement if they defeated 3 of 4 of the targets (using all authorized defilade time) in a total of 42 seconds.[7] Today, if a crew fails to kill any target presented within an engagement, they fail the engagement.

Although the targets within these engagements are different, without scrutinizing the type of targets within the engagement itself, to pass the crews must defeat all targets (not just 3 of 4) presented in less than:

- 59 seconds on the offense
- 57 seconds from the defense.

The scoring models differ conceptually, but they don't differ much mathematically. These numbers are based on a "slowest minimum standard" calculation.[8] In the defense alone, the minimum standard appears 5-seconds slower. But the targetry within those engagements are not equal in nature. For example, Engagement 65 in the Gunnery: Heavy Tank book, provides the conditions for the four targets fired from the defense:

- Troops, 400m (coax) – generally the same range band from the B3S.
- Stationary PC, 1600m (MPAT) – the defilade tank is presented at 700-900 meters – 700-meters closer with a smaller target.
- Stationary tank, 2000m (sabot) – 400-meters farther than the B3S stationary tank.
- Moving tank, 2200m (sabot) – this is 400-meters farther than the B3S's moving target.

The sequencing of the targets coupled with the extended range of the targets provide 5-seconds more time to kill the threats in the current scoring model.

In context to killing, the further the target, the more time to kill it is available.

Minor Crew Penalties Don't Fail You

Lastly, in older scoring models, if the crew killed all the targets and received 70-points (passing), they could have received a penalty for an error in their conduct of fire (-5 points), causing the crew to fail the engagement. Today's scoring model does not permit conduct of fire issues (5-point penalties) from disqualifying a crew's engagement. If the crew killed fast enough but said some things out of sequence, it will not cause the crew to fail the engagement.

Table V, Practice

The principles of the practice course of fire include use of ¾ scale targets at full-range and provide more challenging engagements to build experience for the crew prior to the qualification course of fire, Table VI. This isn't a change, actually… we are just highlighting this as a critical requirement during scenario development along with the required use of battle effect simulators (BES) as part of the Army-standard target presentations.

Train Harder than the Test

That's the most important aspect of Table V. Practice with a higher level of difficulty and the qualification course of fire will be easier.

There are other aspects of "difficulty" that are applied to Table V. The degraded engagement conditions are more complex and difficult to master. The engagement ranges are farther – which provides more time but have a lower probability of hit (Phit).[9] Other aspects of Table V require the unit to actively evaluate conduct of fire to reduce the time it takes to announce the fire commands. The unit should practice brutality evaluating the conduct of fire for each crew during simulations including Table II, Table III, Table IV, and Table V.

Enforce Speed and Violence of Action

In killing, speed and violence of action are critical for the crew's success. For every crew that doesn't understand conduct of fire (fire commands), valuable time is lost. Units that do not adhere to training conduct of fire correctly are the ones that habitually use "fire and adjust" for most engagements without understanding what it is actually for, or that they are adding one or two additional seconds to their kill time.

The goal is for the crews to understand conduct of fire better than proper emoticon use on their phone. Say only what is necessary.

Acquisition Reports vs. Contact Reports

Crews must understand that an accurate acquisition report takes the place of the alert and target description elements of the fire command. If done correctly, it also includes the mandatory crew response terms for the gunner. TC 3-20.31-040, *Direct Fire Kill Chain,* and TC 3-20.31-043, *Conduct of Fire*, establish a clear difference between a contact report and an acquisition report. Contact reports are fine informing leaders of observed things by military description – i.e. the loader announcing

"TANK, LEFT FRONT."

The tank commander and gunner have that contact report to react to. An acquisition report is provided by the gunner and includes a target description and range to target. This takes the place of multiple elements in the fire command AND a required crew response. For example, the gunner can provide an acquisition report of

"TANK, ONE-FOUR-HUNDRED."

This simple acquisition report provides a sufficient target description and includes the determined range to target. It is implied that the gunner identified the target description and does not need to announce "IDENTIFIED" as a crew response.

The tank commander would wait for "UP" from the loader, assess the acquisition report and target, and just announce the command of execution…

"FIRE."

And that speeds up the conduct of fire.

That makes killing faster. That makes crews better. That increases the crew's lethality. If units don't train proper conduct-of-fire or reinforce that training during simulations use and during every tank table, they're placing their qualification in jeopardy.

FIRE, FIRE SABOT

In the next article, we will discuss those slight changes and nuances and explain some of the "why" and "how" behind them. We will provide background information to build better context for each.

Notes

[1]Army Publishing Directorate. (2025, April). APD - Army Publishing Directorate. Retrieved from ArmyPubs: https://armypubs.army.mil/

[2]TC 3-20.31, Training and Qualification, Crew. (2015). Fort Benning: Department of the Army.

[3]III Armored Corps. (2019). III Armored Corps Lethality Report. Fort Hood: Department of the Army, III Armored Corps.

[4]TC 3-20.31, Training and Qualification, Crew. (2015). Fort Benning: Department of the Army.

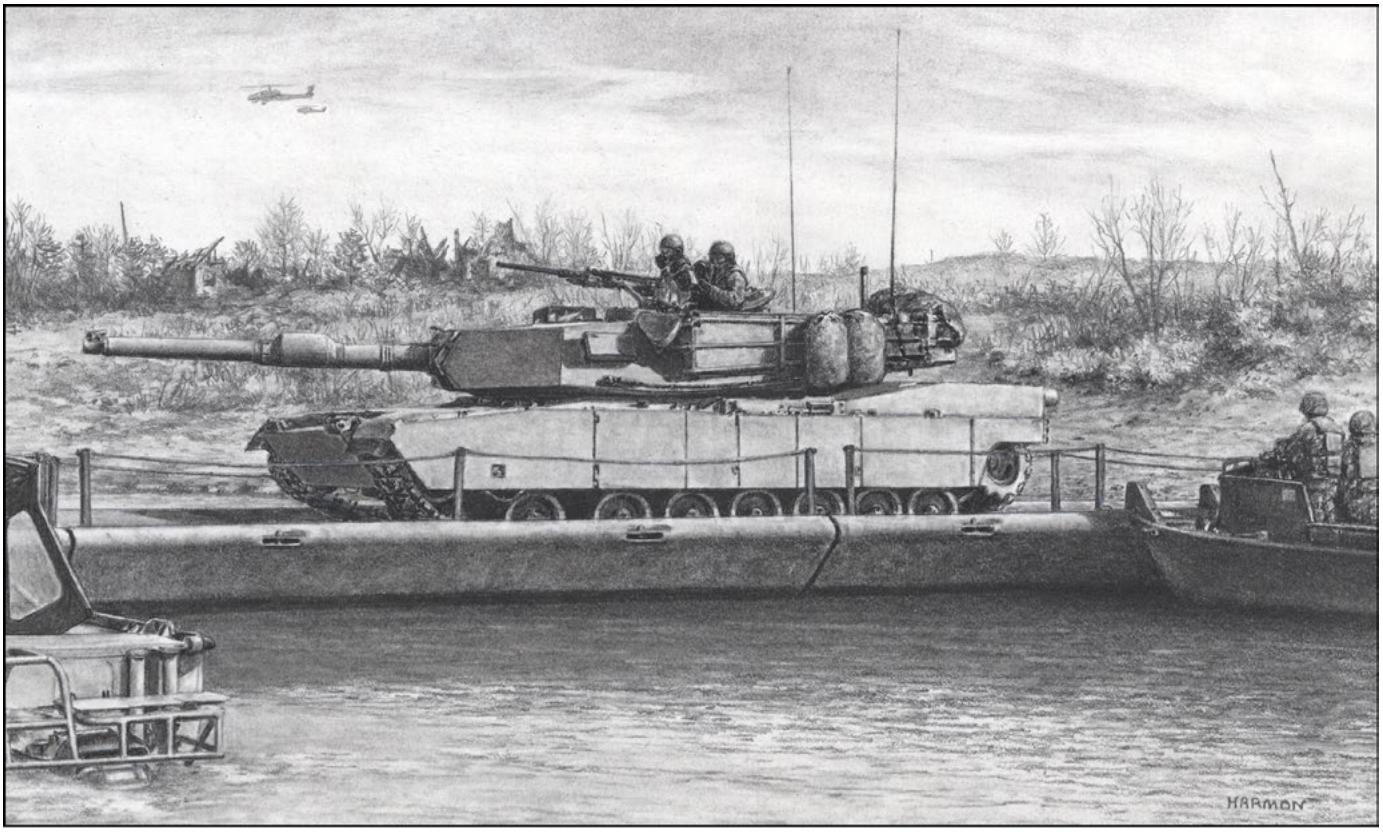
[5](1980). TRADOC ACN 2136, Concept Evaluation of Battlefield Boresight Techniques and Zero Retention. Fort Knox: US Army Armor and Engineer Board.

[6]FM 3-20.21, Tank Gunnery (Abrams). (2001). Fort Knox: Department of the Army.

[7]FM 17-12-1-2, Tank Gunnery (Abrams) Trainer's Guide. (1998). Fort Knox: Department of the Army.

[8]DA Form 8265, Common Crew Score Sheet. (2015). TC 3-20.31, Training and Qualification, Crew. Fort Benning, GA: Department of the Army.

[9]Probability of hit (Phit) for gunnery training accounts for unclassified aspects of the error budget. Generally speaking, the error budget for main gun engagements inlcudes fixed biases that are mathematically accounted for by the fire control syste, variable biases that are mostly addressed by the fir control system, and random errors.



From the ARMOR Art Archives:

"River Crossings"

FROM THE COMBAT TRAINING CENTERS

AS THE COMMANDER, I WILL:

Command and Warfighting Fundamentals at The National Training Center

Rock paintings near the entry to Fort Irwin attest to the units who once trained here. *(Photo by David Vergun)*

by COL Ethan Diven

There are no easy days in the desert of the National Training Center (NTC), especially for commanders. The NTC's Box is an unforgiving environment that tests our ability to fight and lead through constant contact and incomparable demands for our time, our authority, and our direct and organizational leadership. We fail to manage our sleep cycles in an attempt to sprint the entire fourteen days of simulated large scale combat operations during the force on force and live fire periods, insecure of where to best place ourselves before and during the fight, and frustrated that our staff cannot turn our guidance into fighting products faster. We look back over our shoulders with guilt that we failed to progress as far as we wanted in our collective training plans at home station. We experience frustration that our operational readiness rate is not as high as we had hoped, due to a combination of long lead time parts and mismanaged service programs, and we are equally frustrated about the significant personnel turnover right before our rotation. We are confused, angry, and disillusioned by the role our higher headquarters should have, did, or did not play in our path to the rotation. I have heard all the justifications and am equally complicit, having said and believed a version of these same words myself. Then, over two years ago, in February 2023, I was tested,

"The first step to awesomeness is acknowledging where you suck."

- Former COG

falling short many times during rotation 23-05 with the Spartan Brigade of the 3rd Infantry Division. If I could give myself advice before that rotation on how to better prepare myself, my leaders, and my organization with the knowledge and lessons that I have now…this is what I would say: "As the commander, I will."

This is for commanders, from a commander. The following thoughts are my observations and recommendations informed by my own failures, grounded in doctrine, and enabled by others coaching me as I continue to learn alongside incredible leaders training to conduct large scale combat operations. First, the desert does not care (and neither do our adversaries). We are deployed to the NTC to lead our Brigade Combat Team in the crucible of ground combat with the team we brought, the team we are still developing, and the team that deserves our best. Second, the leadership factory of the high Mojave Desert will expose us by combining the unforgiving physical environment and a world class sparring partner in the Opposing Force (OPFOR) who will employ all nine forms of contact, never cheating, but doing their best to make every fight unfair. Finally, there is no magic formula to 'win' at the NTC. Presence, toughness, and fundamentals in training are a great start but do not guarantee anything. Commanders must be aggressive by leaving nothing at rest, fight to generate combat power, and make multiple forms of contact with the enemy constantly, especially when synchronizing brigade efforts to dominate the close fight. The article is commander-centric, using the framework of the Army operations process: plan, prepare, execute, and assess, as well as the commander activities: understand, visualize, describe, direct, lead, and assess to train commanders so they can fight better, period.

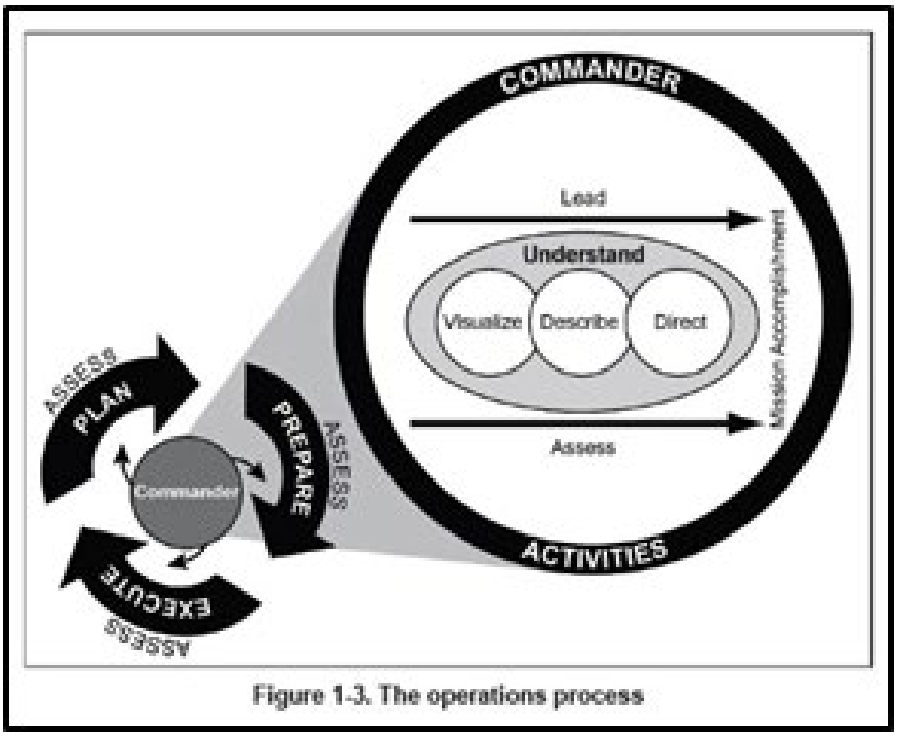


Figure 1. Commander and Staff Organization and Operations, FM 6-0

Plan

As the commander, I will remember that I am the most experienced staff officer in my formation and while I am not on the staff anymore, I still owe the staff my time. My experience helps us abbreviate for efficiency and effectiveness. If I am upset at the staff because they are not giving me the product I want as fast as I want, I bear the responsibility to fix it. This is where I understand, visualize, describe and direct with the staff and subordinate commanders.

I will lead through the Majors and subordinate commanders with simple, clear guidance and priorities:

- The Executive Officer will control time and a battle rhythm that integrates the staff so they do the work in the main command post as well as the admin and logistics operation center: maintain staff running estimates, generate the required inputs and outputs of battle rhythm events, and help the commander think by thinking for and like the commander.

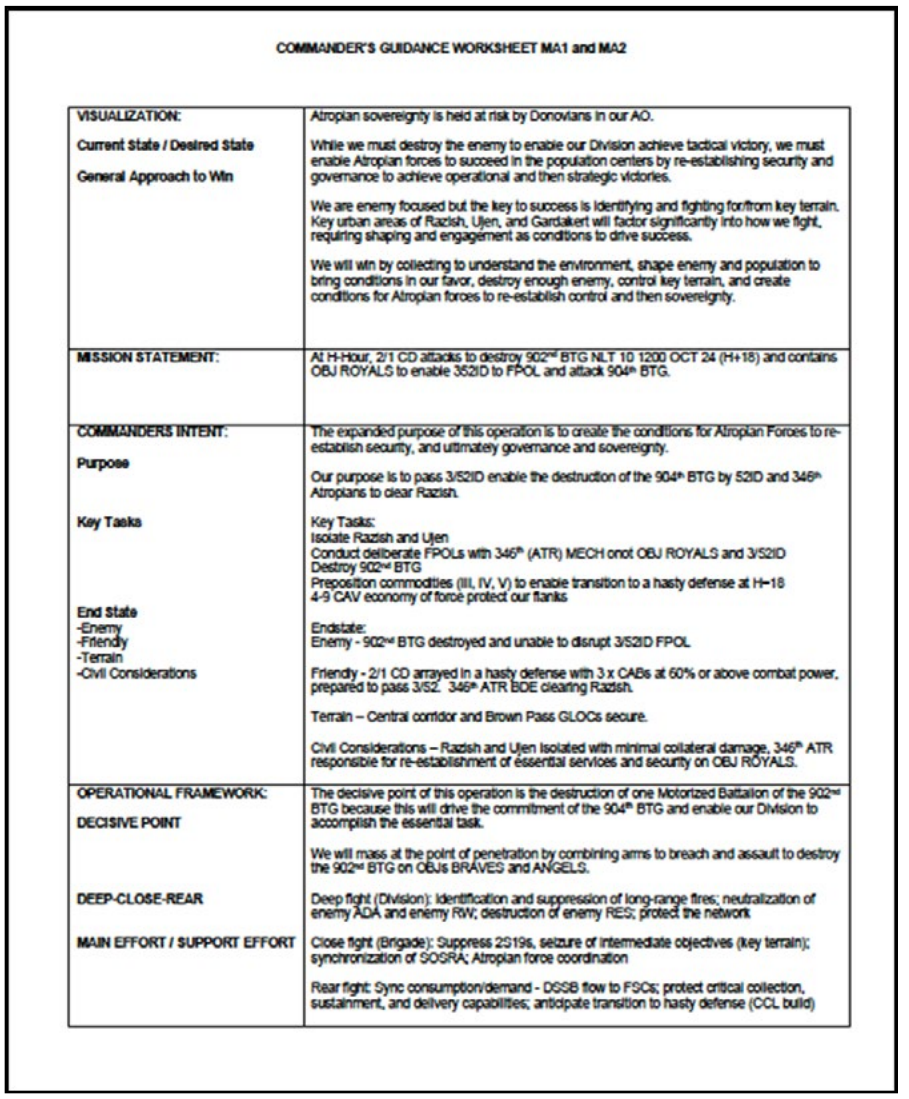
- The Operations Officer will synchronize the plan in time and space: ensuring all capabilities and warfighting functions are accounted for and focused where the commander directs domination in the close fight, building a battlefield framework that allows focus and tempo with prioritization, and creating the minimum executing products required to fight.

- The battle rhythm will allow us to plan the next operation while executing the current one so planners develop a plan that is grounded in reality.

1. I will not project how good I was on my last day as a Company/Battalion

"We do these things, not because they are easy, but because they are hard"

- General (Retired) Stanley McChrystal



COMMANDER'S GUIDANCE WORKSHEET MA1 and MA2

VISUALIZATION: Current State / Desired State General Approach to Win	Atroplan sovereignty is held at risk by Donovians in our AO. While we must destroy the enemy to enable our Division achieve tactical victory, we must enable Atroplan forces to succeed in the population centers by re-establishing security and governance to achieve operational and then strategic victories. We are enemy focused but the key to success is identifying and fighting for/from key terrain. Key urban areas of Razish, Ujen, and Gardakert will factor significantly into how we fight, requiring shaping and engagement as conditions to drive success. We will win by collecting to understand the environment, shape enemy and population to bring conditions in our favor, destroy enough enemy, control key terrain, and create conditions for Atroplan forces to re-establish control and then sovereignty.
MISSION STATEMENT:	At H-Hour, 2/1 CD attacks to destroy 902nd BTG NLT 10 1200 OCT 24 (H+18) and contains OBJ ROYALS to enable 3S2ID to FPOL and attack 904th BTG.
COMMANDERS INTENT: Purpose Key Tasks End State -Enemy -Friendly -Terrain -Civil Considerations	The expanded purpose of this operation is to create the conditions for Atroplan Forces to re-establish security, and ultimately governance and sovereignty. Our purpose is to pass 3/S2ID enable the destruction of the 904th BTG by S2ID and 346th Atroplans to clear Razish. Key Tasks: Isolate Razish and Ujen Conduct deliberate FPOLs with 346th (ATR) MECH onot OBJ ROYALS and 3/S2ID Destroy 902nd BTG Preposition commodities (III, IV, V) to enable transition to a hasty defense at H+18 4-9 CAV economy of force protect our flanks Endstate: Enemy - 902nd BTG destroyed and unable to disrupt 3/S2ID FPOL Friendly - 2/1 CD arrayed in a hasty defense with 3 x CABs at 60% or above combat power, prepared to pass 3/S2. 346th ATR BDE clearing Razish. Terrain – Central corridor and Brown Pass GLOCs secure. Civil Considerations – Razish and Ujen isolated with minimal collateral damage, 346th ATR responsible for re-establishment of essential services and security on OBJ ROYALS.
OPERATIONAL FRAMEWORK: DECISIVE POINT DEEP-CLOSE-REAR MAIN EFFORT / SUPPORT EFFORT	The decisive point of this operation is the destruction of one Motorized Battalion of the 902nd BTG because this will drive the commitment of the 904th BTG and enable our Division to accomplish the essential task. We will mass at the point of penetration by combining arms to breach and assault to destroy the 902nd BTG on OBJs BRAVES and ANGELS. Deep fight (Division): identification and suppression of long-range fires; neutralization of enemy ADA and enemy RW; destruction of enemy RES; protect the network Close fight (Brigade): Suppress 2S19s, seizure of intermediate objectives (key terrain); synchronization of SOSRA; Atroplan force coordination Rear fight: Sync consumption/demand - DSSB flow to FSCs; protect critical collection, sustainment, and delivery capabilities; anticipate transition to hasty defense (CCL build)

Figure 2. Commander's Planning Guidance, Diven 23-05 *(Graphic by author)*

Commander or Battalion/Brigade Field Grade onto my leaders. I will coach them. I am their trainer.

2. I will specify responsibilities and authorities at echelon as well as the minimum number of execution products the staff must develop for planning and for fighting. Leaders two levels down are my primary customer.

3. I will not be an observer of the Military Decision-Making Process (MDMP) because I will drive the 1/3 to 2/3 rule by developing and issuing my own planning guidance, my commander's intent, and by directing the course of action. I will develop and approve the essential fire support tasks with my senior fire supporter, the concept and priorities for sustainment with my senior sustainer, and approve priorities across the warfighting functions with the subject matter expert. I will endeavor to leverage information and make first contact with something that is not a human.

4. I will direct the senior non-commissioned officers (NCOs) to hold the unit accountable with clear authorities that get results. The Operations Sergeant Major will ensure the command post and staff have the infrastructure and resources to plan for the next fight while executing the current fight from a standardized common operational picture that remains current, is common at echelon, and enables me to command and to control. The Command Sergeant Major (CSM) will move to my specified points of friction that ensure we are generating combat power today and preparing for tomorrow. These tasks could include: observing the arrival and download of combat vehicles or throughput of Multiple Integrated Laser Engagement System (MILES) installation to confirm prioritization and resource allocation, the execution of maintenance operations in an assembly area of the main effort unit, and ensuring the reception and integration of non-organic units and task organization changes.

Prepare

The major activity where a commander identifies and mitigates risk through presence and interaction with leaders across the organization using deliberately planned battlefield circulation, directing rehearsals, and ensuring the right amount of detail and control exist within the plan. This is where I continue to improve my understanding, visualization, and description. I increase the strength of my directing and leading while assessing through back briefs, battlefield circulation, and feedback from the CSM.

1. I will give clear guidance for rehearsals: type, sequence, and expectations of leaders in execution. Sustainment is the foundation and run by the Brigade Combat Team Executive Officer (BCT XO) in coordination with the Brigade Support Battalion (BSB) Commander. The Squadron Commander and Fires Support Coordinator run the information collection and fires to shape the environment, and the Brigade S3 runs the combined arms rehearsal to confirm decisions, intent, risk, and triggers (DIRT). The Brigade Engineer Battalion Commander ensures we are integrating the protection warfighting function throughout the battlefield framework.

2. I will communicate what fighting products will be used and the Brigade XO will ensure they are validated during the execution of rehearsals by specifying what conditions must be

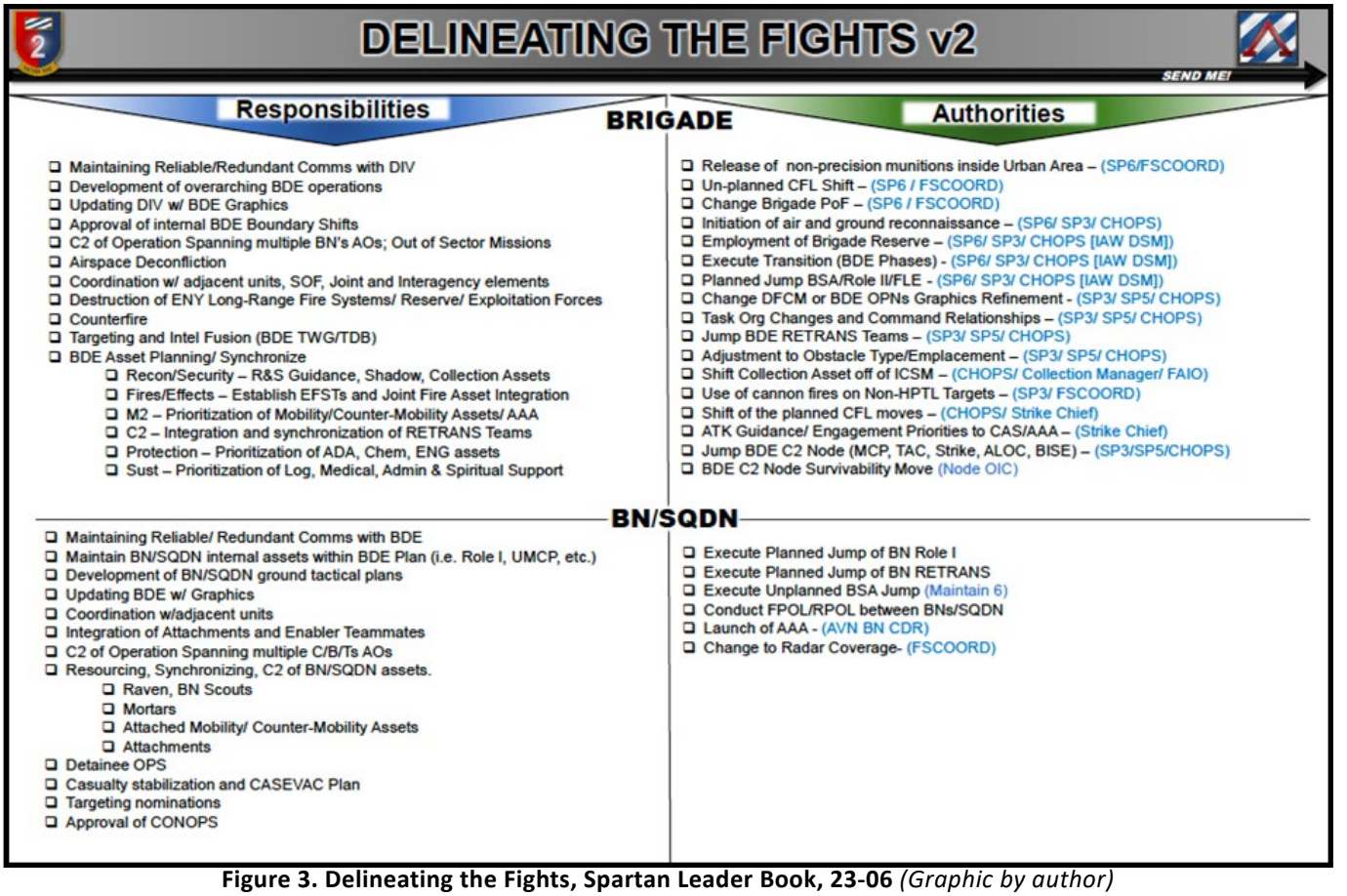


Figure 3. Delineating the Fights, Spartan Leader Book, 23-06 *(Graphic by author)*

set before critical event execution or decisions are made.

3. I will conduct battlefield circulation to ensure my intent is understood at echelon, to further ensure subordinate execution of MDMP and troop leading procedures (TLPs) and to improve my understanding of what the staff is briefing from their staff running estimates. I will endeavor to conduct commander visualization and dialogue on key terrain if possible.

4. I will drive the execution of rehearsals not as a measure of performance but a measure of effectiveness, with multiple repetitions of friction points and transitions as required. I will ensure we can maneuver the network to command and control at distance, anticipate sustainment requirements at scale, protect critical capabilities, and exploit opportunities through disciplined initiative thanks to detailed control measures and simple, clear intent that is understood at echelon.

5. I will direct the Operations Sergeant Major to ensure the terrain model provides the scale, the terrain relief, and the control measures required for an effective rehearsal while enabling the Headquarters and Headquarters Company (HHC) Commander and 1SG to develop the command post (CP) transition plan. The CSM will conduct pre-combat inspections of critical task execution and commodity preparation. These tasks could include: observing subordinate breach and non-standard casualty evacuation rehearsals and ensuring mine plows and rollers are mounted, operational, and the crews are proficient, as well as medical node critical equipment and personnel readiness. The CSM's pre-combat checks help assess our readiness to execute the start point (SP) and / or the line of departure (LOD).

Execute

The major activity where a commander struggles the most to place themselves and where we learn if our command post is conducting the six command post functions effectively. Observations from the Russo-Ukraine conflict often drive us to emphasize survivability over functionality, at our own peril. The commander must be able to communicate in order to command and control with the clear emphasis on directing, leading, and assessing. Work to function first, and then survive.

1. I will ensure the required conditions are set before executing critical tasks and actions, noting that the time may be sooner than expected and with less conditions set than expected. Not having all the conditions set is simply risk and I will determine what is prudent and acceptable.

2. I will not be the Battle Captain nor the Chief of Operations (CHOPS) as the XO runs the MCP. I will fight from my command post because that is where the information is relevant through the staff's running estimates,

SPARTAN 6 Daily Questions

- What are we trying to do to the enemy today?
  - _____
  - _____
- What is the enemy trying to do to us today?
  - _____
  - _____
- What are we trying to collect on and why?
  - PIR 1_____
  - PIR 2_____
  - PIR 3_____
- What is my last guidance?
  - CAV_____
  - FIRES_____
  - SUST_____
  - DIV _____
- What should next guidance be?
  - CAV_____
  - FIRES_____
  - SUST_____
  - DIV _____
- Can we talk ?
  - P_____ C_____
  - A_____ E_____
- Biggest Challenges for the BDE Today?
  1) _____
  2) _____
  3) _____
- Guidance
  - CSM_____
  - XO_____
  - S3_____

Figure 4. Daily Questions, Diven 23-05 *(Graphic by author)*

updated on the common operational picture and good reporting in accordance with our standard operating procedures (SOPs) and my approved commander's critical information requirements.

3. I will not abandon the main command post because I want to move forward in a tactical command post (TAC) or mobile command group (MCG) so I can better 'see' the fight. If I don't want to fight from my CP it is likely because the CP is not functional. The TAC exists as a temporary node that enables the commander to command and control through a transition period or a discrete event; it is not enduring. The TAC maintains the people, the processes, and platforms the commander needs to fight for 6-12 hours at most. The MCG enables battlefield circulation.

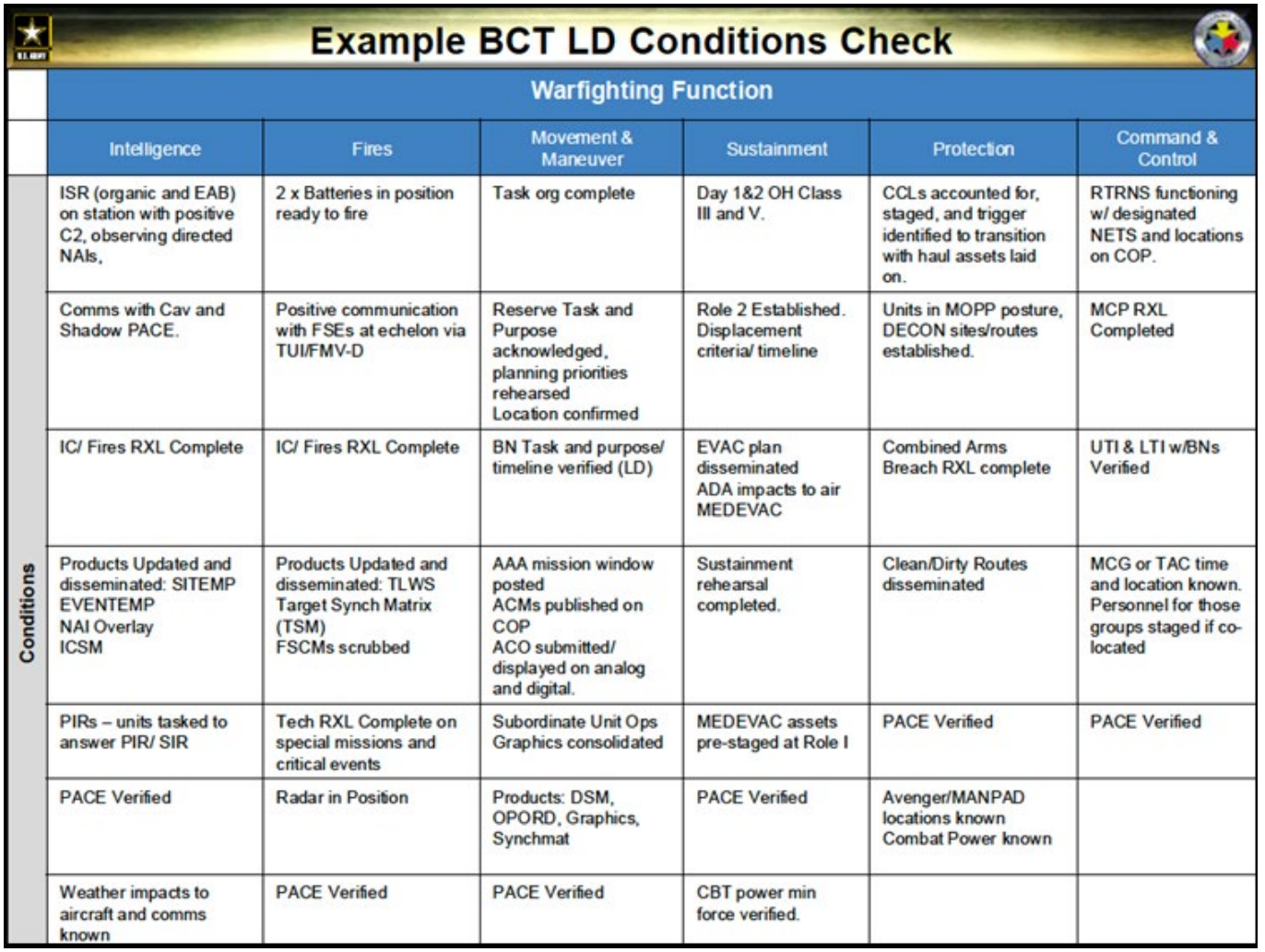
4. I will use the fighting products validated during the execution of rehearsals until conditions change to the extent we transition to the next phase or we conduct the rapid decision making and synchronization process. The XO ensures the staff maintains updated running estimates and continues to plan for the transition to the next phase while the S3 ensures timings, triggers, and synchronization of the current fight.

5. I will hold the Operations Sergeant Major accountable for the COP remaining current, the duties and responsibilities of the CP are being executed, and the HHC Commander and 1SG are prepared to execute the CP transition plan. The CSM will move to specified friction points to ensure transitions occur as planned. These tasks could be: ensuring mission or combat configured loads are prepared to move to their designated location according to planned triggers, forward logistics elements and medical nodes are moving or postured as planned, or inspect coordination and risk mitigation efforts between two converging elements.

Assess

The major activity where a commander must trust and use judgment. We must trust in subordinate reporting, weighing heavily when a subordinate commander reports their own assessment of the situation. The commander synthesizes the inputs and information provided by the staff and applies judgment in decision making.

Figure 5. Spartan Brigade tanks fire during the live-fire portion of the NTC rotation *(Photo by author)*



Example BCT LD Conditions Check

	Warfighting Function					
	Intelligence	Fires	Movement & Maneuver	Sustainment	Protection	Command & Control
Conditions	ISR (organic and EAB) on station with positive C2, observing directed NAIs,	2 x Batteries in position ready to fire	Task org complete	Day 1&2 OH Class III and V.	CCLs accounted for, staged, and trigger identified to transition with haul assets laid on.	RTRNS functioning w/ designated NETS and locations on COP.
	Comms with Cav and Shadow PACE.	Positive communication with FSEs at echelon via TUI/FMV-D	Reserve Task and Purpose acknowledged, planning priorities rehearsed Location confirmed	Role 2 Established. Displacement criteria/ timeline	Units in MOPP posture, DECON sites/routes established.	MCP RXL Completed
	IC/ Fires RXL Complete	IC/ Fires RXL Complete	BN Task and purpose/ timeline verified (LD)	EVAC plan disseminated ADA impacts to air MEDEVAC	Combined Arms Breach RXL complete	UTI & LTI w/BNs Verified
	Products Updated and disseminated: SITEMP EVENTEMP NAI Overlay ICSM	Products Updated and disseminated: TLWS Target Synch Matrix (TSM) FSCMs scrubbed	AAA mission window posted ACMs published on COP ACO submitted/ displayed on analog and digital.	Sustainment rehearsal completed.	Clean/Dirty Routes disseminated	MCG or TAC time and location known. Personnel for those groups staged if co-located
	PIRs – units tasked to answer PIR/ SIR	Tech RXL Complete on special missions and critical events	Subordinate Unit Ops Graphics consolidated	MEDEVAC assets pre-staged at Role I	PACE Verified	PACE Verified
	PACE Verified	Radar in Position	Products: DSM, OPORD, Graphics, Synchmat	PACE Verified	Avenger/MANPAD locations known Combat Power known	
	Weather impacts to aircraft and comms known	PACE Verified	PACE Verified	CBT power min force verified.		

Figure 6. Example LD Conditions Check *(U.S. Army Graphic)*

Sometimes a commander must trust their own instinct, leveraging the coup d'oeil or inward eye that Clausewitz talks about where commanders develop absolute clarity in battle and execute or adjust the plan accordingly. The emphasis is rightly on assessing but also how the commander's assessment then feeds back into the other commander activities as a continuous process.

