ARMOR

U.S. ARMY

Large-Scale Lethality

HARMON

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CHIEF OF ARMOR'S HATCH

BG Kevin D. Admiral
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Armor School Ongoing Efforts

It's my honor to serve as the 52nd Chief of Armor here at Fort Benning, GA. Our vision at the U.S. Army Armor School is to be the premier institution for developing agile and adaptive armor/cavalry leaders and Soldiers who have mastered the fundamentals and are capable of operating in any environment. We want our leaders and Soldiers to be skilled in the art of mounted warfare and reconnaissance and security (R&S) missions in support of combined-arms operations at echelon and across all domains.

My top priority is ensuring that our armor and cavalry leaders are receiving the best institutional training available and we'll continue to revisit programs of instruction to ensure they're relevant for large-scale combat operations and keep pace as the force continues to modernize. We remain nested with the Maneuver Center of Excellence's mission to provide trained and combat-ready Soldiers and leaders and to develop the doctrine and capabilities of the maneuver force.

To highlight a few of the ongoing efforts in motion, we are 1) hardcoding 19A and 19Z billets inside all brigade-combat-team types to ensure that formations are led by armor/cavalry leaders that have the requisite skill sets to be effective on Day 1; 2) working doctrine, organization, training, materiel, leadership and education, personnel and facilities (DOTMLP-F), integration/modernization for future platforms; and 3) providing subject-matter expertise on echelons-above-brigade R&S formations.

This next year is going to be exciting for the armored force at large. In May 2020, the Armor School will host the fifth Sullivan Cup Best Tank Crew Competition. The event will physically and mentally test U.S. Army Soldiers, U.S. Marines and international partners in tank-crew maneuver, sustainment and gunnery skills. More importantly, it will determine which unit has produced the most lethal tank crew. I recommend that units start selecting their teams and building their eight-step training plan now. Also, I'm especially interested in Defender 2020, which is a Department of the Army- directed, U.S. Army Europe-led exercise designed to demonstrate the United States' ability to rapidly deploy a division to the European theater. The exercise will highlight our skills in a complex operating environment and will stress the Army's ability to mobilize, deploy and conduct combined operations.

Thanks to the previous Chief of Armor, BG Dave Lesperance, who in more than two years moved the Armor School forward in the right direction. It's my goal to build on that great foundation and continue developing lethal leaders who are experts in their craft. Over the coming weeks, I will continue to refine my sight picture on critical issues facing the Armor Branch and look forward to establishing an open dialogue with you to gain a better understanding of the current armor and cavalry troopers inside your formations.

Forge the Thunderbolt!

ACRONYM QUICK-SCAN

R&S – reconnaissance and security

GUNNER'S SEAT

CSM Kevin J. Muhlenbeck
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U.S. Army Armor School

Talent Management Needs to Be More Than Just Buzzwords

The 2019 Maneuver Warfighter Conference at the Maneuver Center of Excellence accomplished its goal of continuing to message the criticality of preparing our Soldiers and formations for large-scale combat operations. A key component of ensuring that our Soldiers, tank crews/scout squads and platoons maximize their lethality is effective talent management of Soldiers and leaders.

Most critical of all is the staff sergeant. The staff sergeant is most sought-after noncommissioned officer (NCO) rank to fill our critical positions as drill sergeants, recruiters, tank/scout instructors, etc.

The bottom-line-up-front of the matter is that if units in the operational force are not proactive with a sound talent-management program, Human Resources Command (HRC) will

manage their Soldiers for them. The greatest way to manage the critical resource of an experienced NCO is to have a two-way flow of communication between HRC and operational units in the field.

We at the Armor School and branch-proponent office are adjusting some manning policies found in Department of the Army Pamphlet (DA PAM) 600-25. These are:
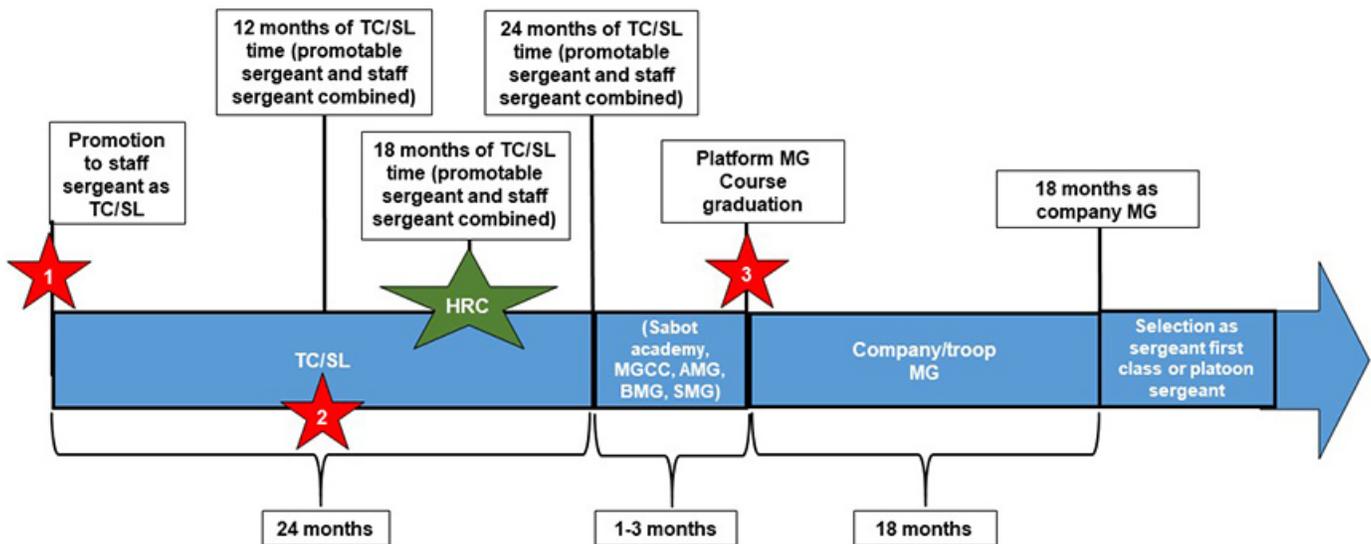
Figure 1. Staff-sergeant talent-management model. Regarding talent-management Milestone 1: Immediately submit key and developmental (KD) stabilization to HRC (24 months to meet KD requirements) and prepare NCO for attendance at ALC, focusing on Career Management Field (CMF) 19 tasks. In Milestone 2, the unit identifies the NCO as s potential MG once KD time is complete; identify Soldier at about 14 months; contact HRC with timeline to attend sabot academy, MG common core (MGCC), Abrams MG (AMG), Bradley MG (BMG) or Stryker MG (SMG). At Milestone 3, the MG branch chief automatically submits MG graduation rosters to HRC for stabilization (18 months). At HRC's Milestone 3, HRC's Armor Branch begins identifying NCOs for broadening assignments. (Note: The unit MG candidate is the same NCO that HRC/Army looks at for other assignments – for example, drill sergeant / recruiter, etc.) Key in this process is early communication between HRC and the unit's command sergeant major.)

- The minimum amount of time a staff sergeant serves in a tank commander (TC)/scout-squad leader (SL) position has been returned to 24 months from the current 18 months.
- Non-promotable sergeants in a staff-sergeant position will no longer have rated time count toward their 24 months of critical leadership time.
- Non-promotable staff sergeants in a sergeant-first-class position will no longer have rated time count toward their 24 months of critical leadership time.

These changes are not designed to stymie the careers of our NCOs but to give them the time to receive the "reps and sets" to become truly proficient in their warfighting skills.

Now that the guidance for assigning NCOs has been adjusted, how can units maximize the amount of time they have in their positions? Figure 1 is an example of how a staff sergeant, once made a TC/SL, can be managed by the unit.

Figure 1 shows how a unit can stabilize a staff sergeant once assigned to TC/SL position; identify the NCO for training as a master gunner (MG) at the 18-month mark; and send the Soldier to the MG course upon completion of his/her 24 months. Once the NCO completes the MG course, he/she is stabilized for 18 months so the unit benefits from the skills the NCO has gained as TC/SL and as an MG. The Soldier then may be selected as a sergeant first class and assigned as a platoon sergeant once he/she has completed professional military education (PME) and is promoted.

The preceding scenario is based on leveraging the stabilization options available from HRC, which are shown in Table 1.

As I travel to units across the force, there is a lack of understanding of these options at the platoon, company and battalion level. It is not that the NCOs are bad leaders, but it is a topic not covered in any PME course. We are messaging these options to the students who attend Armor Advanced Leader's Course (ALC) and the Maneuver Senior Leader's Course, and to the future commanders at the Maneuver Pre-Command Course.

However, education is only part of the solution, as it must be predicated on open communication between units in the field and branch managers at HRC to make it work. It is the "reps and sets" that build proficiency; proficiency builds lethal units; lethal units are units that are filled with pride; and **PRIDE IS CONTAGIOUS!**

ACRONYM QUICK-SCAN

AEA – assignment, eligibility and availability
AI – assignment instructions
ALC – Advanced Leader's Course
AMG – Abrams master gunner
BMG – Bradley master gunner
CMF – career-management field
DA PAM – Department of the Army pamphlet
HRC – Human Resources Command
KD – key and developmental
MG – master gunner
MGCC – master gunner common core
MOS – military-occupation specialty
NCO – noncommissioned officer
PME – professional military education
SL – scout-squad leader
SMG – Stryker master gunner
TC – tank commander

Active Component enlisted-crew stabilization (Assignment, Eligibility and Availability (AEA) F): -Stabilization starting seven months prior to combat training center for specific crew military-occupation specialties (MOSs)/positions	
Special-category stabilization (AEA G):	
-First sergeants	24 months
-Master gunners (additional skill identifiers J3/A8/K8/R8/A7)	18 months (new – auto stability)
-(New) Critical enlisted aviation skills/positions*	24 months
-(New) Ranger (Career Management Field (CMF) 11/13/14/19)	12 months after graduation
-Other HRC-approved extensions	Various
Stop Move and combat deployments: -Deployment to imminent danger/hostile-fire areas: stabilization starts 180 days prior to latest-arrival-date	
Key and developmental (KD) stabilization: -(New) Stabilize NCOs in CMFs 11, 13, 19 (sergeants through master sergeants) and MOS 12B (staff sergeants through master sergeants) for minimal time required to meet career-model requirements in accordance with DA PAM 600-25	
Deletion/deferment: -Request related to Soldiers already on AI	

Table 1. Available stability/predictability tools. Note: HRC puts Soldiers on assignment instructions (AI) six to nine months from report. Refer to the consolidated Active Component enlisted-stabilization procedures in Military Personal Message 18-359, "Stabilization options for commanders to preserve readiness," https:// www.hrc.army.mil/content/Enlisted%20Procedures%20and%20Soldier%20Actions%20Branch.

NATO Reconnaissance and Security Strike Group: Regaining Operational R&S in European Command

by MAJ Steve Orbon

As the United States and its allies return to an era of Great Power competition, the need for military forces to execute large-scale operational maneuver grows in importance. Advances in technology and weapons have given peer adversaries the ability to challenge allied forces in domains where they previously couldn't. This loss of domain dominance has increased the need for members of the Joint force to provide organic and redundant capabilities to continue to conduct operational functions.

However, during the past 18 years of counterinsurgency (COIN) warfare, the U.S. Army divested itself of most of its dedicated operational reconnaissance and security (R&S) capabilities. This has significantly hindered its capacity to execute the functions of intelligence and protection. The greatest impacts from this capability gap are felt in the European Command (EUCOM) area of operations (AoR).

Through examining the character of modern warfare, the reality of the threat posed by Russia and the failed attempts by the Army to fill this shortfall, it can be concluded that a combined North Atlantic Treaty Organization (NATO) solution should be explored. A proposed NATO R&S formation would bring together the required assets to conduct these critical missions from across NATO. This combined solution to a shared problem on NATO's eastern flank could be the catalyst needed for allied forces to gain and retain the initiative in a future high-intensity conflict.

Introduction to problem

The 2018 National Security Strategy assessed that the current security environment is one that is "more complex and volatile than any we have experienced in recent memory."[1] Increasingly aggressive actions by peer competitors such as Russia and China have elicited a dramatic shift in the focus and security efforts of the United States and its allies. As a part of this pivot, the

Joint force has placed exceptional emphasis in preparing itself once again for high-intensity warfare.

To provide legitimate military options in a new era of Great Power competition, U.S. forces must be able to execute large-scale operational maneuver in all domains. Capabilities critical to achieving this need to be prioritized and any gaps identified must be filled. Failing to do so could result in the catastrophic defeat of U.S. and allied forces on a future battlefield.

As the land component of the Joint force, the U.S. Army is responsible for dominating operational maneuver on the ground. A critical shortfall the Army currently has in achieving this is its lack of dedicated operational-level R&S capabilities.

Over the past two decades, the Army has slowly divested itself of nearly all its division- and corps-level R&S elements, leaving it unable to carry out these critical enabling missions at the operational level.[2] Although for years the Army has acknowledged this widening capability shortfall, other competing priorities have prevailed, and a deficit still remains. The ramifications for not filling this gap appropriately would be felt the most in EUCOM's AoR. Without the ability for NATO ground forces to maneuver effectively at the operational level, NATO is at risk on its eastern flank.

The facts of the dynamism of modern large-scale ground combat, the reality of the true threat posed by Russia and the incapacity of the U.S. Army to fill this requirement unilaterally demand that a NATO solution be sought to solve this problem. Therefore, NATO must establish a dedicated and combined formation to fill the operational R&S gap in EUCOM so that allied forces can maneuver and win in a high-intensity conflict.

Detect, protect to attack effectively first

The character of high-intensity conflict in a 21st-Century battlespace is one

that will be defined by extreme lethality, rapid tempo, multi-domain contestation and the denial of critical capabilities.[3] To have the maneuver space and time to properly deploy their forces in this complex environment, division- and corps-level formations will need to gain timely and accurate intelligence on the enemy as well as protect themselves from threat capabilities.[4]

Although in the past, ground forces have been able to heavily rely on other members of the Joint force to achieve these effects, the modern battlefield will not guarantee this. Air, naval or Special Operations assets may be tasked with other missions, could be disrupted or simply destroyed by near-peer capabilities. As U.S. and allied ground forces prepare themselves to operate in this complex environment, the need for dedicated and organic operational R&S formations becomes necessary.

Although distinct domains, the character of modern war on the ground is becoming strikingly similar to that of war at sea due the increasing speed and ranges at which combat can occur. In examining some of the concepts that have been more prevalent in maritime operations, great insight can be gained for those on the ground. Naval theorist CAPT Wayne P. Hughes has stated that the most important principle of naval operations in the modern era is to "attack effectively first."[5]

This idea is based on observations that when facing a peer adversary with comparable capabilities to one's own force, the first engagement might be the most decisive.

Hughes adds that one of the keys to achieving this has always been the effective execution of scouting to gain good intelligence. He even states that this is so important that it should be "emphasized as much as the delivery of firepower."[6] As U.S. and allied ground forces begin to come to the realization that they no longer have a drastic capability overmatch against some of their biggest global threats,

Figure 1. Troopers assigned to 2nd Squadron, 11th ACR, cautiously advance into a bunker area during a March 2005 raid on the Hateen Weapons Complex in Babil, Iraq, with an M3A2 Bradley. The raid was coordinated to disrupt insurgent safe havens and to clear weapons-cache sites in the area of operation. *(U.S. Navy photo by PHC Edward G. Martens)*

detecting effectively first becomes even more relevant.

In addition to being able to conduct effective reconnaissance, friendly forces are going to need to survive long enough to execute operational maneuver to seize positions of relative advantage. This requires that they be protected from the enemy's attempts to gain operational surprise, attrit combat power and induce culmination before the decisive point of battle. The screening, covering and guarding of friendly ground forces from observation or effective indirect and direct fires is known doctrinally in the U.S. Army as security operations.[7] To ensure that this protection is achieved, operational-level forces need to have dedicated organic formations that are properly manned, equipped and trained. As senior Army leaders have said, the future battlefield will require tactical units that are flexible, resilient and able to project power into other

domains.[8] To meet the requirements of being able to survive the modern battlefield and perform effective operational R&S, an Army corps will need to field an extremely robust and dynamic brigade-sized formation.

The highly complex aspects of modern war require the need for both tactical and operational resiliency. This resiliency will come from two aspects: survivability and redundancy. Survivability for tactical units rests on armor protection, firepower, speed, mobility and stealth. Redundancy at the operational level requires that repeated capabilities be provided by multiple members of the Joint force in support of operational functions. For ground forces to provide redundant capabilities to the joint functions of intelligence and protection, they must have R&S elements that can survive the lethality of modern ground combat.

A formation with a core nucleus of

tanks and mechanized units, similar to the old Cold War-era armored-cavalry regiments (ACR), would meet the survivability requirements for a modern operational R&S unit as well. By having a formation that can survive enemy contact, operational land components will be providing themselves, as well as the entire Joint force, with redundant capabilities. This means that when aircraft can't fly and satellites don't work, the Joint force can still see and fight into the deep maneuver areas they would otherwise be completely shut off from.

To maintain the tempo required for operational R&S missions, these dedicated formations will need to have a multitude of organic capabilities not normally found below the division level. The capacity to fight for information as well as defeat enemy forces attempting to disrupt operational maneuver elements will be vital to the successful execution of operational R&S.

The ability for the unit to provide internal long-range precision fires, attack aviation, air defense and cyber will be critical for it to rapidly overwhelm enemy elements. Also, it will need organic long-range reconnaissance and surveillance (LRRS) forces to provide it with asymmetric options that can stealthily infiltrate enemy defense networks. This sensor-to-shooter integration will be key to providing the Joint force with ground options for target acquisition. The execution of rapidly coordinated long-range strikes would make the formation extremely fit for the modern battlefield.

Some might argue that large-scale maneuver is an antiquated concept for the modern battlefield and therefore dedicated operational-level R&S formations won't be required. Although the character of war and force modernization will continue to drive brigade-sized elements to be more self-sufficient, it will not negate the need for large-scale maneuver.

The unique problems that accompany a return to Great Power competition require the U.S. and its allies to be prepared to conduct operations that involve multiple higher-echelon ground elements. For division and corps commanders to properly coordinate fire and maneuver in a denied environment, they must be able to collect intelligence and protect their formations with internal assets.

By creating dedicated R&S units that are designed to survive contact and fight for information, friendly forces will be able to gain and retain the initiative in any circumstance. If NATO ever finds itself squaring off against a Russian adversary in a high-intensity conflict, these capabilities will be invaluable. They will enable operational level forces to detect, protect and strike effectively first, which will be the key to decisive victory on the modern battlefield.

Russian threat: from 21st-Century theory to respecting the bear

It is one thing to hypothesize about a future fight against a near-peer adversary on a 21st-Century battlefield, but it is another to actually prepare for war against a tangible enemy. Currently the U.S. and its allies have two major pacing threats and, although both are extremely important, when it comes to the land components of the Joint force, the primary adversary is Russia. Since its seizure of Crimea and incursion into the Donbass region of Ukraine in 2014, the Russian Federation has demonstrated that it has significantly closed the military gap that NATO forces once enjoyed.