1. I will incorporate reporting from higher headquarters, subordinate units, and the staff to update my own commander's running estimate.

2. I will expect commanders to report their assessments with relation to being on or off plan and on or off time to understand our operational tempo and if prioritization needs to change. I will expect commanders to solve problems through their assessments, that are often transparent to me.

3. I will expect commanders and staff to make recommendations to maintain shared understanding, seeking opportunities, and conducting risk management throughout execution.

4. I will share my assessment vertically and horizontally because our brigade is fighting as part of a division, amongst Special Operations Forces, and in support of Joint and Multinational Forces.

5. I will hold the Operations Sergeant Major accountable for maintaining combat power, readiness, and endurance across the staff and in the command posts in coordination with the Executive Officer. The CSM will provide candid feedback of the operational tempo and stress on the force to help assess where to consolidate and reorganize as a planned or unplanned transition. The CSM will also provide an assessment of how we are taking care of our casualties and regenerating combat power through the evacuation process, mortuary affairs, and replacement processes.

So What

We (brigades and commanders) understand the importance of establishing an operational tempo but are challenged to execute the current fight while simultaneously planning and preparing for the next one. We struggle to describe specific conditions required for execution across the warfighting functions to truly combine arms in time and space. We continue to experiment with command post

configuration by balancing survivability with functionality. We are getting better at visualizing our sustainment as the foundation of our operations with anticipation and not as an afterthought. We try to enable command and control by maneuvering the network across a multi-channel Primary, Alternate, Contingency, Emergency (PACE). We see the need for simple fighting products, that enable commanders to conduct commander activities and employ senior enlisted leaders to drive action. We see the need to find the enemy and make contact using a non-human first, and maneuver to employ all-domain fires. We should be happy with our intent and efforts to improve and fight better, but never satisfied.

The NTC remains focused on warfighting and developing leaders in the most stressful and realistic environment in preparation for future combat. There are no easy days in the desert and this is a leadership factory where one cannot help but be better after a rotation. Our observations are intended for professional development, to inform home station training, and most importantly to prepare leaders for the challenges of large-scale combat operations by preparing us to not only win the first fight, but dominate our adversaries through the last fight.

This article reflects the sweat, the parts hung, the caked dust, and the orders issued over the net at the high Mojave desert that builds leaders, builds readiness, and is helping to transform our Army. The embedded products are not the answer, but "a way" to help leaders drive the operations process and fight better. The NTC and Operations Group exists to Train the Force. We must Lead, Train, and Win. Now, let's go fight.

COL Ethan Diven is the 31st Commander of Operations Group at the National Training Center at Fort Irwin, CA. His previous assignments include Commander, 2nd ABCT "Spartans" of the 3rd ID at Fort Stewart, GA; Commander, 1-40 CAV (ABN) of the former 4-25 (ABN) of the 11th DIV (ABN) at JBER, AK; and Commander, B/1-34 AR of the "Devil" Brigade of 1st ID at Fort Riley, KS. His other assignments include Joint Planner and Operations Chief at the Joint Enabling Capabilities Command Norfolk Naval Station at Norfolk, VA; Assistant Chief of Staff, G-3 of the 3rd ID at Fort Stewart, GA; SQDN XO, BCT XO, and Senior Live Fire Trainer at the Joint Readiness Training Center Operations Group at Fort Johnson, LA; 1-327 IN BN XO and BCT S3 1/101 ABN DIV (AASLT) Fort Campbell, KY; Training Officer and S4 3rd BN, 75th Ranger Regiment Fort Benning, GA; Infantry Captains Career Course Instructor at Fort Benning, GA; and S1 and AS3 in 2-12 CAV, 2/1CD at Fort Cavazos, TX. His military schools include Joint Advanced Warfighting School; Command and General Staff College; Combined Arms Services Staff School; and Infantry Captains Career Course. COL Diven has a Bachelor of Arts from Texas Tech University; a Master of Strategic Studies from CGSC; a Masters of Administrative Science from Central Michigan University; and a Masters in Joint Campaign Planning and Strategy from the Joint Advanced Warfighting School.

Blocked and Bloodied:

Lessons from the Combined Arms Breach during the 2023 Ukrainian Counter-Offensive

by CPT Austin Bajc

Soldiers with the 200th Engineer Company in the 153rd Engineer Battalion conduct Wet Gap crossing training. *(Photo by SSG Jorden Newbanks)*

On the eve of the 2023 Ukrainian counter-offensive, analysts viewed the operation as at a crossroads: "The next phase of the war will hinge, in part, on the ability of Ukrainian forces to retake territory by moving from attrition to maneuver warfare and to shift the offense-defense balance in favor of the offense."[1] From June to November 2023, however, multiple Armed Forces of Ukraine (AFU) brigades failed to penetrate the Russian Surovikin line along the Orikhiv-Tokmak Axis in Zaporizhzhia Oblast, advancing approximately 20km at the cost of 518 vehicles, including 91 tanks and 24 engineering vehicles.[2] The wake of the failed 2023 Ukrainian counter-offensive left more than the loss of life and equipment. It reinforced the notion currently in vogue that maneuver warfare is dead.[3]

At the core of the current maneuver-attrition debate is the ability - or inability - of units to successfully execute the combined arms breach. This article uses the 2023 Ukrainian counter-offensive as a case study to reveal challenges for the Armored Brigade Combat Team (ABCT) in applying the US Army's five breaching tenets on the modern battlefield. The AFU's experience demonstrates the vital importance of detailed intelligence and appropriate task organization. The failed counter-offensive also highlights difficulties in applying the breaching fundamentals known as "Suppress, Obscure, Secure, Reduce, Assault (SOSRA)," synchronization, and mass within in the operational environment the AFU faced. Although the ABCT will fight within a different operational context, identifying Ukrainian challenges in applying the breaching tenets will enable its leaders to develop tactical and technical solutions to succeed in Large-Scale Combat Operations.

Russian Obstacles: The Enduring Importance of Detailed Intelligence

Following the AFU's offensives which recaptured Kharkiv and Kherson Oblasts in 2022, the Russian Armed Forces (RAF) began construction of a complex defense system in Zaporizhzhia Oblast. By April 2023, the RAF defense system consisted of three major sub-systems, spaced 10km to 20km apart to prevent another breakthrough. After more than six months of preparation, the first two defense sub-systems were nearly identical.[4] The third sub-system, however, resembled more of a constellation of disconnected fortifications. Here, the RAF prioritized resources to secure key terrain such as Tokmak, where they constructed defenses along its entire perimeter.[5]

Prior to the AFU's counter-offensive, open-source reports described the composition of the first two sub-systems as: dragons teeth laid out in three rows; 300m to 500m of open area heavily mined; irregular trenches that support both infantry and vehicle fighting positions as well as dugouts and vehicle hide sites; another 300m to 500m potentially mined open area usually containing a woodline or other concealed area to enable resupply,

"I wouldn't say it was unexpected, but we underestimated it... We conducted engineering and aerial reconnaissance, but many mines were masked or buried. In addition to those by the front line, there were mines deeper into enemy positions. We passed enemy positions and encountered more mines where we thought there were none anymore."

- Lieutenant Colonel Olesksandr Sak

observation posts, and anti-armor firing positions; and an anti-tank ditch with a three-layered dragons teeth obstacle immediately behind.[6] These estimates focused on trenches and anti-tank ditches and only mentioned minefields. Nevertheless, RAF doctrine stated that engineers should emplace anti-armor minefields "200-300 meters wide and 60-120 meters in depth with four rows per minefield."[7] In the end, positions are held by soldiers, and analysists hoped poor RAF warfighter quality and morale would assist AFU operations. Accordingly, Ukrainian Brigadier General Oleksandr Tarnavskyi task organized the newly-created 47th Mechanized Brigade as the breach force in part due to its high morale, North Atlantic Treaty Organization (NATO) training, and Western equipment.[8]

The location for the first breach area lay north of the village of Novodarivka because the minefields were less dense in this sector.[9] Although the AFU's intelligence estimate remains classified, Ukrainian leaders certainly miscalculated. Regarding the battlefield situation his unit encountered, Lieutenant Colonel Oleksandr Sak, the commander of the 47th Mechanized Brigade, stated, "Judging by the actions taken on 4 June 2023, the breach force maneuvered to the point of breach shrouded by the fog of war."

The subsequent failed breach at Novodarivka underscores the importance of detailed intelligence prior to conducting a deliberate breach against a determined enemy. Terrain analysis remains a fundamental element to maneuver planning, and information collection must holistically account for all aspects of complex obstacles. The depth of Russian obstacles required mixing several collection systems and employing multiple methods of reconnaissance to enable the breach force. Regarding mines in particular, critical information to collect includes location, composition, orientation, frontage, depth, types, fuses, and methods of employment.[11] The AFU could collect on the point of breach but did not adequately collect on the length of the breach area. Although some AFU unmanned aerial system (UAS) operators had success identifying surface-laid mines through UAS electro-optical or thermal sensors, they could not identify buried or stacked mines, mines with non-metallic casings, mines in areas with considerable metal battlefield debris, and during thermal-crossover. In response, the AFU procured commercial UAS equipped with ground penetrating radar to survey sub-surface areas with some benefit.[12]

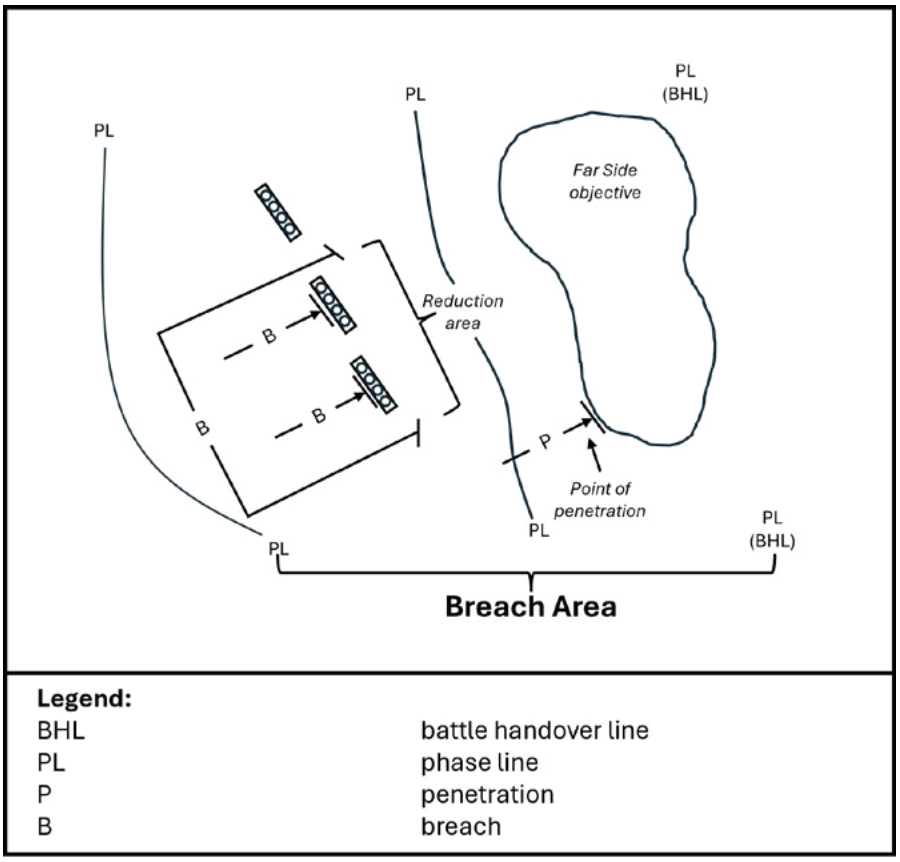


Figure 1. Breach Area from ATP 3-90.4, Combined Arms Mobility, 10 June 2022 *(U.S. Army)*

The discussion above only serves to demonstrate a current training and capability gap. The ABCT should integrate complex obstacle reconnaissance within training and experiment with commercial UAS equipped with ground penetrating radar. Commanders and their staffs at echelon should expect to request and integrate higher headquarters' assets into collection plans to enable breaching operations. The failed breach is a sobering reminder that the breaching tenet "intelligence" cannot be reduced to obstacle intelligence, however. Thorough analysis of the enemy capabilities, composition, disposition, and courses of action are critical to support combined arms breach planning. Reconnaissance by fire can validate obstacle intelligence, cause the enemy to unmask assets, and enable the maneuver commander to assess how and how hard the enemy will fight. Most importantly, no unit should cross the line of departure without a near real-time intelligence update. Technology and tactics will continue to evolve, but the problem set of gathering accurate intelligence for the entire length of the breach area will remain.

Appropriately Task Organize

To apply the breaching fundamentals, the ABCT forms three task organized units to conduct a combined arms breach, namely the support force, the breach force, and the assault force.[13] The support force isolates the

reduction area and suppresses the enemy with direct and indirect fires.[14] The breach force's main purpose is to reduce, proof, and mark lanes through the enemy obstacle.[15] Finally, the assault force destroys the enemy on the far side of the obstacle and seizes the far side objective (see Figure 2).[16] The size and composition of each unit is determined through reverse planning, meaning units first determine the assault force requirement, then the requirements for the breach and support forces, respectively.[17]

Although the 47th Mechanized Brigade's complete task organization remains classified, Novodarivka and Rivnopil were the initial objectives and Robotyne was the final objective for the brigade to seize within the first 48 hours of the counter-offensive.[18] Since the first two breach attempts failed, the planned composition of the assault force is unknown. The AFU committed a company-sized breach force consisted of two mine clearing vehicles, a section of Leopard 2A6 tanks, a platoon of M2A2 Bradley Fighting Vehicles, and four Mine-Resistant Ambush Protected vehicles (MRAPs) to create a single lane.[19] Being wheeled vehicles, the MRAPs struggled to follow the tracked mine clearing vehicles and tanks and "several of the MRAPs bogged in, while the cleared lane was insufficiently wide for other vehicles to pass."[20] When the MRAPs began to become mired in the breach, two RAF tanks engaged the breach force at 800m. Surprisingly, there was no support force, and the AFU instead relied upon indirect fires to suppress the RAF defenders. Thus, each vehicle was destroyed before AFU dismounts destroyed the RAF tank section.[21]

With one company team immobilized in the breach, the AFU committed a second company team of similar composition to breach west of the first attempted breach area. Although the ground was firmer, an additional RAF tank section maneuvered on the breach force. The brigade command post watched the engagement via UAS feeds and employed indirect fires to disrupt the RAF tanks. Attempting to increase tempo, however, the AFU breach force did not proof or stay within the lane, causing every vehicle to become immobilized.[22]

Breach Organization	*Responsiblities*
Support Force	Suppress enemy forces capable of placing direct fire on the reduction area. Prevent the enemy from repositioning or counterattacking to place direct fires on breach force. Control indirect fires and obscuration within your breach area.
Breach Force	Reduce, proof, and mark the necessary number of lanes thorough the obstacle. Report the status and location of created lanes. Provide local security on the near side and far side of the obstacle. Provide additional suppression of enemy overwatching the obstacle Assumes control of obscuration upon commitment to breach. Assist the passage of the assault force through created lanes.
Assault Force	Seize the far side objective. Reduce the enemy protective obstacles. Provide clear lanes from the reduction area to the battle handover line for follow-on forces Prevent the enemy from placing direct fires on follow-on forces as they pass through the created lanes. Conduct battle handover with follow-on forces. Provide reinforcing fires for the support force. Destroy the enemy on the obstacle far side that is capable of placing direct fires on the reduction area.

Figure 2. Support, Breach, and Assault Force Responsibilities from ATP 3-90.4, Combined Arms Mobility, 10 June 2022 *(U.S. Army)*

As seen above, the AFU did not properly assess the enemy or terrain. This led AFU leaders to form company teams with vehicles with different mobility restrictions, in turn causing these units to lose tempo in the breach. Mine clearing vehicles deployed mine clearing line charges (MICLICs), but the density and depth of the minefield was greater than AFU intelligence estimates. Thus, the breach force was not properly weighted. The failed breach attempts also highlight the requirement for the support force to effectively isolate the entire breach area with direct fires. The first 24 hours of the counter-offensive tragically demonstrates the importance of appropriate breaching organization.

Challenges to Integrate SOSRA

Leaders integrate the breaching fundamentals within the planning and execution of breaching operations. Frequently referred to by the mnemonic "SOSRA," the breaching fundamentals consist of suppress, obscure, secure, reduce, and assault. The Ukrainian seizure of the Rivnopil shows the successful application of the breaching fundamentals to an operation. Nevertheless, the operational environment, to include RAF adaptation and Western equipment shortfalls, challenges the ability of US forces to successfully integrate SOSRA into breaching operations.

After nearly a week of fighting, the 47th Mechanized Brigade secured Novodarivka. AFU leaders determined that seizing Rivnopil, located due east of Novodarivka, would be necessary to secure IX Corps flank before continuing to advance south.[23] The previous breaching attempts around Novodarivka had led to two companies' worth of vehicles, to include 60% of Ukraine's mine clearing equipment, becoming non-mission capable.[24] Thus, the 31st Mechanized Brigade leaders decided on a different approach.[25]

As the support force maneuvered to the breach area, an AFU artillery battery provided suppression. An AFU tank section established an attack by fire position and began to engage RAF fighting positions. The defending RAF company was therefore suppressed both by indirect and direct fires. The 31st Mechanized Brigade then employed smoke to obscure two AFU

Figure 3. B 1-37 AR conducts training with tank mounted mine clearing equipment in Grafenwoehr Training Area, February 2024 *(Photo by CPT Samuel Parker)*

infantry platoons maneuvering in squad-size elements along a treeline to the east of the objective. Believing this to be the breaching force, the RAF oriented on the infantry. Meanwhile, a third infantry platoon executed a covert breach west of the objective, reducing obstacles and creating multiple dismounted lanes. By causing the RAF company to orient away from the breach area and increasing their artillery rate of fire, the AFU support force successfully secured the breach area. After completing the breach, the AFU infantry platoon transitioned from being the breach force to the assault force to maintain the initiative.[26] The RAF company rapidly retrograded from their defenses, and the 31st Mechanized Brigade passed forward the 36th Marine Brigade which seized Rivnopil.[27]

By the end of June, the RAF began to adapt their tactics. First, the RAF departed from their doctrine concerning minefield depth, increasing the standard depth from 120m to 500m. The RAF also deliberately constructed obstacles to destroy mine clearing equipment to include stacking multiple antitank mines to increase net explosive weight and placing containers of napalm approximately every 18m across and 40m deep.[28] A translated RAF after action report dryly noted that after encountering incendiary land mines, "the [AFU] offensive resumed only after 3-4 days, while its intensity, composition of forces and funds decreased."[29] Additionally, the RAF increased the use of loitering munitions such as the Zala Lancet to target armored vehicles as well as increased the density of UAS to provide redundant sensing.[30] Attack aviation was also relocated closer to the forward line of troops and placed on a 30 minute alert status.[31] Finally, RAF electronic warfare (EW) assets proliferated to both limit AFU communications and protect RAF from AFU UAS.[32]

Due to many factors to include multiple failed breaches, RAF adaptation, lack of air superiority and UAS proliferation, and finite manpower, ammunition, and equipment, AFU leaders shifted from company teams conducting mechanized combined arms breaches to dismounted sapper teams reducing obstacles.[33] Senior Ukrainian leaders such as General Valerii Zaluzhnyi believed the solution to restore maneuver lay in technology.[34] Technological solutions, however, result in counter-measures. As military analyst Stephen D. Biddle asserts, "Force employment had played a more important role than either technology or preponderance for twentieth century warfare."[35] Therefore, although military hardware matters, doctrine will have a greater role in enabling success on the battlefield.

ATP 3-90.4 Combined Arms Mobility states "the purpose of suppression during breaching is to protect forces that are reducing obstacles and maneuvering through the reduction area."[36] The RAF defense of Novodarivka demonstrates the need for direct fire suppression throughout the depth of the breach area and the value of counter-battery fire. Perhaps due to the examples listed in doctrine, leaders tend to focus on direct and indirect fires, neglecting the role of non-kinetic fires to disrupt enemy command and control. Non-kinetic fires can also facilitate the suppression of enemy air defenses, which enables friendly air support during the breach if air superiority is not achieved. Thus, commanders and staffs must leverage capabilities in multiple domains to achieve suppression.

More significantly, however, US Army breaching doctrine overlooks the role of shaping actions prior to suppression. Between the decision to breach and the execution of the breach, maneuverists must identify enemy critical vulnerabilities and exploit them. Prior to initiating their attack on Rivnopil, the AFU targeted RAF lines of communications. Not only was RAF physical combat power eroded, but so too was their morale. The RAF company immediately retreated when the AFU assault force appeared on their western flank.[37] As enemy defenses gain depth and complexity, the importance of shaping operations also increases.

Obscuration is used to prevent enemy observation and targeting.[38] During the counter-offensive, however, only 3% of AFU fires missions included smoke. Smoke missions prevented AFU higher headquarters from battle-tracking and coordinating their units via UAS. Therefore, as some observers have noted, "Commanders persistently prioritize maintaining their own understanding of the battlefield over laying down smoke and concealing their personnel's movements."[39] Mission command and proficient staffs enable decentralized command and control. The larger challenge for the ABCT is to generate sufficient smoke for enough time. In addition to cannon and mortar fired smoke rounds, units must train to

Figure 4. U.S. Army Reserve Soldiers from the 449th Mobility Augmentation Company, 478th Engineer Battalion, 926th Engineer Brigade, 412th Theater Engineer Command, based in Fort Thomas, Ky., fire an inert Mine Clearing Line Charge during a GATE III validation exercise on Fort Knox, KY., FEB 12, 2018. *(U.S. Army Reserve Photo by SFC Clinton Wood).*

deploy vehicle launched smoke grenades and smoke pots. Units may also consider converting their M1 Abrams tanks to diesel fuel to safely employ the smoke generator. Significantly, the AFU demonstrated that obscuration relates not only to the physical dimension but also the mental. At Rivnopil, the AFU cleverly used smoke to deceive the RAF and conduct a covert breach. Thus, both smoke fire missions and deception play an equally important role in preventing the enemy from divining the location of the breach force.

The proliferation of loitering munitions challenges the ability for the breach force to secure the point of breach and maintain local security on the near and far side of the breach. Suppression may limit enemy UAS operators and obscuration will degrade UAS first person viewer capability. Depending upon the frequency spectrum being jammed, counter-unmanned aerial system (C-UAS) systems may impact both friendly UAS and communications systems. Therefore, the intelligence estimate of enemy loitering munition employment is critical to enable the commander to make risk-informed decisions.

Reduction remains a challenge both for the AFU and the ABCT. Even before the RAF started to construct obstacles targeting the capabilities of mine clearing equipment, both AFU breaching forces had vehicles that were immobilized by mines in the breach at Novodarivka. As the counter-offensive progressed, RAF companies began emplacing hundreds to thousands of anti-tank mines and "stacking three TM-62M mines on top of each other specifically to destroy … the mine-rollers and trawls used by breaching vehicles and tanks."[40] Regardless of RAF counter-measures, an ABCT would be heavily challenged to reduce and proof lanes given the operational environment faced by the AFU during the counter-offensive.

The restructured US Army Engineer Battalion comprised of three Combat Engineer Company - Armored (CEC-A) brings a total of six Assault Breacher Vehicles (ABVs), each capable of firing two M58 MICLICs and equipped with either a surface mine plow or blade, as well as six trailer-pulled M58 MICLICs. Each MICLIC creates a lane 100m in length. However, if multiple MICLICs are required due to the minefield depth, an ABV moves 25m into the path created by the first MICLIC and fires its charge. This extends the lane approximately 85m, not 100m. Therefore, one lane through a 500m obstacle requires six MICLICs. Additionally, MICLICs have limited effects against multiple types of mines to include prong AP mines, magnetic mines, top-attack mines, and delay-time fuzes.[41] According to a US Marine Corps study on breaching during Operation Desert Storm, MICLICs had a 60% detonation

rate and left approximately 25% of the mines intact, making the proofing of lanes necessary.

M1 Abrams tank-mounted mine clearing blades (MCB) and mine clearing rollers (MCR) have their own limitations. The MCB is capable to both breach and proof lanes. It has three depth settings of 8in, 10in, and 12in, but requires 18in of soil depth to be effective; it does not perform well in rocky terrain. When the MCB is lowered, the tank should move no faster than 10 mph, and the main gun should be traversed to the side to avoid damage should a mine detonate.[42] Also, the lifting straps are nylon, so wire obstacles or explosions can easily sever the straps; manually lifting the plow takes approximately 10 minutes. If the mold board extensions are damaged or missing, mines may fall into the path of the tank's tracks.[43] The MCB is a vital piece of equipment which must be mounted and trained constantly for leaders to understand their capabilities and limitations.

The MCR is used to detect the beginning of a minefield and to proof the lane. Weighing 10 tons, the MCR requires an M88 recovery vehicle for installation onto a tank. Once installed, the tank's mobility and speed is greatly reduced, and the tank has an increased likelihood of becoming mired in muddy or soft terrain. After detonating four to six mines, the MCR is no longer serviceable. One study found that both of 1st Marine Division's attempts to proof lanes with the MCR were unsuccessful during Operation Desert Storm.[44] Just like the MCB, operators must train with the MCR to develop proficiency.

Equipment limitations pose a significant problem for the ABCT to reduce the density and depth of obstacles as seen in Zaporizhzhia Oblast. Once the AFU successfully breached, the RAF deployed "mines with artillery, ISDM Zemledeliye mine-laying systems, and even drones, such as the POM-3 and PFM-1 antipersonnel mines….[which] are used to refill lanes cleared by Ukrainian sappers and to mine roads behind Ukraine's front lines."[45] An RAF obstacle platoon consisting of three GMZ-3 mining vehicles can lay a 1,200 meter three-row minefield of 624 mines in 26 minutes.[46] Thus, units may need to reduce and proof lanes multiple times. The key issues with tank-mounted mine clearing equipment are that it restricts mobility and firepower, has limited endurance, and lacks mass. Although the US Marine Corps faced the same constraints with mobility, firepower, and endurance in Operation Desert Storm, a number of M1 Abrams tanks towed a Mk 58 trailer containing a single MICLIC.[47] Similarly, the Ukrainian experience demonstrates the need to build additional mass and capability with explosive and mechanical mine reduction equipment to enable combined arms breaching.

According to one think tank, after the initial failed breach attempts, the AFU transitioned to small-unit dismounted assaults "to maintain a high tempo of ground attacks and attrite Russian forces in the process to achieve an operational breakthrough."[48] Still, the AFU failed to generate sufficient tempo to penetrate RAF defenses. Even during the AFU's successful breach at Rivnopil, however, the RAF retrograded to subsequent positions, and AFU advances remained 700m to 1200m each week. The AFU were unable to successfully breakthrough in part because the assault force did not transition to execute a follow-on breach quickly enough to keep the RAF off-balance. Thus, to maintain initiative and tempo when penetrating multiple obstacle belts, sustained breaching may require a unit to rapidly transition from the assault force to the support force.

The Ukrainian experience shows that SOSRA remains an essential framework to plan and execute the combined arms breach. Indeed, AFU failures can be traced back to violating a breaching fundamental. The evolving operational environment, however, creates multiple challenges for the ABCT to apply SOSRA to breaching operations. Although finding solutions to current tactical or technical shortfalls is valuable, it is more important for leaders to apply a maneuverist mindset to combined arms breaching by exploiting enemy vulnerabilities and placing them in a combined arms dilemma.

Synchronization: The Key to Combined Arms

ATP 3-90.4 Combined Arms Mobility describes the importance of synchronization as a breaching tenet within the context of the support, breach, and assault forces. Synchronization, which is achieved through detailed reverse planning, clear sub-unit instructions, effective command and control, and combined arms rehearsals, ensures actions occur at the appropriate time.[49] Synchronization should not be reduced to the timing of suppression and obscuration, however; it must also relate to the effects of these actions on the enemy. As discussed above, the two breaches near Novodarivka at the beginning of the counter-offensive failed largely due to the lack of a direct fire support force and no obscuration. Still, despite synchronizing breach force direct fires with indirect fires, the 47th Mechanized Brigade was unable to prevent the RAF from destroying the breach force.

Therefore, rather than narrowly applying synchronization to direct and indirect fires, leaders must consider the synchronization of all friendly warfighting functions (WfFs), consisting of command and control, movement and maneuver, fires, intelligence, sustainment, and protection, as well as the desynchronizing of enemy WfFs.[50] Intelligence is its own breaching tenet, but degrading the enemy's intelligence capability serves an equally important role. As another example, sustainment has a critical role in ensuring resources are available to the support, breach, and assault forces during all phases of the operation. Additionally, vehicle recovery plans are critical to prevent breach lanes from being blocked by immobilized vehicles. Shaping operations near Rivnopil which targeted RAF sustainment had both physical and moral effects on the defending company, and enabled 31st Mechanized Brigade's assault. Thus, commanders and staffs

must look beyond synchronizing friendly action and aggressively tear apart the enemy's system.

The Problem of Mass

From July through November 2023, the primary method to reduce obstacles was with dismounted sappers operating as small teams during twilight. Since the AFU used armored vehicles mainly in defensive roles to retain terrain, the RAF began to employ loitering munitions on a larger scale. "At first, our problem was mines. Now, it's FPV [first person viewer] drones," said a 47th Mechanized Brigade platoon leader.[51] Although the AFU had ceased conducting mechanized combined arms breaches, the operational environment presented an enduring challenge of how to mass breaching assets while being constantly sensed and targeted.

The core issue for the ABCT is having the minimum force of explosive and mechanical breaching assets required to reduce obstacles in depth while being targeted. The limitations of MICLICs, MCBs, and MCRs necessitates them being used together. Currently, the ABCT has a limited number of this mine-clearing equipment which supports a limited number of lanes and can easily be targeted by UAS. Although there are intriguing technologies to enable force protection, such as vehicle-mounted UAS jammers and anti-thermal paint, it is more important for units to control their physical and electromagnetic signature. As the AFU experience at Novodarivka showed, the breach force must mass sufficient mine-clearing assets for the length of the reduction area or it will be destroyed in the breach.

Conclusion

The 2023 Ukrainian counter-offensive demonstrates that a critical capability to enable maneuver remains the combined arms breach. The ABCT will fight within a different operational context. Nevertheless, the AFU's experience suggests that to successfully breach in large scale combat operations (LSCO), the ABCT must 1) build capability and competency to conduct detailed reconnaissance for the entire depth of the breach area; 2) appropriately weight the support, breach, and assault forces; 3) emphasize shaping operations to enable the breaching fundamentals as well as increase the capacity to reduce obstacles in depth; 4) seek ways to synchronize all friendly warfighting functions and desynchronize the enemy's; and 5) increase both mechanical and explosive breaching assets to prevent a mismatch between obstacle depth and equipment.

Two hundred years ago, Carl von Clausewitz asserted that although the defense is the stronger form of war, the offense is the most decisive.[52] The "maneuver warfare is dead" debate distorts this assertion and overlooks the role of the combined arms breach, which remains as important as it is difficult. Today, the ABCT must monitor trends in current conflicts, think critically about how it will execute breaching operations, and strenuously train with the tools it currently has to successfully maneuver.

Captain Austin Bajc currently commands Headquarters and Headquarters Company, 1st Battalion, 37th Armor Regiment, 2nd Armored Brigade Combat Team, 1st Armored Division, at Fort Bliss, Texas, previously serving as Tank Company Commander for A Company, 1st Battalion, 37th Armor Regiment, also at Fort Bliss. Prior to these command positions, Captain Bajc served as the Heavy Weapons Troop Executive Officer for Q Troop, 4th Cavalry Regiment in Rose Barracks, Germany, and as a Scout Platoon Leader for O Troop, 4th Cavalry Regiment, also stationed in Rose Barracks, Germany. He is a graduate of the USMC Expeditionary Warfare School, the Cavalry Leader's Course, Army Reconnaissance Course, and Armor Basic Officer Leaders Course, all at Fort Benning, Georgia, and holds a Bachelor of Arts degree in History from Virginia Military Institute.

Notes

[1]Seth G. Jones, Alexander Palmer, and Joseph S. Bermudez Jr., "Ukraine's Offensive Operations: Shifting the Offense-Defense Balance," Center for Strategic and International Studies, 9 June 2023, 13.

[2]David Axe, "On One Key Eastern Battlefield, The Russians Are Losing 14 Vehicles For Every One The Ukrainians Lose," Forbes, 14 November 2023, https://www.forbes.com/sites/davidaxe/2023/11/14/on-one-key-eastern-battlefield-the-russians-are-losing-14-vehicles-for-every-one-the-ukrainians-lose/?sh=2c3351115838

[3]Randy Noorman, "The Return of the Tactical Crisis," Modern War Institute, 27 March 2024, https://mwi.westpoint.edu/the-return-of-the-tactical-crisis/

[4]Seth G. Jones, Alexander Palmer, and Joseph S. Bermudez Jr., "Ukraine's Offensive Operations: Shifting the Offense-Defense Balance," 4.

[5]Daniele Palumbo and Erwan Rivault, "Ukraine war: Satellite images reveal Russian defences before major assault," BBC News, 21 May 2023, https://www.bbc.com/news/world-europe-65615184

[6]Seth G. Jones, Alexander Palmer, and Joseph S. Bermudez Jr., "Ukraine's Offensive Operations: Shifting the Offense-Defense Balance," 8; Gerry Doyle, Vijdan Mohammad Kawoosa and Adolfo Arranz, "Digging in: How Russia has heavily fortified swathes of Ukraine," Reuters, 27 April 2023, https://www.reuters.com/graphics/UKRAINECRISIS/COUNTEROFFENSIVE/mopakddwbpa/

[7]Lester Grau and Charles Bartles, The Russian War of War: Force Structure, Tactics, and Modernization of the Russian Ground Forces, (Fort Leavenworth, KS: Foreign Military Studies Office, 2016), 305.

[8]"In Ukraine, a war of incremental gains as counteroffensive stalls," The Washington Post, 4 December 2023, https://www.washingtonpost.com/world/2023/12/04/ukraine-counteroffensive-stalled-russia-war-defenses/

[9]Dr Jack Watling and Nick Reynolds, 8.

[10]"In Ukraine, a war of incremental gains

as counteroffensive stalls," The Washington Post.

[11]ATP 3-90.4, Combined Arms Mobility, 3-7.

[12]Mingus Pozar, Tony Huggar, and Matteo Muehlhauser, "Russian Large Scale Combat Operations (LSCO) in Ukraine," Emergent Threat, Training, and Readiness Capability, 24 August 2023, 5-8.

[13]ATP 3-90.4, Combined Arms Mobility, 3-10.

[14]ATP 3-90.1, Armored and Mechanized Infantry Team, (Washington, DC: Government Printing Office, October 2023), C-7.

15Ibid.

[16]Ibid.

[17]ATP 3-90.4, Combined Arms Mobility, 3-18.

[18]Dr Jack Watling and Nick Reynolds, 5; "In Ukraine, a war of incremental gains as counteroffensive stalls," The Washington Post.

[19]Dr Jack Watling and Nick Reynolds, 9.

[20] Ibid.

[21] Ibid.

[22] Ibid.

[23]Ibid, 12.

[24] "In Ukraine, a war of incremental gains as counteroffensive stalls," The Washington Post.

[25] "Frontline report: Ukraine takes tactical heights in Rivnopil with minimal engagement," Euromaiden Press, 27 June 2023, https://euromaidanpress.com/2023/06/27/frontline-report-ukraine-takes-tactical-heights-in-rivnopil-with-minimal-engagement/

[26] Dr Jack Watling and Nick Reynolds, 13.

[27] "Frontline report: Ukraine takes tactical heights in Rivnopil with minimal engagement," Euromaiden Press.

[28] Recommendations For Combat Against The Enemy Operating In Tank And Mechanized Columns, (Rostov-on-Don, 2023), 48.

[29] Ibid, 48.

[30] Recommendations For Combat Against The Enemy Operating In Tank And Mechanized Columns, 35; Dr Jack Watling and Nick Reynolds, 19.

[31] Recommendations For Combat Against The Enemy Operating In Tank And Mechanized Columns, 27.

[32]Recommendations For Combat Against The Enemy Operating In Tank And Mechanized Columns, 14; Dr Jack Watling and Nick Reynolds, 18.

[33] "In Ukraine, a war of incremental gains as counteroffensive stalls," The Washington Post.

[34]David Ignatius, "Ukraine's counteroffensive ran into a new reality of war," The Washington Post, 7 December 2023, https://www.washingtonpost.com/opinions/2023/12/07/ukraine-counteroffensive-russia-war-drones-stalemate/

[35]Stephen Biddle, Military Power: Explaining Victory and Defeat in Modern Battle, (Princeton, NJ: Princeton University Press, 2004), 5.

[36]ATP 3-90.4, Combined Arms Mobility, 3-8.

[37]Dr Jack Watling and Nick Reynolds, 13.

[38]ATP 3-90.4, Combined Arms Mobility, 3-8.

[39]Dr Jack Watling and Nick Reynolds, 22.

[40]Michael Kofman and Rob Lee, "Perseverance And Adaptation: Ukraine's Counteroffensive At Three Months," War on the Rocks, 4 September 2023, https://Warontherocks.Com/2023/09/Perseverance-And-Adaptation-Ukraines-Counteroffensive-At-Three-Months/

[41]ATP 3-90.4, Combined Arms Mobility, B-6 to B-9.

[42]Thomas Houlahan, "Mine Field Breaching in Desert Storm," Journal of Mine Action: Vol. 5 Iss. 3 (2001), 27-29.

[43]ATP 3-90.4, Combined Arms Mobility, B-17 to B-19.

[44]ATP 3-90.1, Armor and Mechanized Infantry Company Team, C-21.

[45]Thomas Houlahan, 28.

[46]Michael Kofman and Rob Lee.

[47]Lester Grau and Charles Bartles, 305.

[48]Thomas Houlahan, 29.

[49]Konrad Muzyka, Konrad Skorupa, and Ireneusz Kulesza, "Rochan's report: Ukraine counteroffensive Initial assessment (June-August 2023)," Rochan Consulting, September 2023, 56.

[50]ATP 3-90.4, Combined Arms Mobility, 3-11.