A new doctrine, labeled new-generation warfare (NGW), increased Russia's military capabilities, and aggressive force posturing aided the Federation in achieving this. If NATO forces are going to deter or counter any future aggression by Russia, they will need to be able to conduct rapid operational-level maneuver in a highly contested region. Key to their ability to do this will be dedicated operational R&S formations.

Perhaps the most significant capability Russia maintains is its sophisticated anti-access/area denial (A2/AD) system.[9] This densely layered air-defense canopy is one that can greatly limit NATO forces from achieving air superiority in any future conflict. Without this, NATO ground forces will not be able to rely as much as they recently have on air assets to provide them with the necessary sustainment, intelligence and fires needed for operational success. To get these assets back into the operational fight, ground elements will have to, as former Army Chief of Staff GEN Mark A. Milley said, "penetrate denied areas to facilitate air and naval forces."[10]

To do this, they will need to enter the enemy's disruption and battle zones, where they will encounter another of Russia's newly proven capabilities, its long-range rocket-fire systems. As demonstrated during the war in Ukraine, Russian forces have increased their ability to coordinate and mass the effects of standoff weapon systems such as rocket-launched artillery. Studies of the conflict have shown that nearly 85 percent of Ukraine's casualties early in the war were caused by these systems.[11] Through the combined use of drones and long-range fires, the Russians were able to target static and lightly armored units, with, for example, two battalions rendered combat-ineffective in a single strike.[12]

Figure 2. Russian troops in unmarked uniforms patrol Simferopol International Airport, Ukraine, Feb. 28, 2014. *(Photo by Elizabeth Arrott, Voice of America, Website http://www.voanews.com/content/us-britain-no-zero-sum-game-for-ukraine/1859367.html)*

Figure 3. Map of NATO member Poland, Suwalki Gap marked in red. Poland is bordered by the Baltic Sea, NATO member Lithuania and Russia's Kaliningrad Oblast to the north; Belarus and Ukraine to the east; Slovakia and NATO member the Czech Republic to the south; and NATO member Germany to the west. *(Based on map from CIA World Factbook) (NATO membership list at https://en.wikipedia.org/wiki/Member_states_of_NATO)*

To break this vigorous Russian defense network, NATO ground forces will need to infiltrate, penetrate and rapidly disintegrate its layers. A highly dynamic and robust R&S formation could provide these elements with the initiative to achieve this through the execution of an effective guard mission. To protect maneuver formations as they move through the enemy disruption zone, the R&S unit could send LRRS elements to infiltrate and gain surveillance on key enemy radar and rocket locations. These targets could then be quickly destroyed or suppressed by the R&S units' internal long-range rocket and artillery assets. This would then initiate its highly mobile armor elements to penetrate this first layer of defense and rapidly overwhelm enemy ground and A2/AD forces.

With these two destroyed, the formation's organic attack aviation, along with other air assets, could then be enabled to provide close support to ground maneuver elements as they seized key objectives. By having a robust formation that organically contains all the capabilities required to begin the rapid dismantling of Russia's key advantage, the scales would be tipped back in favor of NATO.

In addition to countering Russia's new critical capabilities, NATO forces are faced with another significant hurdle in the form of Federation posturing. Currently the Russians have substantial armored and mechanized ground units positioned along the boundary between Poland and Lithuania near the Suwalki Gap in both Kaliningrad and Belarus. A 2016 RAND study concluded that if conflict was to break out, Russian forces could seal off that boundary and overrun the region within 10 hours with some 40-50 battalion tactical groups.[13]

Even if a NATO response is rapid and the A2/AD canopy isn't effective, NATO forces will have to fight to re-establish Baltic sovereignties. If the air and space domains are contested by other means, such as enemy fighter aircraft or electronic warfare, the only way to perform effective operational R&S will be with robust formations.

Some may believe that Russia would never actually attack a NATO ally because it would invoke Article V and the Federation would face a collective-defense response. Although it is true that recent Russian aggression within EUCOM, Ukraine in 2014 and Georgia in 2006 were not against NATO allies, they were against partners seeking acceptance into the alliance. Also, Russia has made open threats of aggression against NATO members such as Poland and the Baltic states.[14] Furthermore, the disinformation and subversive aspects of Russian NGW gravitate toward regions that are susceptible to these types of operations due to strong ethnic Russian ties. Vladimir Putin himself has stated that it is the duty of Russia to "protect the rights of all Russians abroad."[15]

This makes the likelihood of future Russian aggression a distinct possibility that NATO forces need to take seriously. For NATO to fail to prepare itself to effectively respond to such aggressive action would be a risk it can ill afford to take. As a part of that preparation, it needs to solve its operational R&S gap, and currently there are no dedicated ground units capable of doing this anywhere throughout NATO, not even in the U.S. Army.

Here doesn't come the cavalry: not meeting operation requirement

The last time the U.S. Army was faced with the grim reality of having to potentially go head to head with a peer competitor was the Cold War. At that time, the Army placed great emphasis on having dedicated division- and corps-level R&S formations. ACRs, division-cavalry squadrons, division and corps LRRS detachments and division Pathfinder companies were all key elements in this operational R&S apparatus.

However, over the past 18 years of COIN warfare, the Army has stripped itself of each of these formations due to the nature of the threat and an overreliance on the space and air domains to cover down. All that remains are tactical-level units that reside in brigade combat teams (BCTs) in the form of cavalry squadrons, cavalry troops and scout platoons.[16] Although these elements are critical in enabling tactical-level missions, they do not have the capacity to effectively conduct R&S at the operational level. They do not possess the proper organic capabilities required; they lack certain training and are simply not big enough to deal with the breadth and depth of an operational R&S problem set.

Acknowledging certain limitations, the U.S. Army has attempted to bridge this capability gap in a couple of ways over the past few years. In 2017, 1st Stryker BCT, from the Army's 4th Infantry Division, was used as a test model for an R&S brigade concept.[17] Essentially this motorized-infantry unit was given some additional armor, aviation and artillery assets to perform corps-level R&S. It was tested at the Army's National Training Center, Fort Irwin, CA.

Also, the Army's 3rd Infantry Division recently conducted Warfighter Exercise 19-02 to test the concept of using the cavalry squadron of an armor BCT to act as a division-level R&S task force.[18] The squadron, like the Stryker BCT, was augmented to conduct this higher-echelon R&S mission set. It was given an additional tank company, attack-aviation company and even an entire artillery battalion from within the division.

The results of both of these exercises were mixed. The Stryker BCT did not possess the armor protection, mobility or firepower to deal with enemy tank and mechanized units. The cavalry squadron achieved some success in certain scenarios but at the cost of taking away critical assets from other subordinate units that would need them to maneuver. Logistics also became an issue for the squadron because the sustainment element of its parent brigade could not support it appropriately. So, although both of these were steps forward in trying to solve the operational R&S gap, they merely reconfirmed that independent and dedicated formations like the old ACRs need to be constituted.

Finally, in an R&S-focused tabletop exercise (TTX) conducted at the Army's Maneuver Center of Excellence, Fort Benning, GA, in March 2019, attempts were made to gain insight into how the Army could update its doctrine to enable R&S at echelons above brigade.[19] The TTX placed different configurations of proposed operational level R&S

formations against a near-peer adversary with an intricate A2/AD network. Again, it was concluded that only dedicated division- and corps-level R&S formations, built with a core of armored and mechanized forces, could properly enable maneuver in large-scale combat operations.

Fiscal constraints, material shortages and other competing demands have hindered the Army from properly addressing this capability shortfall. Acknowledging this reality, land-component commanders need to seek other options to address this problem that are viable and more cost-effective. If a high-intensity conflict were to break out today in Eastern Europe, ground forces would have to accept the fact that the U.S. cavalry is in fact not coming to the rescue!

NATO RSSG: combined solution to a shared problem

Since the EUCOM AoR would be the place in which a lack of operational R&S formations would hinder ground maneuver the most, NATO leaders should attempt to fill this gap multilaterally. If NATO forces intend to gain back the ability to maneuver in a future high-intensity conflict, they will need to accomplish it together. Therefore, a dedicated combined NATO

formation with the sole function of providing operational R&S should be seriously considered to regain the initiative on the ground in Europe. To do so, it should be built around framework of a viable concept.

After the Russian annexation of Crimea in 2014, the U.S. Army reviewed its ability to respond to a high-intensity conflict against a peer adversary. With the transformation of its last ACR to a Stryker BCT in 2011, it found itself without any viable way to conduct operational R&S against a near-peer threat. It looked to the past for solutions; an updated version of the ACR, dubbed the R&S strike group (RSSG), was proposed.[20]

The RSSG would have additional cyber- and long-range precision-fire capabilities to deal with the emerging-threat environment. Unfortunately, due to multiple constraints, these plans never went anywhere, and the operational R&S gap has endured.[21]

Although the Army never established the RSSG, the concept still remains and would be a viable framework to establish a combined formation that could achieve the same operational effect for NATO.

Within the members of NATO rests all the armor, reconnaissance, artillery, rocket, cyber and aviation capabilities

required to create a dedicated formation able to execute operational R&S. To speedily address the urgency of this shortfall, these already existing elements could be pulled together and task-organized into a multinational formation under a single headquarters that would exist in Europe rather than in the United States. The strategic benefits of having the formation already forward-positioned in the region would significantly impact NATO's ability to react fast enough to deter or counter future Russian aggression.

The pooling of assets would reduce the fiscal costs and time needed to man a completely new unit and field completely new equipment. Also, an allied RSSG could also be a way to effectively capitalize niche military capabilities that NATO members have such as long-range reconnaissance and cyber.

Some might argue that creating a combined organization such as the RSSG would be more of a liability than a capability due to the complexities of multinational operations. Although working multilaterally might have its inherent difficulties, the wars in Afghanistan and Iraq have proven that NATO allies can work well together at lower echelons.

In addition to conducting combat operations together in the COIN environment, NATO forces have increasingly been executing more complex combined training exercises within EUCOM.

Multinational tactical formations are constantly being formed and trained within NATO. For example, as recently as April 2019, a multinational brigade consisting of more than 5,000 soldiers from 15 nations was established to support the combined NATO exercise Allied Spirit X.[22]

Establishing the NATO RSSG would bring together from across the alliance the collective capabilities needed to conduct effective 21st-Century R&S. It would be a vehicle for increasing much-needed interoperability and is a shared solution to a shared problem.

This formation would be a critical element in enabling NATO forces to once again conduct operational maneuver on the European continent. The

Figure 4. Israeli soldiers provide security while conducting a town raid during exercise Allied Spirit X at Hohenfels, Germany, April 7, 2019. *(U.S. Army photo by SPC Meagan Mooney)*

cavalry could ride again, just under a NATO guidon.

Recommendation, conclusion

The U.S Army has been proofing a concept for a formation designed to enable maritime maneuver in the Indo-U.S. Army Pacific Command AoR. This new unit, dubbed the multi-domain task force (MDTF), contains organic long-range fires, cyber and aviation capabilities.[23] It contains all key elements necessary for any future operational-level R&S formation.

After being tested through several iterations of wargames, reports have stated this new concept has had dramatic effects in countering the problem that Chinese A2/AD poses.[24] There has also been discussion of establishing an MDTF for the EUCOM AoR. This concept should be the foundation on which a future NATO RSSG could be built, and it would significantly satisfy the U.S. Army's contribution to the force. What the MDTF lacks in armored and mechanized units and LRRS elements, NATO forces could provide.

A NATO RSSG that builds on the MDTF concept could be the critical element needed to finally fill the operational R&S gap that NATO forces currently have.

In a high-intensity conflict, the U.S. and its allies will need to conduct operational-level maneuver across multiple domains to achieve victory. To accomplish this, each component of the Joint force must provide redundant capabilities that enable this higher-echelon maneuver. In the land domain, ground forces must be able to provide effective R&S for division- and corps-level formations.

This requires dedicated R&S forces capable of operating in a highly lethal and dynamic environment.

Currently neither the United States nor its allies have any dedicated operational formations that meet this requirement. This capabilities gap needs to be filled by NATO forces if they are going to conduct operational-level maneuver against a near-peer adversary in EU-COM or any other potential theater of war.

A viable, cost-effective and efficient solution that would rapidly satisfy this requirement could be the formation of a combined NATO RSSG.

This multinational formation would possess the robust, nimble and multi-domain capabilities required to enable large-scale maneuver and gain back the initiative on the 21st-Century battlefield.

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LEGENDS OF ARMOR

LIEUTENANT GENERAL PAUL E. "BUTCH" FUNK

National Training Center
3d Armored Division
United States Army Armor School
III Corps

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Acronym Quick-Scan

A2/AD – anti-access/area denial
ACR – armored-cavalry regiment
AoR – area of operations
BCT – brigade combat team
COIN – counterinsurgency
EUCOM – European Command
FM – field manual
LRRS – long-range reconnaissance and surveillance
MCCC – Maneuver Captain's Career Course
MDTF – multi-domain task force
NATO – North Atlantic Treaty Organization
NGW – new-generation warfare
R&S – reconnaissance and security
RSSG – reconnaissance and security strike group
TTX – tabletop exercise

Lessons-Learned, Organizational Improvements: Saber Squadron in Exercises Saber Strike 16 and 18

by CPT Jared D.L. Moore

Sitting in the regiment's manifesting area May 30, 2018, elements of 4th Squadron, 2nd Cavalry Regiment (Saber Squadron), made their final preparations for the first leg of their tactical roadmarch (TRM) from Vilseck, Germany, to Orzysz, Poland.

For most of the troopers, Saber Strike 18 was their first major multinational exercise with the unit. For a handful of troopers and leaders, this was their second time participating in Saber Strike, an annual North Atlantic Treaty Organization (NATO) exercise conducted across the Baltic countries.

For those familiar with Saber Strike 16, the mindset of the leadership, the preparation and the eventual execution of Saber Strike 18 were different from its predecessor. The changes implemented in Saber Strike 18 converted it from a demonstration of capabilities into a series of tactical operations to increase the unit's readiness while still maintaining a focus on assuring allies, deterring adversaries and, if necessary, defending NATO.

Maintenance mindset

For a long TRM, maintenance is a key issue. For Saber Strike 16, Saber Squadron's TRM timeline included several maintenance days.

The squadron's and regiment's leadership decided to integrate dedicated maintenance days into the TRM timeline as mitigation based on their prior experiences with TRMs in 2015. As planned, there was about one maintenance day for every one or two days of roadmarching.

To maximize the unit's time and complete the commander's intent, Saber Squadron conducted civil-military engagements with elements not actively involved in maintenance on the dedicated days.

Between Vilseck and Orzysz, Saber Squadron conducted three dedicated maintenance days, with another two days in conjunction with a wet-gap crossing rehearsal, resulting in a total TRM timeline of 10 days for Saber Strike 16 to Orzysz.

Over the next two years, 2nd Cavalry Regiment conducted three more major TRMs to northeast Poland to support our enhanced forward presence (eFP). With the data from Saber Strike 16 and eFP, the goal for the Saber Strike 18 TRM was to get from Vilseck to Orzysz in five days without maintenance stops. This meant the squadron needed to validate its Soldiers' and equipment's ability to conduct an extended-duration TRM before Saber Strike 18. Saber Squadron's answer to this problem was an event called the "GTA 500."

Each troop conducted a roadmarch around Grafenwoehr Training Area (GTA) once a month, from March to May 2018, in preparation for the TRM. As they progressed, the roadmarches grew from 90 minutes to three hours. The roadmarches allowed the squadron to identify major issues with vehicles prior to the Saber Strike 18 TRM and conduct maintenance at home station. Also, the GTA 500 gave the squadron an opportunity to conduct a full-dress rehearsal of convoy and recovery operations.

Troops conducted other training events concurrently such as weapons ranges, gas-mask training or command-post exercises. This allowed them to continue their unit training progressions in conjunction with Saber Strike 18 preparations.

In addition to the roadmarches, Saber Squadron executed full vehicle-lubrication orders for all the vehicles executing the TRM. The lubrication orders included all hub oil and differential fluids as well as the usual coolant,

Figure 1. Soldiers assigned to Outlaw Troop, 4th Squadron, 2nd Cavalry Regiment, conduct rural and urban reconnaissance in Saber Strike 18 in Skrunda, Latvia, June 7, 2018. Saber Strike 18 was the eighth iteration of the longstanding U.S. Army Europe-led cooperative training exercise designed to enhance interoperability among allies and regional partners. *(U.S. Army Photo by SGT Timothy Hamlin, 4/2 Cavalry Regiment)*

Figure 2. A Polish army Infantry Fighting Vehicle and U.S. Army AH-64 Apache helicopters with Battle Group Poland participate in the culminating live-fire event of Saber Strike 18 at the Bemowo Piskie Training Area, Poland, June 15, 2018. Exercise Saber Strike 18 was held June 3-15 at training areas in Estonia, Latvia, Lithuania and Poland. Participants from 19 countries participated in the eighth iteration of the exercise, including Canada, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Italy, Latvia, Lithuania, Macedonia, Netherlands, Norway, Poland, Romania, Spain and the United Kingdom. The long-standing U.S. Army Europe-led cooperative training exercise is designed to enhance readiness and interoperability among allies and regional partners. *(U.S. Army National Guard photo by SPC Robert Douglas)*

transmission fluid and oil. For the Stryker fleet, this was a very common maintenance procedure. However, for many of the troopers, including senior leaders, replacing hub oil and differential fluid in humvees or any of the family of medium tactical vehicles was a new experience since the maintenance focus has usually been on the Stryker fleet. Troopers and leaders both embraced the learning opportunity and were excited to execute the in-depth lubrication orders. The mechanics displayed equal excitement to train everyone and decrease their workload on the TRM.

Another common problem from Saber Strike 16 was lugnuts loosening and falling off during the TRM. To mitigate this, the operators tightened all lugnuts and used paint markers to place a visual indicator on each lugnut in the tighten position. The mark allowed operators to identify loosening lugnuts easily at refueling stops or remain-overnight (RON) sites. During the dispatching process, the squadron's mechanics inspected all the lugnuts and

lubrication orders with the operators to doublecheck the vehicles.

The preparation changes had an incredible effect. At the end of the five-day TRM, only three vehicles failed to reach Orzysz under their own power. Of those, only one vehicle required a recovery asset to move it. During the five days, the only dedicated maintenance times were the 30-minute refuel stops and overnight stops. For comparison, in Saber Strike 16, six of nine recovery assets towed or carried a disabled vehicle upon arrival at Orzysz, despite five days of dedicated maintenance time. The changes to its home-station preparations enabled Saber Squadron to conduct a rapid TRM across Poland without the need for extended maintenance periods.

Managing assets

In addition to the preparation changes, the regiment wanted to use internal assets as much as possible during Saber Strike 18 to test its internal-sustainment capabilities. A few of the constraints were using military water

containers, using organic recovery assets and having no bulk-to-bulk fuel resupply for the forward-support troop (FST) until Orzysz. This was a stark contrast to Saber Strike 16 sustainment considerations.