[51]FM 3-0, Operations, (Washington, DC: Government Printing Office, 1 October 2022), 2-1.

[52]Carl von Clausewitz, On War, trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 358.

How To: A New Platoon Leader's Guide to Maintenance

U.S Army SPC Keontae Shack, SSG James Ferrone, and SPC Blake Oakely inspect a Bradley for faults during the 2024 Sullivan Cup at Fort Benning, GA. *(Photo by SGT Duke Edwards)*

by 1LT Christian Arnette

Imagine you're a second lieutenant (2LT) in an armored brigade combat team (ABCT) and you've just been placed in charge of your first platoon. You're now responsible for not only a few dozen Soldiers, but also a platoon's vehicles and ancillary equipment. How does a leader ensure these vehicles and supporting equipment function as designed? The broad answer is an effective maintenance program. At a minimum, maintenance must be managed at the platoon level. All platoon leaders should prioritize maintenance, as platoons train most effectively when their equipment is fully operational. Platoon leaders should become experts on their equipment status report (ESR), maintain effective platoon maintenance standard operating procedures (SOPs), and know how to conduct maintenance in all environments.

When I reported as a new mechanized infantry platoon leader in the 1st Battalion, 8th Cavalry Regiment (1-8 CAV), I encountered challenges related to maintenance operations and equipment readiness. After two years with 1-8 CAV, including my current role as the battalion maintenance officer (BMO), I have learned more about maintenance than I ever thought possible. Much of the knowledge I now possess would have helped me immensely as a platoon leader, for I would've been more effective at building combat power and maintaining readiness.

I once thought maintenance was an impossible task for a platoon leader to master, but it is now clear that the opposite is true. While it may seem overwhelming at first, all it takes is a bit of self-study and dedication. A platoon leader who cares about maintenance is demonstrating care for their Soldiers and for the success and lethality of their platoon.

A common misconception is that maintenance pertains only to Armor or Stryker formations, but it matters to all platoon leaders. Every platoon owns some form of equipment, which must function properly for the platoon to operate effectively. Properly functioning equipment keeps soldiers alive and helps them accomplish their mission. Another common misconception is that the company executive officer (XO) handles the entire company's maintenance in conjunction with the company's field maintenance team

"I once thought maintenance was an impossible task for a platoon leader to master, but it is now clear that the opposite is true. While it may seem overwhelming at first, all it takes is a bit of self-study and dedication. A platoon leader who cares about maintenance is demonstrating care for their Soldiers and for the success and lethality of their platoon."

- 1LT Christian Arnette

EQUIPMENT STATUS REPORT

11/21/2018 23:21:32

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Request induction into CV WG2D9G

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Yoke Broken WG2DF0 011292159 YOKE, UNIVERSAL JOINT, VEHI 1 7108888510 2

WG2DG0 **TANK CO, MANEUVER BN (HEAVY BCT)**

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CB4 Trips WG2DG0 015468794 WIRING HARNESS 1 B14 4514365094 BB 2 08/16/2018

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SUBSYSTEM IS DESIGNATED BY "***" PAGE 1 of 6

Figure 1. An example ESR page recreated from the GCSS-Army's End User Manual+ (EUM+). Of note, this ESR contains no live data and uses generic unit representations. *(U.S. Army Graphic)*

(FMT). This could not be further from the truth. While the company XO may be the steward of the company's maintenance program, platoon leaders play a critical role. A platoon leader is responsible for the success or failure of the platoon, and that includes maintenance. A platoon cannot train or fight effectively if its equipment isn't working properly. There is no point in planning training if the entire event is spent recovering and repairing equipment. A unit's operational readiness must peak at the line of departure.[1]

How to Read an ESR

The first thing a platoon leader must understand is their ESR. The ESR, accessible through the Global Combat Support System – Army (GCSS-Army), provides detailed insights into equipment and unit readiness. While the company commander and XO typically have access, a platoon leader can obtain viewing access by coordinating with their battalion's maintenance team and following the necessary procedures.[2]

The first time looking at an ESR can be daunting—it may feel like a foreign language that platoon leaders are expected to understand immediately. However, once the headings on the ESR are understood and their corresponding information is recognized, reading it becomes much easier. The purpose of the ESR is to provide a clear picture of the status of a unit's equipment. If there is an issue with a piece of equipment, it must be reflected on the ESR. Additionally, a fault must be listed on the ESR to order a part for it. The ESR serves as an essential system of record, enabling a platoon leader to hold themselves and their battalion's maintenance enterprise accountable.

Each ESR page features four headlining rows at the top, distinguished by progressively smaller font sizes in descending order, as seen in Figure 1.

Of all the details on an ESR, there are a few that matter to platoon leaders the most. Their definitions, and how they can improve a maintenance program, are described in Figures 2 through Figure 5. The first four pieces of information are found in the second headlining row.

Platoon Maintenance SOPs and Best Practices

With the maintenance knowledge I've gained as a BMO, I often reflect on how I could have run a more effective platoon maintenance program. One of the key improvements I would have made is establishing structured maintenance

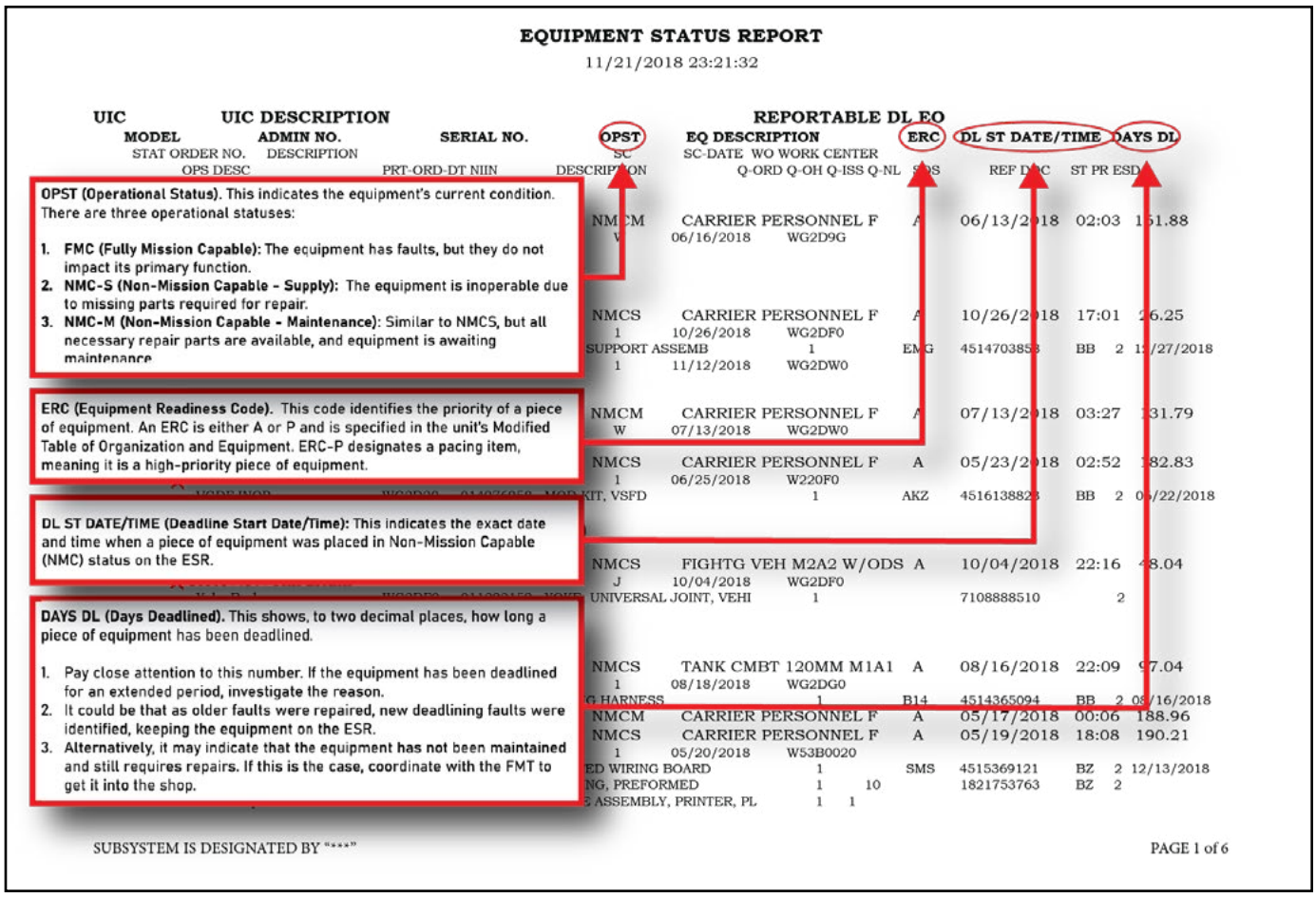


Figure 2. This example ESR shows the key information from the 2nd headlining row. *(U.S. Army Graphic)*

SOPs, including weekly maintenance battle rhythm events, such as command maintenance days and platoon maintenance meetings.

Most platoons already participate in command maintenance days, often referred to as "Motor Pool Monday", but these events could be more efficient and impactful. As a mechanized infantry platoon leader, I frequently had my mounted sections conducting preventative maintenance checks and services (PMCS) on our M2A3 Bradley Fighting Vehicles (BFVs), while my dismounts often had little to do. I now understand the critical importance of conducting weekly ancillary equipment maintenance by properly allocating priorities and manpower.

At a minimum, companies should prioritize ancillary equipment maintenance on a rotational basis. This can be achieved by platoon leaders working with the Company XO to create a four-week maintenance schedule, dedicating each week to a specific category of ancillary equipment:[4]

- Communications Equipment (e.g., radios and Joint Battle Command-Platforms [JBC-Ps])
- Weapons Systems
- Night Vision Devices (NVDs)
- All Other Platoon Equipment

During periods of increased manning, this schedule can be condensed, allowing more equipment to undergo PMCS each week. By proactively maintaining ancillary equipment, potential issues can be identified and resolved before field operations. Conducting after-operations PMCS for the first time post-field exercise is too late—preventative maintenance must be consistent and systematic to ensure operational readiness.

Communications equipment should be tested weekly through communications exercises (COMMEX) using radios and JBC-Ps. Even if higher headquarters does not mandate a weekly COMMEX, platoons should conduct them internally. The company communications representative can fill these systems, enabling platoons to conduct internal checks. Many units, including the 1st Cavalry Division, may already require a weekly COMMEX, making it essential to meet the commander's intent.

Platoon maintenance meetings should be a weekly battle rhythm event. In 1-8 CAV, maintenance meetings are held at both the battalion and company levels, but they rely on information reported up from the platoons. Conducting platoon-level maintenance meetings fosters a shared understanding among the leadership and ensures platoon leaders are well-prepared to provide accurate briefings.

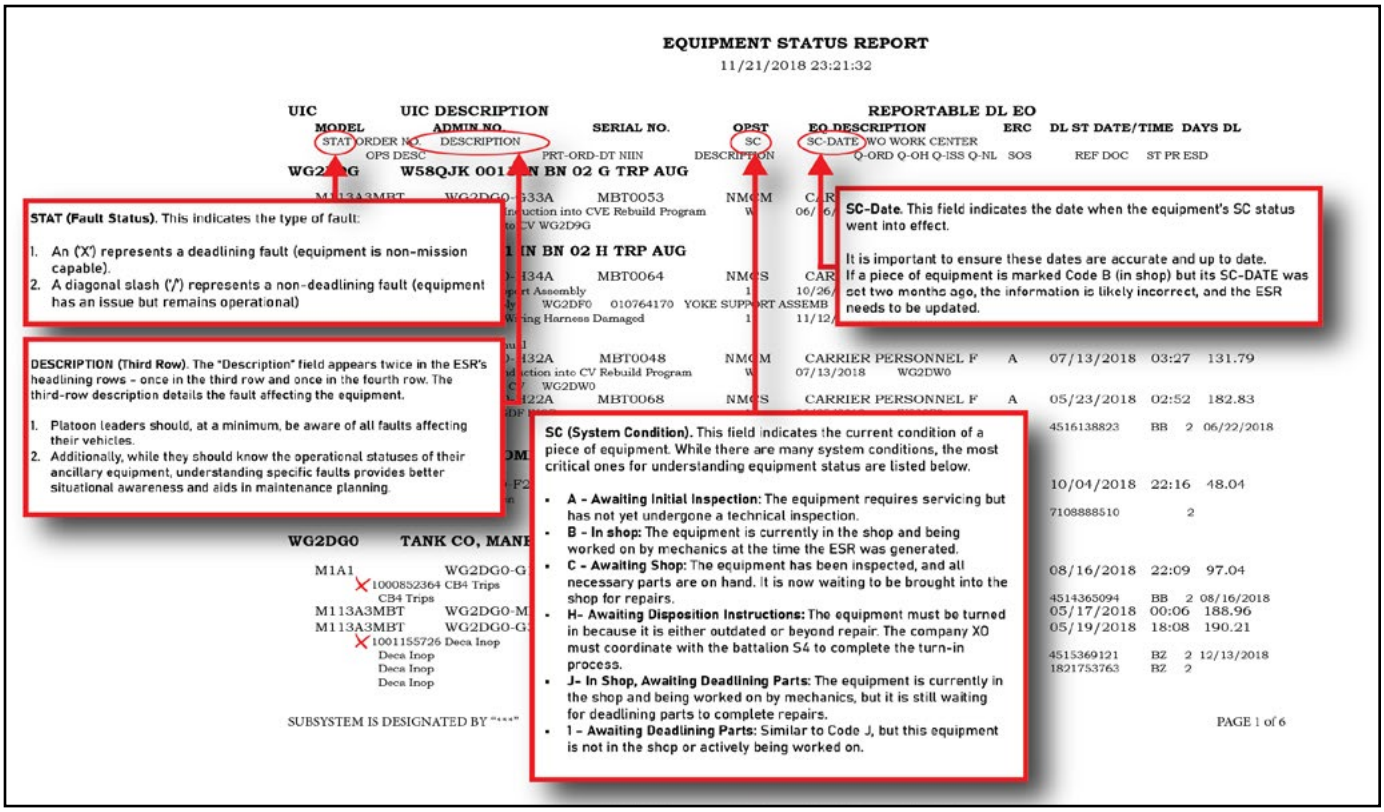


Figure 3. This example ESR shows the key information from the 3rd headlining row. *(U.S. Army Graphic)*

Platoon maintenance meetings should cover several key agenda items, with a primary focus on reviewing the ESR line by line. The platoon leader should facilitate the discussion, while section and squad leaders brief the faults for their assigned equipment. It is essential that platoon, section, and squad leaders understand the statuses of their equipment. Additionally, the radio-telephone operator (RTO) and armorer should assist in briefing the status of communications equipment and weapons. Ideally, all soldiers would be proficient in reading the ESR, but at a minimum, the platoon's leadership, RTO, and armorer must be well-versed in it. When time allows, platoons should review the "wide open" ESR, which includes both deadline and non-deadline faults. Overemphasis on the NMC ESR often leads to neglecting slash faults, which can escalate into more severe equipment issues. The "wide open" ESR also provides visibility on open work orders, such as pending welding jobs, allowing soldiers to track ongoing repairs for their equipment.

Services

Vehicle and equipment services should be another key agenda item in platoon maintenance meetings. Platoon leadership must understand the service schedule for each piece of equipment to prevent overdue services, as overdue equipment cannot be used until serviced.

Service plans consist of three key dates:

- Early Date – The earliest allowable completion date.
- Planned Date – The scheduled service date in GCSS-Army.
- Late Date – The latest allowable completion date before the equipment becomes delinquent.

The early and late dates represent a 10% variance window before and after the planned date in which the service must be completed. Completing a service before the early date can disrupt future service schedules by shifting them forward. Missing the late date results in delinquency without shifting the future service windows. Platoon leadership must also understand the steps involved in a service to track progress effectively. Battalion and company commanders may inquire about equipment status, and platoon leaders should be prepared to provide accurate updates.

Dispatches

Before a vehicle leaves the motor pool, it must be properly dispatched. Tracking open and overdue dispatches in platoon maintenance meetings ensures compliance and prevents unauthorized vehicle use. Dispatches serve as a commander's tool to verify vehicles are FMC and maintain accountability for equipment assigned to different missions. Platoon leaders must ensure their crews process dispatches through the FMT clerk before vehicle use and properly close them upon mission completion. If a mission extends beyond the original dispatch window, the current dispatch must be closed, and a new dispatch packet must be completed in accordance with the unit's dispatch SOP. To maintain accurate

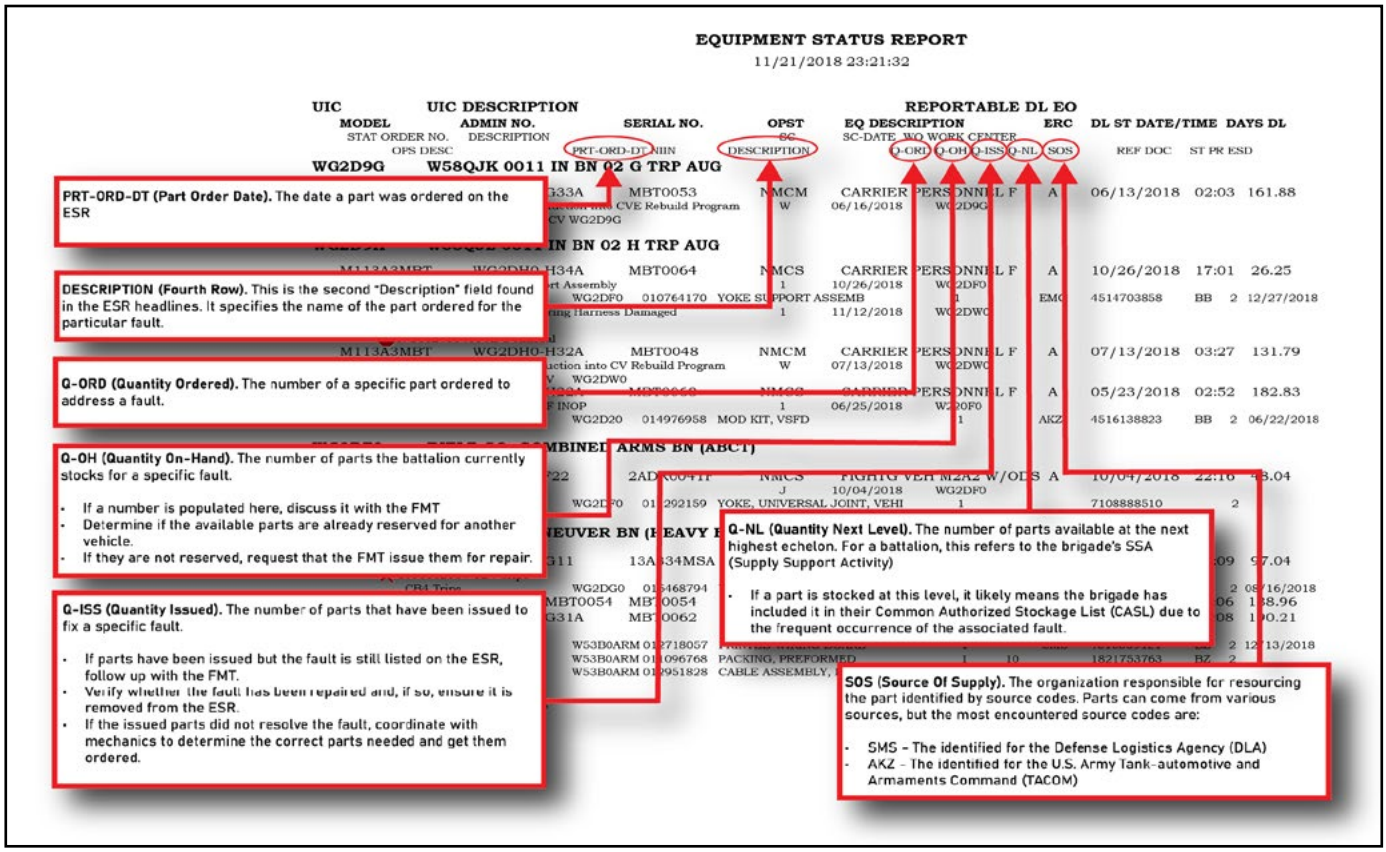


Figure 4. This example ESR shows the key information from the 4th headlining row. *(U.S. Army Graphic)*

mileage records and prevent premature service triggers, soldiers should only approach the clerk to close a dispatch after recording the correct mileage in the dispatch book. This step ensures accurate mileage tracking under optimized service plans.

Army units often require 10-mile road marches for each vehicle quarterly. This road march can be done in conjunction with training events as long as at least 10 miles are driven during the duration of the event. Some battalions prefer to make these road marches battle rhythm events on the calendar, whereas others leave it up to the companies and platoons. 1-8 CAV does not make it a battle rhythm event, but we track company adherence to this policy by including usage reports in our battalion maintenance meetings. As a trickle-down effect, our companies have included these reports in their company maintenance meetings. Usage reports can be pulled from GCSS-Army, and they are systems of record that display the distances travelled by vehicles during a selected period. This mileage is tracked by the change in odometer readings between dispatches, therefore making accurate mileage reporting extremely important when opening and closing dispatches.

Two other important metrics that should be tracked in platoon maintenance meetings are the Army Oil Analysis Program (AOAP) and test, measure, and diagnostic equipment (TMDE). AOAP monitors petroleum, oil, and lubricant (POL) samples to ensure vehicle health and identify engine, transmission, gearbox, or hydraulic failures before they occur[8]. Samples must be drawn and submitted at intervals prescribed by the AOAP lab and submitted for testing. The company XO can pull AOAP due dates from a program called the Army Enterprise Systems Integration Program (AESIP) for the platoon leader to include in their platoon maintenance meetings. TMDE is a list of parts, tools, and equipment that need to be calibrated at specific intervals to ensure they are accurate and effective[9]. Most of these items are owned at the company level, but some platoon equipment may need calibration. A platoon leader should confirm if any of their sub-hand receipt (SHR) is enrolled in TMDE and include their service dates in their platoon's slides.

Another SOP that units should establish is Class IX (CL IX) management. CL IX is the Army's class of supply for repair parts. CL IX management is often done at the battalion and company levels, but it should be done at the platoon level as well. For example, Combat Company, 1-8 CAV, dictated that only platoon leaders and platoon sergeants could sign for CL IX from the FMT non-commissioned officer in charge (NCOIC). This was to maintain better accountability of parts and ensure they were issued to the right vehicle. If a part was installed on the wrong vehicle, then the vehicle needing the part wasted a lot of time on the ESR. If the company does not have an SOP, then the platoon should establish one. Will only the platoon leader or platoon sergeant be able to sign for CL IX? Will section leaders be allowed to do it? My recommendation is that only the platoon leader and platoon sergeant sign for parts. This allows for better awareness and accountability

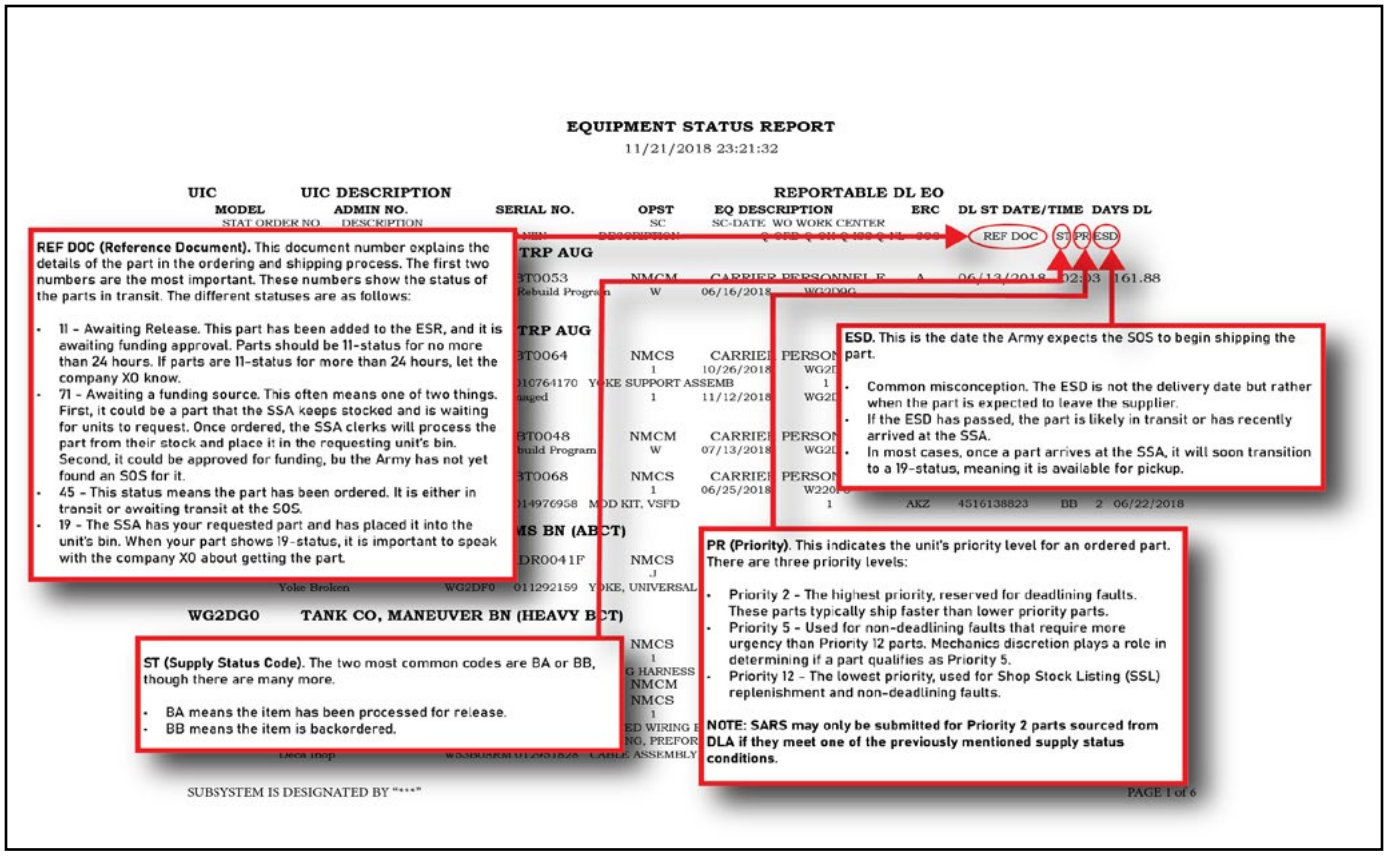


Figure 5. This example ESR shows additional key information from the 4th headlining row. *(U.S. Army Graphic)*

within the platoon's maintenance program.

Allowing the platoon's soldiers to sign for parts makes CL IX management more difficult for the entire company. Crews may not know if the part they need was ordered for another vehicle. Additionally, when CL IX is issued for a vehicle, it needs to be installed immediately to fix the fault. If it is operator-level maintenance (maintenance that can be conducted per the 10-level technical manual [TM]), then members of the crew can apply the part. If it is mechanic-level maintenance (maintenance conducted per the 20-level TM), then a mechanic needs to hang the part. If a parts manual is available for that piece of equipment, then the source, maintenance, and recoverability (SMR) code can be checked in the maintenance allocation chart (MAC) to see who installs it. The SMR code has five characters. The third character, which is the maintenance code, identifies the maintenance level for replacement. A maintenance code of 'C' means a crew or operator can replace the part, and a maintenance code of 'F' means unit-level maintainers can replace the part. Sometimes 'O' is listed in place of 'F' in older MACs.[7]

Whenever a part is hung by a mechanic, whether in shop or on the motor pool line, a member of that vehicle's crew needs to be present.

An important maintenance SOP affecting unit lethality is 24-hour maintenance when pacing equipment parts are received for deadline faults. If a part arrives that would make a pacing vehicle (commonly called a pacer) FMC, then continuous work needs to occur to make it happen. Maintenance will occur until the part is hung and the fault is fixed. The purpose is to remove the amount of time a pacer is on the ESR, and it helps improve the battalion's operational readiness.

Unusable, recoverable parts removed from equipment join the overage repairable items list (ORIL). These parts need to be returned to the Army so they can be repaired and issued back out to the force. Units receive monetary credit back for parts turned in. ORILs are monitored at the battalion and brigade level, and poor management of these parts can cause a unit's ORIL to be extremely long. Operators need to clean the parts and give them to their FMT clerks for turn-in. Platoon leaders should work with their Company XO to get a list of platoon ORILs to be tracked internally.

Field Maintenance

Field maintenance is probably one of the most overlooked aspects in maintenance. Soldiers tend to forget or avoid it until their equipment breaks. Field maintenance is often equated to cleaning weapons in the field, but it is so much more than that. Soldiers need to PMCS their equipment in the field daily. According to Army Regulation (AR) 25-30 ***Army Publishing Program***, each piece of equipment is supposed to be accompanied by a TM.[8] When a Soldier draws a piece of equipment, they should draw the TM as well. TMs should remain in vehicles too. While the Army is beginning to modernize with all-in-one tablets that include both the TM and Department of the

"Whenever a part is hung by a mechanic, whether in the shop or on the motor pool line, a member of that vehicle's crew needs to be present."

- 1LT Christian Arnette

Army (DA) Form 5988-E, it is a good practice to maintain a paper copy of the TM in the vehicle. As long as those copies aren't lost or destroyed, paper TMs are a great contingency for when tablets break or run out of battery.

There are three types of PMCS: before, during and after operations.[9] At a minimum, the during operations PMCS should be completed in the field daily. This will help crews identify problems before they become significant, and it gives the FMT a chance to fix them before more intensive maintenance is required.

Printing capabilities are usually extremely limited in the field. Therefore, platoon leaders should ask their XOs to bring several DA Form 5988-Es for each vehicle prior to starting a field problem. If printing is an option, XOs can ask for the forms in their daily logistics package (LOGPAC) requests. Soldiers should complete PMCS of their vehicles and equipment on these 5988s daily. Leaders throughout the platoon should spot check the accuracy of the PMCS, then they should be submitted to the XO. Conducting continuous field PMCS will allow both the FMT and the battalion's maintenance enterprise to stay up to date on all maintenance issues within the unit.

Final Notes

A platoon leader should make it their priority to establish good relationships with their Company's mechanics. They are the ones that keep the vehicles in the fight and their job is challenging. There are long hours, lots of physical work, and rarely any downtime. A platoon leader also needs to allow the FMT time to PMCS and maintain their own assigned vehicles. An FMT's efficacy relies heavily upon its vehicles' capabilities. If their M88 is NMC, they are unable to recover tracked vehicles. If their palletized load system (PLS) is down, they will be unable to bring their forward repair system (FRS) and field pack-up (FPU) container (also known as a BOH, after the company that makes them), into the fight. While it is important for a platoon to have faults verified and fixed promptly, time needs to be given to the FMT to do the same thing.

Maintenance can be an intimidating aspect of the Army to all leaders, but it is especially nerve-racking for new platoon leaders. If the proper focus and dedication is given to maintenance, it isn't that scary. As a BMO, I believe that while maintenance perfection is impossible, an effective maintenance program is extremely achievable. To build an effective program at the platoon level, a platoon leader must study the ESR, ask maintenance questions to anyone who will listen, and be present in the motor pool. Units with effective maintenance programs, regardless of the echelon, are the most lethal. Lethality is like a house – training is the structure that builds lethality, but maintenance is the foundation on which it stands on. The house cannot last if there is no foundation.

Christian Arnett is a First Lieutenant currently serving as Executive Officer of a Military Intelligence Company within the Regimental Military Intelligence Battalion, 75th Ranger Regiment. Previous assignments include Battalion Maintenance Officer for 1st Battalion, 8th Cavalry Regiment, 2nd Armored Brigade Combat Team, 1st Cavalry Division, and Infantry Platoon Leader for C Company, 1st Battalion, 8th Cavalry Regiment, 2nd Armored Brigade Combat Team, 1st Cavalry Division. His military education includes Ranger School, Basic Airborne Course, Bradley Leader's Course, and Infantry Basic Officer Leader Course, all completed at Fort Benning, Georgia. Arnett holds a Bachelor of Science in environmental engineering from the University of Iowa.

Notes

[1] LTC Jay Ireland, "Peaking at LD: A Way to Achieve Maintenance Excellence," Armor 135/4 (Fall 2023): 25-28, https://www.moore.army.mil/Armor/eARMOR/content/issues/2023/Fall/ARMOR Fall 2023.pdf

[2] MG Jeffery Broadwater, COL Patrick Disney, and MAJ Allen Trujillo, "The Leader's Guide to Creating a Daily Maintenance Battle Rhythm," From the Green Notebook, 25 August 2020, https://fromthegreennotebook.com/2020/08/25/the-leaders-guide-to-creating-a-daily-maintenance-battle-rhythm/

[3] "GCSS-Army Job Aid: Equipment Status Report (Z_EQUST)", United States Government, 08 December 2018, https://gcss.army.mil/Training/WebBasedTraining

[4] MAJ Gary M. Klein, "Operationalizing Command Maintenance to Train Organizational Systems and Build a Culture of Maintenance Readiness," Armor 134/3 (Summer 2022): 19-24, https://www.moore.army.mil/Armor/eARMOR/content/issues/2022/Summer/ARMOR Summer 2022-optimized.pdf

[5] "Army Oil Analysis Program (AOAP)," Army Sustainment Command, n.d., https://www.aschq.army.mil/Offices/Redstone-Detachment/

[6] "About USATA," U.S. Army TMDE Activity (USATA), 04 April 2024, https://tmde-home.redstone.army.mil/

[7] Army Techniques Publications 4-33, Maintenance Operations, 09 January 2024, appendix C

[8] Army Regulation 25-30, Army Publishing Program, 14 June 2021, paragraph 1-28

[9] Army Regulation 750-1, Army Materiel Maintenance Policy, 02 February 2023

Risk-Decision Methodology

by Retired MAJ Lance Brender

While teaching the military decision-making process (MDMP), I found planners struggle with two unglamorous parts of it: risk management and course of action (COA) selection. And I can see why. Risk management, often relegated to slips, trips, and falls, feels tacked on, and COA selection feels redundant when staffs are habituated to producing a directed COA (with two throwaways). But cutting these corners wastes an opportunity to make MDMP easier, faster, and able to produce better plans. In the remainder of this paper, I will show you what I mean by introducing the risk-decision methodology (R-DM).

1. Evaluate Operational Risk
a. Identify Risks
b. Evaluate Risks
c. Develop Conceptual Counters
2. Develop Risk-mitigating COAs
a. Develop Suitability
b. Develop Feasibility
c. Create Distinguishablity
3. Evaluate COAs Risk Mitigation
a. List and Weight Risks
b. Compare by Quantification
c. Select COA

Figure 1. Steps within the Risk-Decision Methodology *(U.S. Army Graphic)*

R-DM addresses a conceptual shortcoming in the evaluation of multiple COAs in MDMP by creating a logical linkage between risks (impediments to end state), counters to those risks, and selection of a COA based on its risk reduction. R-DM operates within the context of the MDMP and consists of the following steps:

Evaluate Operational Risk

Evaluating operational risk is the identification, understanding, and conceptual mitigation of threats to a military end state.

Identify Risks. R-DM begins at the risk management substep within mission analysis and starts with the creation of a list of all the substantive threats to your end state. If that seems like a lot of work, don't worry, you've probably already done it with your military problem statement (a previous step of mission analysis). Risks in R-DM are those threats, terrain, and constraint factors that stand in the way of accomplishing the mission—those things your problem statement intends to overcome.

Threats are the enemy's key assets that it will use to oppose your mission, such as a combat brigade, a disruption zone, or a line of communication, etc. Terrain is the physical ground (or air, sea, et al.) that combat will take place on, including the weather. Examples of terrain as a risk factor might include a long approach march, or a significant map feature to overcome, or a monsoon grounding all aircraft. Lastly, constraint factors are everything else, including friendly conditions placed upon the unit, or the limits of operational reach, or any of a hundred other things that impede an end state.

Evaluate Risks. Evaluate your list of risks to determine how dangerous they are. Evaluation, conveniently, uses the Army composite risk management (CRM) methodology: how likely is an identified risk to affect you, and how badly can it do so? An enemy battalion sitting on the objective will "frequently" affect the mission, and its probable impact is catastrophic, hence its risk is extremely high and represents a top concern. Evaluate as many factors as you have identified in this manner.

To the greatest degree possible, all risks should be quantifiable things: numbers of enemy combat systems, kilometers of terrain to cross, gallons of fuel needed, etc. Non-quantifiable items, like public sentiment or enemy resolve, are to be avoided in R-DM. Non-quantifiable things, while certainly real, are obviously not measurable and, more to the point, can only indirectly be affected by combat operations. For instance, enemy will is very real, and it can be broken, but one cannot shoot "will." Only indirectly can intangibles like will be broken, such as by destroying enemy equipment and troops, which conveniently are quantifiable things.

Once risks are evaluated, categorize them into risks to mission and risks to force. Risks to mission are those things that can defeat the purpose of your operation (but won't necessarily get any friendly equipment destroyed or troops killed, at least not directly; a good example of this is being late). These are inherently the most important, because they directly affect the mission's accomplishment. Conversely, risks to force are those factors that remove friendly troops and equipment necessary to achieve your end state. These are clearly important, as well, but they are one step removed in priority because they are, candidly, means to an end, not the end itself.

Once all risks are categorized, prioritize them. As previously mentioned, risks to mission categorically rank higher, but risks to force are a close second, and so must never be omitted. Within both risks to force and mission, rank-order each threat by its total risk. Logically, higher risks are higher priority. Higher priority items get planned against first in COA development, after the creation of conceptual counters that you'll see in the next step.

Develop Conceptual Counters. With our categorized and prioritized list of risks, we now develop their conceptual counters. Conceptual counters are generalized, "perfect world" things needed to mitigate or defeat risks. These counters are not concrete plans or schemes tied to any COA, hence they are never "B Troop will…" Rather, they are broad and conceptual, such as "the defending force is defeated by a three-to-one combat ratio" or "enemy air defense systems are mitigated by persistent suppression."

This list of conceptual counters to risk is the method by which you will develop courses of action. And, the more conceptual counters you can come up with, the greater diversity of COAs you will be able to create. Using the above enemy air defense example, artillery suppression will work, but so might an effective deception plan that has the enemy looking somewhere else. If there is only one conceptual counter to a risk, that means planners have painted themselves into a corner as they move into COA development.

Develop Risk-Mitigating Courses of Action

Knowing the operational risks relevant to a mission, planners may then develop courses of action against them. The doctrinal screening criteria for a viable COA are: suitability, feasibility, distinguishability, acceptability, and completeness. R-DM addresses suitability, feasibility, and distinguishability.

Develop Suitability. Suitability is a plan doing what the mission needs it to do. It is directly related to operational risks in that risks are what stand between the present and desired end states. Furthermore, suitability is more closely tied to risk to mission than it is risk to force because risk to mission directly affects purpose. As such, mitigation of risks to mission is what allows a force to win its fight. Combined with a properly selected end state, this achieves suitability.

One thing to remember is that as COA development progresses (even into wargaming), our understanding of operational risks grows. This growth is informed by our knowledge of the battlefield, which itself is fed by the priority intelligence requirement (PIR). PIR, of course, is information about the enemy and terrain necessary for the conduct of an operation. Resultantly, PIR informs and updates two things: what the risks are and how serious they are. Initial intelligence at the start of MDMP allowed us to know what we are up against and develop a conceptual counter; updated intelligence confirms those things are still accurate and relevant and allows us to concretize our plan (e.g., we knew there was an enemy tank battalion out there, so conceptually we understood we would need anti-tank systems—but now we know where the enemy is, and hence know where to put our anti-tank systems).

A COA achieves suitability once it mitigates risk down to the point where a friendly element is more likely to win than not. Examples might be a minimum force on the objective, or setting conditions by a no-later-than time, etc. While war is never just a numbers game, numbers really help at knowing when you have reached a tipping point. For instance, you can count how many troops both sides have, and if you have a certain degree of numerical advantage, you're more likely to win. This sort of calculation can be done for almost any battlefield consideration and is inherent in doctrinal COA development.

Develop Feasibility. Feasibility is the capacity to achieve an end state with current or accessible resources. It is closely linked to risk to force because it directly concerns your resources, particularly troops and equipment. However, risks to force, perhaps counterintuitively, are mitigated by other resources. These can be tangible, like body armor to stop bullets or helicopters that allow you to avoid an ambush, or intangible, like training, planning, and command & control.

Just as PIR informed suitability, the friendly forces information requirement (FFIR) feeds feasibility. FFIR, information we need to know about our own forces, gets translated into a staff's running estimates and allows us to assess our resource base. Resources are always finite, and since risks to

force are countered by resources, a COA is not feasible if it requires more resources than you have or can get. This matching of identified risks to actual resources is where you turn a conceptual counter into reality.

Create Distinguishability. Distinguishability refers to multiple COAs being substantively different from one another. It's also another area that MDMP planners often struggle with. Thankfully, R-DM offers a way to create distinguishable COAs, and you already did it in a previous step. If you were able to develop more than one conceptual counter to each identified risk, you already have multiple options for accomplishing your mission. Recalling the air defense example I used in the last section, a unit could suppress the enemy's defenses with artillery, or it could pull their attention away with a deception. Multiple conceptual counters to risk directly translate into multiple distinguishable COAs.

Evaluate COAs' Risk Mitigation

You now have multiple COAs that are suitable, feasible, and distinguishable (R-DM does not address acceptability and completeness). Once complete with wargaming, you now compare these COAs against each other and select one. Many planners have a particularly hard time with this, but R-DM offers a logical approach. The heart of R-DM is making a decision based upon effective risk management and thereby achieving an end state. In sections one and two, we have identified risks and created plans to defeat them. In section three, we choose the right plan by using the risks themselves as the evaluation criteria.

List and Weight Risks. List between two and four of your highest identified risks (preferably three), with at least one being to mission and another to force. These are your COA evaluation criteria. Once listed, weight them against each other. Remember that risks to mission are closer to the accomplishment of the end state, so they are always weighted higher than risks to force. The degree of weighting (like being twice or three times as important), as well as any sub-weighting (risk to mission A is more important than risk to mission B), is completely at the planner's discretion.

Compare by Quantification. Remember that risks within R-DM are quantifiable things, so discerning how good one plan is versus another is a matter of measuring how well your COAs reduce each risk in the evaluation criteria. Those that reduce more numerical risk are better.

Once analyzed, you may want to simply say that one COA ranks first at a particular criterion, or you may want to show the numbers. Referring again back to the enemy air defense example, let's say we discovered that a deception plan is only expected to prevent enemy fire for half as long as suppression. In that example, suppression scores first, and deception second. But it might be advantageous to know that suppression offers sixty minutes of no enemy fire, whereas deception offers thirty.

Select a COA. If the data that was fed into the planning process was good, the COA that reduces the greatest aggregate risk is the most likely to succeed. Aggregate risk is all criteria put together, including their weighting. The COA with the least risk should be selected.

However, this part of the planning process is one last hurdle that unit's trip on. You've selected a plan for execution, but did the staff just waste hours, days, or weeks on two now-discarded COAs? Or, since two plans are going to be dumped no matter what you do, wouldn't it have been better to have just made one that was what the commander wanted anyways, garnished with a couple throwaways?

Absolutely not. Doctrinal MDMP produces three courses of action for a reason: options. One COA always becomes the primary plan, but the other two, since they were also fully capable of achieving the end state, become your branch plans and your deception plans. Branch plans, of course, are like "plan Bs" for the same mission, triggered as necessary by new data and circumstances. Deception plans, on the other hand, are actions that mask a friendly unit's true intentions. These plans come from unchosen COAs, since they could have worked, and are therefore very believable.

Conclusion

Operational risks are measurable things that stand in the way of an end state. COAs are developed to mitigate risks until a force is more likely to win than not. Finally, COAs are evaluated by how well they reduce aggregate risk, and the one that reduces the most is the best option. This methodology offers a quantification-based approach that simplifies rapid planning, reduces guesswork, and increases the chances of success in combat.

Lance Brender is a retired military officer. Brender's military career included positions as Battalion Executive Officer for the 2-357 Infantry Battalion at Joint Base Lewis-McChord, Washington; Squadron Executive Officer for the 8-1 Cavalry Regiment at Joint Base Lewis-McChord, Washington; G3 Chief of Operations at the National Training Center, Fort Irwin, California; Armored Forces Advisor to the Royal Saudi Land Forces (Southern Area Command) in Khamis Mushait, Kingdom of Saudi Arabia; and Commander of B/4-7 Cavalry Regiment at Camp Hovey, Republic of Korea. He attended the Command and General Staff College Red Team Member Course and Maneuver Captain's Career Course, as well as the Mounted Officer Basic Course. He holds a Master of Military Arts and Sciences from the Command and General Staff College, Fort Leavenworth, Kansas, and a Bachelor of Business Administration from Pacific Lutheran University, Tacoma, Washington. His military awards include the Bronze Star and Purple Heart.

Like Moths to a False Flame: Lethality and Protection through Deception Operations

by CPT Paul Dolan

The ongoing war in Ukraine has demonstrated the deadly efficiency of modern battlefield targeting. Rapid sensor-to-shooter integration, enabled by signals intelligence (SIGINT), geospatial intelligence (GEOINT), and unmanned aerial systems (UAS) reconnaissance, has shortened kill chains to the point where detection often leads to immediate engagement. High-value assets, identified through electronic emissions or ground-based reconnaissance, face a severe risk of engagement and destruction. The prevalence of SIGINT collection, integration of UAS, and massed indirect fires in the doctrines of American adversaries represents a complex problem that can be mitigated by the use of tactical deception.[1]

Russia and China both employ multi-layered information collection and rapid sensor-to-shooter systems. Command and Control (C2) nodes are an example of High-Value-Targets (HVT) targeted by adversary doctrines and are a convenient example for exploring the use of, and opportunities created by, deception. Adversary doctrine describes the following kill chain for engaging C2 nodes: mobile SIGINT collectors locate command nodes, UAS confirm the target location, and artillery at echelon execute massed fires strikes before blue force commanders can react. The threat to U.S. forces this system represents is not theoretical, it unfolds daily on the battlefields of Ukraine and represents the conditions under which American forces are expected to fight and win. These doctrines are replicated every rotation at the National Training Center (NTC), where the Troopers of the 11th Armored Cavalry Regiment (Blackhorse) serve as the professional opposing force (OPFOR). Blackhorse provides units with a critical opportunity to train against the techniques America's adversaries use daily. Unexercised solutions already exist within Army formations to mitigate the effects of the modern battlefield's shortened kill chains. By understanding adversary collection techniques, reducing signature, and presenting deception signatures, battalions can disrupt enemy targeting cycles and create opportunities for lethal response.

Threat Collection Doctrine

Russia and China prioritize rapid target acquisition, integrated information collection, and fire control automation as core tenets of their military doctrine. The 7-100 series doctrinal manuals lay out their shared approach to large-scale combat operations (LSCO), detailing the reliance on multi-layered information collection systems that feed directly into massed indirect fires, shortening the time between detection and engagement. SIGINT plays a critical role in this process, by geolocating friendly forces C2 nodes and tracking emissions from communications and mission command information systems. GEOINT, collected by UAS, supplements SIGINT data by confirming target locations and conducting battle damage assessment (BDA) to refine follow-on strikes. This integrated targeting process ensures that friendly forces are rapidly engaged before they can reposition, react, or conceal themselves.

For U.S. forces, the threat posed by this level of collection and targeting cannot be overstated because of our reliance on digital mission command systems. The ability of adversaries to rapidly detect and engage formations means that any electronic emissions or movement bears significant risk of compromise and targeting. Without effective mitigation measures, units risk being outpaced in the decision-making cycle, allowing the enemy to dictate the tempo of battle. Blackhorse replicates these conditions at NTC, ensuring that rotational training units (RTUs) experience the same information-driven targeting process they will face in combat. By understanding how adversaries collect and process information,

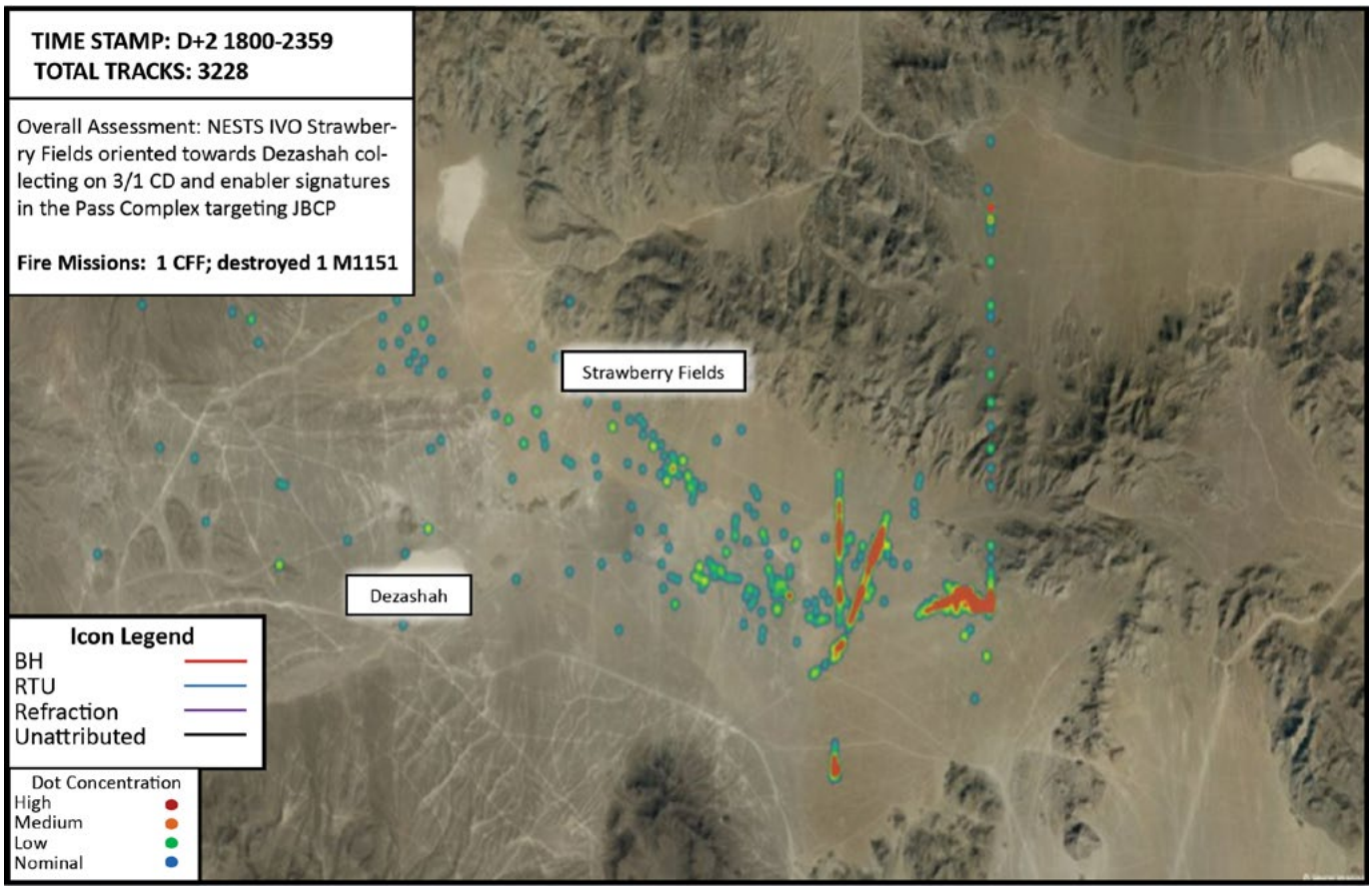


Figure 1. NESTS in the vicinity of Strawberry Fields oriented towards Dazashah collecting on rotational brigade MCP and enabler signatures in the Pass Complex targeting Joint Battle Command-Platform. *(Photo by 11th ACR Regimental S2)*

U.S. forces can better prepare to disrupt, degrade, deny enemy kill chains.

Threat Replication

Blackhorse executes information collection operations by integrating SIGINT, UAS, and ground-based reconnaissance to target friendly command and control C2 nodes, thereby disrupting decision-making processes. Their layered sensor network operates in a sequence designed to detect, validate, and engage targets in real time. The Networked Electronic Support Threat Sensors (NESTS) system collects SIGINT, identifying emissions from satellite-based communications, while the Versatile Radio Observation and Direction (VROD) system intercepts frequency modulated (FM) transmissions to locate and classify targets. Identification of likely targets by SIGINT cues UAS to confirm targeting data and refine collection. Due to limited time on station, UAS only remain on their assigned named areas of interest (NAIs) long enough to confirm targeting data before moving on to identify additional targets in support of the maneuver fight. Small UAS (sUAS) may conduct BDA later if required.

Once validated, the Blackhorse Regimental Targeting Intelligence Cell (RTIC) processes the refined target data and passes it to fires elements for strike execution. This sensor-to-shooter process mirrors adversary workflows, where electronic detection leads to physical compromise and rapid engagement. The effectiveness of this process underscores the necessity for signature management, deception, and counter-fire strategies to disrupt enemy kill chains.

Defeat through Deception

Deception is a fundamental aspect of modern warfare but is typically relegated to a survivability operation. Successful battlefield deception forces adversaries to misallocate resources, delay decision-making, and strike false targets. FM 3-90 defines deception as actions executed to deliberately mislead adversary decision-makers about friendly military capabilities, intentions, and operations.[2]

Adversary intelligence, surveillance, and reconnaissance (ISR) networks rely on rapid detection, classification, and engagement. By integrating deception, friendly forces can manipulate enemy perception, disrupt targeting cycles, and increase survivability.[3&4]

Deception operates across all domains and targets two specific deminision: physical and technical. Together these dimensions infulence the cognitive, or human, dimension of decision making. Physical deception uses false positions and decoys to mislead enemy analysts into assessing a decoy as a legitimate target. Technical deception manipulates the electromagnetic spectrum (EMS) by emitting signals that mimic actual targets, causing adversary collectors to misinterpret the data. C2 nodes have both a physical and technical signature, making them a useful example for exploring the requirements of a deception story.[5]

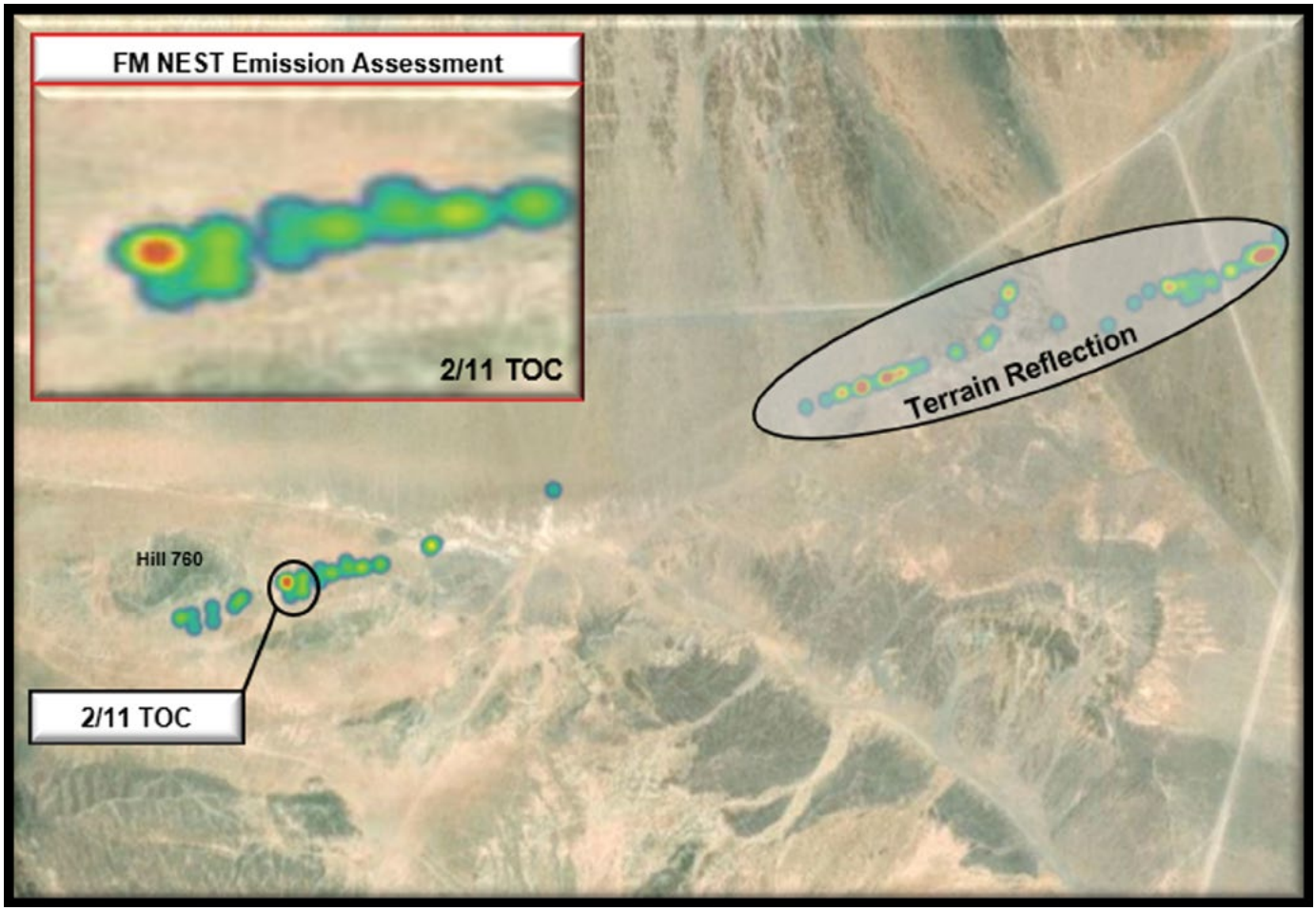


Figure 2. FM NEST Emission Assessment for 2/11 TOC *(Photo by 11th ACR Regimental S2)*

Units generate deception stories by creating signatures inside the collected spectrums, that force adversary analysts to make false assessments. In the electronic spectrum, the deception node must emit signatures that mimic a C2 node. This requires units to allocate FM and Joint Battle Command-Platform (JBCP) capability to the deception node as both systems are present in MCPs. JBCPs constantly update their location data to the network, creating a continuous low-power emission. JBCP emissions are commonly assumed to be too weak to be detected, this is a false assumption. In addition to being detectable, the static nature of C2 nodes allows enemy analysts to accurately classify their emissions as a C2 node and initiate a queuing cycle and kill chain.

Reinforcing the deception story requires physically constructing the deception node to present a believable target. After SIGINT assets identify a likely MCP, adversary doctrine calls for UAS or ground reconnaissance to validate the target. Blackhorse replicates this effect with a dedicated MQ-1C Gray Eagle during NTC rotations. When UAS collection begins, the deception node must match the physical signature of an actual MCP. To achieve this, units must equip the deception node with wheeled vehicles, tentage, antennas, and other identifiable MCP-associated equipment.

Battalions can improve deception effectiveness by creating deception kits from non-functional or excess equipment components. Broken antennas simulate active communication architecture, while trailers transporting generator mockups and fuel cans replicate life support systems. Worn-out power cables present the image of power distribution to tents, reinforcing the illusion of an operational command node. Because high quality thermal sensors are widely available common commercial markets, the deception node should also mimic the thermal signature of an operational command node. Crews can simulate a generator's thermal signature by piping exhaust from the towing vehicle into the decoy, allowing it to escape through a replicated exhaust port. Properly routing exhaust tubing and covering both the vehicle and the fake generator with camouflage netting obscures the deception and breaks up its physical signature, making identification of the deception story as a deception less likely. Damaged shelters staged as command post structures further reinforce the deception story without risking mission-essential assets. Integrating these elements allows units to construct deception nodes capable of withstanding both SIGINT and GEOINT validation.

To reduce risk, all personnel should withdraw from the deception node once it establishes. A technique to improve the deception teams survivability is to locate them in offset security positions, several hundred meters away, minimizing exposure while maintaining operational control of the node. Using wired connections to FM radios enables deception teams to

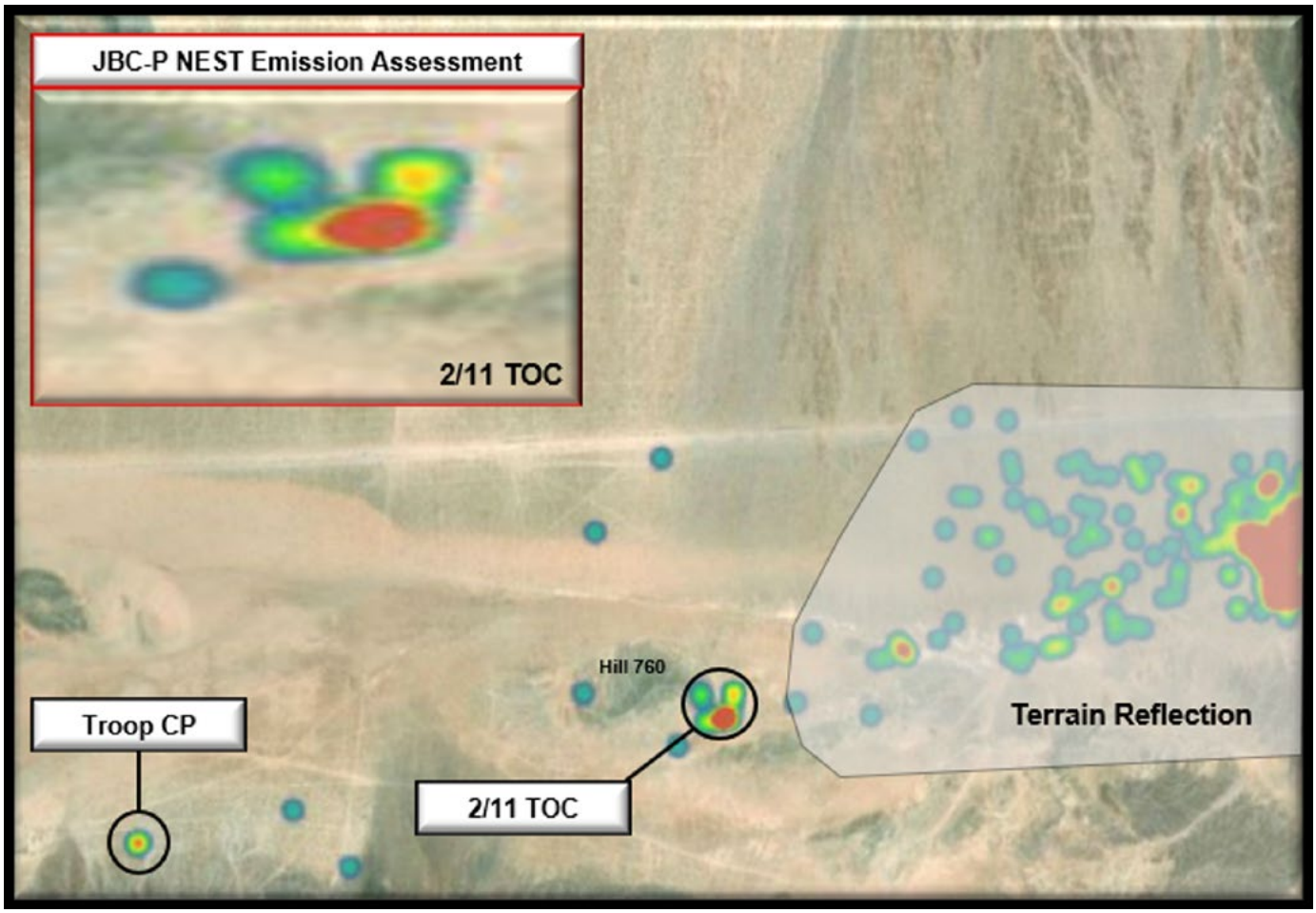


Figure 3. JBC-P NEST Emission Assessment for Troop CP and 2/11 TOC *(Photo by 11th ACR Regimental S2)*

transmit from secure positions, increasing the deception node's electromagnetic (EM) signature while keeping personnel protected. This method strengthens deception by making the site appear active while preserving force survivability. Another technique to strengthen technical deception is to equip the deception node with a CX-13298 Retrans Cable, commonly known as a "dog bone". This cable allows the deception node to act as a retrans site, mimicking the radio traffic of the actual C2 node while simultaneously allowing the C2 node to broadcast lower power transmissions, reducing the likelihood of electronic detection.

The final step in any deception operation is concealing the actual asset. While the deception nodes attract enemy collection by design, the real MCP must obscure or eliminate the signatures that would expose its location. This requires reversing the techniques used to make the deception node appear authentic and ensuring the protected asset remains undetected.

Minimizing electromagnetic emissions is the first priority. JBCP should operate on communications windows, establish offset from the MCP, or establish behind terrain that completely masks horizontal emissions. FM radios should connect by hardline to an offset antenna farm, preventing immediate correlation between transmissions and the MCP's physical location. ATP 6-02.53, "***Techniques for Tactical Radio Operations***," details how antennas can offset more than two miles using ASIP remote operations via hardline connection, reducing the MCP's exposure to SIGINT collection.[6] When using a retrans setup on the deception node, the C2 node can locate in terrain that masks FM communication forward but allows broadcasts to hit the retrans system. These techniques not only improve concealment but also reinforce the deception story by generating EM emissions at the decoy location.

Beyond SIGINT mitigation, the physical composition of the MCP should be structured to blend into the operational environment while still meeting operational requirements. Use of vehicles and equipment incongruent with an MCP, reducing the size of the node, and collapsing assets during periods of UAS reconnaissance all contribute to the deception story by representing the C2 node as a different asset.

Reports of contact with UAS should trigger protection battle drills, including breaking down easily identifiable equipment, applying additional camouflage, or even jumping the command post to prevent the presentation of an easy target. Once the ISR threat is neutralized or off-station, units can restore digital communications as needed.

Leveraging Lethality from Deception

A well-integrated deception plan must align with counter-reconnaissance, fires, and intelligence planning, anticipating how and when enemy collection

assets will react, and how to actively counter their efforts. This concept is rooted in reflexive control, a strategy developed by the Soviet Union in the 1960s and 1970s. Reflexive control seeks to manipulate an adversary's decision-making process by shaping their perception, leading them to take actions that are predictable and favorable to the initiator. In this context, deception forces the enemy into a predictable reaction, which friendly forces can prepare to exploit.

Given the passive nature of SIGINT collection, the first engagement window occurs when enemy UAS attempts to validate the deception target. To counter this, units should establish anti-air ambushes near MCPs and deception nodes, positioning short-range air defense (SHORAD) or mobile air defense teams in ISR flight corridors. This allows friendly forces to engage enemy ISR platforms before they collect actionable intelligence, denying the enemy the ability to confirm or refine targets.

If the enemy cannot validate the target with UAS, they may deploy ground reconnaissance teams to confirm or deny its presence. By identifying and securing ground infiltration routes, units deny the enemy access to the deception node, reinforcing the perception that a high-value target is present while creating opportunities to trap and destroy enemy reconnaissance elements before they can collect.

If deception is successful, the enemy will likely commit fires assets against the deception node without validation, encouraged in their belief that these protective efforts are aligned against a real asset. The final engagement opportunity, where counter-fire radar, ground moving target indicator (GMTI) radar, and national level collection can detect and track enemy fires assets that have unmasked for a valueless engagement. Friendly forces can track and destroy these targets, preventing their use against friendly forces and creating hesitation to unmask assets for future strikes.

By integrating deception with air defense, counter-reconnaissance, and counter-fire operations, units can force the enemy into predictable, exploitable mistakes while preserving their own combat power. Deception is not passive. It is a deliberate operation that includes all warfighting functions and sets conditions for the enemy to fail.[7]

Conclusion

By understanding adversary collection techniques, reducing the signature of high-value targets, and leveraging deception to shape enemy behavior, units can force adversaries to misallocate ISR and fires assets, disrupting their kill chain and protecting friendly forces. Current conflicts are occurring in highly contested ISR environments, where failure to integrate deception will result in rapid targeting and engagement.

Deception is not just a defensive tool, it shapes the battlefield by forcing adversaries to react to false information, creating opportunities to disrupt their targeting cycles and degrade their effectiveness. A well-integrated deception plan must synchronize with reconnaissance, fires, and intelligence planning to maximize survivability and create conditions for decisive action. Success in deception is not based on what friendly forces do, but by what the enemy demonstrates they believe, measured by the actions they take. When applied effectively, deception forces adversaries to waste resources, commit to false targets, and fight based on a reality that no longer ever existed.

Notes

[1] ATP 7-100.1, "Russian Tactics", 2024

[2] FM 3-90, "Tactics", 2019

[3] ATP 7-100.1, "Russian Tactics", 2024

[4] ATP 7-100.2, "North Korean Tactics", 2024

[5] FM 3-90, "Tactics", 2019

[6] ATP 6-02.53, "Techniques for Tactical Radio Operations", 2019

[7] FM 3-90, "Tactics", 2019

Paul T. Dolan, a Captain in the Army, is currently assigned as a Battalion Intelligence Trainer with Panther Team at the National Training Center in Fort Irwin, California. Prior to this, he served as a Squadron Intelligence Trainer with Cobra Team, also at the National Training Center. Previous assignments include Battalion Intelligence Officer for 2-8 Cavalry, 1st Cavalry Division; Current Operations Intelligence Officer for Task Force South East in Paktia Province, Afghanistan; and Platoon Leader for Bravo Troop, 1-40 Cavalry, 4th Brigade Combat Team, 25th Infantry Division. His military schooling includes the Armor Basic Officer Leader Course at Fort Benning, Georgia; Stryker Leader Course at Fort Benning, Georgia; Military Intelligence Captains Career Course at Fort Huachuca, Arizona; and the Army Space Basic Cadre Course at Peterson Space Force Base, Colorado. Dolan holds a Bachelor of Arts in Studies in War and Peace from Norwich University and is currently pursuing a Master of Science in Unmanned and Autonomous Systems from Embry Riddle Aeronautical University.

Tanks in Cities?

Preparing the Armored Force for the Urban Fight

Vignette

Dawn rose on training day (TD) six at the National Training Center (NTC). The 11th Armored Cavalry Regiment (ACR), "Blackhorse" attacked the rotational training unit's (RTU) flank. Dealer Company, 1st Squadron, 11th Armored Cavalry Regiment was the brigade tactical group's (BTG) exploitation force lagered near Four Corners. The original plan had Dealer passing through a breach in the RTU lines near the terrain known as the Iron Triangle and destroying the brigade combat team's (BCT) main command post (CP). However, conditions were not set, and success was hanging in the balance. The main body was decisively engaged and hemorrhaging combat power. Waiting to be committed, Dealer received an unexpected order. The tank company, consisting of nine main battle tanks (MBT), zero infantry fighting vehicles (IFV), and one short range air defense (SHORAD) system, was to wheel south, move through Hidden Valley, assault into Razish, and establish an attack-by-fire position to turn the BCTs southern flank. The only infantry support allotted would be whatever remnants of the defenders with whom they could link-up with inside the city. Even with little coordination, the mission was successful. Dealer Company penetrated into Razish, destroyed the few defending anti-tank guided missiles teams (ATGM) the RTU managed to position in the city and contained the RTUs strong points in the city, successfully turning the RTU flank. During the rest of rotation 23-08.5, Dealer Company would attack Razish three more times, with varying levels of infantry support. Each time, the attack met success with minimal casualties.

by CPT Josh Johnstone and CPT Chris Jordan

The events encountered during Rotation 23-08.5 are not one-off events. Each NTC rotation, Blackhorse spends days fortifying the urban training area of Tiefort City. In addition to the typical mix of infantry strong points, minefields, and mazes of barbed wire, Blackhorse integrates both IFVs and MBTs into the city's terrain. These vehicles are used to shape the foothold fight, enable transitions, and serve as mobile strongpoints to anchor Blackhorse counterattacks. The integration of armored vehicles provides options for the defenders and dilemmas to the attackers. Further, tanks lead Blackhorse's reinforcing attacks into the city to prevent consolidation by the RTU.

Problem

The Armor force has an urban terrain problem. Simply put, the armor community is poorly prepared to conduct urban operations as a part of the combined arms team in large scale combat operations (LSCO). As the Army continues to prepare for LSCO, Armor branch continues to fall behind in our ability to plan and execute urban operations.

Using armor in urban terrain almost always generates consternation. The reluctance to commit armor into cities typically boils down to one central point - vehicles in urban terrain (even if armored) are vulnerable to anti-tank equipped infantry. However, this

"Mounted maneuver forces experienced urban combat as an unwelcome deviation from an otherwise comprehensive mission set."

- Dr. Robert Cameron

Figure 1. Tankers of D Company, 1/11 ACR lead a counterattack into Razish.
(U.S. Army photo by 11th ACR PAO)

critique fails to consider the simple fact that any maneuver element in urban terrain is vulnerable. The density and complexity of urban terrain forces every type of formation to change its form of maneuver to defeat a determined enemy. Armor formations are not unique. Finally, this view fails to appropriately consider combined arms integration, which will necessitate armor formations playing a supporting but key role.

At present, there are two primary doctrine publications that deal with urban operations, ATP 3-06, *Urban Operations* and ATP 3-06.11, *Brigade Combat Team Urban Operations*. The recent publication of ATP 3-06.11 at best does nothing to advance combined arms integration of the armor force, and in the worst case is a step backwards. As a case in point, chapters 3 and 4 discuss combined arms integration for offensive and defensive operations. Chapter 3 on offense dedicates a mere two pages to discuss employment roles and consideration of armored vehicles (defined as Strykers, Bradleys, and Abrams – a problematic grouping in itself) within the offense. In chapter 4 on defense, there is a single paragraph that discusses the integration of armor into strong points[2]. The brevity concerning armored integration seems appropriate given that ATP 3-06.11 focuses on BCTs, until we consider that chapter 4 dedicates over three pages to emplacement of crew weapon systems entirely focused on dismounted antiarmor and machine gun teams. This fine level of detail in ATP 3-06.11 gets deep into the weeds prescribing Soldiers "wet down muzzle blast area[s]" and provides a detailed description of antiarmor backblast and explosive pressure[3]. The combined arms mindset is further hindered with the inclusion of an entire paragraph dedicated to the doctrine of "Put Dismounted Infantry in the Lead".[4] This isn't speaking to the generalized idea that infantry organizations ought to take the lead in planning and executing urban operations (which does have its own benefits), but rather it is the dogma that infantry must be in the lead with vehicles in trail.

ATP 3-06 takes a much broader approach to combined arms asserting that "In various stages of battle, as the preponderance of threats shift between infantry/anti-armor and IED/enemy armor, units may shift the lead elements between U.S. force infantry or armor".[5] This is certainly the correct view of how to best integrate armor and infantry formations and given the level of specificity afforded to other topics in ATP 3-06.11 is the better way in which to view the inclusion of armor assets in the urban fight.

Ironically, until recently, doctrine provided a more cohesive and effective reference for integrating mounted and dismounted maneuver in urban terrain. The Army Tactics, Techniques, and Procedures (ATTP) publication series contained ATTP 3-06.11, *Combined Arms Operations in Urban Terrain.* This publication offered specifics on techniques for integrating armor with infantry, as well as providing analysis on the advantages and disadvantages of each technique noticeably absent from ATP 3-06 and ATP 3-06.11. These techniques provided an effective framework for leaders at the company and below level to combine arms, mitigate the relative vulnerabilities of elements of the combined arms team, and enhance the team's overall effectiveness. The departure of this knowledge from doctrine, without an immediate replacement, prevents the Armored force and Armor branch from establishing a foundation of understanding and building experts in mounted warfare.[6]

To effectively prepare for the future, Armor branch must prepare for urban combat in four ways. First, Armor branch must promulgate doctrine that supports combined arms integration. Second, we must deliberately instruct Armor branch leaders on mounted urban planning and operations. Third, our training progressions must include vehicular and dismount integration. Finally, we need to shift our thinking of

tank units as standalone tools and recognize that we will use armor to support infantry and engineers in urban terrain.

Precedent

The necessity to train tankers for urban operations is not new. As Kendall Gott wrote in the preface of Breaking the Mold: Tanks in Cities in 2006, "I witnessed firsthand the US Army's doctrine and attitude for using armor in the city – it just wasn't to be done".[7] Yet, in every war from World War II to the ongoing conflicts in Ukraine and Gaza, tanks are being employed in cities. Lessons being learned from the ongoing conflicts will shape combined arms actions, but to illustrate the importance we will focus on conflicts which have already been well studied and documented.