For Saber Strike 16, multiple regiment external assets supported the squadron during the TRM. Within the squadron task force, there were three low-boys task-organized from 21st Theater Sustainment Command (TSC) for the roadmarch. Prior to Orzysz, the squadron received two resupplies through the Defense Logistics Agency (DLA). DLA contracted civilian fuel trucks and conducted bulk-to-bulk resupplies with the four M978s (military fuel trucks) assigned to the task force. Class I resupply also came through DLA contracts direct to the squadron. Quartering parties in rental cars received Class I drops 24 hours in advance of the main body at the next templated RON. In addition to the food, the unit received 1.5-liter bottles of water for personnel as their primary water source – not bulk water or military containers.

ARMOR

For Saber Strike 18, the only enablers assigned to Saber Squadron were combat enablers from the Air Force and regimental engineer squadron, and a small sustainment package from the regimental support squadron (RSS). RSS provided an additional M978 and one Medical Evacuation Vehicle for the operation. For recovery assets, the squadron only had its three organic wreckers and one Modular Catastrophic Recovery System for the roadmarch. One wrecker, one M978 and one tank-rack module specifically supported one subordinate unit, Outlaw Troop, which moved 24 hours in advance of the main body for the entire TRM to Orzysz.

To increase organic fuel capacity, the FST received two 2,500-gallon tank-rack modules after Saber Strike 16. This doubled the FST's organic fuel capacity from 5,000 to 10,000 gallons to assist with future operations. Also, all vehicles carried eight fuel cans during Saber Strike 18, doubling what vehicles carried during Saber Strike 16. During predetermined short halts for maintenance and driver swaps, all vehicles refueled using only fuel cans in Saber Strike 18. Support elements only issued retail fuel at RON sites or for unplanned requests during the Saber Strike 18 TRM. By contrast, in Saber Strike 16, quartering parties established retail fuel at the short halts, and the fuel cans were for emergencies only.

Saber Squadron largely depended on like-vehicle recovery to ensure recovery assets remained open for catastrophic vehicle issues during Saber Strike 18. With five fewer recovery assets available to the squadron than during Saber Strike 16, this was necessary to ensure mobility without losing tempo. Also, a major concern during Saber Strike 16 was the potential for damage to the towing vehicle during the long-duration movements. With the in-depth home-station maintenance and multiple GTA 500s, Saber Squadron was confident in its ability to execute like-vehicle recovery for the TRM without damaging the towing vehicles. To mitigate strain on one vehicle, convoy commanders swapped towing vehicles at short halts and held RONs as necessary.

The focus on cutting the movement time to Orzysz, instead of conducting maintenance days and engagements, decreased the need for resupply during the TRM. Increasing internal capabilities such as fuel capacity, and encouraging recovery and sustainment at the lowest level, enabled the squadron to carry the necessary supplies and maximize the use of its equipment to self-sustain during the TRM without resupply. The result of the TRM was a validation of the squadron's ability to self-sustain for an extended-duration road march using only regimental internal assets.

'Get there, do something, tell the world'

At a tactical level, the focus for Saber Strike 16 was not on enhancing Saber Squadron's tactical proficiency in terms of key collective tasks (KCTs) or mission-essential tasks (METs); it was demonstrating interoperability and capabilities in support of NATO operations. This is readily apparent from the commander's intent in the Saber Strike 16 operations order: "The comprehensive purpose of this operation is to set favorable conditions for the NATO Summit in Warsaw. We will accomplish this through the conduct of a series of tactical tasks that demonstrate our operational mobility and freedom of maneuver that create the strategic effect of enhancing the [a]lliance."[1] The regimental commander summarized the intent into a simple phrase for all 2nd Cavalry Regiment troopers to remember: "Get there, do something and tell the world."[2] With this mindset, Saber Squadron moved forward to execute Saber Strike 16.

Throughout Saber Strike 16, the squadron conducted 12 engagements and one live-fire exercise. Of the 12 engagements, three were tactical engagements: a wet-gap crossing in Weiden, Germany; a wet-gap crossing at Chelmno, Poland; and a forward-passage-of-lines (FPoL) at Torun, Poland.

The importance of the civilian-military engagements was very high. On more than one occasion, Saber Squadron elements missed their templated movement times due to planned engagements running over allocated times or an impromptu engagement occurring at a refuel site.[3] To prepare for the engagements, troopers cleaned vehicles with on-hand supplies and applied a "special sauce," internally produced by the unit, on all display vehicles to give them a freshly cleaned appearance. Troopers at the displays wore clean uniforms, Stetsons and spurs, and

Figure 3. The fires team from Outlaw Troop, 4/2 Cavalry Regiment, conducts a combined-fires brief with members of the Latvian army in Skrunda, Latvia, June 7, 2018. *(U.S. Army Photo by SGT Timothy Hamlin, 4/2 Cavalry Regiment)*

carried display boards for the vehicles translated to the local language. Messaging their presence and demonstrating their capabilities was the squadron's priority.

For the tactical events, including the live-fire, elements from the squadron rehearsed for two days before execution to ensure the exercise and key events occurred on time to facilitate observation by distinguished visitors and onlookers. Outside of the FPoL and live-fire exercise, no Saber trooper wore body armor or personal camouflage.

Also, at the river crossings, very-important persons rode across the bridges in tactical vehicles, flags representing participating nations flew at key points on the crossings, and only combat elements, not support elements, conducted the wet-gap crossings.

The events focused on messaging the capabilities and solidarity of NATO according to the commander's intent. However, the events did very little to increase Saber Squadron's proficiency on their METs. As a former troop commander noted, outside of the six days rehearsing and executing the wet-gap

crossings and the FPoL, most of the training benefits were at the individual and crew level. Those individual and crew tasks "[did] not necessarily translate into one or two clear KCTs or METs, but rather influence[d] nearly all of them."[4]

For most, the deployment MET was the only MET that significantly increased because of Saber Strike 16. As such, the 20 days spent executing Saber Strike 16 did little to increase Saber Squadron's readiness outside of achieving proficiency at some of the supporting individual and crew-level tasks.

Recognizing the potential training opportunities, the regiment focused heavily on using Saber Strike 18 as an opportunity to increase unit readiness. The mindset shifted from demonstrating capabilities to conducting tactical training events to increase MET proficiency. The changes to the commander's intent for Saber Strike 18 echoed this change: "The purpose of this operation is to demonstrate 4/2 [Cavalry Regiment]'s readiness and rapid-deployment capability with [operational plan] informed reconnaissance-and-security operations that stress squadron and troop mission-command systems and enables the regiment to execute offensive and defensive operations while building readiness and interoperability."[5] This contrasts with the Saber Strike 16 intent of demonstrating capabilities and messaging presence. For Saber Strike 18, validating internal systems and increasing lethality was the method of assurance and deterrence.

Figure 4. LTC Gregory Campion, commander, 4/2 Cavalry Regiment, welcomes the arrival of his Soldiers to the Bemowo Piskie Training Area, Poland, during Saber Strike 18, June 5, 2018. *(U.S. Army Photo by SGT Timothy Hamlin, 4/2 Cavalry Regiment)*

Improving METs, KCTs

Saber Squadron participated in four key events during Saber Strike 18 to improve on its METs and KCTs. The squadron's main-body elements – consisting of Palehorse Troop, Quickstrike Troop (-), Headquarters and Headquarters Troop (HHT) and FST – participated in the seizure of Rulka Airfield, a contested wet-gap crossing near Kaunas and the defense of Siauliai Airfield in Lithuania. Simultaneously, Outlaw Troop participated in Latvia's Saber Strike 18 exercise, involving a delaying action from the Baltic coastline to a defensive perimeter around Skrunda Training Area.

Each of these events had an unscripted force-on-force element and presented each unit an opportunity to test its systems against a live opposing force. Also, outside of necessary site surveys during joint-event lifecycle planning events, the squadron conducted no on-site rehearsals (terrain walks) before the execution of these events.

During the major training events in Saber Strike 18, all the squadron's subordinate units participated. For the wet-gap crossing in Lithuania, all main-body elements crossed and the site remained tactical, minus the local civilian onlookers. At Rukla and Siauliai, all the squadron command nodes tested their systems to receive and synthesize real-world reports while simultaneously planning future operations in a contested environment, which trained the unit according to multiple KCTs and METs. Rukla added an additional challenge for the combat trains and field trains as they coordinated the movement of small logistical-package convoys from Kazlu Ruda to Rukla, a 90-kilometer movement. For Palehorse and Outlaw, the live enemy during the force-on-force enabled them to use Saber Strike 18 as a way to validate their own standard operating procedures and increase their unit's proficiency according to their specific unit KCTs and METs.

During these events, and for most of the TRM, all equipment and Soldiers used camouflage and body armor. The mindset was tactical. Saber Squadron only used military-issued water containers, and troopers and leaders

conducted their engagements with muddy boots and camouflaged faces – and wore their Stetsons only as required for special events.

The squadron did not want to simply message or show its capabilities during Saber Strike 18 – it wanted to validate its capabilities and demonstrate its unit's readiness to assure allies, deter adversaries and, if necessary, defend NATO.

The changes implemented by Saber Squadron between Saber Strike 16 and Saber Strike 18 enabled it to use the training event to build on unit readiness while simultaneously supporting NATO. While Saber Strike 16 provided some training benefits, it was largely a capabilities display heavily focused on messaging rather than unit readiness.

What Saber Strike 16 provided was many lessons-learned for the squadron and the regiment that enabled them to maximize the training value of Saber Strike 18. The focus on unit readiness during Saber Strike 18 came with one major downside: a lowered integration of allies into squadron operations.

Outlaw Troop had the most exposure in terms of allied integration during its mission in Latvia while working directly for a Latvian headquarters as a subordinate maneuver unit.

Outside the few hours at the wet-gap crossing and the 24-hour mission at Siauliai, there was little integration of allied elements into Saber Squadron's main-body operations during the 23-day exercise.

As comparison, in Saber Strike 16, there was a Bundeswehr Company from 8th Aufklaerungs Battalion attached to the squadron for the entire exercise, and every tactical operation integrated some multinational element.

Overall, Saber Strike 18 achieved the commander's intent to test Saber Squadron's capabilities, improve unit readiness and demonstrate its ability to assure allies, deter adversaries and, if necessary, defend NATO. With improvements on integrating allied units, Saber's experience in Saber Strike 18 serves as a great model for future U.S. units participating in NATO training events to increase unit readiness and demonstrate the alliance's readiness.

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Figure 5. Saber Strike 18 training locations in northeastern Europe showing the Baltic States in color (Estonia, Latvia and Lithuania), as well as Poland – all NATO members – with the Kaliningrad Oblast (Russia), the Russian Federation and Belarus also shown. *(Based on Wikipedia map by Blomsterhagens)*

Notes

[1] Operations Order 16-13: Saber Strike 16; Headquarters, 4th Squadron, 2nd Cavalry Regiment; Vilseck, Germany; May 6, 2016.

[2] Operations Order 16-13.

[3] CPT Ryan Stone, FST commander for Saber Strike 16; interview by author via email correspondence; Nov. 11, 2018.

[4] CPT Noah Scribner, Palehorse Troop commander for Saber Strike 16; interview by author via email correspondence; Nov. 15, 2018.

[5] Operations Order 18-17: Saber Strike 18; Headquarters, 4th Squadron, 2nd Cavalry Regiment; Vilseck, Germany; May 7, 2018.

ACRONYM QUICK-SCAN

DLA – Defense Logistics Agency
eFP – enhanced forward presence
FPoL – forward-passage-of-lines
FST – forward-support troop
GTA – Grafenwoehr Training Area
HHT – headquarters and headquarters troop
KCT – key collective task
MET – mission-essential task
NATO – North Atlantic Treaty Organization
RON – remain overnight (site)
RSS – regimental support squadron
TRM – tactical roadmarch
TSC – theater sustainment command

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Derived from Center of Military History information provided at https://history.army.mil/html/moh/civwaral.html. Listed alphabetically. Note: Asterisk in the citation indicates the award was given posthumously.

CALDWELL, DANIEL SGT
Unit: Company H, 13th Pennsylvania Cavalry. Place and date of action: Hatchers Run, VA, Feb. 6, 1865. Born: June 1, 1842, Marble Hill, Montgomery County, PA. Date of issue: Feb. 25, 1865. Citation: In a mounted charge, dashed into center of the enemy's line and captured the colors of 33rd North Carolina Infantry.

CALKIN, IVERS S. 1SG
Unit: Company M, 2nd New York Cavalry. Place and date of action: Sailors Creek, VA, April 6, 1865. Entered service: Willsborough, NY. Born: Essex County, NY. Date of issue: May 3, 1865. Citation: Capture of flag of 18th Virginia Infantry (CSA).

CAMPBELL, JAMES A. PVT
Unit: Company A, 2nd New York Cavalry. Place and date of action: Woodstock, VA, Jan. 22, 1865, and Amelia Courthouse, VA, April 5, 1865. Born: New York, NY. Date of issue: Oct. 30, 1897. Citation: While his command was retreating before superior numbers at Woodstock, he voluntarily rushed back with one companion and rescued his commanding officer, who had been unhorsed and left behind. At Amelia Courthouse captured two battle flags.

The Implications of Innovation in Space-Based Remote Sensing on Maneuver Warfare

by LTC Brad Townsend

Space technology is on the cusp of significant change that will substantially impact the nature of maneuver warfare in the near future. Change in space is being driven by sudden and dramatic decreases in the cost of reaching orbit, and the development of ever smaller and cheaper satellites that can be launched by the dozens to create networked global constellations far more capable than the larger and far more expensive satellites of the recent past.

The rapid pace of these developments and their implications for future warfare are something the military space community is finding difficult to understand and adapt to. As the space community struggles to understand the implications of these new capabilities within the space domain and wrestles with substantial organizational change, scant attention is being given to how these new capabilities will impact mounted-maneuver warfare.

Existing space capabilities enable modern armored warfare at both the tactical and operational level. The Global Positioning System (GPS) timing signal enables force tracking and effective encrypted communications. Beyond-line-of-sight communications and network access are functions of satellite-communications capabilities. Though underappreciated in the era of counterinsurgency operations, space-based infrared satellites underpin the effectiveness of time-sensitive warning and interception of inbound missile threats to ground forces.[1]

For the foreseeable future, these capabilities will continue to support maneuver operations in largely the same way they do today, albeit with more bandwidth and precision. One area of advancing space technology that will change how armored units operate is the rapid increase in the quantity and quality of near-real-time satellite imagery, especially to disadvantaged adversaries.

Surprise 'left hook'

In 1991 U.S. forces executed a sweeping "left hook" through the desert that bypassed Iraqi defenses, surprising the defenders and quickly overwhelming them. The battered Iraqi army, under constant air attack and struck in the flank by rapidly advancing armored forces, collapsed. A number of factors made this maneuver possible. The newly fielded and still only partially complete GPS constellation allowed accurate navigation across the otherwise featureless desert. Also, the coalition was able to safely stockpile enough fuel and other logistical necessities for this force to operate without outrunning its supplies.

Perhaps the most crucial factor in the attack's success, however, was the ability of coalition forces to stage in secrecy. With complete control of the air, the coalition was able to prevent the Iraqi military from conducting any aerial reconnaissance. Even a single high-altitude reconnaissance flight would have revealed the scope and scale of the coalition attack. With this information, the Iraqi army could have repositioned forces and constructed defenses to defend its flank.

It is highly unlikely that even with insight into the coalition battle plan, though, the Iraqi army could have changed the outcome of the Gulf War, but it certainly could have raised the price of victory.

The "left hook" of the Gulf War was a stunning success that is unlikely ever to be repeated due to evolving space capabilities that are making operational deception by large formations impossible. The movement of individual companies or even isolated battalions may go unnoticed due to the fog of war, but the unobserved positioning of larger forces is no longer possible. The U.S. Air Force may continue to dominate the skies and prevent aerial observation of staging areas by unmanned aerial vehicles or other aircraft; however, it cannot prevent satellites from passing overhead in the course of their normal orbits.

To be clear: the Desert Storm "left hook" could never happen again unnoticed. The recent and rapid proliferation of remote sensing satellites that produce various forms of satellite imagery has dramatically changed the paradigm of space support and its effects on maneuver warfare.

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The U.S. military is not accustomed to considering the impact of satellite observation on operations because it has been largely irrelevant at the tactical and operational level. Until recently there were only a handful of imaging satellites in existence, and they could only image relatively small portions of the Earth's surface from low-Earth orbit (LEO).

Unlike geosynchronous orbit (GEO) where satellites remain stationary relative to the Earth's surface, imaging satellites are in LEO, between 250 and 400 miles in altitude. They circle the Earth once every 90 to 120 minutes. For reference, GEO satellites operate at an altitude of 22,300 miles above the Earth. At this altitude, they "fall"

around the Earth at the same rate the planet rotates, meaning that they remain nearly stationary relative to a point on the equator. However, GEO is much too far away for any tactically useful imagery; as a result, all imagery satellites use much lower orbits, so they can only see a portion of Earth's surface at any one time. This low altitude, combined with the high cost of imaging satellites, created limitations for the tactical usefulness of satellites because it was possible to image only a relatively small area each day.

Limitations

Low altitude is just one of the limitations on imagery satellites that have limited the tactical relevance of satellite imagery to analyzing terrain. Even if an imagery satellite passed over the battlespace, it did not necessarily mean that everything within it was imaged.

The cameras on board satellites have many limitations driven by resolution limits, the satellite bus and by simple time. For example, the swath width of WorldView-3, one of the most advanced traditional commercial satellites in orbit today, is just 13.1 kilometers. (Albeit with a best-case resolution of 0.31 meters, it is much better than an average Google Earth image.[2]) Limited swath width means that this "exquisite" (large, highly sophisticated satellites usually based in GEO for imagery, missile warning and intelligence-community missions) platform can choose to image a strip of territory 13.1 kilometers wide once a day, or it can make several increasingly lower-quality sweeps of a selected area before traveling out of view.

The satellite must then pass over a ground station, download its collected imagery and have it processed and analyzed. The speed of this process varies depending on urgency, but at least another day would pass before analysts could draw any useful conclusions from satellite imagery. These limitations historically prevented satellite imagery from impacting tactical decision-making and limited it to strategic roles.

Space-industry transitions

These traditional limitations on satellite observation are rapidly disappearing, driven primarily by a recent dramatic decrease in the cost of reaching orbit and the rise of small, inexpensive satellites that capitalize on this development. The space industry is transitioning from a positive-cost spiral to a negative-cost spiral. Under the previous paradigm of the positive-cost spiral, the high cost of reaching orbit reinforced the need for high-quality exquisite satellites, which in turn incentivized the launch provider to develop extensive risk-avoidance measures, further driving up cost. These factors are now inverted, resulting in a negative-cost spiral.

Cheaper launches are justifying the launch of smaller, less expensive satellites, which can be built in greater numbers and placed in lower orbits where they will have greatly decreased orbital lifespans due to atmospheric drag. Orbiting at a much lower altitude than traditional imagery platforms compensates for the reduced capability of the optics on board these smaller satellites. One company that is capitalizing on this paradigm shift is Planet Labs. It now operates a constellation of hundreds of small satellites that image the entire surface of the Earth each day at resolutions high enough to be operationally and tactically relevant.