In the Second Battle of Fallujah in 2004, armor-infantry teaming was critical to the success of the battle. Throughout November 10,000 Americans and 2,000 allied Iraqi forces fought approximately 3,000 insurgents in prepared defenses.[8] The Coalition plan was for armored spearheads to penetrate deep into the center of the city, with infantry moving to secure bypassed buildings and routes.[9]

As the assault of the city unfolded, armored vehicles acted both as the spearhead and as mobile, protected, firepower available to be called up from the rear. Lead vehicles provided cover to dismounted infantry and immediate firepower, while vehicles farther back would respond to destroy strongpoints as they were identified by dismounted elements.[10] Army Abrams and Bradleys operating in sections with dismount support mitigated traditional weaknesses of tanks in cities. The vehicles didn't blindly move into kill zones but had mutual support, and their firepower quickly suppressed and unhinged enemy lines. Meanwhile, the Marines, with fewer tanks, successfully demonstrated their role as assault guns. Marine Infantry would locate enemy strong points, then call the tanks forward.[11]

Looking further back from Fallujah, armor has consistently been used in urban terrain to mass firepower, defeat obstacles, and support infantry maneuver. The Battle for Hue City was one of a series of battles fought during the 1968 North Vietnamese Tet Offensive and highlighted both the advantages and limitations of armor in urban terrain. The signature feature of Hue is the city's thick stone walls which encircle the city center and the city moat which is tied into the Perfume River. During the Battle for Hue City, Marine Corps M48 Patton tanks and M50 Ontos self-propelled guns supported Marine Infantry in two slightly different ways. First, the M48s provided exceptional firepower and protection, allowing the Marines to follow behind the heavily armored tanks and rapidly reduce strong points. Second, the M50s provided comparable firepower but traded protection for mobility.[12]

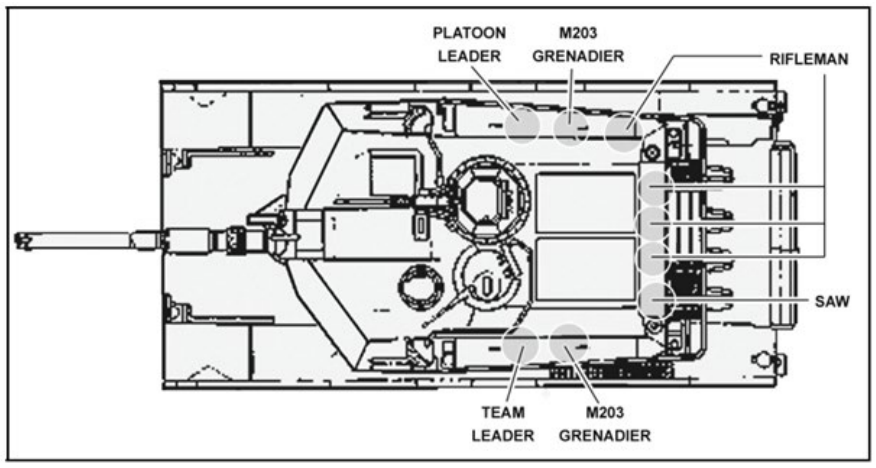


Figure 2. Example of detailed techniques in previous editions of doctrine that can be reintroduced, ATP 3-06.11, 2011. *(U.S. Army Graphic)*

The main limitation of armor in urban terrain is the problem of mobility. On the first day of the battle, Marine tankers in M48s found themselves unable to cross a final bridge into the city due to the bridge's weight classification. While the tanks would eventually cross into the city, at this early stage in the fight the tankers were only able to provide supporting fires to Marine Infantrymen who crossed the bridge and established a foothold on the far side. As the Marines pressed forward, they did so without armor support.[13]

As the battle progressed, Marine armor successfully made it into the city and was used in a variety of ways to enable the maneuver of the Marine infantry units. By the second week of fighting, Marines in the city began to fully recognize the potential of using the M48s and M50s in concert to reduce enemy strongpoints. An M48 would move out in front of the infantry with an M50 close behind. As the M48 drew fire infantry on the ground would relay the targets to the M50 crew which would then use its superior mobility to move in front of the tanks, reduce the enemy position, or create breaches in walls.[14] The use of the M48 and M50 in concert also highlights the reality that not all armor is created equal. An especially salient point as we consider the inclusion of the M10 Booker alongside the M1 Abrams and M2 Bradley.

Proposed Solutions

To educate leaders on urban operations, Armor branch needs to renew its focus on urban operations planning in all of Armor branch's programs of instruction. Cities are vital hubs of political power, commerce, and popular will, which means Armies will be forced to fight in cities whether they intend to or not. Put simply, we need to plan for combat in cities.

The first change is to commit to lead our doctrine on combined arms urban operations. As the Army continues to expand on urban doctrine, it should provide greater detail on techniques and procedures to integrate armored vehicles into the urban environment. Doctrine gives commanders and staffs robust, adaptable principles which can be understood and refined. As ATP 3-06.11 and ATP 3-06 describe infantry and engineer best practices, future publications should give Soldiers best practices for vehicle integration.

Figure 3. M2 Bradley overwatches a street while infantry clear adjacent buildings during the seizure of the training village of Unen, National Training Center. *(Photo by Christopher Jordan)*

As urban doctrine is refined from the BCT level to the battalions and below, it should provide tools to plan and execute operations by not shying away from detail. Items to be added need to include specific capabilities and limitations of main gun rounds, machine gun employment, vehicle dead space, dismounts maneuvering with or on vehicles, and tank infantry phone (TIP) use. In particular, the on-going development of armor specific Training Circulars (TCs), specifically TC 3-20.31 Training and Qualification, Crew, can then provide tables and training scenarios not dissimilar to tools like Appendix H in TC 3-20.40 Rifle Marksmanship provides dismounted commanders with specific urban engagements to include in a training plan. At end state, doctrine should be refined, giving the tools and resources for any staff, regardless of background, to integrate armored vehicles into their operations. Its specifics and items must encompass the M1 Abrams, M2 Bradley, and M10 Booker platforms as distinct platforms with special emphasis on how differences between the M1 Abrams and M10 Booker in particular will affect their employment.

The development of focused combined arms urban operation planning in doctrine will enable urban operations to be included as a discrete block of instruction added to Armor courses. At a minimum, courses which produce platoon level and higher leaders or planners (i.e. Armor Basic Officer Leader Course, Cavalry Leader Course) need an urban module. The urban module should culminate in a planning exercise, a tactical decision exercise (TDE), or a simulated mission such as a tactical exercise without troops (TEWT). These urban modules should incorporate the lessons learned from two decades of counter insurgency operations (COIN) with the realities expected in a LSCO fight. By integrating urban planning into these courses, we establish early and often that cities aren't something that can be "hand-waved" or wished away to other members of the combined arms team.

An urban module would have another, ancillary benefit. The urban module would reinforce the fundamentals of combined-arms operations and the complementary nature of the combined arms team. This would enhance the understanding of combined arms doctrine through practice rather than simply listing the advantages and disadvantages each formation brings to the fight. By including an urban block, we would inculcate an appreciation for branch integration and lessen the effect of branch parochialism.

Increasing the Armor force's exposure to urban operations through professional military education (PME) naturally allows for the expansion and inclusion of urban operations training as a part of unit training cycles. Exposure in PME should further be reinforced by adapting the existing section gunnery tables to include section certification of a vehicle and squad, not just two vehicles. Given the time constraints in unit training cycles, the logical solution is to re-define section certification as either two vehicles, or a vehicle and a squad.

Again, given the limitation of time not all combined arms battalions need to place the same emphasis on urban operations. A CAB(A) designated as the Brigade breach element might have less focus on the urban fight, due to their mission alignment and modified table of organization and equipment (MTOE). However, the CAB(I) is a natural place where urban operations should be included early and often during a training progression. Situational Training Exercises (STX) that incorporate mounted-dismounted teaming in built up areas would build combined-arms teams from the ground up. The time a CAB(A) spends training the combined arms breach is time a CAB(I) can spend training combined arms urban operations.

For CAB(I)s or other units that expect to operate in complex terrain, integration should start at the team and squad level. As dismounts train to enter and clear rooms or operate within an urban training area, the mounted force needs to plan to support the dismounted force. Simply tasking the vehicles to "maintain an outer cordon" does not develop leaders for the complexity inherent to urban operations. On the mounted side of the equation, sections and platoons should train and rehearse operating in the built-up areas, directly communicating with and supporting dismounted operations, and vice versa.

Mounted dismounted integration should progress concurrent with an organization's training progression. As the unit builds through platoon and company operations, these echelons should incorporate an urban component. At the platoon level, Task-organized platoons can train to attack and

defend an urban area. As companies train, company teams attack and defend more complicated and dug-in urban terrain. TDEs and TEWTs are incorporated between training events to provide leaders additional exposure to different types of urban complexes. Ultimately, tactics, techniques, and procedures (TTP) are tested, refined, and perfected, and leaders gain familiarity working with others. Bottom line, if an armored brigade combat team (ABCT) plans to send the CAB(I) to clear complex terrain, the first time a tank commander/vehicle commander (TC/VC) encounters the realities of complex terrain should not be the streets of Razish, or the alleyways of a city down range.

The final major adaptation is cultural. The Army, and the expected battlefield on which we will fight are evolving. We must adjust with those changes. With the continued changes mandated by Army Structure (ARSTRUC), armor expertise is concentrating. Combined with the task organization changes resulting from the creation of the 19C military occupational specialty (MOS), there is a temptation to "double-down" and focus on large maneuvers in more open areas, while the rifle platoons focus on the urban problems. Deliberately inculcating a combined arms mentality will enable us to win. Armored fighting vehicles (AFV) have weaknesses. The war in Ukraine is full of examples of armored vehicles' vulnerabilities. However, evolving technology in sensors and protection are mitigating traditional weaknesses of AFVs. Moreover, weakness does not equal obsolescence, nor does it mean there is no utility. Alone, dismounts lack protection and suppression and can be defeated by dug-in small arms. Alone, AFVs can be surrounded and overwhelmed. As part of a trained, combined-arms team, AFVs provide unique capabilities to ensure success. Even if armor has weaknesses, they still provide mobile, protected firepower capable of enabling dismounted infantry as well as providing responsive, lethal effects to enemy strongpoints. Armor is worst used in complex terrain (specifically urban terrain), when it is committed alone, manned by the untrained, and tasked ambiguously.

Figure 4. A M2 Bradley section maneuver into an urban training to deploy dismounted infantry onto the objective. *(Photo by Joshua Johnstone)*

Conclusion

As the Army and the Armor force continually prepare for the next fight, the best time to incorporate the lessons of the past into preparation for the future is the present. The Armor branch has seen a variety of changes in the last decade from the inclusion of a tank company in the ABCT Cavalry Squadron to the recent adoption of the M10 Booker. An urban module in PME builds a baseline knowledge in the force. Updated and refined doctrine provides commanders and staff with the tools necessary to develop TTPs and create robust plans. A training progression that deliberately includes urban operations provides refinement, real-world lessons, and creates an expert force. As the Army continues to transition in contact, Armor Branch has an opportunity. We can revitalize our education, training, and culture on urban operations, enabling combined-arms teams that will fight on the battlefields of today and tomorrow. If we do these things, then we will enable our Soldiers to win, regardless of the location.

CPT Joshua Johnstone is currently assigned as the Major General James Wright Scholar, Raymond A. Mason School of Business at the College of William and Mary. His previous assignments include Commander, Headquarters and Headquarters Company (HHC), 1st Battalion, 8th Infantry Regiment, 3rd Armored Brigade Combat Team, 4th Infantry Division, commander, A Company, 1st Battalion, 68th Armor Regiment, 3rd ABCT, 4th ID, Battalion Maintenance Officer, 1st Battalion, 8th Infantry Regiment, 3rd ABCT, 4th ID, Company Executive Officer (XO), B Company, 2nd Brigade, 7th Infantry Regiment, 1st ABCT, 3rd ID, and Tank

"I am a Soldier, I fight where I am told, and I win where I fight."

GEN George S. Patton Jr.

Platoon Leader, D Troop, 5th Squadron, 7th Cavalry Regiment, 1st ABCT, 3rd ID. CPT Johnstone's military schools include the Cavalry Leader's Course, Maneuver Captain's Career Course, Army Reconnaissance Course (now the Scout Leader Course), Armor Basic Officer Leader Course and Airborne School. He has a bachelor's of science in international history and foreign areas studies from the United States Military Academy.

CPT Christopher Jordan is currently assigned as an instructor, Cavalry Leaders Course, P Troop, 3rd Squadron, 16th Cavalry Regiment, 316th Cavalry Brigade. His previous assignments include Commander, Regimental Headquarters and Headquarters Troop (HHT), 11th Armored Cavalry Regiment (ACR), Commander D Company, 1st Squadron, 11th ACR, scout observer coach/trainer, Tarantula Team, Operations Group, NTC, Executive Officer (XO), C Company, 1st Battalion, 8th Infantry Regiment, 3rd Armored Brigade Combat Team (ABCT), 4th Infantry Division, and mortar platoon leader, Headquarters and Headquarters Company (HHC), 1st Battalion, 8th Infantry Regiment, 3rd ABCT, 4th ID. His military schools include the Cavalry Leader's course, Joint Firepower Course, Maneuver Captain's Career Course, Infantry Mortar Leaders Course, Armor Reconnaissance Course, Armor Basic Officer Leader Course, and Airborne School. He has a bachelor's of science in defense and strategic studies and Portuguese from the United States Military Academy.

Notes

[1]Dr. Robert Cameron, "Armored Operations in Urban Environments: Anomaly or Natural Condition?," ARMOR, May-June 2006, pp. 7-12.

[2]Army Technique Publication (ATP) 3-06, Urban Operations, U.S. Government Printing Office, Washington, D.C., 21 July 2022. Army Technique Publication (ATP) 3-06.11, Brigade Combat Team Urban Operations, U.S. Government Printing Office, Washington, D.C., 27 July 2024, Paragraph 4-123.

[3]ATP 3-06.11, Paragraph 4-62 and 4-63.

[4]Ibid., 3-61

[5]Ibid., 4-22.

[6]Army Tactics, Techniques, and Procedures (ATTP) 3-06.11, Combined Arms Operations in Urban Terrain, U.S. Government Printing Office, Washington, D.C., 10 June 2011.

[7]Kendall D. Gott, "Breaking the Mold: Tanks in Cities," Combat Studies Institute, Fort Leavenworth, 2006, pg v.

[8]Ibid., 95-98.

[9]Ibid., 97.

[10]Ibid., 99-101.

[11]Ibid, 105-106.

[12]John Spencer and Jayson Geroux, "Case Study #3 – Hue," Modern War Institute at West Point, November 4, 2021. https://mwi.westpoint.edu/urban-warfare-project-case-study-3-battle-of-hue/.

[13]Mark Bowden, Hue 1968, Atlantic Monthly Press, New York, 2017, 321.

Figure 5. U.S. Army Soldiers assigned to Troop G, 2nd Squadron, 278th Armored Cavalry Regiment, Task Force Reaper fire a M1A2 Abrams tank within the U.S. Central Command's area of responsibility during the Friendship 25 exercise, Feb. 12, 2025. Exercises like Friendship 25 develop U.S. and Royal Saudi Land Forces service members and enable increased military capacity to address threats to regional security. *(U.S. Army Photo by Maj. Matthew Madden)*

Driving Efficiency at the Battalion Level

by LTC Michael D. Hebert and MAJ Andrew T. Kilcer

Army leaders have a duty and vested interest in running their organizations efficiently. This article is a compilation of various techniques to drive efficiency within a battalion, organized along Lean's 8 Wastes categories. Regularly used in manufacturing and office environments, Lean's 8 Wastes categorize ineffective use of resources and can be used by Army leaders looking to maximize the output of their units. Leaders can then reinvest the rewards in benefits across their people, training and equipment.

Defects

Quality Control. Commanders must determine who is validating the work performed within their organization accounting for incentive structures. An individual validating his own work presents an incentive structure that may produce defects. The leader managing the troops to task should also be inspecting the work, particularly for maintenance teams. Battalions should require their platoon leaders to validate the faults listed on the platoon's equipment maintenance and inspection worksheet (5988-E), ensuring the quality of crew preventive maintenance checks and services (PMCS) and educating the platoon leaders on the technical aspect of their equipment. Ideally all work performed, even at the individual level, will have an external evaluator. A battalion can designate subject matter experts to host training or quality assurance/quality control (QA/QC) for the entire battalion to improve quality. Units must design quality checks to capture the actual status of the system being tested, i.e. a mission command system may turn on but not able to communicate to the network.

Figure 1. Lean's 8 Wastes as defined by authors *(U.S. Army Graphic)*

Manuals, Publications, and Diagrams. Work instruction documents within units must have both breadth and depth throughout the formation as their use reduces costly errors. Ensuring instruction documents are in the right place at the right time requires efforts from the publications manager, usually the S1, Maintenance Support Device (MSD) manager, often the S6, and individual staff members. Physical libraries should be located within each company, particularly for training materials. Units should anticipate ordering new rolling stock manuals each fiscal year to account for updates and document degradation. Public releasable manuals should be distributed as widely as possible via electronic means, often by company executive officers (XOs). The MSD manager should include the MSD status in the Battalion's communication situation report (COMSTAT). Individual staff members should design diagrams and flow charts for tasks. Large printing can be completed via the brigade's geospatial intelligence (GEOINT) section or installation print shop. A battalion's motor pool should have diagrams depicting vehicle dispatching, parts accountability, oil disposal, and other common tasks. Companies should have soldier skill level 10 tasks publicly depicted, sourced through installation Training Aid Support Centers (TASCs) or unit generated.

Overproduction

Products for One. Commanders need to push their staff to produce products that drive action, tell the staff what you want. Products intended only for a commander, often tied to decision making or informing, waste time if these products can't be directly issued to subordinates. Commanders and

staff should become practiced in examining options based on bed rock products i.e. Long-Range Training Calendars, Common Operating Picture, and Mission Command Systems. Ideally battalion products should be "pocketable" one sheet of paper front and back, one swipe of the phone. Getting draft products to a commander for feedback early and often via battle rhythm events can save hours of time. Commanders are ultimately responsible for what their unit's output and should focus their staff's efforts accordingly.

Waiting

Time on Tasks. Commanders and planners should maximize the amount of time Soldiers spend on value adding task(s) compared to the total time invested into an event. Waiting in the military can be broken down into the following categories: waiting for a process to start, waiting your turn, waiting on movement to another task. Nowhere is this more manifested than range day for a unit, usually spans an entire workday, and only produces about 20-40 minutes of trigger time per individual. Units need to identify the bottlenecks in their activities and then optimize those bottlenecks until they reach a point beyond their control i.e. the physical space at a range. Training timetables, continuous transportation, alternative training events, and consolidation of training events all can be employed to reduced waiting time. Commanders can drive efficiency through their battle rhythm events. Production control meetings and operation sync meetings should specifically address management of limited recourses and bottlenecks.

Non-Utilized Talent

Schooling to Master Level. Commands must task to fill master level producing school regardless of individual hesitancy or operational demands. Schools such as master gunner, master drive, master fitness, and master marksmen instructor should always be filled. Units should prioritize individuals with a propensity to pass and retainability, not seniority. Individuals in a skill identifier coded position should be sent without option. Qualified individuals should be sent regardless of their general desires. Many individuals have anxiety over attending high visibility schools. Commands should prioritize and slot these individuals anyway; a set school date will reduce procrastination. Even individuals who fail will bring back knowledge that will generate improvements at the platoon or company level.

Qualifying Expiring Crews. Individuals scheduled to depart the unit during the qualification window, normally 270 days, should be removed from the firing line. Their participation as firing members in gunnery has a cooling effect on the subordinates that would advance to fill their space. Senior individuals scheduled to depart the unit should be utilized as trainers, quality control inspectors, and training support during the gunnery cycle. Evaluation reports should not penalize an individual for not being offered a chance of qualifying on a crew due to a permanent change of station (PCS) window. Company 1SGs and the Battalion CSM are critical to enforcing this through accurate management of troops to seat rosters. The battalion commander must validate crew rosters a minimum of quarterly and provide top cover to company leaders when their members are removed from the gunline.

Transportation

Combat Load Plans. Underloaded or improperly loaded combat platforms generate future unnecessary demand on combat trains. Most modern military vehicles can easily accommodate over a week of food and water for their occupants, especially once they are relieved of their full combat ammunition carrying requirements such as during a combat training center (CTC). Designers should examine the historical record for the load plans of the 2003 Iraq invasion. Units can build further efficiency by designating vehicles as specialty carriers for common parts and all vehicles should maximize their use of combat spares. Load plans should be enforced consistently to build habits and prevent loss. Securing components separate from vehicles encourages loss during movement, slows crew level maintenance, and risks those components being lost during mobility operations, especially if the sea lanes are contested. Keep your vehicles loaded as combat ready as possible including during motor pool and mobility operations, secondary loads are authorized for a reason.

Inventory

Excess Property. The Battalion S4 must drive property divestiture. Companies are busy and the nuances of specific individual property divestitures leads to avoidance. Non modified table of organization and equipment (MTOE) equipment not used on a deployment or during a complete training cycle should be divested. Centralizing divestitures within the S4 with a weekly battalion (BN) XO review during a logistics synchronization (LOGSYNC) meeting enables efficiency of efforts, setting of priorities and sharing of lessons learned. Every company commander should appoint an additional duty supply officer, who is not the executive officer. The supply officer should have two primary goals, forecasting equipment orders and supervising divestiture of excess. The Battalion S4 non-commissioned officer-in-charge (NCOIC) should conduct monthly low-density training with company unit supply specialists (92Ys) ensuring current Global Combat Support System-Army (GCSS-A) processes and administrative procedures are adhered too. The divestiture process should be continuous with dedicated clean sweeps incorporated into mobility operations, if you didn't take it on deployment, you probably don't need it.

Motion

Form Determines Function. Setting the office layout is critical in ensuring optimal administration. The Army's propensity to move around and operate in environments of various austerity can produce suboptimal working spaces. While each battalion is unique in terms of staff skill, members personalities,

mobility needs, and space available, benefits can be reaped via establishing an optimized workspace layout. Battalions should follow some common principles when considering their administration layout. War Fighting Functions should be established to collaborate internally and externally, preventing information "stovepipes". Doctrinally the staff is consolidated into the Main Command Post (CP) and a smaller Tactical Command Post (TAC).[1] A physically consolidated battalion main CP is not always practical, in these cases an operations and sustainment split with information link(s) is a possible arrangement. Regardless of the layout, junior soldiers should be within direct observation of a leader, accommodations similar among grades, and considerations should be made for extreme introverts or extroverts.

Extra Processing

Workflow Management. Tasks should be operationalized into formats that enable rapid action, feedback, and enables the commander to make decisions. The traditional orders process via word processer files is manpower intensive. Subordinate feedback should be a semi-automated process via voice, email, or shared file arrangement. The contracted Microsoft suite of tools provides several options for automating workflow management such as SharePoint Excel, Planner, or Lists. These tools, integrated into Microsoft (MS) Teams allow for the assigning of tasks to individuals and provides a centralized area for feedback. Units should use a centralized task tracker and subsequent trackers for detailed tasks such as command inspections. A simple MS Teams excel document enables multiple users to collaborate, while replacing or supplementing written orders.

Material Situation (MATSIT). Units should invest the upfront and quarterly inventory time to ensure their GCSS MATSIT is accurate for class II and class IX items. Accurate MATSITs save processing time by automatically ordering when stock falls below set levels. It provides hard data during consumption projections. The battalion maintenance officer and maintenance tech should have the responsibility to ensure quarterly updates are made to the class IX MATSIT. The Battalion S4 officer-in-charge (OIC) or NCOIC should supervise each supply room's class II MATSIT. Further efficiencies can be gained by designative subordinate units as key items holders, such as the Forward Support Companies (FSCs) stocking paint supplies and subsequently consolidating the storage requirements.

Conclusion

The combined arms battalion exists "to close with and destroy enemy forces using fire, maneuver, and shock effect or to repel their assault by fire and counterattack".[2] Commanders must create effective and efficient units if they are to accomplish this purpose. Applying a detailed analysis to generate specific efficiencies within a unit will raise that organizations overall effectiveness. Commanders must optimize workflows, eliminate bottlenecks and maximize the use of resources. Efficiently run units instill pride in its members, and its savings can be reinvesting into increasing lethality.

LTC Michael D. Hebert is a U.S. Army Armor Officer currently serving as the Commander of 1-68 AR, 3rd Armored Brigade Combat Team (ABCT), 4th Infantry Division (ID). He has previously served in Light, Stryker, and Heavy Calvary Formation, including deployments to Iraq, Afghanistan, Republic of Korea, and Poland. LTC Hebert's military schools include U.S. Naval War College, Newport, RI; Ranger, Pathfinder, Airborne, and Calvary Leaders Course. He has a bachelor of arts from Louisiana State University, Baton Rouge, LA; and masters of arts from the U.S. Naval War College, Newport, RI.

MAJ Andrew T. Kilcer is a U.S. Army Armor Officer currently serving as the Battalion executive officer for 1-68 Armor, 3rd Armored Brigade Combat Team, 4th Infantry Division. He has previously served in Stryker and Tank formations, including deployments to Afghanistan, Republic of Korea, and Poland. MAJ Kilcer's military schools include Command and General Staff College, Fort Leavenworth, KS; Maneuver Captains Carrer Course, Fort Benning, GA; Basic Officer Leader Course, Fort Knox, KY; Ranger and Calvary Leaders Course. He has a bachelor of science from Rochester Institute of Technology, Rochester, NY; and a masters of business administration from The Mason School of Business, College of William and Mary, Williamsburg VA.

Notes

[1] ATP 3-90.5 Combined Arms Battalion, July 2021, Pages 2-6 to 2-7

[2] ATP 3-90.5 Combined Arms Battalion, July 2021, Page 1-1

Training Management Systems to Sustain Readiness within a Band of Excellence

A 5th Squadron, 4th Cavalry Regiment "Long Knife" Trooper qualifying on their M240 at Fort Riley, Kansas. *(Photo by author)*

by LTC Gary M. Klein

A wise mentor told me that commanders are responsible for building and maintaining as much readiness as they can with the resources available to them at that time. Similarly, the 1st Infantry Division and 2nd Armor Brigade Combat Team (ABCT) "Dagger Brigade" commanders charge their leaders to train and prepare their organizations to execute within a band of excellence.[1] Some leaders might reference the fact that the Army no longer uses the Sustainable Readiness Model (SRM), but this change did not absolve commanders from having to maximize their unit's readiness at any given time.[2] There are certainly challenges to sustaining readiness – the first and foremost being the Army's manning cycles – but leaders must achieve their readiness objectives regardless. This paper presents some common observations, challenges, and training management systems that the 5th Squadron, 4th Cavalry Regiment and Dagger Brigade leaders are employing to sustain unit readiness within a band of excellence.

Observations and Challenges to Sustaining Readiness

When it comes to sustaining readiness over time, leaders face numerous challenges, some of which are inadvertently self-imposed. A non-exhaustive list of challenges includes the Army's manning systems; the need to balance personnel, supply, maintenance, and training readiness requirements; misunderstanding or misapplying priorities; and maintaining systems that survive changes in leadership. Some of these challenges are universal and some are unique to specific circumstances, but Army leaders will likely face all of them at some point in time.

The Army's current manning systems cause most Soldiers to move every three years, which means that roughly a third of a unit's Soldiers turn-over every year.[3] Without stabilization levers,

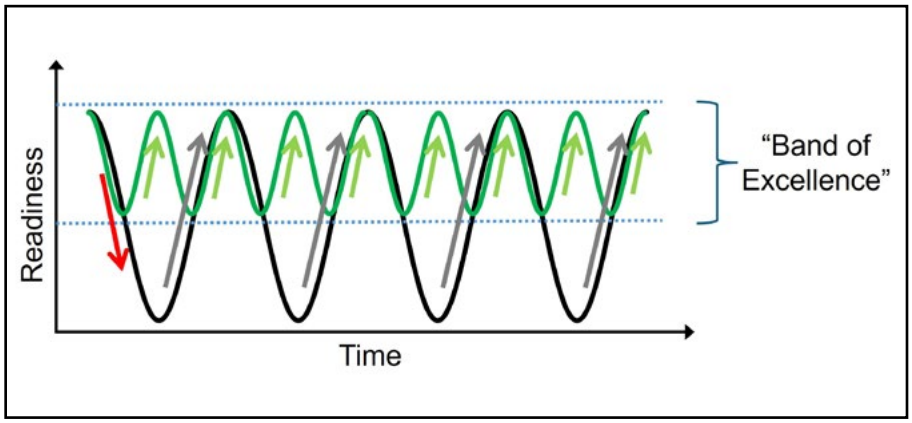


Figure 1: Unit Readiness Over Time and Bands of Excellence. Personnel turn over and other factors lead to a natural degradation of unit readiness over time (red arrow). A unit that conducts qualifying training events more frequently (light green arrows) will be more successful maintaining readiness within a "band of excellence" (green line), whereas those who conduct larger, less frequent training events (grey arrows) will see larger peaks and troughs in their readiness (black line). *(U.S. Army Graphic)*

personnel turn-over causes a natural degradation of unit readiness over time (Figure 1, Red Arrow). For a company/battery/troop (C/B/T)-sized unit, this means that every month two to four Soldiers arrive and depart. When viewed through the lens of qualifications, this means that a C/B/T may lose between 5-10% of its qualifications readiness in a quarter, and sometimes more for low density qualifications. If the goal is sustaining readiness, this means that leaders must seek consistent ways to build unit readiness.

A second challenge is that leaders have a natural tendency to focus on training first – indicative by the fact that most units call their calendars training calendars. However, leaders and Soldiers must spend a significant amount of time on personnel, supply, equipment readiness, and training (PSRT) activities. Some C/B/T commanders fall into the trap of failing to account for all PSRT activities in their training calendars, which causes them to react to supply and maintenance activities and adjust their plans on short notice. To avoid this, commanders must anticipate and add as many PSRT activities as possible (e.g. personnel on-boarding, counselling, property inventories, lateral transfers, scheduled maintenance, and other activities) to their training calendars.[4] It is nearly impossible to avoid all short notice changes, but leaders should seek to minimize the frequency of short notice changes and the associated lost time and effort, which hurt overall readiness.

A third challenge arises from the unintended second order effects of priorities. Leaders are wise to issue priorities to provide guidance and enable their subordinates' time management decisions. Unfortunately, some leaders or Soldiers take these priorities a little too far, unnecessarily halting other routine activities that should be completed by trained and proficient junior leaders. At the C/B/T-level and above, commanders usually have three or more subordinate elements and eighty or more Soldiers. Although it would be nice to have one priority for the entirety of a unit, commanders and leaders must train subordinate leaders so that the organization is capable and comfortable achieving multiple priorities at once. An individual Soldier may have one priority at a given time, but as leaders account for all their Soldiers and hours throughout the day, leaders must be capable of providing guidance and direction to their units such that they can accomplish several priorities.

The final challenge for consideration here is the development and maintenance of organizational systems that survive leader turn-over and mission requirements over time. Leaders are aware of the benefits of standard operating procedures (SOP); they are a common check in staff assisted visits, organizational inspection program, combat training center (CTC) rotations, etc. However, leaders must take the time to read their SOPs, use and refer to them, update them as conditions change, and develop knowledge management systems to ensure others can find them. One way to do this is to ensure SOPs are linked to battle rhythm events so that they are constantly reviewed and refined as conditions change. Additionally, tactical SOPs (TACSOPs) should be reviewed prior to and after training events in the form of leader professional development sessions and after-action reviews accordingly. A top-notch unit will know and use their SOPs to pass along knowledge, help them achieve routine things routinely, and perform within a band of excellence.

A Training Management System to Sustain Battalion Small-Arms Training Readiness

Building and sustaining readiness is not easy, so how can battalion-level leaders enable their C/B/Ts to accomplish this task? Using individual weapons qualifications as a specific example, how can battalions resource their companies to enable sustained readiness? If resources are abundant, it is easy to tell C/B/T commanders to reserve small arms ranges at least once a quarter for their Soldiers to qualify on their individual weapons. However, what happens when resources are scarce? How might leaders treat headquarters and support C/B/Ts differently? How can leaders maximize efficiency with small-arms qualifications across a battalion?

One successful model is for battalions to plan and execute "company-run, battalion small-arms ranges." This model is planned by having battalion-level land and ammunition managers reserve M4, M17, and machine gun ranges in the range facilities management support system (RFMSS) and an appropriate amount of ammunition in the total ammunition management information system (TAMIS) monthly. This achieves three things. By making it a battalion priority, the battalion can synchronize small arms ranges with the other training events they are planning at their level. Secondly, by making it a battalion-level battle rhythm, battalion commanders can exert their influence to receive those resources. Finally, by freeing up C/B/T-level leaders from longer-range resource planning, C/B/T-level leaders can focus more on conducting the 8-step training model to standard. Collectively, these benefits enable leaders at echelon to achieve routine things routinely.[5]

Within the 5th Squadron, 4th Cavalry Regiment (5-4 CAV), the land and ammunition team request the resources to qualify 100 M4 firers, 50 M17 firers, and 35 machine gun crews every month.[6] This requires one or two range days every month. Understandably, the training calendar fills up some months, especially around activities like crew gunnery and collective situational or live-fire training exercises, so the squadron does not request squadron small-arms ranges every month. However, by making it a battle rhythm request, the squadron creates a predictable system that enables it to smooth over the readiness dips and spikes that would occur otherwise.

Reserving the ammunition is relatively easy. The squadron requests ammunition in TAMIS 90 days out and then

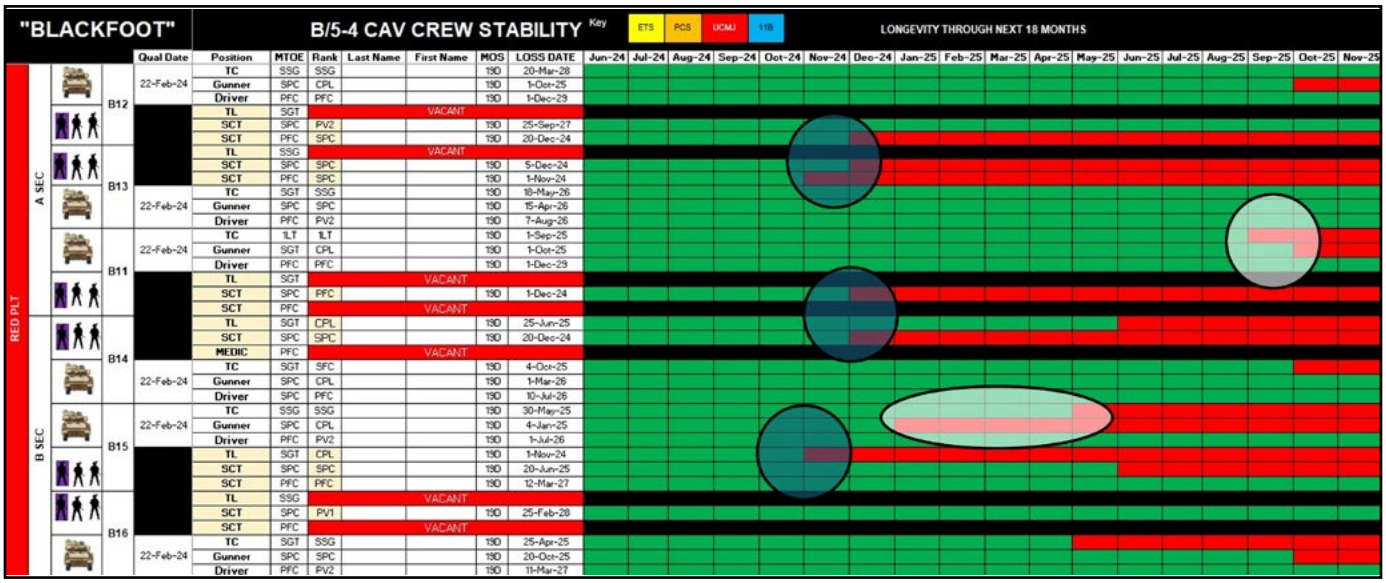


Figure 2: Example Crew Roster. To maximize the longevity of crew qualifications, commanders and first sergeants must maintain crew rosters that align TC and gunner PCS / ETS dates (white circles) and assign Soldiers with shorter times remaining on station to dismounted duty positions (blue circles). This maximizes crew readiness qualifications over time and minimizes the likelihood of having to re-qualify crews before required annual qualifications. *(U.S. Army Graphic)*

schedules to pick it up from the ammunition supply point (ASP), or roll the ammunition back into its account, depending on the time and range availability at land resource conferences.[7] Once the squadron reserves and synchronizes both the land and ammunition, it brings those two resources into the squadron training resource meeting to identify a troop responsible for running the range. Generally speaking, the line troop that needs to qualify the most firers volunteers to run the range, and then the assistant S3 and troop executive officers determine how many firers the other troops send to that range. The key is that all troops can qualify some firers every month.[8]

Within the "company-run, battalion small-arms range model," headquarters and headquarters companies (HHC) and forward support companies (FSC) rarely have to run small-arms ranges, but they generally send firers to the range every month. This enables those companies to send small portions of their Soldiers over time so that most of their Soldiers can focus on their routine activities in support of the line companies. This system decreases the number of HHC and FSC leaders required to run a range – they do not usually provide range officers-in-charge (OIC) , non-commissioned officers-in-charge (NCOIC), lane safeties, ammunition point details, etc. – but first line non-commissioned officers (NCO) must still accompany their Soldiers in sufficient quantity to lead and coach their Soldiers towards successful qualifications.

The "company-run, battalion small-arms range model" works well when seeking to sustain baseline small-arms qualification readiness, but what other training readiness requirements might leaders achieve through routine actions? The 2022 ***ARMOR*** article *"Operationalizing Command Maintenance to Train Organizational Systems and Build a Culture of Maintenance Readiness"* describes how units can train basic radio and command post proficiency during weekly command maintenance.[9] Additionally, the Dagger Brigade is developing a system to run monthly company-sized tank and Bradley crew gunneries.