The proliferation of small observation satellites and launch platforms capable of putting them in orbit is allowing ever-smaller nations to develop a space presence. Even minor global powers such as Nigeria now possess multiple active satellites.

For military operations, one of the poorly understood implications of this transformation in space is the impact this will have on military planning. The staging of armored forces in preparation for operations such as the "left hook" carried out during the Gulf War can no longer occur in secrecy. While it is possible to control the airspace within a theater, satellites have freedom of passage, and it will be extremely difficult to prevent many third-party imaging satellites from imaging the battlespace each day. Any significant military operation is likely to draw the interest of these third-party observers, and the ease of information transmission in the modern era will make it impossible to prevent even the most disadvantaged opponent from gaining access to this valuable open-source intelligence.

There are a limited number of methods of preventing an opponent from gaining access to satellite imagery. During the Gulf War in 1991, the United Nations mandated an embargo on the sale of commercial imagery to Iraq.[3] This worked; however, the circumstances were unique and unlikely to be repeated. At the time, China did not possess satellite-imagery capability, and the Soviet Union was preoccupied with difficult internal reform and negotiations with the North Atlantic Treaty Organization (NATO) and the United States over the future of Eastern Europe. In addition, there was only one non-U.S. commercial provider, the French-owned SPOT satellite (Satellite Pour l'Observation de la Terre – literally, "Satellite for observation of Earth"), which could produce only 10-meter resolution imagery.

By 2001, the situation with commercial satellite imagery had not changed significantly. The first true U.S. provider of commercial imagery, Earthwatch, only succeeded in reaching orbit with its first satellite, QuickBird 2, in October 2001.[4] This satellite was capable of producing images with resolutions of less than one meter, far better than was available to any non-governmental entity at the time. Under the terms of its licensing agreement, the U.S. government retained the right to exercise "shutter control" over Earthwatch and prevent it from selling its imagery of Afghanistan.[5] Rather than potentially damaging the credibility of the nascent U.S. imagery market, the Department of Defense instead chose to purchase all the imagery produced by Earthwatch on an exclusive basis.[6] While expensive, this buy-to-deny tactic effectively denied high-resolution imagery to media outlets and prevented them from accidentally revealing key details of U.S. military maneuvers to the Taliban.

Despite retaining the ability to exercise shutter control over U.S. imagery providers, doing so or attempting a tactic of buy-to-deny in today's environment would be futile. While it would prevent U.S.-based providers from selling or

releasing any potentially harmful imagery, it would not apply to third-party providers based in countries that oppose U.S. actions. Geopolitical rivals who possess far greater on-orbit capabilities today than they did a decade ago would be easily capable of tracking U.S. military movements from orbit. Releasing imagery of U.S. troop build-ups and locations will no doubt be a less than subtle method of expressing dissatisfaction with U.S. military actions operating under the guise of freedom of information. Even if domestic media outlets refrained from televising analysis of this imagery, it would not prevent it from falling into the hands of a disadvantaged opponent, providing an intelligence windfall to an opponent that would otherwise be blind to the disposition of U.S. military forces. It would also make military deception exceptionally difficult as demonstrated by Russian forces in Ukraine.

The difficulty of military deception in the face of high-resolution commercial imagery was demonstrated in Ukraine when the presence of Russian forces was revealed using commercial satellite images. Few serious observers doubted that Russian forces were involved in Eastern Ukraine, but isolated ground-level images and reports were easy to dismiss as fabrications, providing the Russian state with a useful degree of plausible deniability. Releasing classified satellite imagery taken from national platforms would no doubt have proven Russian involvement, but it would also have provided insight into the specific capabilities of sensitive national platforms, something that nation-states are understandably reluctant to do. NATO resolved this dilemma using commercial imagery provided by the U.S.-based company DigitalGlobe. These images of large convoys of Russian military forces exposed the lie that significant Russian ground forces were not present in Ukraine.

NATO's decision to use U.S. commercial imagery assets to expose Russian involvement in Ukraine did not come without cost to DigitalGlobe. Following NATO's release of the images, DigitalGlobe saw a $14.5-million decline in Russian business from a high of $23 million in 2013.[7,8] The company cited several potential causes for the downturn in Russian business. These included the downturn in the Russian economy due to sanctions, although this did not affect DigitalGlobe's legal ability to sell imagery to Russian customers. Potentially the most significant reason cited by the DigitalGlobe chief executive officer was the "very public use of DigitalGlobe imagery by the U.S. government and the NATO alliance showing Russian troop locations and, more recently, purporting to prove that missile strikes in Ukraine came from batteries located in Russian territory."[9]

This assertion by the company cannot be proven, but it neatly explains the nearly complete disappearance of revenue from Russian sources following the publication of the photos by NATO. Political exposure represents a unique risk that U.S.-based companies take when providing imagery to the military and government, potentially jeopardizing its non-governmental business.

Russia is not alone in having its clandestine military actions exposed to a global audience. Commercial imagery has also revealed the Chinese military build-up in the South China Sea. High-resolution imagery provided by DigitalGlobe has made it possible for the media to analyze China's gradual build-up in the area carefully. Media outlets and think tanks have revealed details of Chinese build-ups from the number and type of aircraft based on newly constructed airfields to the presence of radar tracking stations.[10]

The idea that military build-ups now occur entirely in the public eye is something the global military community is beginning to adjust to. What the world has not yet seen is daily high-resolution satellite imagery from a conflict of interest to the American public.

Likely scenarios

Consider the impact of ubiquitous surveillance on two likely scenarios where significant U.S. armored formations could feasibly become involved: North Korea and the Baltic/Polish frontier. These scenarios involve opponents with vastly different space capabilities. Russia is a great space power by any measure, with the third-largest number of active satellites in orbit – behind the United States and China. Russia also has a robust space launch
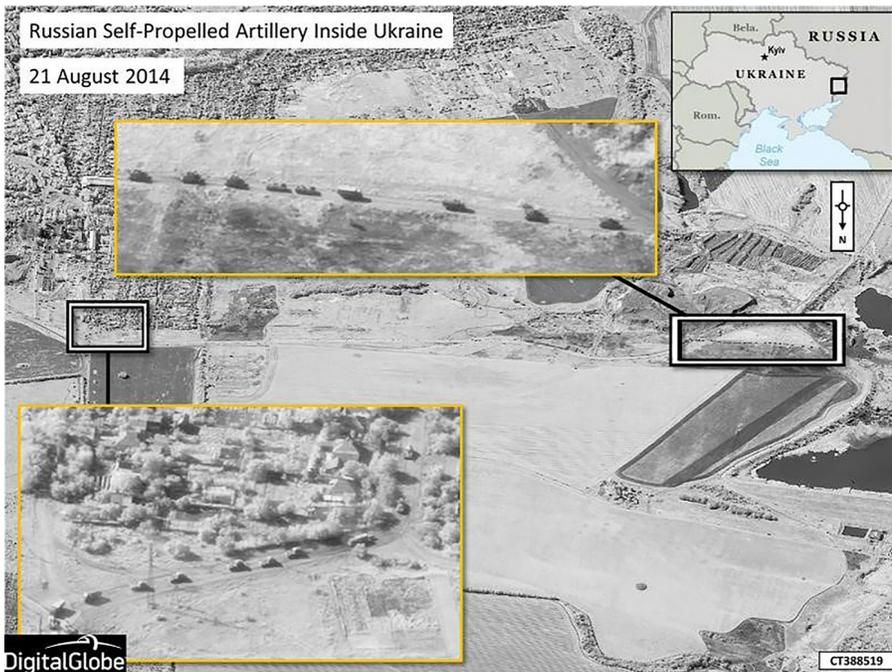

Figure 1. DigitalGlobe image showing Russian military units within Ukraine Aug. 21, 2014. *(Source: NATO, Supreme Headquarters Allied Powers Europe, news release Aug. 28, 2014, "New Satellite Imagery Exposes Russian Combat troops inside Ukraine,"* http://shape.nato.int/new-satellite-imagery-exposes-russian-combat-troops-inside-ukraine*)*

capability.[11] In contrast, North Korea represents a disadvantaged state with no domestic space capability. Within these two scenarios, different factors would influence operations in space and on the ground.

Russia possesses domestic-surveillance capabilities that would allow it to observe the movement and positioning of U.S. military formations. As the current administration now considers space "a warfighting domain just like the air, land and sea," active measures to deny Russia the ability to use its space based remote-sensing capabilities may occur.[12] Assuming that it is possible to deny Russia the ability to observe U.S. forces from space using military force – incidentally leading to the first war in space with potentially devastating consequences for space support to U.S. forces – then Russia would still not be blind. Even if NATO is willing to authorize attacks against Russian satellites, it would undoubtedly abstain from attacking assets belonging to third parties, notably China. Nominally, Chinese commercial assets

would likely be willing to sell Russia imagery as well as communications bandwidth and other space-enabling capabilities on its satellites. The impact of attempting to deny Russia the use of its space assets would, in operational terms, have left it no weaker thanks to Chinese or other third-party support. Meanwhile, highly vulnerable U.S. and NATO space assets would likely be devastated by a conflict in space.

North Korea represents a different case from Russia. Since North Korea has no space assets to attack or any known ability to attack U.S. space assets, conflict in space would not occur. In a scenario where North Korea attacks South Korea and China chooses not to become directly involved, a United Nations resolution condemning North Korean actions and banning the sale of commercial imagery could be possible, as occurred in 1991 with Iraq. However, it is unlikely that China or Russia would not continue to provide clandestine intelligence support to North Korea. In addition, unlike in a conflict in Eastern Europe involving

NATO powers that possess most of the non-U.S. commercial imagery capabilities, conflict in Korea would not directly involve many of these countries. This lack of direct involvement could allow these nations to continue to sell imagery of the conflict zone, creating a useful source of accurate open-source intelligence. This intelligence support would make large operations similar to the landings at Inchon in 1950 impossible, as they would not go unobserved and could never achieve the necessary level of operational surprise.

Another factor to consider is that both these scenarios involve conflict in parts of the world that are infamous for extreme weather conditions that may provide windows of opportunity to remain unobserved from space. This is only partially true. While typical electro-optical imagery taken in the visible spectrum is subject to the vagaries of weather, space-based synthetic-aperture radar (SAR) is not. This all-weather capability was an expensive niche capability with extreme technical challenges and limited commercial

Figure 2. SAR image of ships passing through the Panama Canal taken by Airbus TerraSAR-X, Sept. 26, 2013. *(Image provided by Airbus Defense and Space upon request from the author)*

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potential – until recently. That is changing rapidly as companies based in Italy, Finland and Canada are on the leading edge of efforts to launch constellations of SAR satellites.[13] These satellites eliminate the need for unobstructed daylight imagery, which typically drives the placement of imagery satellites in orbits where they pass over the targeted area as close to noon as possible to minimize shadows.

Surprise not possible

The primary outcome of the growth in space-based surveillance is that operational surprise is no longer possible. This statement is not without caveats. While some experts argue that ubiquitous surveillance from space will soon allow observation of military movements in real-time, making stealth and military deception irrelevant, that is an exaggeration.[14] It is true that large armored formations will never again be able to mass in secrecy to bypass an enemy, as happened in Iraq in 1991 and again in 2003. It is also true that there will remain an upper limit on the amount of observation possible from space. Even hundreds of small satellites operating in a constellation will face limitations in the area they can observe during any one pass.

Furthermore, there is a limit on the effective use of large quantities of data. A lag will always exist between the moment an image is taken and when that data is transmitted, received and analyzed. This window of opportunity will continue to narrow from the roughly 24 hours that is the current likely window between useful third-party observations today down to less than eight hours over the next decade. As a result, even though operational surprise may not be possible, tactical surprise is still a real possibility.

Beyond the impact of space-based surveillance on operational surprise, there are several implications for armored forces. First, as discussed, there is only a small window in which low-level tactical surprise can be achieved. As a result, mounted reconnaissance forces must have the combat power to rapidly defeat an opponent's screening forces and identify weaknesses not apparent from overhead imagery in the enemy defense exploitable by follow-on

forces. This calls for formations organized more along the lines of the older divisional cavalry squadron rather than its less-combat-capable successor organizations.

Second, because the time available to concentrate armored forces will be short, and future opponents will likely have access to weapons of mass destruction, commanders must plan for and accept limited gains. Rather than a single knockout blow, the maneuver commander will need to plan multiple, small and sequential operations to throw an opponent off-balance. These operations will demonstrate conventional superiority and achieve the limited military objectives necessary to obtain political goals without triggering strategic escalation.

Conclusions

The central thesis of this article is that practitioners of armored warfare must be aware of and ready to adapt to the operational impact of near continuous space-based surveillance. There is a decreasing window in which armored forces can mass for offensive action unobserved, even if they possess air superiority. Commanders must accept the limitations this creates and be prepared to accept limited gains using limited forces.

Corps- and division-level maneuvers will never again achieve the operational surprise they did in 1991 or 2003. This does not mean that maneuver warfare is no longer relevant; the opposite is true. In a future dominated by information, military units must be able to mass quickly while possessing the combat capability to defeat localized enemy forces and consolidate gains rapidly – something that armored forces are uniquely capable of doing.

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Notes

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ACRONYM QUICK-SCAN

GEO – geosynchronous orbit
GPS – Global Positioning System
JTAGS – Joint Tactical Ground Station
LEO – low-Earth orbit
NATO – North Atlantic Treaty Organization
SAR – synthetic-aperture radar
SAASS – School of Advanced Air and Space Studies

Armored Fighting Vehicles of the World

FV4034 Challenger 2 🇬🇧

British main battle tank, first fielded in 1998. Four-man crew, 68.9 tons (82 tons with full add-on armor). L30A1 120mm rifled bore main gun, advanced Chobham armor protection. Upgrade options include modular hull and turret armor, an electronic countermeasures package and remotely controlled weapons system. In service with: United Kingdom, Oman.

Snorkeling Russian Tanks Across Rivers

by retired LTC (Dr.) Lester W. Grau

Russian equipment was designed for use in large expanses of woodland and tundra, intersected by broad rivers and massive swamps. Russia is a northern country where severe winter weather is a normal training and combat condition. Large rivers, canals and lakes dominate Eurasia and serve as major arteries of commerce and industry, defensive barriers, lines of communication and avenues of advance.[1]

In Central and Eastern Europe, an advancing or withdrawing force can expect to encounter a six-meter-wide water obstacle every 20 kilometers, up to a 100-meter-wide water obstacle every 35-60 kilometers, a 100- to 300-meter-wide obstacle every 100-150 kilometers and a water obstacle more than 300 meters wide every 250-300 kilometers.[2] Crossing water obstacles is a recurring mission for military forces in Central and Eastern Europe. Getting combat power across quickly is key. Airmobile forces are great for river crossings, but if they are opposed by armored forces, serious reinforcement with tanks and artillery is needed almost immediately.

Building on Soviet-era equipment

The former Soviet Union developed the light amphibious T-40 tank in 1939. It had a two-man crew and carried a 20mm cannon and a 12.7mm heavy machinegun or a 12.7mm and 7.62mm machinegun.[3] In 1951, the Soviets followed up with the light amphibious PT-76 tank. It had a three-man crew and carried a 76.2mm cannon with a 7.62mm coax machinegun.[4] Today's Russian army has the amphibious 2S25 Sprut-D vehicle, which has a 125mm turret mounted on a *Boyevaya Mashina Desantnika* (amphibious Russian air-droppable vehicle) chassis. This swimmer has a three-man crew with an autoloader capable of firing four to six armor-piercing, fin-stabilized discarding sabots; high-explosive fragmentation ammunition; high-explosive anti-tank; and anti-tank guided missiles (ATGM) per minute.[5]

All the Russian infantry fighting vehicles and personnel carriers are swimmers, so their ATGM can cross rivers quickly. Real tanks, however, still require river fords, ferries or a bridge to cross. A Russian maneuver brigade can ferry a tank battalion across a medium-sized river in 30 minutes. A pontoon bridge will take an hour to construct, and pontoon bridges are susceptible to artillery fire.

There is a last option. If your tank cannot swim, why not drive it across the river bottom to the other side?

One of the unique features of Soviet-era and Russian tanks is their ability to snorkel tanks across river bottoms. All Soviet and Russian tanks since the introduction of the T-54A in 1952 have had snorkels. Even the 52-ton T-10 Heavy Tank had a snorkel.[6]

Naturally, there are qualifiers to using a tank snorkel. The river depth at the crossing site cannot exceed five

meters. The river bottom has to be suitable (sand, pebbles) so the tank will not get stuck; the river cannot be more than a kilometer in width; and the current has to be two meters/second or less. The entry and exit banks cannot exceed 25 degrees and the river bottom slope cannot exceed 15 degrees.[7] Some tanks have one snorkel for the crew compartment and another for the engine, while others run both through a single snorkel. There is even a training snorkel that allows the crew to exit the tank without having to open a hatch underwater.

Engineer support

Engineers play a significant role in supporting tank snorkeling. First, they check the designated crossing area for obstacles on the route to the entry and exit points. Second, they conduct a crossing reconnaissance, usually with an Engineer Reconnaissance Vehicle (IRM). Two divers and a sapper scout, equipped with a mine detector, mine probes and explosive charges detect mine obstacles and determine the quality of the suitability of the riverbed bottom and banks in that section of the river. The remaining team located in the IRM uses a sonic depthfinder

and other instruments to create and record a profile of that river section, as well as to detect and record pits, craters, boulders and underwater obstacles. Third, they construct entry and exit points on the river. Fourth, they mark the approach route, the direction of approach to the river and the boundaries of the crossing site. Fifth, they construct shelters for the traffic controllers, lifeguard and evacuation personnel.[8]

Tanks aid the engineers in preparing the crossing site. A tank with a mine flail clears routes and assembly areas, while tanks with the TBS-86 dozer blade prepare the routes and crossing sites. They also help dig the emergency shelters for the traffic controllers, evacuation group and crossing commander.[9]

Figure 1 shows the layout of a tank snorkeling site.

On the right hand side of Figure 1, Russian motorized rifle forces have crossed the river by swimming their *Boyevaya Mashina Pehoti* (Russian mechanized-infantry vehicle) and are calling in artillery and clearing the retreating enemy from the beachhead. The engineers

have created a primary tank-crossing site to the north and a reserve crossing site in the south. The first tank battalion is concealed on the right getting ready for crossing the river. They are busy unstrapping their on-board snorkels and erecting them and hermetically sealing their vehicles for the crossing.[10] They are doing radio checks and confirming their crossing azimuth. When ready, they began moving by platoons in a single file with ample space behind the vehicle in front. They are released by platoon by the traffic regulating post (KPP) and follow the marked route to the vehicle checkpoint (KTP). Here, the communications and waterproofing are checked.