A Proposed Training Model to Sustain Brigade Crew Gunnery Readiness

Training management at the brigade-level often focuses on large training events, but there are opportunities for brigades to contribute to routine training systems such as "battalion-run, company-sized, brigade-wide crew gunnery ranges." Gunnery ranges are usually managed at the brigade and higher-level because those resources are often scarce, requiring prioritization based on brigade-sized unit deployment schedules, etc. Accordingly, the Dagger Brigade is developing a system to run monthly crew gunnery ranges akin to the model 5-4 CAV and other battalions use to enable routine small-arms qualifications.

Building and maintaining vehicle crew qualifications is a top priority in any ABCT, but many units struggle to maintain crew qualifications over extended periods of time. Crews become unqualified when a vehicle commander (VC) or gunner executes orders for permanent changes of station (PCS) or expiration terms of service (ETS). Leaders do their best to mitigate this by building crew rosters that align anticipated VC and gunner PCS or ETS dates. For Soldiers with shorter times remaining on station, leaders often assign them to dismounted duty positions (Figure 2). Additionally, leaders can create turbulent crews by pairing VCs and gunners together who qualified in different crews within the last 12 months.[10] These activities mitigate against unqualified crews and the requirement to

"Priorities First Model"

Step 1: Provide priority unit(s) the resources they've requested.

Step 2: Provide resources to lower priority units in sequence based on the remaining resources.

"Baseline then Priorities Model"

Step 1: Determine how many units of resources are available for allocation.

Example: 17x training days x 4x ranges = 68 range training days available

November 2024						
SUN	MON	TUE	WED	THR	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Step 2: Determine how many "units of resources" units should receive to sustain a baseline level of readiness.

Example Allocation Rule: Each BN-sized formation should receive 1x M4 range per month.

Step 3: Provide brigades a baseline minimum of resources to sustain readiness.

Example: 23x BN-sized formations (in 5x BDEs) x 1x M4 range / month = 23x range training days allocated

Therefore, 45x range training days remain for allocation to units in priority sequence

Baseline Allocations For Sustained Readiness	BDE 1	BDE 2	BDE 3	BDE 4	BDE 5
	6x BNs	6x BNs	3x BNs	5x BNs	3x BNs
	6x Range Days	6x Range Days	3x Range Days	5x Range Days	3x Range Days

Step 4: Provide additional resources to the highest priority units then to lower priority units.

Figure 3: Training Resource Allocation Models. Range training days available after baseline allocations are allocated using the traditional "priorities first model." *(U.S. Army Graphic)*

start new crew qualifications from scratch. Unfortunately, leaders are not able to anticipate all orders and other emergent issues.

Running a monthly crew gunnery range should be of particular interest for any brigade interested in maintaining collective readiness, including brigades on a prepare to deploy order (PTDO) mission. The PTDO mission necessitates maximizing and maintaining vehicle crew qualifications, but units on this mission do not have the ability to use crew stabilization levers like you would leading up to a National Training Center rotation or for some operational deployments.[11] As such, leaders in the Dagger Brigade are implementing a system whereby each month a battalion – one of the three combined arms battalions or the cavalry squadron – runs a crew gunnery for all four of the battalions, the engineer companies, and the fire support teams to quality crews monthly. This system may not be feasible at all times, depending on the totality of the training and range requirements at an installation at the time, but the Dagger Brigade will begin employing this system in the spring and summer of 2025.

A Training Resource Allocation System to Enable Sustainable Battalion Small-Arms Training Readiness

Another area where brigade, higher, or installation resource managers can contribute to training readiness is their systems for allocating small-arms ranges. At the installation-level, leaders often allocate ranges using a strict prioritization model. However, a recommended model is to allocate a baseline minimum number of ranges to all battalion-sized units and then allocate the remaining resources to priority units. Higher-level leaders must develop a system that accounts for all available resources and then determine the best system to allocate those resources, balancing short-term priorities and the desire to maximize readiness for all units. Unfortunately, some resource managers may weigh priorities so heavily that their allocation systems provide excess resources to some units, while unnecessarily withholding resources from others.

A common observation is that leaders allocate range resources to priority brigades or battalions first – a "priority first model" – and then offer the remaining resources to units further down the list of priorities. A potential side effect of a "priorities first model" is that some battalions receive a lot

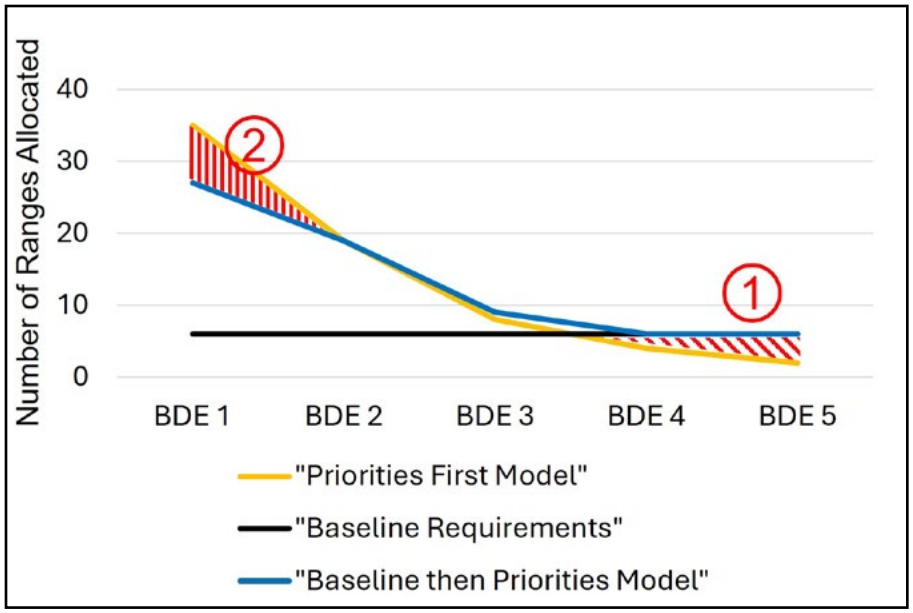


Figure 4: Comparing the Outcomes of Resource Allocation Models. *(U.S. Army Graphic)*

while others might not receive any ranges some months, which can lead to larger fluctuations in readiness levels over time (Figure 1, Black Line). An alternative model would be to allocate a baseline minimum number of ranges to each battalion-sized element first, and then allocate the remaining ranges to priority units – a "baseline then priorities model." There are likely times when installations must employ a "priorities first model," but a "baseline then priorities model" should be appealing to leaders seeking to sustain readiness and bands of excellence across a greater number of units.

The "baseline then priorities model" would look different at each installation, but Figure 3 explains the concept using an installation with four M4 ranges as an example. After accounting for training holidays and weekends, there are usually at least 17 training days on any given month. Therefore, an installation with four M4 ranges has at least 68 range training days available each month. If this installation has 23 battalions, and leaders establish a baseline allocation of one M4 qualification range per battalion per month, that means installation leaders have 45 additional range training days available for distribution after meeting baseline requirements.

If installation resource managers apply the "baseline then priorities model" to allocate resources it will help their units sustain readiness, but it still requires the artful application of allocation rules to account for range availability, subordinate unit requirements, and other variables. For instance, in some months, the number of ranges may be less, because of maintenance or conflicting range surface danger zones. In other months, some units will elect not to reserve any small-arms ranges because they are busy with other PSRT or deployment activities. However, by starting with a "baseline then priorities model," leaders can allocate resources in a manner that enables more units to sustain their readiness within a band of excellence with minimal cost to priority units (Figure 4). Like most activities, synchronization requires the skilled mixing of science and art, but brigade, division, and installation resource managers should use the "baseline then priorities model" as a starting point to allocate resources to sustain readiness better than the "priorities first model."

Conclusion

There is nothing revolutionary about "company-run, battalion small-arms ranges" or "baseline then priorities" training management systems, but they both represent ways in which higher headquarters can enable units to sustain readiness within bands of excellence. There are natural tendencies for higher-level headquarters to focus on larger and higher-echelon training events, but staffs have a critical role in routine resource allocation all the way down to small-arms weapons qualifications. Some training management systems default to priorities or "first come, first serve" allocation rules, but if sustaining readiness is the goal, those methods may hinder that goal by creating more significant ebbs and flows in readiness. Ultimately, the first principle to maintain readiness within bands of excellence is to commit to doing routine things routinely, which requires systems and processes that empower all leaders and allocate and synchronize resources – including time – across personnel, supply, maintenance, and training activities.

LTC Gary Klein is currently serving as the Commander, 5th Squadron, 4th Cavalry Regiment, 2nd Armor Brigade Combat Team, 1st Infantry Division. His previous assignments include Assistant Executive Officer (XO), Deputy Chief of Staff G-3/5/7, HQDA, Brigade XO, 2nd ABCT, 1AD, Fort Bliss, TX, Squadron XO and Operations Officer, 1st Brigade, 1st Cavalry Division, Commander, B Troop and Headquarters, Headquarters Troop, 1st Squadron, 33rd Cavalry Regiment, and Tank Platoon Leader and Tank Company XO, D company, 1st Squadron, 5th Cavalry Squadron. LTC Klein's military schooling includes the Advanced Military Studies Program and Command and General Staff Officer Course, the Maneuver Captains Career Course, the Armor Officer Leadership Course, the Ranger Course, Airborne, and Air Assault. He has a master's of art in military operations from the School of Advanced Military Studies, a master's of science in medicinal chemistry from the University of Illinois-Chicago, and a bachelor's of science in biochemistry from the University of Michigan.

Notes

[1] Sustaining unit proficiency within a band of excellence is described in Headquarters

Department of the Army, Army Doctrine Publication (ADP) 7-0, Training (April 2024), pg.10-11 and Headquarters Department of the Army, Field Manual (FM) 7-0, Training (June 2021), pg.1-3.

[2] The Army likely changed its unit life-cycle management model from Sustainable Readiness to the Regionally Aligned Readiness and Modernization Model (ReARM) in 2020 to increase emphasis on modernization and regional alignment. This change appears to have been at least partially in response to the 2018 National Defense Strategy. See Government Accountability Office, "Army Modernization: Actions Needed to Support Fielding New Equipment," (July 2024): pg.1 and Devon Suits, "ReARMM to help stabilize training, modernization, mission requirements," Army Times, (October 20, 2020): accessed November 8, 2024, https://www.army.mil/article/240100/rearmm_to_help_stabilize_training_modernization_mission_requirements

[3] Karen Jowers, "Army secretary: Is it time to cut back on military moves?" Defense News (October 17, 2024): accessed November 10, 2024, https://www.defensenews.com/land/2024/10/17/army-secretary-is-it-time-to-cut-back-on-military-moves/.

[4] See Headquarters Department of the Army, FM 7-0, Training (June 2021), Figure 3-2 for an example training schedule.

[5] Some might argue that centralizing the planning of small-arms ranges removes an opportunity for C/B/T-level leaders to learn training management, but there are other opportunities to learn training management and the trade-off may be worth it depending on the supply and demand for small-arms ranges.

[6] The author has first-hand knowledge that the 1st Squadron, 1st Cavalry Regiment successfully executing "company-run, battalion small-arms ranges" from 2019-2021 and knows other battalions doing the same thing.

[7] TAMIS standardizes ammunition requests across the Army, but installations lock unit land reservations into RFMSS using different time horizons. At Fort Riley, land is penciled into a draft reservation schedule approximately 75 days out and it is locked into RFMSS approximately 45 days out, which means units must reserve ammunition prior to knowing what land and ranges they will receive.

[8] Installations can enable small-arms training readiness by running installation-level open small-arms ranges with civilian employees or borrowed military manpower as well. The author used such a range at Fort Cavazos back in 2008-2011 and other installations do this too.

[9] Gary M. Klein, "Operationalizing Command Maintenance to Train Organizational Systems and Build a Culture of Maintenance Readiness," ARMOR (Summer 2022): pg.19-24.

[10] Headquarters Department of the Army, Army Techniques Publication (ATP) 3-20.0 Integrated Weapons Training Strategy (IWTS) (June 2019): pg.7-13.

[11]The most common stabilization levers that commanders can request to use through the Human Resources Command are crew stabilization, career developmental, master gunner, and ranger graduate.

The New Pentomic?

by Jonathan Moore

Evidence of modern high-intensive combat in Ukraine highlights the difficulties on the modern battlefield of concentrating enough forces to achieve decisive success at the tactical and operational level. The ubiquitous nature of drone technology makes it increasingly difficult not to be rapidly identified and face effective and timely depth fire of increasing accuracy and flexibility. Along with cheaper satellite and electronic intelligence technology, as well as the rich information environment created by social media, these sources have created for the first time in military history an almost transparent battlefield for both sides.

The result has been seen most evidently in Ukraine where the ability to manoeuvre any above company sized formation on the battlefield has led to such units being rapidly identified and met with devastating fire. This was highlighted in the Ukrainian summer counter-offensive of 2023. Or more correctly, what transpired to be a series of unconnected and uncoordinated counter attacks that disintegrated into squad or platoon sized advances from treeline to treeline or from hamlet to hamlet, where obstacle crossing became difficult in the extreme and increasingly time consuming. In such conditions a decisive operational scale breakthrough was impossible. The conflict rapidly turned into an attritional battle within fixed defences. A grinding struggle which will go to the side with the greater depth of resources both in material and manpower.

The difficulty of exploitation has been compounded by the need for forces once they have broken into the enemy position to dig-in and seek cover to avoid being identified and struck by the inevitable response from artillery, first person view (FPV) and tactical drones. It means that any breakthrough has difficulty in maintaining impetus unless reserves are immediately on hand. The premium on defence becomes one of dogged resistance in fixed positions as a means of slowing any attack, reducing one's own vulnerability, whilst mobility, the characteristic of warfare that has so sought after this last 150 years, brings greater risk of being located and struck.

This vulnerability will apply to any element of armed force that requires fixed infrastructure. For example, airpower will be increasingly vulnerable to precision strike weapons launched from hundreds of kilometres away, whilst sea power will be pushed further away from the coast and where naval bases will be vulnerable to the same deep strike as airpower to missiles. Greater resources will have to be dedicated to resilience and protection through the deployment of missile defences, pre-emptive strikes in depth and again constant dispersion of assets.

So, is there a solution to the need to reintroduce decision on the modern battlefield if an attritional struggle is to be avoided?

A Blast From The Past

Perhaps the problems faced by armed

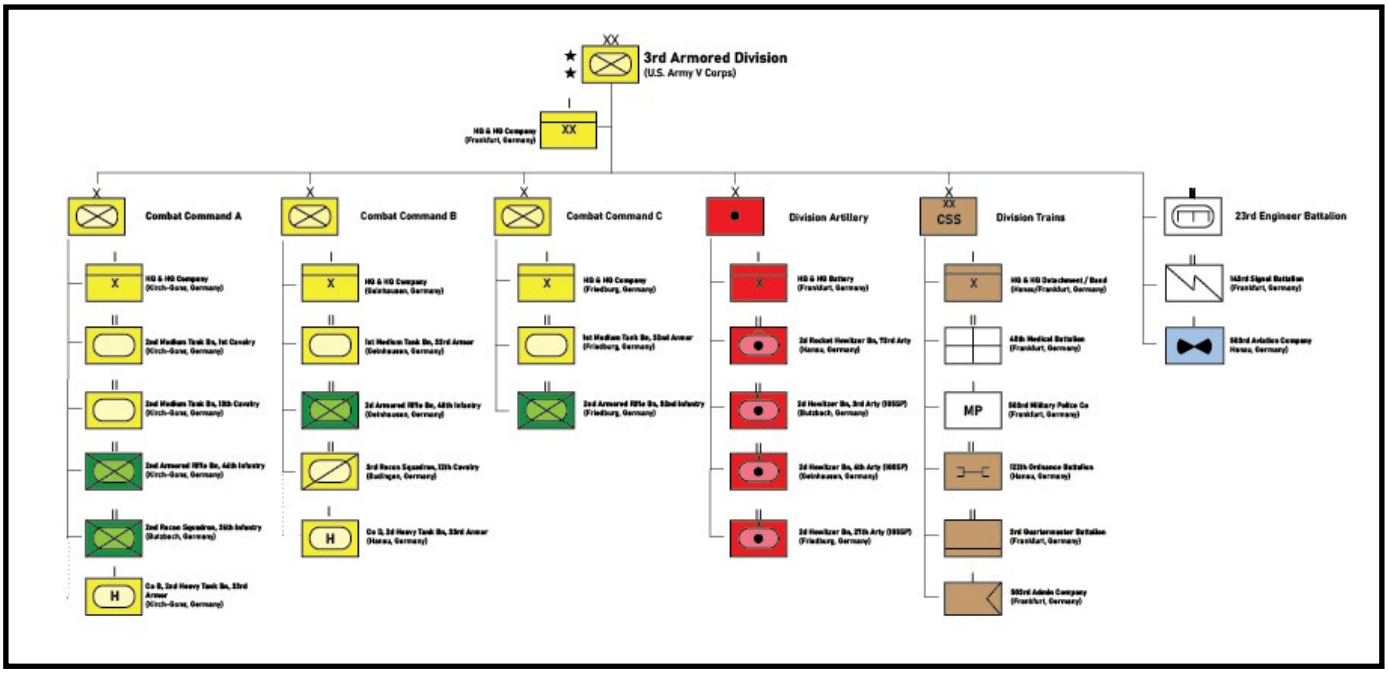


Figure 1. 3rd Armored Division Pentomic Organizational Structure *(U.S. Army Graphic)*

forces in the past may provide some pointers. In the 1950s the US Army was faced with a problem of operating large formations for effect and to achieve decision on what was perceived to be a nuclear battlefield. The existing divisional structure of regiments and brigades made the manoeuvre formations vulnerable to a tactical nuclear strike, especially so if the division was massing to achieve a breakthrough. The aim was to balance survivability created by increased dispersion with the ability to bring enough mass and firepower at the critical point to achieve a breakthrough and then to be able to exploit to decisive depth.[1]

The solution as it was perceived was the creation of the Pentomic division built around five combat teams (hence the 'pent'); formed on the core of around 4-5 infantry companies with support from armour, artillery, and engineers as required. In modern parlance a reduced regimental or reinforced battalion combat team. The key point was that the battalion command would no longer exist as the main manoeuvre unit and the traditional "triangular" divisional structure would disappear. Depth fire would be provided by divisional long-range artillery including nuclear tipped rocket artillery. It was felt that under nuclear strike conditions enough combat capability would be retained and be mobile enough (it was envisaged that infantry would be mounted on armoured personnel carriers (APCs)) to achieve decisive mass at key points and be able to exploit. There was an assumption that once a breakthrough had been achieved then the threat from enemy nuclear firepower would recede as the defender would be striking behind their own lines.

The experiment did not last long as the expense of mechanisation and a change towards flexible response rather than nuclear warfighting led to a return to a more conventional structure. That was compounded by the US Army's increasing involvement in Vietnam and a focus on counter-insurgency warfare.

Furthermore, at a more fundamental level regardless of these changes in war-fighting doctrine, the practicalities of maintaining a span of command of five combat units both at divisional and combat team level was proving difficult with the technology of the time. This, alongside having to coordinate fire support, provide timely intelligence and sustainable logistics resulted in the concept being ultimately abandoned.[2]

Is The Pentomic The Way Forward?

The nature of modern high intensity combat as described above drives the need for a means of producing decision on the battlefield, if attritional war is to be avoided.

A devolved battlefield organisation as envisaged within the Pentomic concept should:

Increase survivability. The defender would have to ruthlessly prioritise or dissipate effort in countering a number of tactical offensive operations each with the potentially to achieve a breakthrough. Offensive action must be based on the assumption that any build-up or unit on the line of approach will be identified and countered. By dispersing to smaller combat units this is less likely to be achieved or at least face the defender with the quandary of having to choose were to focus their own defensive effort.

Rapid, concerted and contiguous offensive action could enable a decision. Yes, there will be losses, but it should not lead to the complete failure to mount offensive action. The defender will in turn have to commit his own forces and firepower which can create opportunities for a flexible attacker. It should be noted from experience in Ukraine that main front line combat units do seem to be around company sized. That formation size has enough combat power to achieve local success while having enough resilience to sustain combat for a useful length of time. Such a new "Pentomic" structure would operate at not just the combat team level but use the flexibility of the company structure within that battle group/combat team. Each in turn being its own "Pentomic" combat unit. Improved situational awareness at every command level would provide that flexibility.

It would provide the means to exploit as even if the break-in force is expended then there should be additional units that can make use of that opportunity. Such opportunities are likely though, to be fleeting.

Enable depth fire to be directly connected to decision on the ground. Otherwise, such fire, no-matter how effective, becomes an attritional tool.

Stress the defender as the potential for multiple thrusts exists in a divisional area. This if connected to simultaneous supporting depth fire has the potential to disrupt or delay the defender's response.

Likewise on the defence such a Pentomic structure has sufficient reserve potential to meet a range of attacks and will require increased effort by an attacker to neutralise a defence in depth and use that most precious of assets – time. A dispersed Pentomic defence based on areas of concealment such as villages, towns, wooded and rough terrain can allow for gaps as these can be covered by precision fire at every level and improve unit survivability.[3]

So, it would seem something similar to the Pentomic structure may have something to teach in terms an answering the battlefield problems of today. In terms of issues like command, control, communications, and intelligence (C3I), technology has moved on significantly. Even the smallest unit has, through FPV drone technology, the means of battlefield reconnaissance and precision strike. Whilst distributed command systems have great resilience and an ability to jump echelons in terms of targeting. Whilst higher command echelons will have a clearer picture which should enable them to pre-empt the requirements of

engaged combat units and provide battlefield deconfliction on a messy front. It may be able to prioritise effort when opportunities emerge not immediately apparent to the units in combat.

Problems?

We should not under emphasise the point that a range of issues exist that would still create difficulties for more dispersed operations as outlined above.

C2. For effective use of such a Pentomic concept command would have to be distributed forward at the tactical level to best exploit success and ensure survival. Neighbouring and supporting units would have to react accordingly either in being 'pulled' towards that success or continuing active operations to pin the enemy or even exploit opportunities as the opponent reacts to a breakthrough elsewhere. So C2 will not just have to be vertical but horizontal within the division if rapidly emerging opportunities can be exploited. Higher command echelons, from the divisional above should have a greater view of the deeper battle so can focus on the commitment of reserves whilst providing depth fire not just to disrupt the defender at the operational level but with precision weapons should be able to contribute to the tactical battle.

The swiftness of a defender's response. It is clear from operations on the Ukraine that any breakthrough can be quickly stymied or sealed off by rapid reaction by artillery and FPV drones. It has created a dynamic where any unit involved in a breakthrough immediately goes to ground to secure its immediate gains. Creating the time for reserves to be deployed by the defender. In fact, operations outside any form of cover have become problematic, canalizing any advance and make its route predictable. Even the best protected of modern armoured vehicles is vulnerable in the open to everything from precision artillery, anti-tank guided missiles (ATGMs) and drones. To minimise losses there is a powerful trend towards dispersal and cover; yet which reduces impetus and the chances of exploitation.

Logistics remains as ever problematic. To sustain a breakthrough logistics needs to be timely and robust and able to withstand the disruption which will come. How can you ensure the ready supply to dispersed forces to ensure the ability to continue the fight? Technology may provide some solutions such as heavy lift drones or even robot vehicles. But it may be that the battlegroups detailed above have to be treated as logistically expendable. That is once they have consumed fuel and ammunition, in in effect that fighting power, they have to be replaced by other fully stocked battlegroups to ensure the continued advance or even to secure the ground seized.

Time expensive activities such as obstacle clearance, bridging and stocking of logistics all face the risks of being identified and vulnerable to a response from fire, whilst the defender can develop his own response and counteraction.

Ultimately any success will depend on a high level of initiative and a willingness to gamble on success. This will have implications for training and leadership at every level.

Simultaneous action across a broad front may the only way of creating a dynamic situation and enough doubt in the defender's mind that their response is constrained. Allowing for something that looks like exploitation and success. The "Schwerpunkt" will be where it is found in the course of offensive operations and not pre-ordained focus of operation. The focus for achieving success may rest with breadth rather than the assumption of achieving mass and depth on a short section of the front.

All the above point to what would be seen in past military theory and doctrine as the classic mistake of the dissipation of forces, when under current conditions such a broad dispersed approach may be the only way success is achieved. All this at what would been seen as achieving success only at the tactical level, rather than at the operational level where decision has been sought over the last 100 years.

Experience from the Ukraine has highlighted the difficulty of identifying the culmination point. On a transparent battlefield it is clear that some operations have culminated before they have begun as accurate depth fire, the ability to generate obstacles such as scatterable mines disrupt offensive operations before even reaching the departure line. Is it by maximising the potential actions available at the divisional level a means of mitigating this risk?

Moreover, does all the above really point to a more active form of attritional conflict where ultimately victory does ultimately go to the big battalions? Such an outcome would raise a question mark over the whole nature the Western approach based on relatively small numbers of regular forces with exquisite equipment. In the case of the British Army would it be better in 2024 to have any army with 1000 upgrade Chieftains than one of a 148 Challenger IIIs? Yes, a loss of some combat power with the ability to achieve simultaneous actions across a wide front with resilience to persevere? It sounds more like 1917 than 2017.

An Exquisite Capability?

In the 50's the Pentomic division was seen as potential solution to the tactical and operational problems of a nuclear battlefield, but it was seen in the context of a mass army. The US army by the 1960s consisted of 1,000,000 men in 16 divisions.[4] This was sustained by a conscription system and with a significant reserve capability. What we see in the Ukraine is the fact that there is no substitute for mass and that within this context being small highly trained and with exquisite equipment is no longer enough. Whether in terms of equipment or manpower you can never have enough "stuff". A lack of mass of a transparent battlefield will, no matter how good

those forces, be disrupted by enemy fire, will not have the resources to stretch the enemy across a wide front creating the opportunities for success, or simply sustaining combat. Small forces no matter how good cannot be in two places at one nor can they fight continuous battles without relief.

Conclusion

Every war went it is fought has its unique features making it different from its predecessors. What we need to create is a military organisation that has the ability to achieve decision on the battlefield but has the resilience to sustain combat whilst responding to the unique tactical operational and technological circumstances it faces. The most successful armies (actually military systems) are the ones that learn quickest.

Mr. Jonathan Robert Moore is a retired British civil servant who served with the United Kingdom's (UK's) Ministry of Defence (MOD). He graduated with a degree from Manchester University, England.

Notes

[1]Captain J House, Towards Combined Arms Warfare, Combat Studies Institute Research Survey 2, 1984; Major R Doughty, The evolution of US Army Doctriner1946-76, Major J Smith, Pentomic Doctrine: A model for Future War, School of Advanced Military Studies 1994.

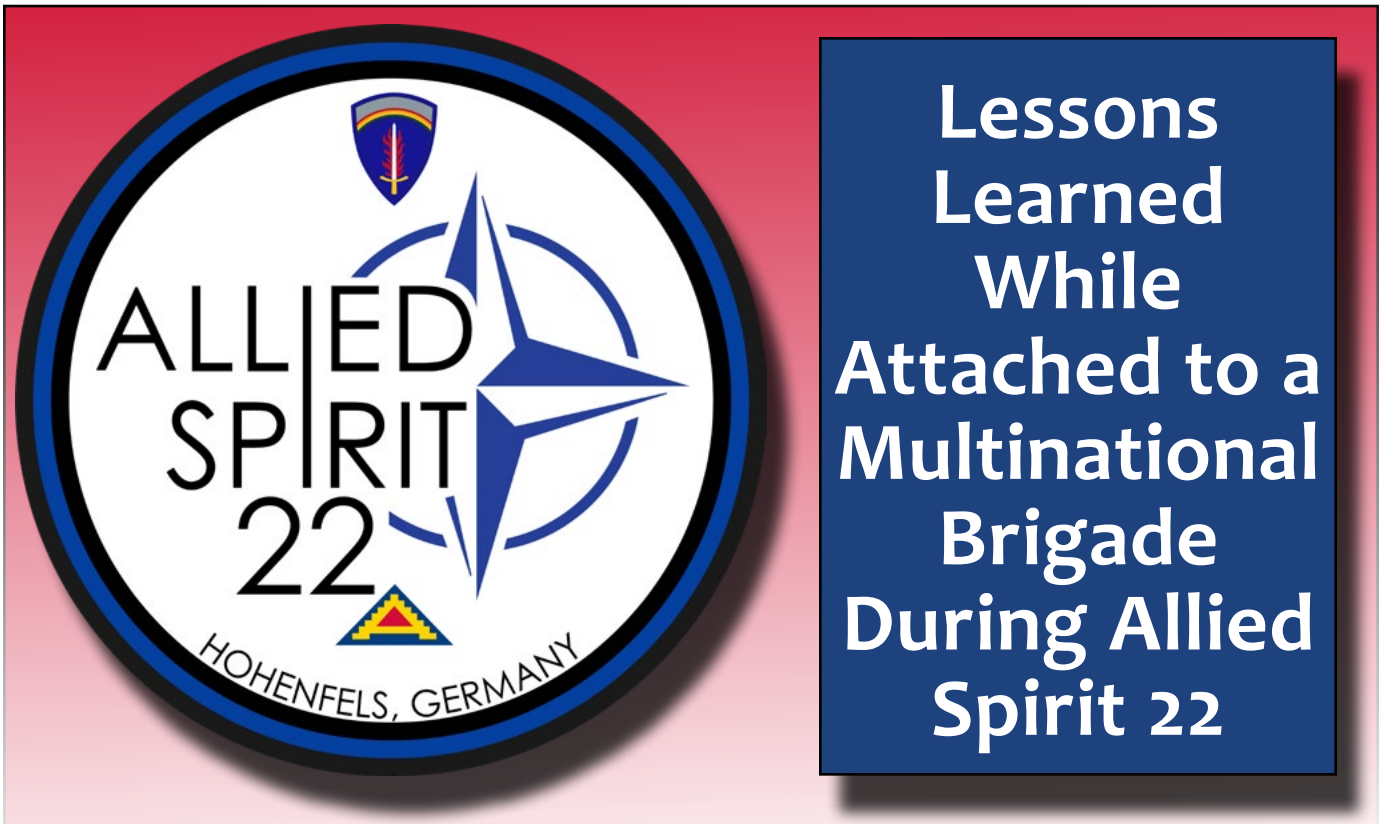
[2]The Pentomic structure did not apply to the US Army's armoured division where the long standing "combat command" organisation was felt flexible enough to fight in the manner described above.

[3]The original Pentomic doctrine posited a similar concept in defence as a means of surviving tactical nuclear strikes. Smith Ibid.

[4]P Tsouras, Changing orders, p.89

From the *ARMOR* Art Archive

"Blitzkrieg"



Lessons Learned While Attached to a Multinational Brigade During Allied Spirit 22

by MAJ Christopher M. Perrone

In January 2022, a US combined arms battalion consisting of one headquarters and headquarters company (HHC), two tank companies, one mechanized infantry company, and one forward support company (FSC) participated in exercise Allied Spirit 22 as part of a larger multinational brigade consisting of approximately 5,000 Soldiers representing eight nations. Exercise Allied Spirit is the Joint Multinational Readiness Center's (JMRC) largest annual exercise at Hohenfels Training Area. The Rotational Training Unit (RTU) is typically either a US or multinational division headquarters with an allied brigade headquarters serving as the primary training audience. The brigade is typically comprised of a mixture of its organic battalions, a US Army maneuver battalion, and other multinational battalions from across NATO. During this unique rotation, the lessons learned at every echelon were indispensable to building partner capacity, enhancing interoperability, strengthening relationships, and enabling NATO's preparedness for a future armed conflict in Europe. This article aims to describe and share some of the personal friction points and lessons learned during the multinational exercise from someone who participated in the exercise as a Combined Arms Battalion S3 and who is now a current Observer Coach/Trainer (OC/T) at JMRC. The lessons learned in this article are intended for maneuver battalion field grade officers, battalion staffs, and their senior enlisted advisors who are expected to take part in future multinational operations.

Task Organization

During exercise Allied Spirit 22, the concepts of multinational interoperability were stretched to the limits during the 9-day fight in an austere large-scale combat operations (LSCO) environment. This exercise saw a unique task organization consisting of the Latvian mechanized infantry brigade serving as the brigade headquarters with the subordinate battalion headquarters consisting of a German reconnaissance battalion, a Latvian mechanized infantry battalion, a German panzergrenadier battalion, a US combined arms battalion, a German field artillery battalion, and a Latvian support battalion. Additionally, there was a plethora of multinational enablers from various nations to include a US general support aviation battalion (GSAB), a Latvian air defense battery, an Italian tank platoon, Hungarian and Spanish civil affairs assets, Hungarian and Spanish military police, Dutch engineers, Lithuanian engineers, and a Lithuanian chemical platoon to name a few along with many others. The interoperability challenges at all levels from squad to brigade were numerous and wide reaching and provided an excellent learning laboratory in the fight against the infamous JMRC Opposing Forces (OPFOR).

For a unit planning on conducting multinational operations, leaders must look at how the organization will conduct the full operations process (plan, prepare, execute, and assess) through the lens of the three dimensions of interoperability: human, procedural, and technical. Though there have been many efforts to standardize operations and terminology amongst NATO members, there will still be inherent differences that leaders must work through at every level.

Multinational Interoperability: The Human Dimension

The human dimension is the bedrock and foundation to interoperability and

is by far the easiest to get right. On the contrary, if the human dimension is done poorly, it can be disastrous. The human dimension is built on solid interpersonal relationships defined by mutual respect and a healthy dialogue. Mastering this domain requires time, effort, and patience to overcome language and cultural differences. If time allows, any pre-operational training or team building events should be maximized to better foster personal relationships. When all else fails, the human dimension will overcome any temporary gaps in the procedural and technical dimensions.

During the five months leading up to exercise Allied Spirit 22, as part of the US rotational force deployed to Lithuania within Operation Atlantic Resolve, the US battalion took advantage of its proximity to Latvia by sending multiple platoons and companies to conduct periodic training in Latvia. In October 2021, JMRC held the in-person Leader Training Program (LTP) event for Allied Spirit 22 and this venue provided an excellent opportunity for the multi-national participants to get to know each other, provide capabilities and limitations briefs, and develop a baseline understanding of the Latvian Brigade Commander's intent. Over the course of the five months, strong relationships developed between the battalion leadership and the Latvian mechanized infantry brigade. These relationships were further solidified when the battalion sent a company team to Latvia to participate in a month-long Latvian training event that included live fire exercises at every echelon from platoon to battalion. In addition to developing relationships with the Latvians, the training schedule allowed for relationships to develop between the battalion and the US Army Security Force Assistance Brigade (SFAB) team assigned to the Latvian Brigade headquarters. Knowing that the SFAB Team would be embedded into the Latvian Brigade's staff during Allied Spirit 22 allowed for discussions about how the SFAB would act as a cultural, linguistic, and technical intermediary (also known as a "swivel-chair") if needed between the battalion and the brigade headquarters. In terms of relationship building and understanding the brigade commander's intent for operations, the battalion emphatically assessed itself as well trained. With this, came the confidence that any challenges could be overcome with strong relationships.

However, the rotation exposed some of the holes in that thinking and preparation. During the reception, staging, and onward movement phase (RSOM), the brigade headquarters, unable to control the equipment arrival timelines for so many nations struggled to synchronize the generation of combat power. The result was that the brigade "powered down" the generation of combat power to each subordinate battalion. With the delayed arrival of one of the battalion's trains that contained a significant number of Abrams and Bradley Fighting Vehicles (BFV), the battalion struggled to generate enough combat power to move into the assigned tactical assembly area (TAA) and then to the subsequent battle positions (BPs) as planned. Since the brigade headquarters had already moved into the Area of Operations (AO), the battalion's "top 5" were challenged with the cultural and language barrier to articulate the friction and the risk to mission associated with deploying into "the box" in a piecemeal fashion.

Figure 1. Key leaders from Latvia, Germany, and the US huddled around a map while operating in the JMRC Box at Hohenfels Training Area as they discuss positioning for the defense. *(Photo by CPL Savannah Miller)*

Therefore, to prevent the embarrassment of a US unit not crossing the Line of Departure (LD) on time, the decision was made to deploy the battalion's scout platoon as quickly as possible with what little combat power was available. That night in the middle of a snowstorm, the battalion scout platoon crossed LD with only five gun-trucks, none of its BFVs, and without artillery or mortar assets in position to support. Additionally, since the battalion tactical command post (TAC) and the main command post (CP) were not yet functional, the element deployed into the fight with no ability to communicate with the brigade headquarters or any adjacent units. The lead element was misdirected into some restricted terrain which in-turn led to a fueler being rolled-over. The decision was then made to halt movement for the night and wait until morning to try and get the lead elements into position.

Over the course of the next three days, the battalion struggled to get its combat platforms into the BPs to establish the defense. This lack of ability to project combat power forward resulted in a very significant gap in the brigade's defensive line, which in turn caused a

significant amount of friction across the brigade as its staff tried to figure out how to best close the gap and prevent enemy penetration.

There are several lessons I learned from those first three days of chaos, in particular the importance of mutually understanding the capabilities and limitations, the importance of liaison officers (LNO), how to put pride aside, and the importance of paying attention to the details in multinational sustainment operations.

Regarding spotty radio communication, I expected the Latvian leadership to inherently understand how a combined arms battalion fights. The battalion's inability to articulate how conditions were not yet set was largely due to the fact the battalion staff was simply not used to dealing with an allied headquarters. Key leaders, including myself, wrongly assumed the Latvians would be able to see the problems as Americans saw them. Additionally, the battalion staff officers never went in person to provide their brigade staff counterparts with a recommendation for how to adjust the plan to cover the frontage gap with those battalions already in the box to enable our battalion to finish generating combat power.

Another lesson I learned was that even though LNOs were assigned to adjacent battalions, a battalion LNO was never assigned to be in the brigade main CP; and thus, the battalion staff relied too heavily on the SFAB to articulate any concerns. Even though the SFAB team was made up of an exceptionally talented group of Soldiers that worked tirelessly to assist the battalion, the team did not have as much of an intimate understanding of capabilities and limitations as a leader from our own formation would have. Admittedly, we did not want to swallow our pride and say that we were not ready to fight. Had we not been so concerned about the image of a US Army unit not making LD, the result would not have been such a massive desynchronization of the brigade. This in turn would have allowed the brigade to cover the battalion's gaps and enable the setting of conditions for a concentrated deployment into the AO.