The tanks move slowly forward, maintaining 50 meters between tanks to avoid underwater collisions. As a tank enters the water, the driver loses visibility through his vision blocks due to the dirt particles and debris in the water. It is dark and floating objects may bounce against the hull. The drivers don't change gears and maintain their steady azimuth so that they don't get lost on the river bottom. As they emerge on the other side, a traffic controller directs the tanks to an assembly
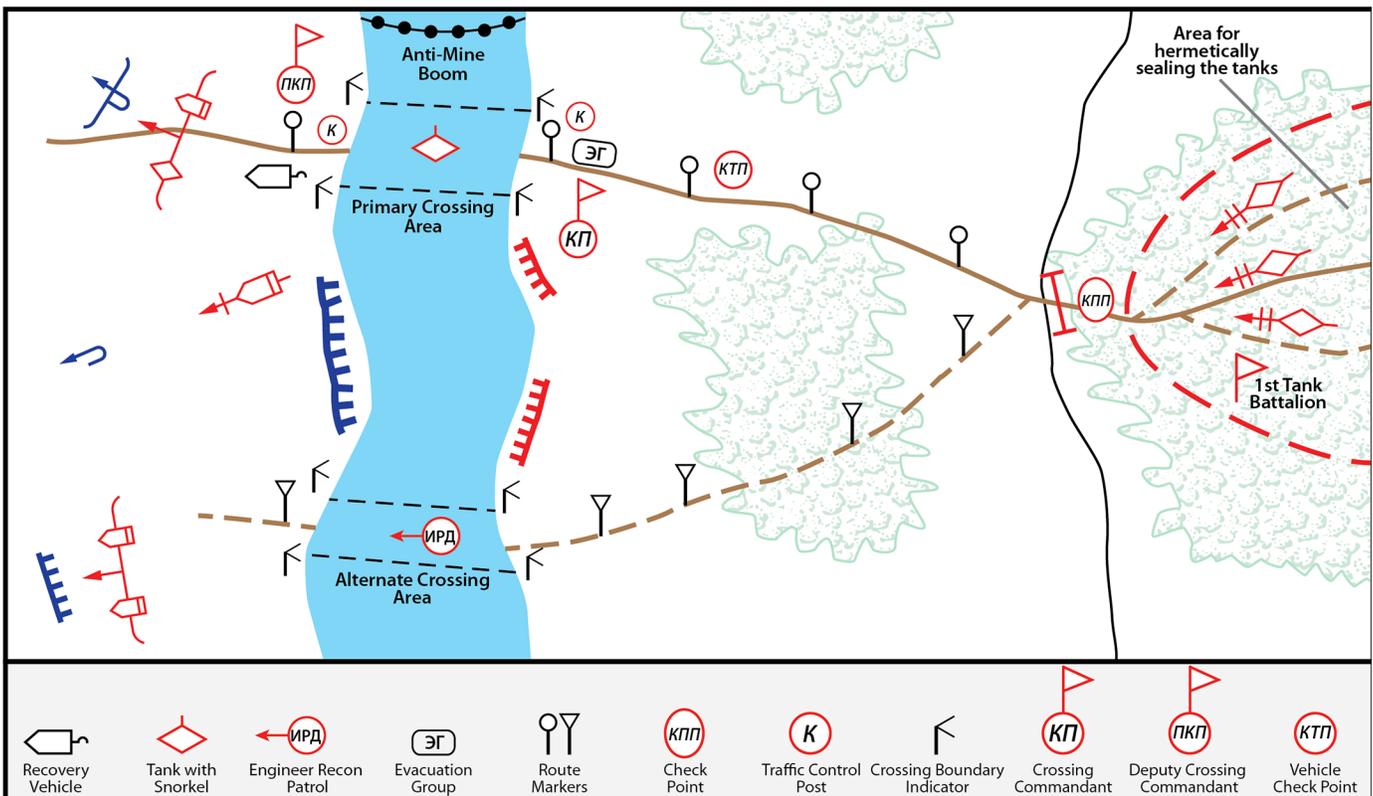
Figure 1. Layout of tank snorkeling site. *(Graphic by Charles K. Bartles)*

Recovery Vehicle	Tank with Snorkel	Engineer Recon Patrol (ИРД)	Evacuation Group (ЭГ)	Route Markers	Check Point (КПП)	Traffic Control Post (К)	Crossing Boundary Indicator	Crossing Commandant (КП)	Deputy Crossing Commandant (ПКП)	Vehicle Check Point (КТП)

area, where the platoon may take off and stow the snorkels and unseal their vehicle. The tank-platoon leader is now in charge.

In case the tank gets stuck or the engine quits, each crew member has a small scuba system and a life vest. After opening the hatch underwater, the crewmembers swim to the surface. Lifeguards in a boat are on standby. A heavy evacuation vehicle is prepared to haul the tank out. If this involves too much time, the tanks are diverted to the reserve crossing site. A boom is usually constructed upriver to stop floating mines, heavy logs and other debris from impeding progress. Still, the first time underwater in a tank likely gets the heart rate up.

Training for crossing

The first time a tank crew snorkels across a river should not be in combat. The Russians train tank crews to snorkel in military-district training centers as part of crew certification. One such training center is Prudboy Range, located west of Volgograd (Stalingrad of World War II fame) between the Don and Volga Rivers. Prudboy Range is located on the Karpovka River and offers all sorts of live-fire and electronic-warfare training opportunities. Last training year, the range trained more than 1,000 tankers from the Southern Military District in underwater driving and tank gunnery. The underwater driving facility includes a water-obstacle training area with concrete pools, concrete ramps and clear water for the first experience of driving underwater in a tank.

What if, in real life, the tank breaks down and water starts leaking into the tank? In the scuba-diving training classroom, the tankers familiarize themselves with the IP-5 self-contained breathing protective mask, safety requirements in working with it, and the procedure for its preparation and use underwater. In the pool of the scuba-diving training classroom, there is a training simulator using a mockup of a tank that can be flooded. A new emergency water discharge has been installed on the simulator. While previously it took 15 seconds to drain the body of this armored vehicle, it now takes three.[11]

The servicemen first "become accustomed" to the IP-5 (the hot air coming from the regeneration cartridge is initially uncomfortable). Then they orient themselves underwater with limited visibility. Finally, they learn to function in the submersible tank mockup. These practical skills can come in handy should the tank break down or get stuck underwater, and the crew has to come to the surface on their own.

After passing a series of tests, the tankers move to the water-obstacle training area, where they take the main exam – driving across a water obstacle underwater.[12]

Traditionally, the tank battalion commander is always the first in the water during all stages of this training, and his tank is first. It is a short ride, but it is necessary.

The unit conducts other tank training while at the range. The Karpovka River is fordable at spots and must be

Figure 2. A T-90 tank with its wading snorkel erected enters a concrete pool at a Russian training site. *(Photo by Serguei S. Dukachev)*

Figure 3. A T-72 tank fully submerged during snorkeling training uses the training snorkel. The crew can exit through this large snorkel, but it is not used in combat. *(Photo courtesy Wikimedia)*

snorkeled at others. There are opportunities to gain more confidence and skills.

This experience is also ongoing in the Russian Far East where "in the Republic of Buryatiya more than 600 tankers from Eastern Military District tank subunits undergo scuba-diving training, entailing the use of self-contained oxygen masks and practice escaping flooded vehicles."[13] Training is conducted at two ranges: the Tsugol Range in Transbaikalia and the Sosnovyy Bor Range in Buryatiya. During the training, the tank crews learn how to move correctly underwater and how to act in the event of the loss of oxygen.

Tank-crew members conduct up to 10 dives in submersed simulators. The scuba-diving training of the crews ends with the crossing of a water obstacle and underwater driving of T-72B tanks at the water range of an Eastern Military District combined-arms combined formation, and the tankers from the Eastern Military District tank formation located in Buryatiya will carry out a forced crossing of the Onon River in Transbaikalia in the course of upcoming exercises.[14]

Takeaways

1. Russian tanks have three-man crews, lower silhouettes, less top-attack armor and weigh in the 46-ton range. Russian military ferries and pontoon bridge sets can handle their tank's weight, as can many highway bridges in Eastern Europe. Fording is often an option. Snorkeling (deep fording) gives them yet another option.

2. River current can take a tank off course and that is why the driver keeps a constant speed and steers to stay on azimuth. Radio communications are possible but are an electronic giveaway as to what is going on if not encrypted. A strong current and the buoyancy of the tank lifts the tank off the bottom so that the driver often doesn't feel the treads turning. The treads are propelling the tank through the water and the tank is indeed swimming.

3. Initial training for underwater driving is done in clear-water conditions; however, field conditions will engulf the crew in a brown or green soup, which causes a loss of orientation. Staying on azimuth and maintaining constant speed are essential.

4. Abrupt turns and stops are anathema in this maneuver. This is why a tank underwater driving course and scuba

school are essential before snorkeling. It reduces fear, provides experience and becomes an anticipated adventure and tale of daring-do.

5. Snorkeling is not a far-flung possibility but a skill the Russian army regularly trains to conduct.

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Notes

[1] Lester W. Grau and Charles K. Bartles, *The Russian Way of War: Force Structure, Tactics and Modernization of the Ground Forces,* Fort Leavenworth: FMSO, 2017, https://community.apan.org/wg/tradoc-g2/fmso/p/fmso-bookshelf.

[2] Ibid.

[3] G. L. Kholyavskiy, Энциклопедия Танков*:* Полная Энциклопедия Танков Мира *1915-2000* г.г. [*The Encyclopedia of Tanks: The Complete Encyclopedia of the Tanks of the World 1915-2000*], Moscow: Harvest, 2000.

[4] Ibid.

[5] Grau and Bartles.

[6] Kholyavskiy.

[7] D.V. Shunyakov, O. N. Bondarev, D. N. Bagin and S. Fokin, Ministry of Education and Science of the Russian Federation, Переправы {*Crossings*], Ekaterinburg: Ural University Press, 2017.

[8] Ibid.

[9] Ibid.

[10] The sealing is done primarily around the hatches using a clay-like "glop." It takes about 15 minutes to prepare a tank.

[1] Yu. Borodin, "Along the River Bed as on Dry Land," Армейский Сборник [*Army Digest*], April 2019.

[2] Ibid.

[3] Eastern Military District Press Service, "In Buryatiya More Than 600 Eastern Military District Tank Crew Members Begin Scuba-Diving Training," Ministry of Defense of the Russian Federation*,* http://www.mil.ru, June 24, 2019.

[4] Ibid.

ACRONYM QUICK-SCAN

ATGM – anti-tank guided missile
FMSO – Foreign Military Studies Office
IRM – Russian acronym for their Engineer Reconnaissance Vehicle

Honoring our Armor and Cavalry Medal of Honor Heroes

Derived from Center of Military History information provided at https://history.army.mil/html/moh/civwaral.html. Listed alphabetically. Note: Asterisk in the citation indicates the award was given posthumously.

CAPEHART, CHARLES E. MAJ
Unit: 1st West Virginia Cavalry. Place and date of action: Monterey Mountain, PA, July 4, 1863. Entered service: Washington, DC. Born: 1883, Conemaugh Township, Cambria County, PA. Date of issue: April 7, 1898. Citation: While commanding the regiment, charged down the mountainside at midnight in a heavy rain upon the enemy's fleeing wagon train. Many wagons were captured and destroyed and many prisoners taken.

CAPEHART, HENRY COL
Unit: 1st West Virginia Cavalry. Place and date of action: Greenbrier River, WV, May 22, 1864. Entered service: Bridgeport, OH. Born: March 18, 1825, Johnstown, Cambria County, PA. Date of issue: Feb. 12, 1895. Citation: Saved, under fire, the life of a drowning soldier.

CAPRON, HORACE JR. SGT
Unit: Company G, 8th Illinois Cavalry. Place and date of action: Chickahominy and Ashland, VA, June 1862. Entered service: Peoria, IL. Born: Laurel, MD. Date of issue: Sept. 27, 1865. Citation: Gallantry in action.

Deliberate Wet-Gap Crossings in the Korean Theater of Operations
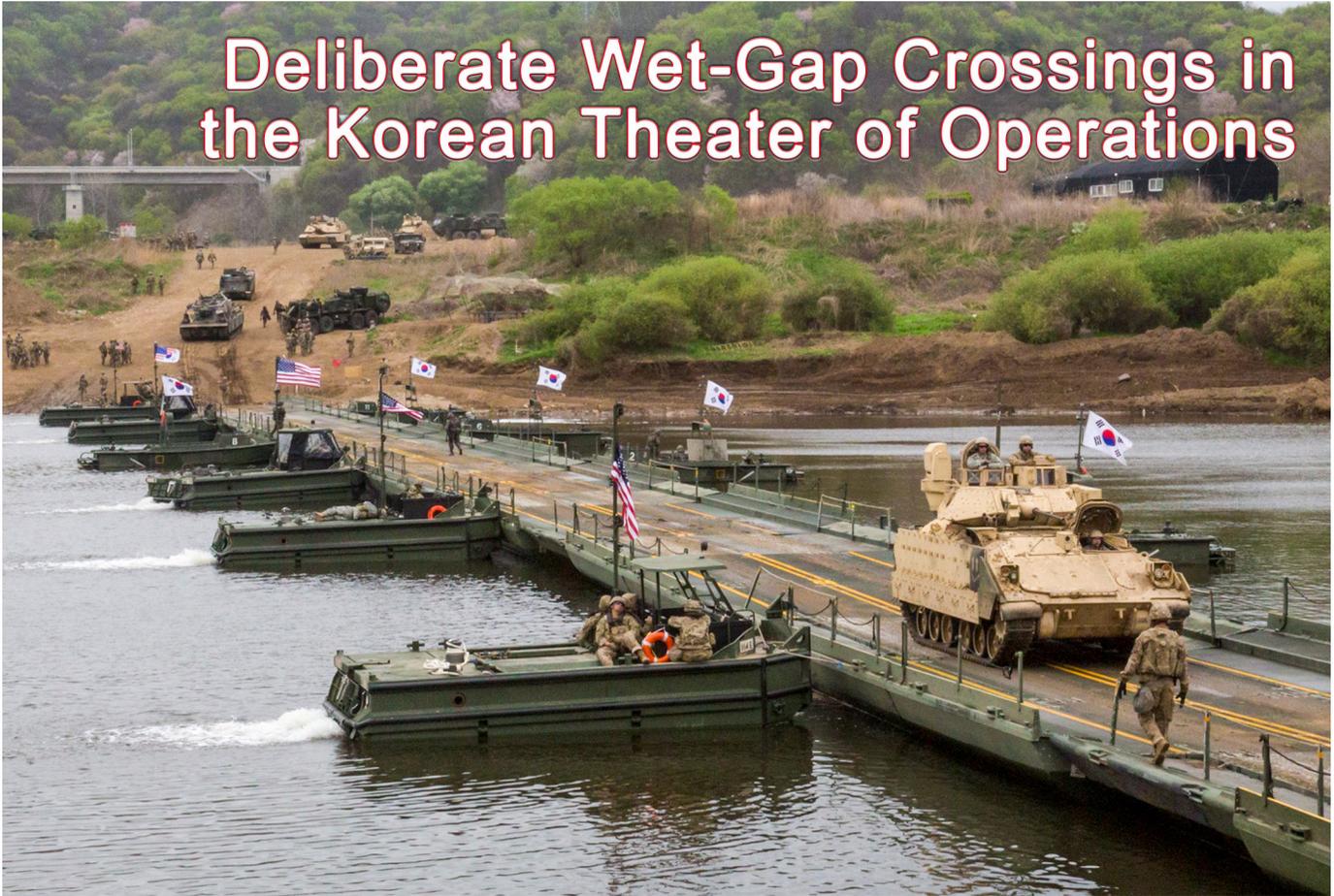
by LTC Robert E. Dion Jr.

The 2nd Infantry Division/Republic of Korea – U.S. Combined Division is the only permanent forward-deployed division in the U.S. Army, and its mission is to deter aggression from North Korea. Readiness deters aggression, and one area the division demonstrates readiness in is by maintaining operational-plan proficiency in deliberate wet-gap crossings – a critical capability every rotational armored brigade combat team (ABCT) that deploys to Korea plans and executes.

The division has an advantage over every division in the U.S. Army by having operational control of an echelons-above-brigade engineer battalion with a multi-role bridge company (MRBC). The 11th Engineer Battalion, with 814th MRBC, activated in Korea in October 2017 under operational control of 2nd Infantry Division to fill a critical capability gap. This permanent relationship allows the division to plan and execute a wet-gap crossing exercise year-round.

In April 2019, 3rd ABCT, 1st Armored Division, conducted a combined wet-gap crossing with 11th Engineer Battalion – plus, from RoKA, 137th Mechanized Battalion, 16th Mechanized Brigade and a river-crossing company from 6th Engineer Brigade. The 3/1 ABCT successfully planned and executed this exercise by using the six gap-crossing fundamentals of surprise, extensive preparation, flexible planning, traffic management, organization and speed.[1]

Surprise

The rugged terrain in Korea consists of many mountains and narrow valleys that limit the number of maneuver corridors. Therefore, most military movements are limited to travel on the existing network of roads and trails. Unfortunately, this limits the element of surprise in a wet-gap crossing because the enemy knows the locations of the likely crossing points. Ideally, planners look for a salient on the enemy side of the crossing area, as this allows friendly forces to mass fires across a wide area into a concentrated section of the enemy. The river-crossing area chosen by 3/1 ABCT met this condition and allowed the assault force to mass fires on the simulated enemy.

To mitigate the limited crossing area options available in Korea, 2nd Infantry Division staff developed an effective deception plan for the exercise. The deception plan was needed because, in the event of a real conflict, the enemy will attempt to track the MRBC's location by using satellites or unmanned aerial vehicles, as the gap crossing cannot occur without this capability. Therefore, planning to employ decoy engineer equipment parks and crossing sites aid the deception plan; elements of the MRBC can deceive the enemy by moving to the decoy location.

Past division exercises have also used 2nd Combat Aviation Brigade to conduct slingload operations to airlift boats and bays to the crossing area. This can aid the element of surprise by airlifting the initial equipment needed to conduct rafting operations while the rest of the equipment moves forward.

Another way to surprise the enemy involves the timing of the gap crossing. The 3/1 ABCT conducted the exercise at dawn to facilitate the professional development of the division and RoKA visitors observing the crossing. However, a night crossing would aid the element of surprise, so planners will consider it for future exercises.

Extensive preparation

The division has an advantage over every unit in the U.S. Army because its Soldiers know exactly where they will fight. The division's leaders and planners used this to their advantage when preparing for the exercise by studying the characteristics of the crossing sites and training for wet-gap crossings replicating the same conditions in which they may fight.

In the weeks preceding the exercise, both the division and brigade conducted leadership professional-development sessions with the staffs and key unit leaders to teach the fundamentals of gap-crossing operations. These sessions were critical to explaining the doctrinal principles needed to successfully plan and execute a deliberate wet-gap crossing.

A key component of the planning process was conducting a river reconnaissance. Intelligence planners first collected data on the river with weather reports and aerial imagery to determine the best crossing location and characteristics of the terrain. Reconnaissance teams with engineers then collected data on river velocity, water depth, soil types and the conditions of the entry and exit banks. Identification of fording sites were also an important objective of the reconnaissance teams. The 3/1 ABCT highlighted the importance of fording to leaders to ensure they didn't focus only on conducting a wet-gap crossing when a fording site might be nearer.

To validate the plan, 3/1 ABCT conducted full-scale rehearsals prior to the crossing to ensure the sequence and responsibilities were clear. Three days prior to the exercise, 814th MRBC and a bridge platoon from 6th Engineer Brigade (RoKA) conducted rehearsals on rafting and bridging operations, including how to replace a bay damaged by indirect fire. Following the rehearsals,

Figure 1. Members of 814th MRBC conduct rafting operations during rehearsals. *(U.S. Army photo by 55th Combat Camera)*

the units were able to reduce the time required to complete the bridge from four hours on the first day down to 80 minutes during the day of execution. An option for rehearsals would be to establish a wet-gap crossing rehearsal site in the rear area to practice prior to the operation. This would increase the chance of a successful operation, especially if the MRBC has not conducted a wet-gap crossing recently.

Flexible planning

The motto for the exercise was "Kapchi Kapshida," the Korean words for "We go together!" To the greatest extent possible, the division conducts combined training exercises with its RoKA partners because this is how they will fight. The benefit of conducting a combined wet-gap crossing was realized early in the exercise for 3/1 ABCT.

Low water in the river resulted in boulders in the water that blocked the preferred path for the ribbon bridge. Dive teams from 6th Engineer Brigade (RoKA) marked the locations of boulders to prevent damage to bridging equipment. Engineers then adjusted by turning the bridge away from the rocks, which increased the length of the bridge from 137 meters to 202 meters. Unfortunately, the increased length exceeded the capabilities of 814th MRBC due to the amount of equipment available on-site. The solution was to construct a hybrid bridge using bays from

both the U.S. and RoKA bridge units with Korean Augmentation to the U.S. Army soldiers placed in U.S. boats to help with communication.

RoKA uses the standard ribbon bridge (SRB), which is the bridge the U.S. Army used prior to upgrading to the improved ribbon bridge (IRB). For a river velocity up to 0.6 meters per second, the IRB can support a military load class (MLC) of 105 for tracked vehicles, and the SRB can support an MLC of 75.2. The hybrid bridge uses the lower MLC, which was enough to pass 3/1 ABCT tanks.

The 3/1 ABCT also adapted its plan for getting the crossing force across the river based on the capabilities of the attached RoKA armored unit. The 137th Mechanized Battalion (RoKA) is equipped with the K200 infantry fighting vehicle, which is capable of swimming. The updated plan took advantage of this by having the assault force swim across the river, which negated the requirement to conduct rafting operations for the assault force.

During the river reconnaissance, engineers determined the entry and exit bank slope. This revealed that soil type would be an issue during the crossing, exceeding the capabilities of the MRBC to maintain. The 11th Engineer Battalion was able to adjust by assigning the mission to 643rd Engineer Support Company to maintain the banks.

Figure 2. An M1A2 tank from 3/1 ABCT crosses a hybrid IRB/SRB bridge constructed by members of 814th MRBC and 6th Engineer Brigade (RoKA) during a wet-gap crossing exercise. *(U.S. Army photo by LTC Robert Dion)*

A decision point for the division commander during a wet-gap crossing is when to transition from tactical bridging to line-of-communications bridging (LoC-B). IRBs are designed to be used up to 72 hours. However, these bridges can be used longer, but they require the MRBC to stay on-site to maintain the bridge due to changes in water height and speed. On the other hand, upgrading the site to LoC-B allows the MRBC to move forward on the battlefield.

The 11th Engineer Battalion constructed a 40-meter logistics-support bridge (LSB) over a dry gap on the far side of the river. The LSB can support an MLC of 80 for tracked vehicles.[3] Every vehicle from 3/1 ABCT that used the IRB also crossed the LSB, which allowed Soldiers to gain confidence in the bridge systems. In future exercises, the division will construct a floating LSB over a wet gap.

Traffic management

The terrain in Korea limits the ability for units to plan the crossing area according to doctrine, which is normally two to 2.5 miles on either side of the gap.[4] To demonstrate the distance required for a gap crossing in Korea, the division-engineer section developed crossing-area graphics depicted on actual terrain. This allowed the staff to see how the crossing area extends when key areas (battalion holding areas, engineer regulating point, engineer equipment park and call forward areas) are planned on restricted terrain.

A decision point for the crossing-area commander (CAC) is when to call forward combat forces to the next holding area and call forward areas. Commanders must consider the current enemy situation at the crossing site to prevent moving forces too soon. This is especially important when deciding when to move forward the MRBC. The Army cannot easily replace military-occupation specialty 12C bridge crew-member personnel and bridge equipment with only four companies in the active Army and 20 in the Army Reserve and National Guard.

Organization

When planning for the exercise, division planners had to determine if a joint operations area (JOA) was needed before the wet-gap crossing could be conducted. "A JOA is an area of land, sea and airspace, defined by a geographic combatant command or subordinate unified commander, in which a [joint force commander] (normally a joint task force) conducts military operations to accomplish a specific mission."[5] The division may operate in either a noncontiguous area or not be assigned an area of operation due to conducting a follow-and-support mission to RoKA. The establishment of a JOA will allow the division to prepare the crossing area with fires and air support before conducting the gap crossing.

Having clear command-and-control nodes and responsibilities is also critical to a successful gap crossing operation. During this exercise, 3/1 ABCT served as the CAC, and 11th Engineer Battalion was the crossing-area engineer (CAE). As the CAE, 11th Engineer Battalion needed to be co-located with the CAC to assist with planning and ensure both headquarters had the same common operating picture. As CAE, 11th Engineer Battalion ensured that all

Figure 3. A humvee from 3/1 ABCT crosses a 40-meter LSB over a dry gap constructed by members of 814th MRBC. *(U.S. Army photo by LTC Robert Dion)*

units involved with conducting engineer operations and moving units within the crossing area had a clear task and purpose, and that they understood the 3/1 ABCT commander's intent. Successful units are the ones that do this, as it allows subordinate units to complete the mission as conditions change.

Engineer forces available to support the gap crossing limited the number of lanes emplaced. Every lead brigade combat team (BCT) requires two crossing lanes to quickly move forces across the gap. The river width and bridging equipment on site prevented emplacing two lanes for this exercise, but future exercises will incorporate planning for a second crossing to exercise the staff in the additional resources and factors required.

During planning for a wet-gap crossing, the division staff must resource BCTs with required assets that are not organic to the unit. Therefore, planners will always remember bridging assets, but other critical capabilities can be overlooked. For example, air- and missile-defense assets on-site can mitigate the risk from air threats; chemical, biological, radiological and nuclear units can conduct decontamination after an attack; mobile, active, electronically scanned array counter-battery radar systems (also known as AN/TPQ-53) can enable counter-fire; and more field-artillery support can assist, firing both high-explosive and obscuration rounds.

Speed

Once a wet-gap crossing operation commences, the enemy knows where the unit is crossing and will do everything it can to stop it. Units do not need to race to the gap because this can lead to failure. The actual crossing is the focus of *speed* as a fundamental.

During the recent exercise, the 3/1 ABCT used the breaching fundamentals (**suppress**, **obscure**, **secure**, **reduce**, **assault**) to conduct the gap crossing once they reached the river.[6] A concern when executing these fundamentals was the best way to provide battlefield obscuration. The chemical corps no longer has the capability to provide obscuration, so the unit was left with either smoke pots or those fired from artillery. Artillery-fired obscuration is a good solution, but it is a constant balance between providing obscuration and eliminating the enemy with high-explosive rounds. In addition, the artillery basic loads do not have enough obscuration rounds to obscure the battlefield for the required two to three hours.

Way forward

The 2nd Infantry Division/Republic of Korea – U.S. Combined Division and 11th Engineer Battalion are actively preparing for wet-gap crossing exercises with future rotational ABCTs. The goal of these exercises remains to increase the tactical and technical competency and proficiency of the

combined RoK-U.S. forces for this type of operation. With the shift back to decisive-action operations against a peer or near-peer threat, it is critical that leaders and Soldiers have the foundational knowledge needed to execute this complex operation.

LTC Rob Dion assumed command of 11th Engineer Battalion in August 2019. His previous assignments include division engineer, 2nd Infantry Division/ RoK-U.S. Combined Division, Camp Humphreys, Korea; program integrator within G-8, Headquarters Department of the Army, Pentagon, Washington, DC; Arroyo Center fellow, RAND Corporation, Santa Monica, CA; brigade S-3, 555thEngineer Brigade, Joint Base Lewis-McChord (JBLM), WA; battalion S-3, 864th Engineer Battalion; and brigade plans officer, 555th Engineer Brigade, JBLM. LTC Dion's military schools include Ranger School, Sapper School and Airborne School. He holds a bachelor's degree in civil engineering from the U.S. Military Academy, West Point, NY; a master's of science degree in civil engineering from the Georgia Institute of Technology; and a master's of science degree in engineering management from the University of Missouri-Rolla (now the Missouri University of Science and Technology). LTC Dion is a registered professional engineer in Missouri, a certified project management professional and a certified construction manager.

Notes

[1] Field Manual (FM) 3-90.12, *Combined-Arms Gap Crossing*, July 2008.

[2] Technical Manual 5-5420-278-10, *Operator Manual for [IRB] Ramp Bay*, April 8, 2003.

[3] FM 3-90.12.

[4] Ibid.

[5] FM 3-0, *Operations*, October 2017.

[6] FM 3-90.12.

For Company- and Platoon-Level Leaders' Professional Development: *Musicians of Mars, Vol. 3: the Cobra Strikes*

One of the Center for for Army Lessons Learned (CALL)'s recent products (published in February 2019), it is a series of tactical vignettes in the same vein as *Duffer's Drift* and should aid mounted-maneuver leaders in conducting professional development with their junior officers / noncommissioned officers. From the CALL Website:

"*Musicians of Mars III The Cobra Strikes* picks up the tale of ... Task Force Mustang in the aftermath of their successful defense (in CALL Handbook 16-12, *Musicians of Mars II*) of Engagement Area Blackjack. ... As with *Musicians of Mars II*, this handbook takes the reader through a fictional scenario where the tactical leaders make decisions, some good and some not so good, that impact subsequent actions. *Musicians of Mars III* will have its leaders learning and improving as they progress through tactical engagements. This was intentional in the development of this publication and is designed to facilitate tactical discussions at the company and platoon levels."

All three *Musicians of Mars* publications are available by going to the CALL Website, https://call.army.mil, and clicking on "Publications." Direct links are *Musicians of Mars III: The Cobra Strikes*, https://usacac.army.mil/sites/default/files/publications/19-08.pdf; *Musicians of Mars II*, https://usacac.army.mil/organizations/mccoe/call/publication/16-1; *Musicians of Mars I: A Story of Synchronization for the Company/Team Commander,* https://usacac.army.mil/node/2358. The publications are also available to order in hard copy. (Books and shipping are free to unit address. To order publications, visit https://call2.army.mil/rfp (CAC login required). General questions can be directed to CALL's Request for Information line at (913) 684-2255 (CALL).)

From foreword:

"There is still a tendency in each separate unit ... to be a one-handed puncher. By that I mean that the rifleman wants to shoot, the tanker to charge, the artilleryman to fire. ... That is not the way to win battles. If the band played a piece first with the piccolo, then with the brass horn, then with the clarinet, and then with the trumpet, there would be a hell of a lot of noise but no music. To get harmony in music, each instrument must support the others. To get harmony in battle, each weapon must support the other. Team play wins. You musicians of Mars ... must come into the concert at the proper place at the proper time." -MG George S. Patton Jr., address to 2nd Armored Division, July 8, 1941

Building Equipment Readiness in Armored Brigade Combat Team Cavalry Squadron

by LTC John P. Horning, MAJ G. Wade Greenlee, 1LT P. Andrew Bailey and 1LT Dustin M. Kaminsky

"Getting back to fundamentals" or "going back to the way we used to do things before the global war on terrorism" are common refrains heard when discussing the readiness of units to fight and win in a decisive-action training environment – and, more importantly, to win in potential future wars.

Often – especially in armored brigade combat teams (ABCTs) – these comments are related to and augmented by "re-establishing a maintenance culture." However, we must ensure that building and maintaining a healthy maintenance culture is more than a "bumper sticker" in armored units. Conducting command maintenance and ensuring leaders teach Soldiers to do detailed preventive-maintenance checks and services by the technical manual are unquestionably the foundation of a good maintenance program.

Units can take several concrete actions to help improve their operational-readiness (OR) rate. First, fill authorized modified table of organization and equipment (MTOE) positions with the right people; second, develop and fund a tailored, functional shop-stock listing (SSL) using the Global Combat Support System-Army (GCSS-A) and the expertise of senior maintainers; and third, plan and conduct combat-vehicle services as a collective-training event.

Right people in right positions

The armored-cavalry squadron and combined-arms battalions have an MTOE position for an armor captain to serve as the squadron/battalion maintenance officer (SMO/BMO). This position, recently re-added to the MTOE, is in addition to the maintenance-control officer (MCO) and the maintenance-platoon leader (MPL) on the forward-support company's (FSC) MTOE.

Recent experience shows that logisticians tend to view the MCO position in a different light than how armor officers viewed the BMO position under the previous MTOE variations. Often, brigade-support battalions (BSBs) place their most experienced lieutenant in the FSC executive-officer position. However, logisticians appear to prefer a developmental path from MPL to MCO and then executive officer. In contrast, from the perspective of a maneuver commander, we recommend successful completion of troop/company executive-officer time as the minimum prerequisite to be the SMO/BMO.

When the squadron or battalion does not put an experienced armor or infantry officer in the SMO/BMO position, relying instead on the more junior MCO to do both jobs (or in some cases three jobs if there is no MPL), he or she can become quickly overwhelmed with the amount of work, coupled with trying to learn technical aspects of GCSS-A and the maintenance enterprise. The benefit of selecting the right officer who already has been a successful platoon leader (PL) and executive officer is that the individual will have greater familiarity with the pacer fleet (which is, of course, the most important vehicle in the unit) from the standpoint of its operation, functions and maintenance requirements.

Also, success as an executive officer means the selected officer will have more in-depth experience with the maintenance system and logistically supporting units. He or she will also bring experience working with both mechanics and the squadron/battalion staff and executive officer. When the unit does not appoint an SMO/BMO and instead relies on the MCO to accomplish both responsibilities, he or she is less equipped from an experiential standpoint to be successful right away. If the MCO was previously the distribution-platoon leader, possibly from another battalion or from a company in the BSB, he or she may have little to no exposure to the pacer fleet, GCSS-A or the battalion-level staff and its functions.

When assigning officers to all three positions according the MTOE, delineating specific roles for the three positions eliminates confusion and places well-defined responsibilities for specific functions with specific persons. Because all three individuals have a role and a stake in the outcome of the unit's maintenance program, they must work together to be successful.

Table 1 and Figure 1 lay out how our squadron defined the individual responsibilities of key players in the maintenance program, and it attempts to show the overlapping interests that combine to achieve and maintain a 90-percent OR rate.

The SMO/BMO is a primary staff officer who plans maintenance activities and recommends priorities to the squadron/battalion commander to maintain or generate combat power. He reports to the squadron executive officer.

The MCO manages the use and implementation of the technical logistics enterprise to ensure repair-part stockage and flow. The MCO also ensures that any needed outside experts are available to support operations. The MCO reports to the FSC commander.

The MPL is a leader of troops who is responsible for the training, administration, health, welfare, discipline and morale of the mechanics assigned to the FSC. The MPL is also accountable to the FSC commander for the unit's property and equipment calibration.

Primary staff officer	
-Responsible for ensuring maintenance operations are prioritized, synchronized and executed within squadron commander's intent. -Owns and implements squadron's maintenance standard operating procedure and maintenance Organizational Inspection Program / Marne Inspection Program. -Attends and briefs at all maintenance/staff meetings. -Synchronizes service schedules with training schedules. -Prioritizes unscheduled maintenance and battle-damage assessment and repair tasks. -Makes recommendations to squadron commander and squadron executive officer for controlled substitutions. -Ensures unit maintenance-collection point (UCMP) maintains communications with combat-trains command post and field-trains command post. -Manages Army Oil Analysis Program (AOAP) process to ensure samples are taken in a timely fashion. -Ensures unit property books are properly reflected in AOAP, Test, Measurement and Diagnostic Equipment (TMDE), and GCSS-A systems. -Coordinates activities with MCO and MPL.	
Manager of maintenance enterprise	Leader of troops, chain of command
-Responsible for Class IX supply operations and status-reporting procedures using GCSS-A. -Monitors Logistics Information Warehouse for updated info. -Ensures timely update of ESR to maintain accurate reports. -Interfaces with logistics-assistance representatives and field-service representatives to expedite arrival of parts. -Manages SSL ordering, inventory/storage, receipt/issue, demand analysis and zero balance. -Accounts for recoverable items and ensures turn-ins are completed on time (Overaged Reparable-Item List management). -Maintains communications systems for GCSS-A in field. -Ensures compliance and reporting for safety-of-use messages and modification work orders. -Coordinates activities with SMO and MPL.	-Responsible for training, administration, health, welfare, discipline and morale of Soldiers in Paragraphs 505-510. -Leads recovery missions and tactical movements of maintenance platoon. -Oversees and executes environmental compliance. -Maintains accountability and serviceability of issued tools and equipment. -Manages TMDE. -Ensures verified load tests are performed. -Oversees UCMP's layout, security and life support. -Oversees key control and physical security of motorpool. -Coordinates activities with SMO and MCO. -Performs other duties as assigned by FSC commander.

Table 1. Maintenance roles and responsibilities.

SSL increases readiness

The SSL's purpose is to reduce time waiting for the unit's most needed parts, which in turn reduces "not-mission-capable-supply" time in the Army Materiel Status System and thereby improves the OR rate reported in the Unit-Status Report. More importantly than the reports, however, the SSL keeps more vehicles fully mission-capable for training and readiness.

Our maintenance team identified three guiding principles for building a squadron SSL. First, the SSL must be rooted in routine demand analysis. Second, the SSL must to be tailored to the unit's mission and environment. In our recent deployment to Korea, for example, we found this to be true as our requirements differed from what we experienced at Fort Stewart, GA.

While all vehicles and equipment can be represented in the SSL, we recommend prioritizing parts for equipment-readiness-code (pacing items) vehicles as well as critical-to-mission-accomplishment vehicles.

Finally, the SSL must complement, without unnecessarily duplicating, the brigade's authorized-stockage list (ASL) to maximize capabilities.