Finally, during RSOM a more concerted effort should have been made to ensure the battalion's sustainment warfighting function was fully communicating with the brigade S4 section and articulating the challenges and any required assistance during routine touchpoints. Regardless of the challenges faced in the human dimension, the solid relationships that were built prior to the exercise were relied on to make

JMRC Tier 1 Interoperability Training Objectives (Battalion and Above)

* Tier 1 Interoperability Training Objectives are focus areas that JMRC OC/Ts will observe during Exercises with Allies and Partners

Human	1. LNO Teams integration conducted no later than RSOM. 2. Fully integrate LNO team into the main command post (provide dedicated work space, attend all battle rhythm events) 3. LNO integration in the planning process to assist their Higher Headquarters in properly accounting for their parent formation. 4. LNOs empowered to speak on behalf of their parent unit for assessments/requirements. 5. LNOs maintain communication with parent unit and maintain a current running estimate.
Procedural	1. Share releasable SOPs with Allies and Partners. All documents releasable to the widest possible audience, or facilitated through tear lines when applicable. 2. Disseminate and understand organizational capabilities that includes equipment, tactical employment, and bridge differences with operational terms and graphics at the BDE and BN level (NATO Terms and Graphics vs. U.S.). 3. Establish and rehearse a PACE plan that all units are capable of attaining. 4. Create and execute a knowledge management plan achievable by all units. 5. Develop common risk management procedures. 6. Create and execute a deliberate plan for friendly force fratricide prevention measures (day and night). 7. Maintain an analog and digital COP on MPE. 8. Demonstrate the ability to regain communication with Higher HQs following COMSEC compromise or degraded Communications window (EW or other).
Technical	1. Execute Mission Command Validation Exercises (MCVE) and Fire Support Validation Exercises (FSVE) early in the operations process to identify and resolve technical interoperability shortfalls. 2. Understand, confirm, and employ Fires systems interoperability capabilities for the following systems: AFATDS / TAIS / AMDWS / JADOCS. 3. Coordinate with Higher HQs for employment of organic TUAS (MN Partners and Allies bridge technical barriers for airspace management to employ T-UAS).

Figure 2. Allied Spirit 22 Interoperability Training Objectives *(U.S. Army Graphic)*

the mission happen despite the significant friction faced in the other two dimensions.

Multinational Interoperability: The Procedural Dimension

The procedural dimension encompasses "the how" of planning, preparing, and executing for all things of a warfighting nature. This dimension includes how units absorb and operate in accordance with standard operating procedures (SOP) as they relate to various aspects of doctrine. Inevitably, there will be differences in operational terms and graphics, definitions, planning processes and steps, briefing techniques and expectations, knowledge management methods, orders production and dissemination, rehearsal constructs, risk mitigation, fratricide avoidance, national agreements and caveats, and command and control procedures during execution.

As previously mentioned, during the five months leading up to the rotation, the battalion focused heavily on sending tank and infantry platoons to Latvia to train with that brigade. As a result, the company-grade maneuver leaders gained valuable first-hand knowledge of the capabilities and limitations of our Allies. These leaders became intimately familiar with the challenges inherent in a multinational task organization and developed sound training plans in preparation for the rotation. However, at the battalion-level there was a lack of emphasis to integrate the battalion headquarters and the forward support company (FSC) into those training events; nor was there a full appreciation for how the Latvian brigade staff would conduct the operations process.

The battalion's key leaders quickly realized that the Latvian brigade headquarters did things very differently than what the US Army is accustomed to. With so many different units and so many ways of doing things, the Latvian brigade commander decided that he was going to pull in the battalion commanders and personally plan each phase of the operation. On the evening of the exercise's third night, the battalion commanders and operations officers were summoned to the brigade plans tent to receive what we thought was going to be an operations order (OPORD) brief in preparation for an attack in two days. Instead of an OPORD brief, the battalion commanders gathered around an analog map for a three-hour council of war session to conceptually discuss each unit's proposed actions during the attack. Once everyone came to an agreement, the brigade operations officer intended to codify everything that was said into a written order to be published over a secure system that would synchronize the operation with digital graphics being provided to each battalion. Obviously, this was very different than the typical

Figure 3. Key leaders from Latvia, Germany, and the US huddled around a map while operating in the JMRC box at Hohenfels Training Area as the multinational brigade prepares for the final attack. *(U.S. Army Photo by CPL Uriel Ramirez)*

OPORD brief that US Army leaders are accustomed to.

Subsequently, the battalion staff's unfamiliarity with the Latvian knowledge management process and naming conventions, caused the staff to lose precious planning hours as staff officers could not ascertain which order they were looking at due to the unfamiliar naming conventions that were being used. Once the correct OPORD was attained, it was found to be an exceptionally large document that was written in accordance with NATO standards, but it included terms and graphics that were formatted in a manner that the battalion staff had never seen before. This unfamiliarity caused the staff to lose even more precious time in trying to analyze what was written. Additionally, the OPORD was overly vague and came with minimal PowerPoint graphics that had unfamiliar intent symbols and markings. The written portion included minimal details regarding time and distance analysis, triggers, sustainment, and intelligence and fires synchronization. Realizing the battalion staff had to hurry and begin planning since the combined arms rehearsal (CAR) would be the next morning, the staff quickly went through a session of the military decision-making process (MDMP) to issue a battalion OPORD later that night.

The next morning as the key leaders arrived for the brigade CAR, we were surprised to see once again the battalion commanders being pulled around a table to go through another council of war in the exact same manner as the day prior. Once again, each commander discussed in vague terms the actions his battalion would take. The brigade commander would then initiate a wargame to discuss branch plans and sequels over the map. Once again, the brigade staff developed a second, full OPORD and issued it in the same manner as before. Taking the lesson learned from the previous day, this time we made sure to trace a copy of the brigade's analog graphics so that we had the same common operating picture as the brigade staff. Their system for planning was clearly different than anything we had seen before.

From this experience came multiple lessons learned regarding procedural interoperability. First, I should have exposed the battalion staff to NATO doctrine, terminology, and orders formats beforehand to avoid the lost planning time it took to decipher the orders during the stress of the fight. Secondly, the

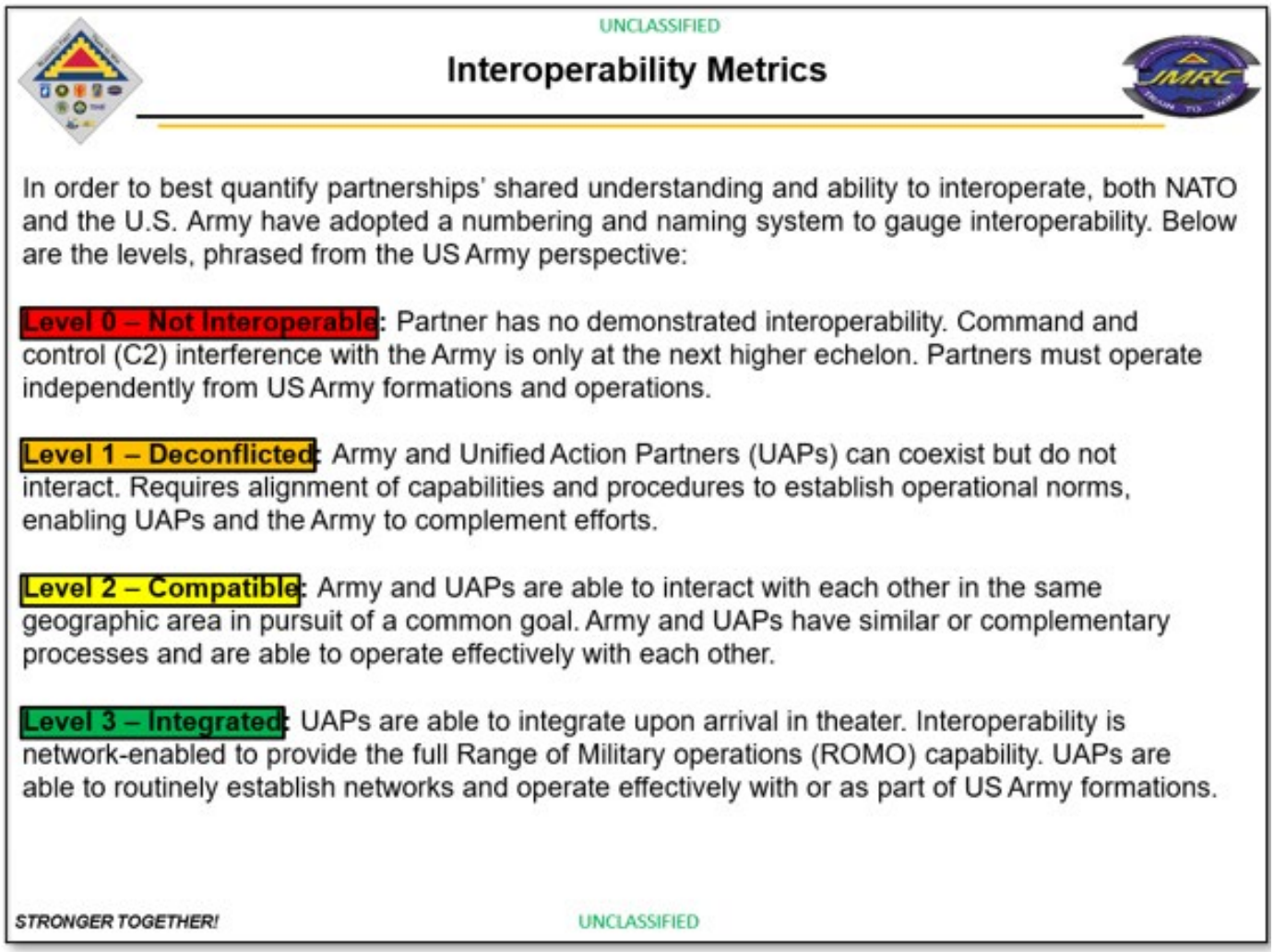


Figure 4. Allied Spirit 22 Interoperability Metrics *(U.S. Army Graphic)*

battalion staff should have had a better understanding of the higher headquarters' knowledge management processes and naming conventions so that time wasn't wasted either looking for the order or planning off the wrong document. Third, this was another example of the importance of having an experienced LNO at the brigade headquarters who should have also been involved in planning on our behalf. Had an LNO been dedicated to the brigade headquarters, he could have gathered the OPORD, gotten copies of graphics, and prepared the battalion staff for the expectations and briefing formats for the key leader touchpoints. Fourth, had questions been asked about how the brigade staff conducts the planning process, the battalion staff would have been better prepared to initiate parallel planning with minimal guidance as the brigade conducted their planning. Fifth, the focus of the commanders' dialogues was largely centered around maneuver and fires. However, since most of the multinational formations were either light, motorized, or made of light tracks, they had little experience in sustaining a large combined arms battalion over that length of time.

There was little consideration for ammunition and fuel resupply across the brigade's AO. During the entire rotation, the battalion was severely hindered by sustainment across all classes of supply and had the battalion staff known the structure of the meetings (specifically the warfighting functions synchronization meetings), the battalion S4 would have been better prepared to pose the question of how sustainment was going to be conducted across the brigade. With that understanding, he could have offered sound recommendations to the Brigade S4 along with the Latvian Support Battalion based on everyone's collective experiences. Additionally, the battalion should have integrated its FSC into the Latvian Support Battalion's planning process and an LNO should have been assigned to be co-located into their battalion headquarters. Finally, if I had better understood how the brigade commander and his staff intended to synchronize operations, I could have provided recommendations for detailed graphic control measures that were tied to terrain features instead of intent symbols to maximize combat power at the brigade's decisive point and avoid fratricide. Though the maneuver companies had spent a great deal of time conducting vehicle identification, the risk of fratricide was exponentially elevated with multinational units being task-organized at the platoon and company-levels.

Multinational Interoperability: The Technical Dimension

The technical dimension focuses on the ability to communicate through the various systems and equipment required to conduct operations. These systems include voice and digital systems and must consider the capabilities and limitations of radios, computers, global positioning system (GPS), fires networks, and airspace coordination systems all while trying to ensure security and reduce digital signatures to avoid enemy targeting. Without an ability to communicate effectively and securely, a multinational organization will risk quickly becoming desynchronized and unable to react to the changing conditions on the battlefield.

By and large, the battalion at echelon struggled the most with the technical dimension. Critically undermanned in the battalion S6 section, the battalion was consistently challenged with communications. Due to the incompatibility of the ASIP radios with the Latvian higher headquarters, two Tactical Satellite (TACSAT) radios were used to effectively communicate with the brigade headquarters. However, for the adjacent units, the battalion staff relied heavily on some rather inexperienced officer LNOs acting as a swivel chair within the adjacent battalion headquarters. Though the battalion staff was able to communicate, the language and cultural differences coupled with too many "communicators" made the conversations ineffective. This inability to conduct rapid and efficient cross coordination with adjacent units added to the de-synchronization of the brigade and an inability to gain a true intelligence picture of enemy actions on the ground.

The lack of preparedness and training for the battalion staff and companies on how to properly fill radios with the correct encryption caused constant issues. The S6 section experienced challenges with conducting retrans operations as the lack of pre-combat checks (PCC) resulted in missing equipment that left the battalion unable to deploy the battalion retrans section until the seventh day of the exercise. Additionally, none of the Joint Battle Command-Platform (JBCPs) had the proper US Europe Command (EUCOM) image as they still had the US image from before the deployment, therefore, they were incompatible for operations in Europe. Not to mention, because of one printer being broken during the movement into the area of operations (AO), the battalion staff had to rely on runners and face-to-face conversations with hand-written OPORDs and manually drawn graphics to synchronize all battalion operations.

On top of the communications friction, the relentless OPFOR pressure forced the staff to jump the main CP multiple times. Since the training plan had not placed a significant amount of emphasis on procedures for setting up and tearing down the main CP, Soldiers were relatively inexperienced at this task, and it only complicated the communications problem-set. Initially, the main CP was internally and externally robust and took too long to establish, however, it was quickly learned that the key to rapid emplacement and displacement centered around non-commissioned officers (NCOs) developing a systematic process to efficiently pack and unpack the minimum essential items to establish a small and mobile main CP.

As in the other two dimensions, the key lessons I learned in the technical dimension were numerous. First, more emphasis should have been placed on experimenting with how to bridge the gap with technical compatibility. I

should have established a communications working group to garner lessons learned from other organizations such as the Tactical Voice Bridge, the Android Tactical Assault Kit (ATAK) "Green Kit" (which is a series of components and devices used to bridge the communications gap between the different Allied radio systems), or looked at cross-leveling from within to distribute frequency modulated (FM) Radios to the higher headquarters and adjacent units. Second, regarding PCCs and pre-combat inspections (PCIs), instead of taking a myopic approach by focusing our attention on equipment for the individual Soldier and the combat fighting platforms, we should have prioritized the inspection and packing of the main CP along with the radio equipment and retrans systems. Third, the training plan should have placed a larger emphasis on conducting maintenance on communications systems and forced the platoons to send JBCP messages during motor stables. Also, the battle rhythm should have made it routine to setup both the internal and external main CP to build repetition and to identify shortages and place them on order with enough lead time before the exercise. Lastly, key leaders should have had extensive discussions with the rest of the brigade leadership on the command & control architecture and fully discussed the procedures we would execute for various contingencies, such as communications security (COMSEC) compromise and jamming.

Conclusion

By the end of the 9-day exercise, the battalion as a whole gained an education in multinational interoperability and took home countless lessons learned in the human, procedural, and technical dimensions from which to build follow-on home station training plans. More importantly, the challenging exercise solidified an incredible bond between the Allied units that participated in the exercise, and it gave our Soldiers a concrete understanding of what it means to fight alongside Allies in large scale combat operations. Despite the challenges, I learned the greatest lesson: that leaders must work exorbitantly hard to build and maintain relationships with our Allies during training; so that when everything is going wrong and systems start failing, simplicity and teamwork will get us to the objective and win. Hopefully, these lessons will prevent your unit from making the same mistakes.

MAJ Chris Perrone is the Deputy Task Force OC/T for the Timberwolf Team at the Joint Multinational Readiness Center (JMRC) in Hohenfels, Germany. His previous assignment was as a combined arms battalion operations officer and executive officer in the 1st Infantry Division, Fort Riley, Kansas.

Realizing a Cavalry Troop's Place in the OPLAN

Figure 1. An Alpha Troop Section Leader prepares to deploy after a Deployment Readiness Exercise in Korea *(Photo by CPT John Reynolds)*

by CPT John Reynolds

"Fight Tonight and Win" is the watchword for Korean Rotational Deployments. The immediate months prior to the deployment include a Combat Training Center (CTC) rotation, sustainment gunneries, qualification ranges, and a myriad of other events ensuring that units are administratively and tactically ready to fight tonight and win. From the Troop-level to the Division-level, commanders constantly deliver assessments of combat power and training in terms of our ability to fight the Operational Plan (OPLAN). A commander rarely assesses their unit as unable to fight the OPLAN, and there are always metrics that can be used to demonstrate readiness. However, due to OPLAN-specific requirements and training restrictions, readiness for the United States Indo-Pacific Command (INDOPACOM) mission as a cavalry troop needs to be deliberately trained prior to or immediately upon arrival to Korea. Units may be ready on paper to "Fight Tonight" as soon as they conduct relief in place/transfer of authority (RIP/TOA), but true readiness takes weeks, if not months to achieve due to both the specific operational readiness required, as well as the unique hurdles related to fighting in the Korean Theater of Operations (KTO).

Troop-Internal Readiness

The first element of OPLAN readiness that the 3rd Squadron, 61st Cavalry Regiment, 2nd Stryker Brigade Combat Team, 4th Infantry Division focused on upon arriving to Korea was the ability to rapidly deploy within hours of notification. Deployment Readiness Exercises (DREs) are a hallmark of every Korea rotation, and the procedures for DREs are installed as soon as possible. While understanding a Notification hour (N-hour) sequence and various prowords are important for DREs, the biggest friction points remain both equipment and people; a prime example of this is weapons draw. Having to draw an entire fleet of both vehicle-mounted and individual weapons from a new arms room and install them on the Troop's Strykers is an iterative process that can only be improved through multiple DREs. Mastering the load plan of Strykers with all weapons, optics, B & C duffle bags, planning materials, CLI (food, water, and other rations) and CLIII (petroleum, oils, and lubricants) and any other classes of supply is something that comes with training and practice – iteratively. In short, rapid deployment of equipment and personnel is an essential task for OPLAN readiness in Korea and any other theater. From Alpha Troop's experience during Korea Rotational Force-13 (KRF-13), it takes at least six weeks after TOA and three iterations of DREs to attain optimal performance. This timetable can be increased but dedicated training time must be allocated to ensure all parties can execute to standard.

Figure 2. An Alpha Troop Stryker crew conducting reconnaissance at the Joint Readiness Training Center in Fort Johnson, Louisiana. *(Photo by SFC Zachary Francis)*

The other element of OPLAN readiness that the CAV needed to train upon arriving to Korea was security operations. Indeed, cavalry troops are the masters of both reconnaissance and security operations for the brigade; however, training specific to the KTO takes time. Four months prior to deploying for Korea, 3-61 CAV conducted a training rotation at the Joint Readiness Training Center (JRTC) in Fort Johnson, LA. Its mission at JRTC; however, was focused almost exclusively on reconnaissance operations—constantly out front of the brigade, identifying trafficable routes and enemy composition to enable the brigade's march through the training area. Additionally, the training area at JRTC is devoid of the massive urban structures that are ubiquitous throughout South Korea. Upon arriving in Korea, 3-61 CAV realized that the OPLAN involved far more security operations than was trained at JRTC – requiring additional training and preparation. Alpha Troop subsequently designed a training progression that culminated in section-level situational training exercise (STX) and live fire exercise (LFX) focused exclusively on security operations, as well as designing an urban operations STX. While JRTC made the Troop proficient in reconnaissance tasks and maneuvering, it had to actively seek opportunities to train security operations on the Korean Peninsula to achieve OPLAN readiness. Due to constraints of land and other training resources, reaching a fully training status or "T" in security operations took approximately five months. Redesigning training progressions prior to Korea will enable units to be able to achieve its mission prior to stepping foot on the peninsula.

Troop-External Readiness

Even with the dedicated work Alpha Troop conducted to achieve OPLAN readiness, there were still efforts required to integrate with the adjacent units within 2nd Infantry Division (2ID) – the principal division in the KTO. While this article dutifully adheres to operations security (OPSEC) requirements, it should be noted that 3-61 CAV worked alongside adjacent brigades such as 210th Field Artillery Brigade (FAB), 52nd Brigade Engineer Battalion, and Republic of Korea – Army (ROKA) counterparts. Creating a shared understanding between Stryker Cavalry Troops and Rocket Artillery units is no small feat. Misconceptions abounded on both sides regarding the other's capabilities, mission set, and even tactics, techniques, and procedures

(TTPs). Deliberate planning sessions and combined training are requirements to ensure OPLAN readiness.

The Alpha Troop Commander worked to integrate his troop into the one of the field artillery battalions in 210 FAB. Alpha Troop platoon leaders conducted reconnaissance to OPLAN locations with their battery commanders and designated 210 FAB Soldiers attend Alpha Troop's land navigation training. Most importantly, both units scheduled capabilities briefs for their unit to understand what a stryker cavalry troop and FAB brings to the fight. Both units identified and worked to mitigate potential friction through this cooperation, resulting in a greater shared understanding between the units. However, due to collective training requirements for both units, the time for coordination between Alpha Troop and the field artillery (FA) battalion was limited. Without dedicated opportunities planned ahead of time, the ability of the cavalry squadron and 210 FAB to achieve joint OPLAN readiness was diminished. To correct this, 2ID forces through the assigned KRF brigade and permanent party brigades on the peninsula should plan combined training prior to arriving in Korea.

Alpha Troop's efforts at achieving Troop-external OPLAN readiness culminated in a counterfire taskforce DRE coordinated by US Forces Korea. Alpha Troop, the field artillery battalion, 2ID aviation assets, and a ROKA infantry battalion deployed to a training area north of their assigned duty station to test their ability to deploy and integrate with each other for the OPLAN. In terms of readiness for the INDOPACOM mission, this was the best, most valuable training Alpha Troop conducted throughout KRF-13. All units identified challenges, especially regarding communication systems and maintaining contact with the disparate units involved in the operation. Overall, Alpha Troop came out of the exercise feeling confident in their ability to execute the OPLAN and "Fight Tonight" jointly with 2ID and ROKA units. Due to competing priorities and collective training cycles, that exercise was the only opportunity for Alpha Troop and the 210 FAB to explicitly and jointly test the OPLAN. Future units undertaking the Korea rotation should consider prioritizing joint training opportunities centered around the OPLAN and increasing engagements between the rotational force and 210 FAB.

Recommendations

There are options available for the Eighth Army to ensure constant OPLAN readiness. The first option is to transition the OPLAN mission to a permanently stationed force. This move would not be unprecedented, as the rotational mission in Korea is only ten years old. A permanently stationed force would have two primary benefits. The first is continuity: the force would retain all institutional memory and relationships that it needs to fight the OPLAN. The permanently stationed units would have iterations of deployment TTPs to draw on. Arms room draws, communication management, and on-call DREs would be second nature to a permanently stationed force, instead of being a major muscle movement for a newly arrived rotational force. The second benefit is that 2ID

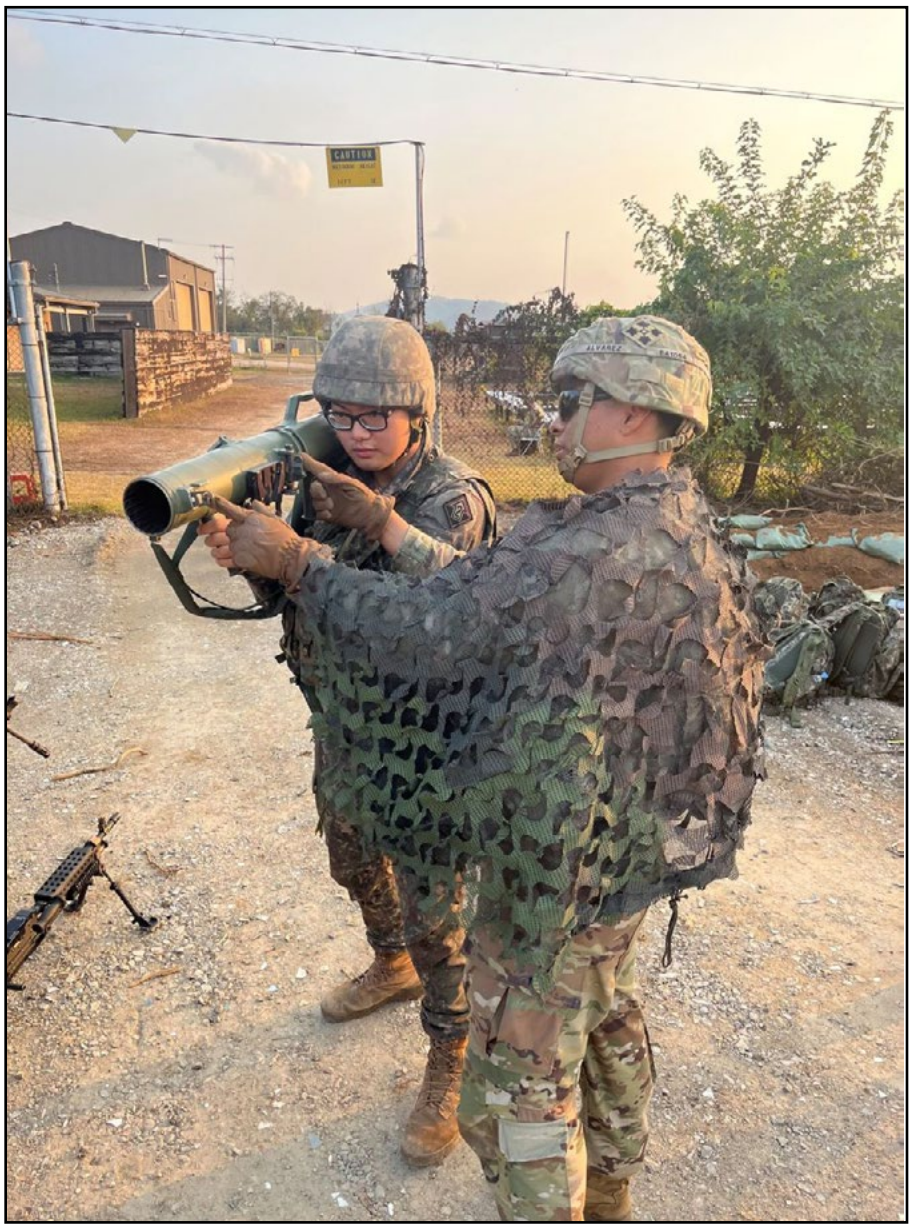


Figure 3. Alpha Troop Sergeants training ROK Army Soldiers during the counterfire task force mission. *(Photo by 1LT John Pomeroy)*

would have full ownership of the permanently stationed force. The unit would be able to design training management fully focused on the OPLAN without worrying about their Continental United States (CONUS) division's intended training progression for rotational units. This reallocation of the mission set would enable 2ID to stress-test the OPLAN with divisional assets on a regular basis, which would only increase synchronization among the distinct units involved in the OPLAN.

Understandably, transitioning to a permanent force is a decision that would take a significant amount of time, logistics, and bureaucratic measures to implement. Until that happens, a way to ensure OPLAN readiness is for 2ID to provide expectations for the rotational force far ahead of the KRF deployment. Currently, the rotational force does not get briefed on the OPLAN until the key leader Pre-Deployment Site Survey (PDSS), which typically occurs at most four months ahead of their KRF deployment. For 2nd Stryker Brigade Combat Team, 4th Infantry Division, the PDSS occurred after the brigade's JRTC rotation, and the only training events after the PDSS were a sustainment gunnery to qualify all crews prior to the deployment. Furthermore, due to the security classification of the OPLAN, the leaders that attended the PDSS were not able to come back and communicate OPLAN requirements to subordinate leaders, nor did they have the time to redirect training ahead of the deployment.

Ultimately, the OPLAN should be communicated to the rotational force at least nine months ahead of their KRF deployment to ensure the training progression at home-station matches the expectations of 2ID. Furthermore, 2ID should provide the rotational force with Additional Mission Essential Tasks (AMETs) on which the rotational force is expected to be proficient nine months in advance. This would enable the rotational force to design unit training management with the AMETs in mind—Alpha Troop would have conducted security operations throughout the collective training cycle and their CTC rotation if this were the case. It would also enable the various staffs for the rotational force to conduct the Military Decision-Making Process on the OPLAN in their CONUS Sensitive Compartmented Information Facilities (SCIFs) prior to assuming the KRF mission. This would lead to a far easier RIP/TOA process, where the units could focus on implementation of the OPLAN rather than starting the process of generating readiness for the OPLAN as soon as they arrive in Korea.

Conclusion

While Alpha Troop was a trained, proficient cavalry troop fresh from a CTC rotation upon arrival in the Republic of Korea, it still took serious effort to find its place in the OPLAN and become ready to "Fight Tonight." From developing new rapid deployment procedures, to training security tasks that were not focused on at JRTC, to conducting training events with the organic 2ID units, there were multiple iterations and exercises needed to feel prepared to fight the OPLAN successfully. Ultimately, Alpha Troop achieved OPLAN readiness and conditions were set for the Troop to maintain high-level readiness. However, the RIP/TOA to 3d Cavalry Regiment (3CR) required another round of coordination between CAV and FAB supporting KRF-13. 3CR and future units may still meet all performance metrics set by 2ID, but the risk that a deliberate effort to achieve OPLAN proficiency, or that other training priorities get in the way of focusing on the OPLAN is too high to continue on the present course without changes to the nature of the force, or the timeliness at which the OPLAN requirements and expectations ae communicated, rotational units will continue to face an uphill battle to achieve the OPLAN. Without a dedicated effort to communicate and train the unique skill sets for Korea, units will struggle to be truly ready to "Fight Tonight."

CPT John Reynolds is the Brigade Knowledge Management Officer, 2nd Stryker Brigade (2SBDE), 4th Infantry Division (4ID), Fort Carson, CO. His previous assignments include Troop Commander, Alpha Troop, 3-61 CAV, 2nd Stryker Brigade Combat Team (SBCT), 4ID, Fort Carson, CO; Squadron Planner, 3-61 CAV, 2SBCT, 4ID, Fort Carson, CO; Squadron Planner, 5-4 CAV, 2nd Armored Brigade Combat Team (2ABCT), 1ID, Fort Riley, KS; Troop Executive Officer, Bravo Troop, 5-4 CAV, 2ABCT, 1ID, Fort Riley, KS; and Scout Platoon Leader, Bravo Troop, 5-4 CAV, 2ABCT, 1ID, Fort Riley, KS. His military schools include Armor Basic Officer Leaders Course; Air Assault School; Army Reconnaissance Course; Maneuver Leaders Maintenance Course; Cavalry Leaders Course; and Maneuver Captains Career Course. CPT Reynolds has a Bachelor of Science degree in American Politics from the United States Military Academy and a bachelor of science degree in Arabic from the United States Military Academy. His awards include the Meritorious Service Medal, Military Outstanding Volunteer Service Medal, and three Army Commendation Medals.

Critical Information for Informed Decision Making

by MAJ Christopher Salerno

Soldiers with 5-7 Cavalry, 1st Armored Brigade Team, 3rd Infantry Division reference a training area map. *(U.S. Army Photo by SFC Richard Hoppe)*

Friendly force information requirements (FFIRs) are a powerful tool for informing decisions throughout an operation if routinely reviewed and refined as the fight evolves. During Warfighter 25-01, the 1st Armored Division did not review the FFIR until after the mid-rotation after-action review (AAR). The division's initial approach to operations prioritized the speed of the armored brigade combat teams (ABCT) to gain a position of relative advantage compared to the enemy. After a difficult wet gap crossing that slowed the pace of operations, the enemy established their defense. They emplaced their long-range shooters and established a robust air defense bubble. The division's emphasized speed as a key condition for success early in the operation. The division required a change in approach, but switching objectives for subordinate units would not suffice. The staff needed to challenge the assumptions that led to the prioritization of speed. After the first few days of execution the staff better understood the enemy but needed a better understanding of the necessary friendly conditions.

Thus, the 1st Armored Division switched its rapid approach to a more deliberate conditions-based approach. The Division Artillery Brigade focused on targeting the enemy's air defenses, which enabled the Aviation Brigade to destroy enemy artillery, which provided maneuver space for the brigade combat teams (BCT) to gain the necessary ground to jump the general support rocket battalions into their next set of position artillery areas. This cycle repeated until the enemy's air defense bubble collapsed, which enabled the Aviation brigade to conduct a mass attack and the BCT to rapidly maneuver across large swaths of land and envelop the enemy's position. In a deliberate effort, 1st Armored Division effectively changed its approach in using the FFIR to inform a conditions-based approach that ultimately informed the commander's decision-making ability to make rapid, informed decisions.

The 1st Armored Division initially executed this change without deliberately readdressing the FFIR, which created a blind spot in planning and execution. The initial FFIR are listed below.

By this point in the operation, the division had already crossed both rivers

Initial FFIR
Insufficient bridging assets in the division to cross the Neman or Neris rivers
Defeat of Lithuanian forces in vidinity of Objective (OBJ) VIOLET
Ability of Lithuanian civil defense forces to control avenues of approach (OaO) from Poland to OBJ Violet
Loss of any bridge on the Neman or Neris River
1st Armored Division unable to range division forward boundary with counterfire radar and artillery
Any priority protection list (PPL) asset with local security, counter-fire, and air defense artillery (ADA) protection

Figure 1. FFIR utilized by 1st Armored Division during the initial phases of Warfighter 25-01 *(U.S. Army Graphic)*

and was opening a ground line of communication to our partners on OBJ VIOLET. The division conducted a daily assessment of the operation, but did not deliberately relook the assumptions made during the military decision-making process (MDMP) and determine if they needed to be readdressed.

When the division's leadership directed a deliberate reassessment of FFIR after the mid-rotational AAR, the division staff initially struggled with how to approach developing the new FFIR. After a brainstorming session, the team decided to approach it through the warfighting functions based on how the division wanted to fight. This is in line with Field Manual (FM) 5-0, ***Planning and Orders Production***, which states, "A Commander's Critical Information Requirement (CCIR) is specified by a commander for a specific operation, applicable only to the commander who specifies it, situation dependent and directly linked to a current or future mission, and time-sensitive."[1] The staff adopted this new approach and examined each warfighting function by risk to the overall operation. The intent was twofold, first to catch both problems that were bubbling before they erupted, and secondly to better understand if the division was positioned to seize opportunities as this would inform both the planners and current operations team to enable decisions. Additionally, the new FFIR prioritized concerns that would impact the artillery and aviation brigades over the maneuver brigades. The new FFIR are listed below:

The G35 team led the effort to develop the new FFIR, but coordinated with the functional cells for input on what would break this chain. This FFIR is not perfect and the G35 team should have included the G4 at the rear command post for better clarity on sustainment issues that could break this approach.

The enemy routinely targeted friendly air defense systems. The protection team revalidated the prioritized protection list daily through the protection working group and decision board. A whole staff approach to developing the FFIR can inform this process as it visualizes what will become more important over time and informs the PPL decisions made by the working group and decision board. A continual refinement of the FFIR would have highlighted that the key to the aviation brigade team's operation was time on station. As the division progressed, forward aerial refueling points (FARP) became integral to increasing time on station before the aviation brigade could jump forward. There is risk associated with any decision, but prioritizing securing a FARP even if it meant pulling combat power from the close fight would have enabled the division's ultimate rapid maneuver forward. The FFIR is not an all-encompassing list, but a forcing function to force the staff to think through how the operation will unfold and where decisions will need to be made. As the plans team develops branches and sequels the division staff need to reassess the FFIR. A properly fleshed out FFIR shows that the division staff understands the operating environment.

The FFIR is just one example of how division staff needs to relook its products throughout an operation and not assume that everything is complete with orders production. The collection manager routinely reassessed the priority intelligence requirements and associated indicators throughout the operation, but understanding the enemy is only one half of the equation when it comes to a decision. The decision maker needs to understand, "is information the commander and staff need to understand the status of friendly force and supporting capabilities."[2] The FFIR is not a stagnant product and reassessing it forces the staff to relook their running estimates and if they enable decision making.

This connects back to the Division's critical path. The assessments working group (AWG) should be determining whether the assumptions made throughout the planning process remain accurate. This is in line with what the Mission Command Training Program (MCTP) recommends in their fiscal year (FY) 2023 key observations that one of the outputs of the AWG is to, "update, change, add or remove critical assumptions."[3] This assessment will ultimately inform whether the division staff will need to form a cross-functional team (CFT) lead by one of the integrating cells to address those issues identified by the AWG. The assessment working group should help the staff better understand the operational environment.[4] Implicit in this is understanding the assumptions initially made during the planning process about the operational environment. The staff needs to challenge those assumptions based on the actual experience operating in that environment. This can then feed the working groups and decision boards throughout the day.

The division commander can approve the output of this staff work during the Commander's decision board. This will

Updated FFIR
FIRES a. General Support (GS) Rocket Battalions cannot range the division forward boundary b. Direct Support (DS) Artillery Battalions are unable to range the brigade forward boundary
PROTECTION a. Any PPL asset with less than a platoon of local security, counter-fire, and ADA protection b. Unable to establish a counter-fire zone over a position area for artillery (PAA) c. AN/MPQ-64 Sentinel or AN/TPQ-53 radars unable to acquire enemy fires (due to jamming or destruction)
INTELLIGENCE a. Inability to collect on named areas of interest (NAI) in support of (ISO) the targeting plan b. Loss of MQ-1C Grey Eagle unmanned aircraft system (UAS)
SUSTAINMENT a. Inability to establish a forward aerial refueling point (FARP) b. Insufficient AGM-114 Hellfire missiles to complete the enemy's destruction and expand the defense c. GS Rocket Battalions are unable to execute a day's targeting objectives due to Class V limitations d. Loss of a bridge over the Neman River
MOVEMENT and MANEUVER a. The emergence of a sema between any 1AD unit or with an adjacent division b. Loss of a bridge over the Neris River
COMMAND and CONTROL a. Degradation of upper Tactical Internet (TI) in a command node b. Loss of a command post (CP)

Figure 2. Updated FFIR based on guidance obtained from FM 5-0, Planning and Orders Production *(U.S. Army Graphic)*

inform the division commander's understanding of the operational environment, which he can communicate to the subordinate commanders during the Commander's visualization. A critical path that focuses on specific issues is important, but the Division staff can 'lose the forest through the trees' if it does not reassess its assumptions that underpinned the original plan. The FFIR is one element of the original plan that should be readdressed, but it is not the only factor that the staff should routinely readdress throughout the operation. The Division's planners should be responsible for facilitating the reassessment of planning assumptions during the AWG, which can be split between the G5 team and the G35 team depending on the time horizon.