The process of conducting demand analysis and building an SSL in GCSS-A is a technically complicated process, which we outline in this article to explain tactics, techniques and procedures that worked well for 5th Battalion, 7th Cavalry.
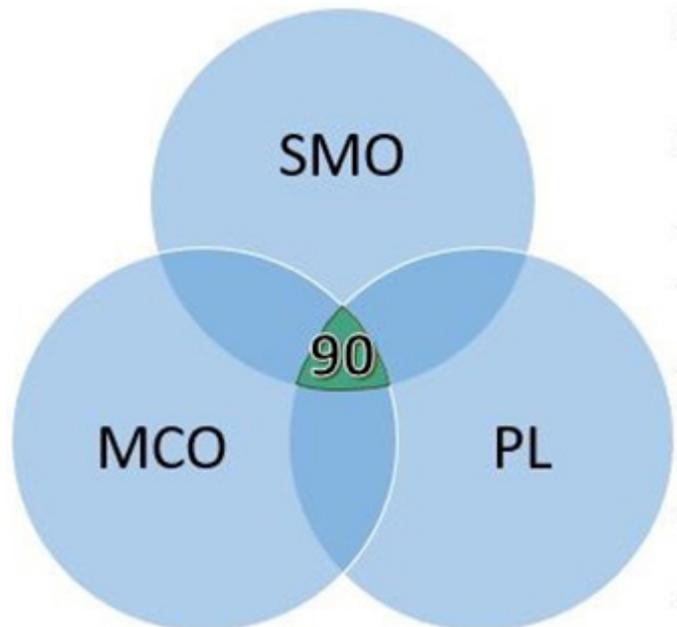

Figure 1. Maintenance roles and responsibilities in achieving a 90-percent OR rate.

GCSS-A provides historical data for all units' equipment, and it recommends

retaining or deleting stocked Class IX repair parts from its historical lists. Using this as a baseline, we then created a list of repair parts that had been consumed six times in the last 12 months. We compiled the consumption of like parts into a single squadron list to build a more holistic view of consumption because the analytics tools in GCSS-A are designed to analyze individual troops or companies, which presented a problem.

For example, Troops A, B and C may have consumed two of a given repair part each. The analytical tool would recommend "delete" for the line because all three consumptions fell below the threshold to retain. The consolidated six consumptions, however, show a clear demand for the line in the squadron SSL. Since squadrons and battalions are no longer allocated prescribed load lists (PLL) at troop level, nor is there adequate lift capacity at troop level to support a PLL, GCSS-A should expand its demand-analysis tools to examine the battalion/squadron more holistically.

Because of the unique nature of the squadron's mission in Korea and the need to be ready to "fight tonight," we determined that our SSL had to prioritize our pacers, and it had to be tailored to fit in our parts truck, parts trailer and balance-on-hand containers in a configuration that could be fully loaded in one lift and be ready to move on a few hours' notice. Because of mission requirements, we could not rely on using additional lift from our internal Heavy Expanded Mobility Tactical Truck-Load Handling Systems or on external support. We needed to create an SSL that could support our critical vehicles and be moved if we were called to emergency-deployment operations. We determined to stock only deadlining parts in six categories by priority:

- M2A3 Bradley Fighting Vehicles (BFVs);
- M1A2SEP Abrams tanks;
- Weapons systems;
- Communications systems;
- Other tracked vehicles; and
- Wheeled vehicles.

Our analysis and work to build the SSL had several implications. First, we had

to analyze not only the cost and number of lines but the parts' sizes. We limited our full-up powerpack lines to a single BFV engine based on available space. We determined tank and M88 engines were too large to meet our mobility requirements. Conversely, weapons parts could be stored primarily in the armament-shop van, so we were able to allocate proportionally more lines to weapons systems.

Second, we focused on pacer line-replaceable units (LRUs). These are generally smaller high-pay-off items that enable us to evacuate broken LRUs to a higher-level maintenance without deadlining a vehicle. Once LRUs returned from higher-level maintenance, we conducted a quality control/assessment and added them back to the SSL. Based on the cost of LRUs and the demand for overall mobility of our SSL, we set an initial target for 300 lines. This allowed us to re-evaluate space-available and priorities for funding at the SSL's next quarterly review.

Once we had a manageable list rooted in demand analysis and prioritized systems, the senior mechanics and motor sergeants proofed our revised list. In many cases, based on their experience, the mechanics recommended either stocking a higher-level assembly or stocking more of one part. For example, the initial draft for BFVs listed inadequate stock of bolts to hang the on-hand stock of BFV propeller shafts. (The value of subject-matter expertise cannot be overstated in SSL development, and it is reason to retain adequate commander discretion in both ASL and SSL development as Headquarters Department of the Army seeks to standardize both.) At this point, we presented the list again to the squadron command team for final approval.

While our experience was unique to the cavalry-squadron mission for the rotational ABCT in Korea, we learned how to use the ASL to inform the contents of our SSL and to conduct quarterly demand analysis to ensure our SSL remained relevant. It was not until several months into the rotation, after the SSL's initial approval and while the squadron was under 210th Fires Brigade's tactical control, that we realized we had incorrectly assumed the ASL

designed to support the M270 Multiple Launch Rocket System (MLRS). This meant we would have little to no repair parts for BFVs. Our assumption was flawed partly because the ASL had been supporting an ABCT cavalry squadron for several years.

More importantly, the MLRS and BFV share a common engine and transmission. Our supporting ASL kept a healthy stock of engines, transmissions, hoses, fittings and wiring harnesses. During our next maintenance review, we realized we could significantly decrease our stocks of these items and increase our stock of unsupported tank and BFV turret components not in common with MLRS.

Quarterly reviews are an important function that provide continuous improvement to the SSL as external factors change. Furthermore, we recommend that another SSL review accompany the ASL review at the supporting supply-support activity, whether that is a unit's organic BSB or not.

Quarterly reviews are a crucial recurring step to this process. Each quarter of the training calendar presents a different type of wear on the equipment based on training schedules, weather, leave and deployments. The rolling 12-month analysis tools in GCSS-A help capture the fleet's changing needs so leaders are prepared to handle similar challenges the next year. The reviews provided opportunities for inventory updates and control, which will reduce the human error that accumulates in GCSS-A over time. We also found quarterly reviews enabled us to understand changes in lead times for high-consumption parts.

The rights to edit reorder points that default to zero quantity are held at the brigade-support operations' maintenance technical officer's (MATO) level. This is a peculiar responsibility to be held above the squadron level since the authority to fund the order remains at brigade level. We absolutely recommend that authority be delegated down to the squadron MCO's role.

In the meantime, an increased safety stock that can be edited at the squadron level may alleviate some of the issue of long lead items, but this requires more storage, longer
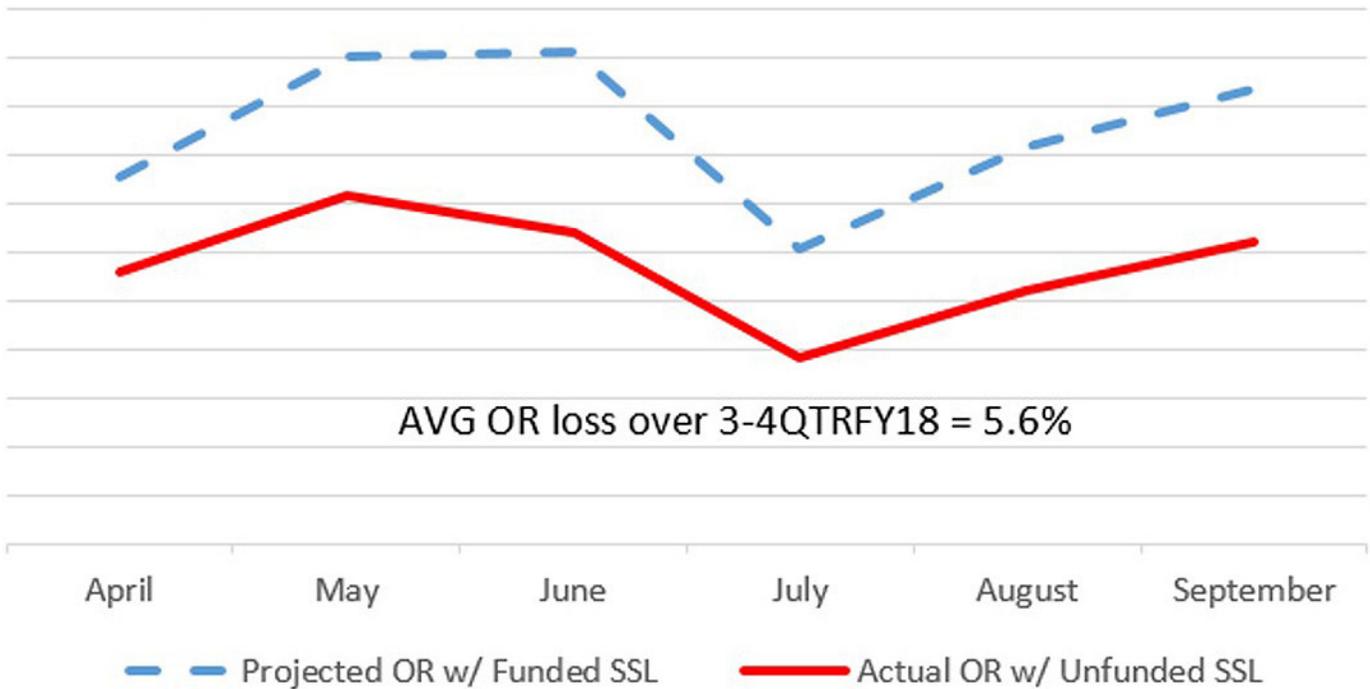
Figure 2. 5-7 Cav's SSL comparison by month.

inventories and still a long period with a zero quantity, even if less frequent. Identifying these lines and requesting an increased reorder point from MATO quarterly will help to eliminate these issues.

We made one other important discovery during review of our SSL. Several zero-balance lines on our SSL never generated purchase requests. We found that when G-4/G-8 purged ZPARK (financial hold to review, reject or release) to reduce the queue of unfunded requirements, it also had the effect of hurting our SSL. Such a purge of unfunded requests that have been in ZPARK for a certain amount of time does not trigger an automatic reorder of SSL parts the way consuming those items below the reorder point does. This left us with the option of either manually inputting all affected lines, then immediately consuming them to trigger the reorder point (which also negatively impacts demand analysis), or manually reordering affected lines to the safety stock. Depending on the number of lines affected, this can take several days to correct. This is equal to the amount of time required to initially build an SSL.

While ZPARK can quickly become unwieldy when several weeks of orders remain unfunded, deleting all lines

prior to an arbitrary date defeats two critical advantages of the ZPARK function in GCSS-A: first, ZPARK's ability to calculate a running bill of sustained readiness; and second, items ordered as SSL repeatedly fail to automatically reorder despite consumption below their unique reorder point. If battalions and squadrons are going to be held to achieving the Army standard of 90 percent of the OR rate, the issues with funding SSL and management of ZPARK must be addressed.

During the third and fourth quarters of Fiscal Year (FY) 2018, 5-7 Cav experienced a loss of 5.6 percent to our OR rate exclusively due to waiting for parts to ship that we had previously ordered for our SSL but were not funded. For our pacing items, that translated to 93 not-mission-capable days per month, all of which were preventable had the squadron's SSL orders been funded. Due to funding constraints, parts to fix deadlines and maintain the fleet at the 10/20 standard received priority over the SSL. However, maintaining an adequately stocked and accurate SSL is a necessity to sustain readiness.

Collective-training event

Our next priority for the maintenance enterprise was executing platoon-level services on the squadron's pacer fleet. Every ABCT's long-range training

calendar is, or should be, built around gunnery and services. Our squadron applied the same collective-training mentality to services we naturally apply to gunnery or other maneuver-training events. This ensured we allocated appropriate time, leadership and resources to services, enabling the training audience to focus on singular events during discrete training blocks rather than completing annual rolling services.

This not only increased the quality of operator-level maintenance, but it also improved the professional development of operators and leaders during services. Maintenance is training. This will also prepare officers through experience to be successful as a future SMO/BMO.

Based on the unique nature of constant readiness in Korea, the Korean Enduring Equipment Set fleet was initially set on a rolling-service schedule where every troop was required to complete a service on just under 20 percent of its fleet each month. While this may have some advantages to the Korean mission, we were tasked to take these vehicles back to Fort Stewart with us, so we had to realign the service plan.

To achieve realignment as we approached the service window, we were

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left with the decision to do the services twice in a short period or allow a service to remain delinquent until the scheduled platoon-service window. We made these decisions on a vehicle-by-vehicle basis in consultation with the brigade commander and with consideration of our upcoming gunnery.

While neither of those options is ideal, the outcome of allowing platoon-level services executed by leaders cannot be overstated. This is especially true in the case of military-occupation specialty (MOS) 19D cavalry scouts who, based on previous experience in different BCT types, may not be as familiar with a Bradley as their MOS 19K armor-crewman cousins are with tanks.

Platoon services enabled the squadron commander to ensure that platoon leaders fundamentally grasped the importance of maintenance activities to sustained readiness. Platoon leaders must understand and track the completion of all checks, and they should synchronize the efforts of operators and maintainers. With that in mind, our platoon leaders built comprehensive plans to service all their equipment, including communication systems, weapons and optics in their dedicated training window.

These procedures forced junior officers to more closely inspect the maintenance processes within their platoon and comprehend the squadron's overall system. Our platoon leaders learned more about what their troop executive officer, SMO, maintainers and squadron and brigade leadership do to ensure the right parts are ordered and applied to correct job orders during their two-week service window than they would have by only observing the system from the perspective of command maintenance each Monday.

Platoon services also had the added benefit of increasing emphasis on non-commissioned-officer (NCO) accountability in the maintenance process by emphasizing sections leaders' and vehicle commanders' responsibilities to train their Soldiers and own their vehicles' ability to fight tonight. Maintenance is a -10 level task; it should be trained and supervised by our NCOs; and they should also share in the accountability for the platoon's maintenance status – the platoon's maintenance status shouldn't fall only on the platoon leader.

To capture this emphasis, we adopted a systematic approach in both how our leadership communicated intent and with the tools we provided platoon leaders. Platoon leaders conducted in-briefs with the squadron commander and led in-progress reviews (IPR) in the maintenance bays with the squadron executive officer. Platoon sergeants then led outbriefs with the squadron commander. Again, by doing this, we held both platoon leaders and platoon sergeants equally accountable for learning, understanding and affecting change in the maintenance enterprise. The platoon leaders and platoon sergeants were expected to bring copies of the Equipment-Status Report (ESR), all relevant Department of the Army Form 5988-Es, the planned maintenance schedule and a task-completion list.

The in- and outbriefs created a mentorship and quality-control opportunity for the squadron commander while also enhancing understanding of equipment readiness across his platoons and troops. The squadron executive officer's IPRs with platoon leaders allowed the unit to refocus priorities or allocate more resources to keep each unit on schedule. The cumulative effect of these briefs led to successful outcomes, developed the squadron's junior officers and improved the commander's understanding of his unit's readiness.

Our squadron also took several steps to ensure that training time was adequate to support services and that the time was used appropriately since it required reprioritization of all other tasks. The squadron gave supported troops tactical control of their aligned field-maintenance teams (FMT) during the services training window to optimize daily schedules. Troop commanders were then responsible for the success of their training and were able to set the FMT's priorities.

The SMO created a lifecycle of a BFV and tank-service plan compiled from the maintenance-allocation charts and the experience of the maintainers to form a foundation of what could

reasonably be achieved each day. Each platoon leader knew exactly how many and which service checks should be accomplished by the end of every day to achieve results. We tailored these plans and the training calendars to the platforms. Six BFVs take longer to service than four tanks based on the number of mechanics in an FMT and the number of crewmembers in a platoon. To overcome this, we created troop windows of three weeks.

Our tank platoons completed hull and turret services in a week, while our scout platoons required a week-and-a-half and shared the maintainers and bay space during the second week of the three-week training window. The squadron's armament section conducted M242 25mm chain-gun services for one scout platoon while the other platoon focused on vehicle services. This was an important step of analysis that ensured every platoon had adequate time to complete all services, paperwork and any unscheduled maintenance.

Also, our S-6 and troop communications representatives were on hand to assist crews with any issues related to the communications systems.

Our platoon services resulted in a temporary drop in the squadron's OR rate because of the level of detailed maintenance conducted, but it resulted in a higher sustained readiness after identifying and correcting all faults found. The quality of services improved with prioritized and protected time for the operators and maintainers. Most importantly, leaders across the squadron received training that will have a continued impact in daily-maintenance operations and the Army at large as these Soldiers make permanent-change-of-station moves to other units during their careers.

Conclusion

For the foreseeable future, operational deployments on a near-annual basis to Europe, Korea or Kuwait are reality for all ABCTs. Like many others, our squadron has already completed regionally aligned forces deployments to Europe and Korea. We will head to Kuwait next.

To sustain readiness at home station,

combat-training centers and while deployed, units should establish policies for assigning the right individuals to authorized MTOE positions. Units should also use the full functionality of GCSS-A to maintain a supportive SSL and conduct pacer-fleet services as dedicated training events that not only increase vehicle readiness but also serve as a leader-development opportunity.

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Leader's Course, Warrior Leader's Course and Combatives School. He holds a bachelor's of science degree in business management from National American University. 1LT Kaminski's awards and decorations include the Purple Heart Medal.

ACRONYM QUICK-SCAN

ABCT – armored brigade combat team
AOAP – Army Oil Analysis Program
ASL – authorized-stockage list
BCT – brigade combat team
BFV – Bradley Fighting Vehicle
BMO – battalion maintenance officer
BSB – brigade-support battalion
ESR – Equipment-Status Report
FMT – field-maintenance team
FSC – forward-support company
FY – fiscal year
GCSS-A – Global Combat Support System-Army
IBCT – infantry brigade combat team
IPR – in-progress review
JMRC – Joint Multinational Readiness Center
LRU – line-replaceable units
MATO – maintenance technical officer
MCO – maintenance-control officer
MLRS – Multiple Launch Rocket System
MOS – military-occupation specialty
MPL – maintenance-platoon leader
MTOE – modified table of organization and equipment
NCO – noncommissioned officer
O/C/T – observer/coach/trainer
OR – operational readiness
PL – platoon leader
PLL – prescribed load list
SMO – squadron maintenance officer
SSL – shop-stock listing
TMDE – test, measurement and diagnostic equipment
UCMP – unit maintenance-collection point
USMA – U.S. Military Academy

A Different Approach to the Scout Squad for the Mounted Force

by LTC John Horning, CPT Jake Kelly, SFC Brian Andrade and SFC Brian Ellis

The 1st Armored Brigade Combat Team (ABCT), 3rd Infantry Division, returned to the Republic of Korea (RoK) in February 2018 for the first time in 65 years as a regionally aligned force (RAF) rotational brigade under the command and control (C2) of 2nd Infantry Division. During the predeployment training cycle prior to its historic return to Korea, the Raider Brigade conducted two National Training Center (NTC) rotations, two brigade gunneries, two combined-arms live-fire exercises (CALFEXes) and a modified table of organization and equipment (MTOE) reorganization in less than 10 months.

The change to the cavalry squadron's MTOE was significant as the unit moved from the 3x5 mixed scout platoon that had been in existence since the advent of modularity to the new standard 6x36 configuration with all Bradleys. Not only is the all-Bradley scout platoon more lethal than the 3x5 mixed version, this new configuration also provided us with the six-man scout squad for the first time.