MAJ Christopher M. Salerno is the G35, 1AD. His previous assignments include Maneuver Captain's Career Course Small Group Leader, Fort Moore, GA; Troop OC-T, Cobra Team, National Training Center, Fort Irwin, CA; Troop and HHC Commander, 2nd ABCT, 1st Cavalry Division, Fort Cavazos, TX; and Platoon Leader, 1-89 CAV, 2nd IBCT, 10th MTN Division, Fort Drum, NY. His military schools include Armor Basic Officer Leader's Course; Maneuver Captain's Career Course; and Naval War College. MAJ Salerno has a Bachelor of Science degree in Business Management from Boston College; a Master of Science degree in Organizational Leadership from Columbus State University; and a Master of Arts degree in Defense and Strategic Studies from the United States Naval War College.

Notes

[1] Field Manual 5-0, ***Planning and Orders Production***, (Washington, DC: U.S. GPO, 2022), 5-57.

[2] Field Manual 5-0, ***Planning and Orders Production***, (Washington, DC: U.S. GPO, 2022), 1-85.

[3] Mission Command Training Program, "FY 23 Mission Command Training in Large-Scale Combat Operations Key Observations,"

[4] Field Manual 6-0, ***Commander and Staff Organization and Operations***, (Washington, DC: U.S. GPO, 2022), 4-35.

FORDS against FERRARIS

How the Principles of Simplicity and Mass Can Guide the Army of 2040

by LTC Kyle Trottier

In 1986, GEN Donn Starry spoke at the American Defense Preparedness Association Conference at Fort Knox, Kentucky and discussed how "we remain outnumbered, outranged, and outgunned in new and impressive dimensions from armor to guns to missiles to helicopters to electronic warfare systems."[1] Nearly four decades later the U.S. Army faces similar challenges when considering how to fight outnumbered and win in Large-Scale Combat Operations (LSCO). The U.S. Army can learn from Security Assistance Group – Ukraine (SAG-U) and other NATO partners on what is required to train, sustain, and reconstitute combat power during LSCO. The principle of simplicity, when carefully synchronized, enables the generation of mass. When the U.S. Army develops solutions for the Army of 2040 it must develop simple solutions like a Ford versus exquisite Ferraris that are expensive and take a lot of time to train, sustain and reconstitute.

The novel and innovative application of emerging technology in the Russo-Ukraine War reaffirms the importance of the principles of war to decisions about force design for LSCO. Of the nine principles of war, the Russo-Ukraine War clearly demonstrates the principles of simplicity and mass must guide the decisions of military leaders more than the others due to the unique challenges the U.S. Army will face. As the Russo-Ukraine War completes its second year, the defense and security studies community should assess the conflict and discern relevant implications for future force design decisions. An outcome of this conflict is that military leaders must weigh the continuities of the nature of war versus the present character of warfare, such as how electronic warfare (EW) and the inexpensive first-person viewer (FPV) drones impact decision making for 2024 and beyond. The U.S. Army as an expeditionary-capable, campaign-quality force must be able to deploy globally, win its first battle, fight outnumbered to defeat a near-peer adversary while sustaining and reconstituting combat power.

To win a fight against a near-peer adversary the U.S. needs to mass mobile and lethal combined arms corps to execute multi-domain operations. These corps sized elements need agility to mass and penetrate an enemy defense in depth, then have the endurance to exploit this success across the depth of enemy territory until operational objectives are accomplished. The ability to accomplish this penetration and exploitation is inextricably tied to operational reach and ability of the U.S. Army to sustain and reconstitute combat power.

The principle of simplicity when carefully synchronized enables the generation of mass. In tandem, the ability to have the endurance to sustain the fight for prolonged periods of time and in depth across enemy formations can achieve the lasting effects of a decisive penetration. Endurance should be tied to a simplified strategic logistics from the military industrial base, ensuring strategic mobility, and supporting tactical formations who must transport the various classes of supply. The principles of simplicity and mass enable strategic and tactical mobility by creating commonality of equipment, streamlining manufacturing requirements, reducing operator and mechanic training, and decreasing the amount of supply required to be transported. Division Sustainment Brigades must have the ability to fabricate and repair to reconstitute forces in austere environments. Theaters should develop plans for sustaining and regenerating combat power while the Army must reduce the burden of policies to enable experimentation and transformation. The principles of simplicity and mass are inter-connected and should be viewed together to develop solutions to generate, sustain, and re-constitute combat power during LSCO.

Continuities of War

According to Field Manual (FM) 3-0, *Operations*, the characteristics of warfare are "affected by changes in technology, national policy, operational concepts, public opinion, and other factors."[2] An example of the impact of the characteristics of warfare on how nations fight occurred between WWI and the Gulf War. During WWI, the machine gun caused massed formations to entrench themselves into defensive positions. Later, during WWII tanks and aircraft overcame the machinegun to again enable offensive operations. In the 1973 Arab Israeli War, anti-tank guided missiles (ATGM) and air defense missiles made offensive maneuver costly for armored formations and air forces. Over the course of roughly

Principles of War
Maneuver: Place the enemy in a position of disadvantage through the flexible application of combat power.
Objective: Direct every military operation toward a clearly defined, decisive, and attainable goal.
Offensive: Seize, retain, and exploit the initiative.
Surprise: Strike at a time and place or in a manner for which the enemy is unprepared.
Economy of Force: Expend minimum-essential combat power on secondary efforts to allocate the maximum possible combat power on the main effort.
Mass: Concentrate the effects of combat power at the most advantageous place and time to produce decisive results.
Unity of Command: Ensure unity of effort under one responsible commander for every objective.
Security: Prevent the enemy from achieving surprise or acquiring unexpected advantage.
Simplicity: Increase the probability that plans can be executed as intended by preparing clear, uncomplicated plans and orders.

Figure 1. Principles of War[5] *(U.S. Army Graphic)*

fifty-five years, the character of war shifted from defense having the advantage in WWI to speed and offense having the advantage in WWII back to defensive advantages during the 1973 Arab Israeli War. Learning from 1973 the U.S. Army adopted Airland Battle to regain offensive abilities to fight outnumbered and win.

The Doctrine, Organization, Training, Material, Leadership and Education, Personnel, Facilities, and Policy (DOTMLPF-P) changes of Airland Battle provided the U.S. a solution to penetrate and exploit the defense of an enemy force with quantitative and qualitative advantages as proven during Operation Desert Storm (ODS). Today the Russo-Ukrainian conflict is dominated by strong defenses with complex obstacles 20 km in depth, a massed Russian Army of 670,000 Soldiers enabled with EW and a variety of drones providing constant surveillance and the potential for lethal strikes across the battlefield.[3]

Unlike the continuous change in the characteristics of warfare, the nature of war remains constant. FM 3-0, *Operations*, defines the nature of war as "1) fought to achieve a political purpose, 2) a human endeavor, 3) inherently chaotic and uncertain."[4] The principles of war are not a rubric for battlefield success, but instead summarize the essential elements of the nature of war so that tactical, operational, and strategic leaders may better understand, visualize, describe, direct, lead and assess forces in war. FM 3-0 defines the nine principles of war (see Figure 1). These definitions are narrow, and assessment of the Russo-Ukraine War demands an expansion of these definitions to guide military decision making.

The current definition of mass focuses on the tactical application of combat power. To produce the mass required to win the first battle, fight outnumbered and win, sustain and reconstitute forces during a LSCO the U.S. Army must simplify and synchronize DOTMLPF-P solutions. Policies and processes to rapidly increase manufacturing of arms and munitions, recruit, house and train Soldiers, transport and sustain forces globally must be simplified and synchronized to achieve the greatest efficiency possible. Synchronization is essential, for example to field the next generation squad weapon (NGSW) the Army must field the new weapon, the new optic, new ammunition, and develop new ranges capable of supporting the munition. To generate mass these elements must be simplified and synchronized.

Once again, simplicity enables the generation of mass as SAG-U and NATO forces have experienced with training, sustaining, and regenerating Ukrainian forces over the past two years. Again, the doctrinal definition of simplicity is too narrow focusing on the conduct of the orders process. As military leaders reflect on the Russo-Ukrainian War and how the U.S. Army will be able to generate the combat power required at a particular place and time to achieve political aims, U.S. Army leaders must simplify and synchronize DOTMLPF-P solutions. To generate and sustain combat power simple material solutions must be adopted for future equipment. To the greatest extent possible vehicles and equipment must have commonality of parts. This simplifies training requirements for operators and mechanics while

streamlining strategic and tactical logistics requirements. Russia has proven to be more resilient than western military leaders thought, thus the U.S. Army must plan for reconstitution of forces to regenerate mass.[6] Simplifying doctrine, training, material solutions, and policy enables the U.S. Army to increase the agility, endurance, and depth of combined arms corps during the conduct of multi-domain operations.

The principles of simplicity and mass are key to enabling the U.S. Army to fight outnumbered and win when contested in all domains. In 1988, GEN Starry spoke at the Center for Strategic and International Studies stating, "The combination of armor/ anti-armor, indirect fire, air defense, mine/ countermine, and electronic warfare capabilities clearly favors the other side (Russia). We are behind, have been for some time, and are getting further behind at an alarming rate."[7] GEN Starry was instrumental in driving change within the "Army of Excellence" that would field new equipment, doctrine, and training. He passionately spoke about being able to fight outnumbered and win. When discussing Operation Desert Storm he stated, "The part of the force that brought the war to a successful termination was a corps-sized combined arms mechanized force employed with lightning speed and devastating lethality. In summary, the equipment, organization, and training designed to support AirLand Battle doctrine was an unqualified success."[8] For Operation Desert Storm, the U.S. Army, as part of a Unified Operation was able to mass multiple U.S. and coalition divisions and conduct a tactical operation to achieve national political aims through the delivery of effects from multiple domains.

Over the last 30 years adversary nations have learned to contest the ability of the U.S. to generate the required mass of combat power to achieve military objectives. Military leaders must now develop simple DOTMLPF-P solutions to achieve mass in a contested environment. While technology has changed, the U.S. Army faces similar challenges GEN Starry did decades ago. The U.S. Army must be able to win its first battle, it must be able to fight outnumbered and win, and it must sustain and re-generate combat power against a near-peer adversary. The first step is to use the principles of simplicity and mass to enable global operations.

Simplicity and Mass to Enable Global Operations

ADP 3-0 describes the U.S. Army's requirement to have expeditionary capability and campaign quality forces.[9] As the predominance of the U.S Army capabilities are permanently stationed within the United States the ability to promptly deploy world-wide and sustain operations as long as necessary to obtain success are essential to achieving national interests.[10] When considering global operations, the U.S. Army must balance strategic mobility against tactical mobility. Strategic mobility is the balance to develop equipment that maximizes sea, air, and rail modes of transportation to deploy formations worldwide. Tactical mobility is the ability to develop equipment with maximum maneuverability across varying geographic terrain. Together these factors impact operational reach, which is "the distance and duration across which a force can successfully employ military capabilities."[11] In short, the ability of the U.S. Army to deploy, fight, sustain, and repair on a global scale determines the options available to commanders. General Eisenhower was presented with just these sorts of options on the eve of the allied invasion of Europe in WWII.

A historical example of strategic mobility is the 1944 invasion of Normandy France, Operation Overlord. On D-Day, June 6th 1944, 156,000 Soldiers crossed the English Channel and by the end of June 1944, 850,000 Soldiers and 150,000 vehicles surged into France.[12] As one of the primary vehicles for Allied Forces, 50,000 M4 Sherman Tanks were produced by US auto manufactures to support war efforts in both the Pacific and European theaters.[13] The tactical mobility of the Sherman enabled Allied forces to fight across the varied terrain of Europe from the Mediterranean to Berlin and a multitude of islands across the Pacific.

The M4 Sherman found the middle ground to enable both strategic and tactical mobility to deliver the mass required to defeat Axis forces. The simplicity of the Sherman platform generated greater tactical options for operational commanders. The Sherman chassis was used for the M7 105mm self-propelled howitzer, the M12 155mm self-propelled howitzer, the M30 Cargo Carrier, the M32 and M74 Tank Recovery Vehicle, the T34 Calliope multiple launch rocket system, M4A3R5 Flame Thrower, M4 dozer, M4 Mobile Assault Bridge, Mine Roller and Mine Flail variants.[14]

This one vehicle chassis enabled infantry, armor, artillery, engineer, and other formations. Simplicity of design across warfighting functions enabled simplicity of logistics. The U.S. industrial base could focus production on a specific set of parts able to be used across multiple platforms. The simplicity of logistics allowed operational commanders to generate mass and enable tactical success through the ability to seize, retain, and exploit the initiative to gain a position of relative advantage. The ability to mass a combined arms formation at a decisive point created favorable force ratios and enabled victory – this was strategic, tactical, and logistical simplicity at its best.

The M4 Sherman was akin to a Ford, a simple solution able to be produced in mass and easy to sustain globally. In contrast was the German Tiger Tank, analogous to a Ferrari. The Tiger IV tank for example was superior in every way with thicker armor, a more powerful engine, more capable suspension, and larger cannon with higher penetrating velocity. But only 1,350 Tiger IVs were produced.[15] While the Tiger IV was a superior tank, the German Army lacked a simple solution they could sustain to generate sufficient mass to achieve decisive battlefield results.

Figure 2. Soldiers from 4th Squadron, 9th U.S. Cavalry Regiment "Dark Horse," 2nd Armored Brigade Combat Team, 1st Cavalry Division, drive through a low-water crossing in the AMPV after completing field testing on Fort Cavasas, Texas September 2024. *(Photo by MAJ Carson Petry)*

FM 3-0 discusses the requirement for reconstitution by stating, "commanders must plan for the possibility of heavy losses to personnel, supplies, and equipment. Even with continuous and effective sustainment support, units may become combat ineffective due to enemy actions. Commanders at all levels must be prepared to conduct reconstitution efforts to return ineffective units to a level of effectiveness that allows the reconstituted unit to perform future missions."[16] As of 27 May 2024 Russia has lost, 502,304 Troops, 7,671 armored vehicles, 12,981 howitzers, 14,818 vehicles, 457 planes, 326 helicopters, and 27 ships. U.S. military leaders must develop and synchronize DOTMLPF-P solutions to win its first battle, fight outnumbered and win, sustain and re-constitute combat power.

For the armored brigade combat team (ABCT), the Next Generation Combat Vehicle Cross Functional Team (NGCV CFT) is focused on fielding the Armored Multi-Purpose Vehicle (AMPV) to replace the M113 family of vehicles (FOVs), field the XM-30 Optionally Manned Fighting Vehicle (OMFV), then develop the Next-Generation Main Battle Tank (NGMBT), given the M1E3 designation.[17] For each of these platforms there is a focus on improving survivability and force protection, increasing mobility and transportability, increasing lethality, reducing logistical impacts, and providing growth for future capabilities.[18] These vehicles are being built to fight and win in an operating environment with the constant threat of observation and strike by drones. The defeat of FPV drones will be integrated into these future platforms. While not a single platform conducting multiple functions like the M4 Sherman, these platforms are striving to have increased commonality of parts through a Modular Open Systems Approach (MOSA). The AMPV will replace 2,800 of the 60-year-old M113 family of vehicles (general purpose, mortar carrier, medical treatment, medical evacuation, and mission command). The AMPV shares a common powertrain and suspension with the M109A7 Paladin and M2A4 Bradley.[19] The XM-30 OMFV will be more lethal, more survivable, and have lower sustainment requirements than the M2A4 Bradley. Rheinmetall and General Dynamics have produced XM-30 prototypes for testing and evaluation.[20] The NGMBT will incorporate the best of existing technology while having the ability to fight and win in the contemporary environment full of drones and EW.[21] Program Executive Office for Ground Combat Systems (PEO-GCS) is using open systems software and hardware architecture.[22] This means as the U.S. Army modernizes its combat platforms, they will share common parts and digital systems and be able to upgrade and repair rapidly.

Message to the Army Team

'This We'll Defend' has been our Army's motto since the Revolutionary War. It reminds us that our purpose is timeless and clear: *to fight and win our Nation's wars.* When our Army hits the dirt, America means business. Our teammates don't want to fight without us, and our enemies are wise to fear us. We are not a Pacific Army or a Europe Army. We are not Brigade-centric or Division-centric. *We are a global force that fights when called upon at the scale required.*

To do that, we must stay grounded, and dedicate our energy in four focus areas:

Warfighting

We must *ruthlessly prioritize* time and resources towards building lethality and cohesive teams. Soldiers need to shoot, move, communicate, and be experts in their craft. They also need to bond together through tough, realistic training.

Commanders and leaders, *we trust you to figure out what you should not be doing*. Communicate that up so the leaders above you can underwrite risk. Let us know where you need our help.

Delivering Ready Combat Formations

We must be ready to get our formations to the fight and sustain them there. Leaders at installations will have the appropriate authorities to build readiness. Ft. Wainwright is different than Ft. Liberty; *local leaders know best how to translate strategic intent into solutions at the local level*.

And at the heart of our Army's readiness is people. Our warfighters and their families will have access to timely information and enabling resources. Our strength is our Soldiers and families, and we are committed to taking care of both.

Continuous Transformation

We will transform *iteratively and continuously* to become leaner, more mobile, lower signature and, most importantly, *more lethal*. We will integrate technology faster, pushing new, cost- effective technologies into our operational units as soon as they are useful. We want our tactical units to innovate, test ideas, fail fast, and adapt. The best ideas often come from the bottom up.

Strengthening the Profession

To maintain America's trust, *we must serve with competence and character*. Foundational to that is *enforcing standards* and ensuring accountability, which ensure discipline in our formations. When it comes down to a close fight in the mud, character, grit, and discipline make the difference. Additionally, we all must own our profession – share ideas, engage in debate, and learn together.

When you are downrange and you hear a call sign come over the net, a mental picture comes to mind... When the American Army comes over the net, we want our teammates to know that the best, most disciplined land force in the world has arrived. *All of us contribute to that reputation*.

We are proud of this team. When we are called, we will answer... and we will win. ***This We'll Defend!***

Michael R. Weimer
Sergeant Major of the Army

Randy A. George
General, United States Army
Chief of Staff

Christine E. Wormuth
Secretary of the Army

Figure 3. Message to the Army team from Sergeant Major of the Army Michael R. Weimer, Chief of Staff of the Army General Randy George, and Secretary of the Army Christine E. Wormuth signed Oct 27, 2023.

The Modular Open Systems Approach not only allows for commonality, but also rapid upgrading and modernization into the future.[23] By designing MOSA systems the U.S. Army will create combat vehicles with the greatest amount of commonality possible. This will decrease tactical sustainment requirements as battalions will carry fewer varieties of parts in their on-hand stockage. The simplification of parts required to be carried by tactical formations increases the agility of units and improves their ability to mass at a decisive point to gain a position of advantage. The MOSA simplifies the demands on military industrial partners as many companies can manufacture parts common to multiple systems. Which, in-turn, allows the U.S. Army to generate mass strategically. The principles of simplicity and mass are interconnected and must be viewed together to develop solutions to generate, sustain, and re-constitute combat power.

Simplicity and Mass to enable Multi-Domain Operations.

In the July-August 1975 edition of ***ARMOR*** magazine, GEN Starry said, "winning the first battle(s) is critical, and they will have to be won by U.S. Army forces fighting outnumbered. The secret to winning is not in numbers. Mobility provides the means to mass in the time and place arriving at a reasonably matched force ratio, say three, four, or six to one."[24] Thus, if Russia does have 670,000 troops committed to the war in Ukraine, it does not mean the U.S. must have over 2 million forces to achieve a 3:1 force ratio to win the war. Instead, as GEN Starry states, the ability to mass combat power at a decisive point creates the favorable force ratios required to achieve a position of relative advantage where joint and coalition partners can penetrate and exploit.

Lethality and firepower are inter-related elements which enable the massed formation to deliver combat power to achieve tactical success. Lethality is the capability and capacity to destroy, and firepower is the primary source of lethality.[25] According to FM 3-0, firepower facilitates maneuver by suppressing enemy fires and disrupting or preventing the movement of enemy forces.[26] The ability for a combined arms formation to use tactical mobility and devastating lethality to gain a position of relative advantage preserves combat power and creates opportunities to exploit success. If a friendly formation can conduct such operations throughout the depth of the enemy formation without reaching a point of culmination, then tactical victory can be achieved.

The 1973 Arab Israeli War, the 2017 Siege of Mosul, the 2020 Second Nagorno-Karabakh War, and the ongoing Russo-Ukraine War all highlight the lethality of the modern battlefield. In 1973, the Israeli Defense Force (IDF) lost 800 armored vehicles and 100 attack aircraft in three weeks.[27] The 162nd Division alone lost 83 of 183 tanks on 8 October 1973.[28] To overcome the Arab defense a joint and combined arms approach was required.

The initial Israeli armored assault lacked combined arms integration and tanks drove into anti-armor ambushes with anti-tank guided missiles (ATGMs). Similarly, attack aircraft flew into integrated air defense networks of surface to air missiles (SAMs). As the IDF incorporated infantry to clear enemy battle positions armored forces could penetrate the defense with mobility and lethality. The ground corps exploited this success destroying SAM sites creating clear air corridors for the air force. The complementary effects of joint and combined arms operations enabled freedom of maneuver across multiple domains.

During the Russo-Ukraine War, Russian EW systems have proven capable of neutralizing U.S. precision strike capabilities.[29] Simultaneously, the M2A2 Bradley Fighting Vehicle has proven to be one of the most capable platforms on the battlefield in Ukraine. Its combination of mobility and lethality has resulted in devastating destruction to Russian formations including the highly publicized destruction of a T-90 main battle tank with the 25mm Bushmaster auto cannon.[30] Another high visibility event is the destruction of a T-80 main battle tank with a TOW missile from over a mile away.[31] With an abundance of confirmed kills on the battlefield the mobility and lethality of the Bradley demonstrates the capabilities required to defeat a near-peer army in depth and enable multi-domain operations.

If the U.S. were engaged in LSCO against a near-peer military, the U.S. must plan for destruction at scales similar to 1973 and Ukraine. The U.S. needs to have mobile and lethal combined arms corps to enable multi-domain operations. U.S. Army combined arms corps will be essential to the destruction of SAM and EW sites to enable surface to ground and air to ground strike capabilities throughout the depth of the enemy formation. These strikes will be required to destroy drone launch and recovery sites and control stations, which will further protect the ground force from future enemy drone strikes.

The M2A2 Bradley represents the impact of simplicity and mass required to enable MDO. With the U.S. donating over 200 M2A2 Bradley Fighting Vehicles to Ukraine the Bradley has made a tremendous impact for the Ukrainian Armed Forces (UAF).[32] The simplicity of the vehicles' design has enabled the UAF to repair battle-damaged vehicles and return reconstituted forces to the fight.[33] The simplicity of the vehicle makes it easy to operate and easy to train new Soldiers how to employ and maintain. The Bradley's small size generates mass through numbers facilitating efficient strategic mobility while having superior tactical mobility on the battlefield. Together, the simplicity of the vehicle enables rapid generation of combat power which provides endurance to the operating force. The success of the M2A2 in Ukraine validates the MOSA approach and commonality of parts across the AMPV, XM-30, and M1E3[34]. The principles of simplicity and mass have been proven on the battlefield with the M2A2 during ODS and

the Russo-Ukraine War and must inform U.S. Army modernization for LSCO. Winning ground wars requires Fords not Ferraris.

Simplicity and Mass to Be Combat Ready, Transform, and Strengthen the Profession

In October 2023, Army senior leadership delivered a Tri-Signed with priorities for the Army. It stated, "we are a global force that fights when called upon at the scale required."[36] Chief of Staff of the Army (CSA) GEN Randy George further set four priorities for the U.S. Army as Warfighting, Delivering Ready Combat Formations, Continuous Transformation, and Strengthening the Profession.[35] CSA George challenges the Total Army enterprise to build lethal cohesive teams with leaders of character and competence that enforce standards and take care of Soldiers and their families and become leaner, more mobile, and more lethal through rapid iteration. As Army leaders analyze contemporary problems and generate solutions in-line with the CSAs priorities, the principles of simplicity and mass viewed through the DOTMLPF-P framework can guide how the U.S. Army generates the combat power required to win.

To build warfighting ability CSA George challenges Army leaders to cut out unnecessary activities to build lethal and cohesive teams. Dr. Leonard Wong and Dr. Stephen Gerras discussed these challenges in their 2015 article "Lying to Ourselves: Dishonesty in the Army Profession" where they present the challenges leaders at echelon face to meet mandatory requirements as well as those related to operations and readiness.[36] Simplicity is required to meet the CSA's intent. Policy changes must be made to reduce or modify mandatory requirements or remove as many activities as possible that detract from building lethal and cohesive teams. For example, the Army Sponsorship Program. It takes a lot of time and organizational energy for company leaders to sponsor every Soldier arriving to their unit. Why is it mandatory for units to sponsor every single Soldier coming to the unit? Does it make sense to sponsor an E-6 making their third or fourth permanent change of station (PCS)? Sponsorship makes sense for initial term Soldiers and Outside the Continental United States (OCONUS) moves where there are many different rules and regulations. But, for Continental United States (CONUS) moves, non-initial term Soldiers should opt in to the sponsorship program if they feel they need assistance instead of making it mandatory for every Soldier.

The CSA wants iterative experimentation and transformation of forces as well as a reduction in requirements on units. To achieve this policy changes will be required to allow for divisions to rapidly procure or locally produce and test experimental equipment. Islamic State (ISIS) flew armed small drones in Iraq in 2014 but the US Army still lacks a similar capability. Divisions could 3D print drones and use a simple application to get Federal Aviation Administration (FAA) clearance and fly within the local training area to allow Soldiers to maneuver with aerial support. Until these policy changes can be made the U.S. Army will continue to be decades behind our adversaries who rapidly iterate without bureaucratic barriers.

Reconstitution of forces is an area Army leaders should focus now to prepare theaters for future conflicts. Army leaders can identify facilities to house, feed, and train forces on a rotational basis and design reconstitution plans based upon the capacities of these locations. Then, decisions weighting risk can be made regarding what level of training is acceptable for a reconstituted force and in what amount of time. Failure to develop theater reconstitution plans now will delay future battlefield endurance, agility, and depth of operations. For example, as Ukrainian battalions were attritted they would be pulled off the front line and veteran Soldiers would serve as the core cadre of companies and replacement Soldiers are then added to re-constitute the battalion. From there units would complete squad, platoon, and company situational training exercises (STX) and live fire exercises (LFX) then returned to the front line.

Repair and fabrication capabilities must become a major focus for Army transformation to build combat ready forces. Although the Israeli 162nd Division lost 83/183 tanks on October 8th, 1973 battle damage and repair capabilities reconstituted dozens of tanks within a week. Facilities like Maintenance Activity Vilseck (MAV) at Rose Barracks Germany and Material Support Command-Korea (MSCK) at Camp Carroll, Korea must be present within Division Sustainment Brigades (DSB). Facilities like the MAV and MSCK can repair faults to wiring harnesses and line replaceable units (LRUs) and fabricate hundreds of different parts. These facilities represent the ability to reduce demands on the military industrial base, repair equipment more rapidly and at a cost savings to the government. The ability to repair and fabricate close to operational units simplifies the ability to sustain and re-generate units which enables commanders to mass combat power in the most efficient manner possible.

Conclusion

Napoleon Bonaparte is often attributed to the saying that, "amateurs discuss tactics, but professionals discuss logistics." The tactics of the Russo-Ukraine War like EW and FPV drones make headlines, but the lessons for U.S. Army leaders to learn centers around logistics. To fight and win against a near-peer adversary the U.S. Army must:

1. Develop products with the greatest amount of part commonality possible.

2. Every Division Sustainment Brigade must have the ability to repair and fabricate components in a remote location without civilian contractors and battalions must be proficient in battle damage and repair procedures

to regenerate combat power.

3. Theaters must develop plans to reconstitute combat power.

4. Policy changes are required to enable increased experimentation by allowing units to rapidly procure or fabricate solutions.

The Army needs to develop solutions akin to a Ford. Simple solutions able to generate rapidly and easy to sustain globally. From WWII to 1973 to the present this same formula has proven successful. Exquisite technological solutions go against the principles of war and the history of mechanized warfare does not favor Ferraris like the German Tiger Tank. As Army leaders reflect on lessons from the Russo-Ukraine War they should synchronize simple solutions across DOTMLPF-P to enable the generation of mass as this will empower corps with agility, endurance, and depth to conduct multi-domain operations and win.

LTC Kyle Trottier is the Battalion Commander of 1-37AR, 2ABCT, 1AD, Fort Bliss, TX. His previous assignments include Career Manager, HRC, LTC and MAJ; Executive Officer, 1ABCT, 3ID; Executive Officer, 2-7IN, 1ABCT, 3ID; and G35, 3ID. His military schools include School of Advanced Military Studies; Command and General Staff College; Air Assault Course; Maneuver Captains Career Course; Armor Officer Basic Course; Northern Warfare Course; and Basic Airborne Course. LTC Trottier has a Bachelor of Science degree in Criminal Justice from Texas Christian University; a Master's of Arts degree in Security Management from Webster University; and a Master's of Military Art degree from the School of Advanced Military Studies. His awards include four Bronze Star Medals, one Defense Meritorious Service Medal, and four Meritorious Service Medals.

Notes

[1]Press On! Selected Works of General Donn A. Starry, Volume 1, September 2009. 2009. 113. https://www.armyupress.army.mil/Portals/7/combat-studies-institute/csi-books/PressOnI.pdf

[2] Field Manual 3-0, Operations (Washington, DC: Government Printing Office, 2022), 1-35.

[3] "Russia-Ukraine Tensions: Putin Orders Troops to Separatist Regions and Recognizes Their Independence," New York Times, 21 February 2022.

[4] Field Manual 3-0, Operations (Washington, DC: Government Printing Office, 2022), 1-29

[5] Field Manual 3-0, Operations (Washington, DC: Government Printing Office, 2022), Table 1-1

[6] "They've Grown Back: How Russia Surprised the West and Rebuilt Its Force," Defense News, 21 May 2024. https://www.defensenews.com/global/europe/2024/05/21/theyve-grown-back-how-russia-surprised-the-west-and-rebuilt-its-force/

[7] Press On! Selected Works of General Donn A. Starry, Volume 1, September 2009. 2009. 125. https://www.armyupress.army.mil/Portals/7/combat-studies-institute/csi-books/PressOnI.pdf

[8] Press On! Selected Works of General Donn A. Starry, Volume 1, September 2009. 2009. 31. https://www.armyupress.army.mil/Portals/7/combat-studies-institute/csi-books/PressOnI.pdf

[9] Army Doctrine Publication 3-0, Operations (Washington, DC: Government Printing Office, 2019), 1-59 thru 1-62

[10] Army Doctrine Publication 3-0, Operations (Washington, DC: Government Printing Office, 2019), 1-62

[11] Army Doctrine Publication 3-0, Operations (Washington, DC: Government Printing Office, 2019), 1-60

[12] Editors, History.com. 2009. "D-Day." HISTORY. October 27, 2009.

https://www.history.com/topics/world-war-ii/d-day#victory-in-normandy

[13] "Landing Ship, Tank, Navy Ship. N.d. Encyclopedia Britannica. https://www.britannica.com/technology/landing-ship-tank

[14] M4 Sherman (1942). https://tank-afv.com/ww2/US/M4_Sherman.php

[15] Hill, Andrew. The Online Tank Museum. April 30th, 2019. https://tanks-encyclopedia.com/ww2/germany/panzer-vi_tiger.php

[16] Field Manual 3-0, Operations (Washington, DC: Government Printing Office, 2022), 6-95

[17] The Kyiv Post keeps a running tally of these figures and other Russian losses in a ticker across the top of their homepage: https://www.kyivpost.com/

[18] Heaton, Dan. 2022. "Combat Vehicle Developments to Propel Army of 2030 and Beyond. https://www.moore.army.mil/Armor/eARMOR/content/issues/2022/Fall/4Heaton22.pdf

[19] Heaton, Dan. 2022. "Combat Vehicle Developments to Propel Army of 2030 and Beyond. https://www.moore.army.mil/Armor/eARMOR/content/issues/2022/Fall/4Heaton22.pdf

[20] Heaton, Dan. 2022. "Combat Vehicle Developments to Propel Army of 2030 and Beyond. https://www.moore.army.mil/Armor/eARMOR/content/issues/2022/Fall/4Heaton22.pdf

[21] https://www.army.mil/article/269609/army_awards_full_rate_production_contract_for_ampv

[22] Magnuson, Stew. Park, Allyson. 2024. Nationaldefensemagazine.org.2024. https://www.nationaldefensemagazine.org/articles/2023/6/26/gd-rheinmetall-win-optionally-manned-fighting-vehicle-contract

[23] Saballa, Joe "US Army OKs Major M1 Abrams Tank upgrade." The Defense Post, September 11, 2023. https://www.thedefensepost.com/2023/09/08/us-army-abrams-upgrade/

[24] Dr Dattathreya, Macam, MG Cummings, Brian, Mr. Sharaif, Fasi. "Reusable and Refreshable: Open System Architecture for Fighting Vehicles. August 23, 2018.

Accessed 28 May 2024. https://www.army.mil/article/210117/reusable_and_refresh_able_open_systems_architecture_for_fighting_vehicles

[25] Defense Standardization Program. "DSP MOSA." https://www.dsp.dla.mil/Programs/MOSA/

[26]Press On! Selected Works of General Donn A. Starry, Volume 1, September 2009. 2009. 51. https://www.armyupress.army.mil/Portals/7/combat-studies-institute/csi-books/PressOnI.pdf

[27] Field Manual 3-0, Operations (Washington, DC: Government Printing Office, 2022), 1-23 and 2-19.

[28] Field Manual 3-0, Operations (Washington, DC: Government Printing Office, 2022), 2-20

[29] The 1973 Arab-Israeli War: Insights for Multi-Domain Operations. 2022. AUSA. December 16, 2022. https://www.ausa.org/publications/1973-arab-israeli-war-insights-multi-domain-operations

[30] The 1973 Arab-Israeli War: Insights for Multi-Domain Operations. 2022. AUSA. December 16, 2022. https://www.ausa.org/publications/1973-arab-israeli-war-insights-multi-domain-operations

[31] Cohen, Alex Marquardt, Natasha Bertrand, Zachary. 2023. Russia's Jamming of US-Provided Rocket Systems Complicates Ukraine's War Effort. CNN Politics. CNN. May 5, 2023. https://www.cnn.com/2023/05/05/politics/russia-jamming-himars-rockets-ukraine/index.html

From the ARMOR Art Archives

"Tigers at Kursk"

[32] "Watch Two Ukrainian Bradleys Outmaneuver Russia's Might T-90M Tank through Sheer Grit." 2024. Popular Mechanics. January 23, 2024. https://www.popularmechanics.com/military/weapons/a46446996/ukrainian-bradleys-outmaneuver-russias-mighty-t-90m-tank/

[33] Axe, David. N.d. A Ukrainian M-2 Fighting Vehicle Sneaked up on a Russian T-80 at Night – and Hit it with a Missile from a Mile Away. Forbes. Accessed May15, 2024. https://www.forbes.com/sites/davidaxe/2024/05/08/a-ukrainian-m-2-fighting-vehicle-sneaked-up-on-a-russian-t-80-tank-at-night-and-hit-it-with-a-missile-from-a-mile-away/?sh=45f30a3-6774b

[34] Epstein, Jake. n.d. New Photos Show the US Army's Latest Version of the Bradley Fighting Vehicle That Proven Itself in Ukraine. Business Insider. Accessed May 15, 2024. https://www.businessinsider.com/see-us-army-new-bradley-vehicle-armor-battle-tested-ukraine-2024-5

[35] Axe, David. n.d. "The Ukrainian Army Piled 15 Wrecked M-2 Bradley Fighting Vehicles in One Scrapyard." Forbes. Accessed May 15, 2024. https://www.forbes.com/sites/davidaxe/2023/12/24/the-ukrainian-army-piled-15-wrecked-m-2-bradley-fighting-vehicles-in-one-scrapyard/?sh=6b2a5bac108f

[36] Message to the Army Team. Tri-Sign CSA Range George, SMA Michael Weimer, Secretary of the Army Christine Wormuth. https://www.army.mil/article/271225/october_26_2023_message_to_the_army_team

[37] Message to the Army Team. Tri-Sign CSA Range George, SMA Michael Weimer, Secretary of the Army Christine Wormuth. https://www.army.mil/article/271225/october_26_2023_message_to_the_army_team

[38] Wong, Leonard, Gerras, Stephen. Lying to Ourselves: Dishonesty in the Army Profession. U.S. Army War College Strategic Studies Institute. 1 February 2015. https://press.armywarcollege.edu/cgi/viewcontent.cgi?article=1465&context=monographs

196th CAVALRY REGIMENT

The distinctive unit insignia was originally approved for the 196th Cavalry Regiment on 4 October 1965. Its yellow and green colors reflect the unit's constitution as a Cavalry organization (yellow) with units that have an Armor background (green).

The shield portion of the insignia is shaped like a pine cone, a reference to North Carolina; in the center of the pine cone is an upright artillery projectile superimposed over a crossed bayonet and, behind both of these objects, a green space. The spade represents Engineer units and the projectile Artillery, both found in the unit's lineage. "Eyes Of Hickory" is the unit motto, a reference to the Cavalry's role as a scouting and reconnaissance unit for the 30th "Old Hickory" Infantry Division.

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