When properly manned, each platoon has 18 dismounted scouts in addition to the 18 Bradley crewmembers. While the MTOE change was official and the Maneuver Center of Excellence (MCoE) published an operational and organizational concept on the scout platoon to describe it and the scout squad, there was not yet any "implementing doctrine" on how to employ the squad. Based on the conversion occurring just prior to the brigade's second NTC rotation, a lack of doctrine and optimal personnel levels, we were not able to fully employ scout squads at NTC. However, that changed when we arrived in Korea.

Leading up to our deployment, the tensions between the United States and North Korea were at an all-time high, so the brigade was determined to be ready to "fight tonight" (the motto of U.S. forces stationed in the RoK). As we

readied for deployment, the 3rd Infantry Division leadership ensured we were manned at sufficient levels to be able to fight and win as soon as we hit the ground. Also, we were augmented with RoK soldiers under the long-standing Korean Augmentation to the U.S. Army Program. The net effect was that across the squadron, we had full 6x36 scout platoons with the full complement of dismounted scouts.

As we took over our mission in Korea from 4th Squadron, 9th Cavalry Regiment, 2nd Brigade Combat Team, 1st Cavalry Division, and gained a full understanding of the operational environment (specifically the terrain), we quickly realized we needed to rethink how our cavalry troops and scout platoons had been trained to fight. The open environment of NTC cannot provide a unit with a sense of the Korean environment. We learned many valuable lessons at NTC, but we did not get an appreciation for the confining and isolated nature of the Korean terrain. NTC also didn't prepare us for how sprawling urban areas with high-rise apartment buildings tended to sprout up anywhere there was flat ground in Korea. As such, we found we needed to relook how we trained and employed the dismounted scouts, and in particular the scout squad, that came with the 6x36 MTOE redesign.

Environmental challenges

The Korean Peninsula's terrain near the Demilitarized Zone (DMZ) is primarily heavily wooded, steeply sloped mountains with rivers and streams running between them. Flat terrain between mountains is alternately covered with built-up urban areas and adjacent agricultural fields. These agricultural areas tend to be relatively small and interspersed with urban areas. These are not the large farmlands typically seen in the Midwestern United States or the plains of Central Europe. Many RoK agricultural fields are used to grow rice, which makes them very poor for mobility most of the year because rice

fields are covered in water and very muddy.

Overall, the terrain near the DMZ severely restricted our ability to take full advantage of the Bradley's cross-country mobility and long-range target-acquisition capability. Movement was limited to improved roadways with tall buildings and mountains dominating almost every mobility corridor. Observation and fields of fire were also restricted due to the dense vegetation on the mountains, which can provide a dismounted enemy force advantages with freedom of maneuver not normally available in a more open NTC-like environment.

Our approach

Since the publication *Strategy and Tactics* 3-20.983 was rescinded, no doctrine has been officially published to explain how dismounted scout squads should move and maneuver. As a result, troop commanders and platoon leaders are left to figure it out and develop their own tactics, techniques and procedures. While there is certainly not just one correct answer, the following describes the standard operating procedure (SOP) that 5th Squadron, 7th Cavalry Regiment, developed for dismounted scout operations to set a framework for future refinement and doctrine.

Prior to the SOP's development, published doctrine did not adequately describe how best to employ the 6x36 scout platoon, much less in terrain such as our unit faced in Korea. As we assessed our MTOE, we recognized the need for an independent dismounted-scout-squad capability to support the mounted elements. Current infantry doctrine is built for nine-Soldier squads. Therefore, our SOP is a way of bridging the gap to account for six-Soldier scout squads.

With a different problem set than we faced in home-station training, at NTC or during the brigade's previous RAF rotation to Europe, and coupled with a fully manned organization, we set

about changing how we would define and employ the six-Soldier scout squad. In the past, the dismounted scouts in an armored-cavalry squadron were often thought of as the "guys in back." They were not the focus of training or employment because vehicle maneuver and gunnery took precedence.

Another contributing factor to this was that units at home station are often not fully manned. As personnel turbulence takes its toll on Bradley crews, a dismounted guy is typically moved into a seat. When employed, the "guys in back" were primarily used in small team-sized elements that were tied to a specific vehicle. Each Bradley carried a team whose primary focus was the local security of that Bradley Fighting Vehicle (BFV) or the establishment of a short-duration observation post (OP) within the limits of the individual vehicle's supporting distance. With this technique, scout teams were used more as an asset of each vehicle commander rather than as part of an independent squad able to carry out missions of its own.

Given the restrictive nature of the terrain in Korea, we aligned the scout platoons into three two-vehicle sections. Each section had one dismounted scout squad that could act as an independent element with a designated squad leader who took guidance from the platoon leader just like in any mounted section. These three scout squads gave the platoon leader added flexibility to conduct zone and area reconnaissance and security operations in highly restrictive terrain (be it mountainous or urban) with the ability to establish three long-duration (more than 24 hours) or six short-duration (less than 24 hours) dismounted OPs for depth. Also, it provided an added level of control that six independent teams of "guys in the back" could not.

The six-Soldier scout squad is comprised of two three-Soldier teams that include one noncommissioned officer (NCO) and two Soldiers. One NCO is a team leader and one is a squad leader. This is a key difference between the infantry squad and the scout squad. The infantry-squad leader leads two separate fire teams. The scout-squad leader is part of one of the scout teams. The current MTOE authorizations do

- 6 Soldiers in a scout squad vs 9 Soldiers in an infantry squad
- Transported in 2 separate Bradleys
- Able to man 2x short-duration OPs or 1x long-duration OP
- Standard equipment includes:
- 6x M4, 2x M240L, 2x shotgun, 1x M320, Javelin, AT-4
- 2x PAS-13
- LTLM and LLDR
- ASIP, HF radio, AN/PRC-119
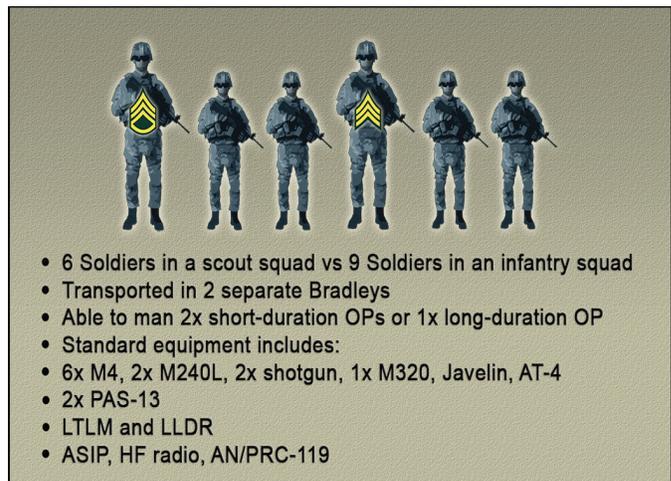
Figure 2. Scout squad vs. infantry squad.

not fully support every squad being led by a staff sergeant and a sergeant, so some Soldiers had to "serve up," which is not different from many units and positions.

The scout squad's organization:

- **Squad leader** – Senior NCO on the ground in the rank of staff sergeant/ sergeant. The squad leader's primary responsibilities include maintaining C2 of the six-scout squad and ensuring the overall success of the assigned mission. As a dismounted squad leader, the staff sergeant must be an expert in the implementation of all weapon systems organic to the squad as well as other assets within the troop (mortars/Raven). While the squad leader should always stay within supporting distance of the two BFVs, the squad acts as an independent entity reporting to the platoon leader. With a primary mission that supports the maneuver or security of the section or platoon, the squad leader must be able to plan, emplace and execute both long- and short-duration OPs. The squad leader must also lead squad reconnaissance patrols in areas where mounted maneuver is restricted or impossible.

- **Team leader** – Junior NCO in the rank of sergeant or corporal. The team leader's primary responsibility is maintaining C2 of the three-Soldier scout team. The team leader is second in command of the squad and must be trained and prepared to take command of the squad and its mission if the squad leader becomes

Figure 1. Comparison of scout squad and M2 crews.

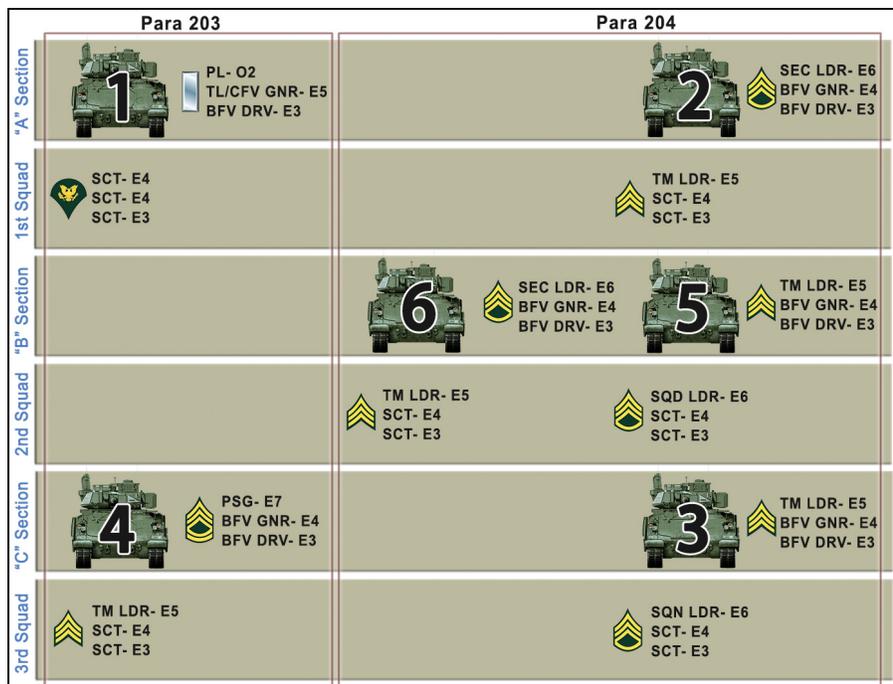|	Squad leader	Scout	Scout	Team leader	Scout	Scout
Squad 1-1 (A11/A12)	203-03-1 — SGT	203-06-1 — SPC	203-08-1 — PFC	204-03-1 — SGT/CPL RGR	204-06-1 — SPC 2C-JAV	204-08-1 — PFC
Squad 1-2 (A15/A16)	204-01-1 — SSG RGR F7-PATH	204-05-1 — SPC	204-08-1 — PFC	204-03-2 — SGT RGR	204-06-2 — SPC 2C-JAV	204-08-3 — PFC
Squad 1-3 (A13/A14)	204-01-2 — SSG RGR F7-PATH	204-05-2 — SPC	204-08-4 — PFC	203-05-1 — SPC/CPL 2C-JAV	203-06-3 — SPC	203-08-3 — PFC
Squad 2-1 (A21/A22)	203-03-2 — SGT	203-06-2 — SPC	203-08-2 — PFC	204-03-3 — SGT/CPL RGR	204-06-3 — SPC 2C-JAV	204-08-5 — PFC
Squad 2-2 (A25/A26)	204-01-3 — SSG RGR F7-PATH	204-05-3 — SPC	204-08-6 — PFC	204-03-4 — SGT RGR	204-06-4 — SPC 2C-JAV	204-08-7 — PFC
Squad 2-3 (A23/A24)	204-01-4 — SSG RGR F7-PATH	204-05-4 — SPC	204-08-8 — PFC	203-05-2 — SPC/CPL 2C-JAV	203-06-4 — SPC	203-08-4 — PFC

Figure 3. Dismounted-scout-squad MTOE.

incapacitated. The team leader must be able to plan, emplace and execute a short-duration OP and lead a team reconnaissance patrol.

- **Senior observer** – Point man responsible for route selection and forward security during squad movement. The senior observer should not have any other responsibilities to prevent any distraction as he or she is ideally the first to come into contact with enemy forces. Note: Some prefer to have the team or squad leader as the lead element. We decided on a senior observer to prevent distraction and allow the Soldier leading the squad to focus on the surroundings and identifying enemy forces before they come into contact.

- **Scout/assistant gunner/gunner** – Competent junior scouts have multiple responsibilities within the team and squad. These duties

include, but are not limited to, M240 gunner, assistant gunner, Javelin gunner, route recorder, pace man and members of aid-and-litter, enemy-prisoner-of-war and tactical-security-element teams. Like all scouts in the squad, they must be proficient in all weapon systems organic to the squad to continue the fight if a member becomes incapacitated. Use of the M240 or the Javelin is mission, enemy, terrain and weather, troops and support available, time available, civilian considerations (METT-TC) dependent and may not be used on every patrol or OP.

1. Senior observer/scout
2. Scout/Javelin gunner
3. Squad leader/radio
4. Scout/AG
5. Scout/M240 gunner
6. Team leader/grenadier/radio

Figure 4. Scout-squad organization.

Team, squad formations

The following movement formations will be METT-TC dependent. These formations were developed based on Army dismounted doctrine and refitted to meet the requirements of a three-Soldier team and the six-Soldier squad. While they are not the final solution, they can be used as a base product to refine based on a unit's area of operations and mission requirements.

Team formations include the wedge and file. Regardless of the formation a team leader chooses, each Soldier must know his/her location in the formation relative to the other members. Each Soldier has a specified area for observation and direct fires as the team is moving. It is a team leader's responsibility to be constantly aware of the team's sector and to correct things as required.

The wedge is the primary formation used by a scout team. The interval between Soldiers should be about 10 meters. Team leaders, however, should modify the wedge based on terrain, weather or other factors that can affect C2. Unlike an infantry fire team, the scout dismounted team leader does not physically lead the formation. The team, as well as the squad, is led by a senior observer. This scout's sole job is to track his/her current route

and focus on observing any enemy presence ahead of the unit.

The alternate formation is the file. It is used primarily when the terrain or visibility limit C2. A team leader may also use the file formation when time is limited and/or enemy presence is unlikely.

Scout-squad movement formations are based on Field Manual (FM) 3-21.8, *The Infantry Rifle Platoon and Squad*. However, we made adjustments to account for the size of the scout squad. Because the squad's movement must be concealed from the enemy for survivability purposes, the scout squad normally moves through restricted terrain that provides concealment. Concealment is critical to any scout element because once it becomes decisively engaged, it is no longer conducting reconnaissance and providing information to the headquarters.

C2 of the squad through this type of terrain is difficult, thus the use of the file formation that provides easier control of the unit. However, as terrain changes, the squad leader should adjust the formation as appropriate for the circumstances. The squad file is a movement technique used when there is limited visibility due to vegetation or night. This formation is used like a team file to move through choke points and when contact is not likely.

The squad wedge is used when moving through sparse vegetation, normally during daylight hours. This formation is similar to a modified diamond wedge used by infantry squads. The squad wedge is used when enemy contact is expected. Due to the formation shape, the squad is able to make contact with the smallest element possible and quickly react to contact from the front, left or right flanks and gain fire superiority.

The primary difference between the infantry- and the scout-squad formation is size and location of the key leaders. Due to limited personnel, the scout squad cannot conduct a squad column fire-team wedge but it instead forms a larger, single wedge or diamond formation.

Some readers may think of the "enter and clear a room" task and immediately argue that it is not a cavalry task.

However, in any future war that takes place in a country like Korea or in any of the emerging megacities, scouts will not be able to avoid built-up areas. Specifically in Korea, it may be necessary for a scout squad to establish an OP or conduct counter-reconnaissance within a high-rise building. Even while establishing local security in an urban area, it may be required to clear rooms in buildings.

With this in mind, we developed an SOP for conducting room clearance by scout squads and teams. Doctrinally, entering and clearing a room is a four-Soldier team concept. However, due to the six-Soldier scout squad, we refined the concept into a three-person drill. Depending on the building's complexity, having an entire squad clear each room can become too time-consuming. By adapting to a three-person procedure, a squad can clear two rooms at a time and speed up the process while still maintaining security.

The concept is not drastically different than the four-person infantry drill. The primary difference is that once the team or squad leader moves into the room and conducts the initial sweep oriented on the focal point, the leader will then turn around and pull security out the door where the fourth Soldier in the infantry drill would normally be. This allows the three-Soldier team to initially clear the room while still maintaining outward security.

Figure 5. Scout team file and wedge.
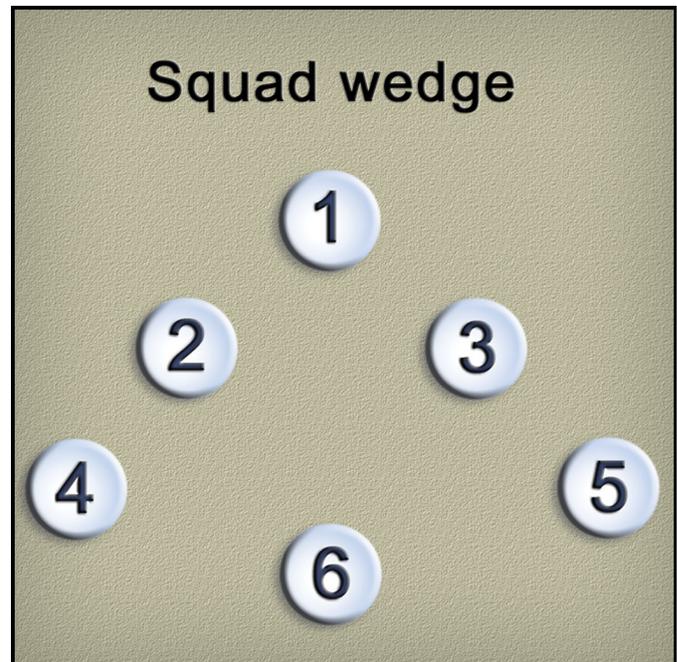
Figure 6. Scout-squad wedge.

Train as we fight

Aligning dismounted scouts into squads is only effective if you also change the way you train the overall formation. The primary focus of the armored-cavalry squadron and troop has rightfully been on mounted combat, which has led to scout teams being thought of as merely an asset of the Bradley rather than of the platoon. We learned that once we had full squads, we had to relook how we trained our dismounted scouts. As simple as it may sound, the easiest way we found to fix this was by implementing a well-resourced culminating training event focused on dismounted training similar in priority as squadron gunnery or a field-training exercise.

We planned and executed a squadron-resourced, troop-led, week-long

dismounted squad training event named "School of the Scout." It was based on a concept we borrowed from 8th Squadron, 1st Cavalry Regiment, 2nd Stryker Brigade Combat Team, 2nd Infantry Division. Scout squads were taken to the field and run through various situational-training exercises that provided both the squad leader and team an opportunity to hone leadership and practice their military-occupation specialty 19D20- and 19D30-level (cavalry scout) skills.

It also provided a way to test all the scouts' abilities in a field environment. Squad leaders led their formations while conducting zone and area reconnaissance on the actual terrain in Korea where they could be called on to fight.

Conducted each quarter, the training event was aligned with the squadron commander's mission-essential task list focus for the quarter as outlined in the quarterly training guidance. Holding true to the mindset of "train as we fight," the troops were not relieved of the tasks to train the mounted side of the fight. In an effort to tie both mounted and dismounted operations together, the Bradleys were incorporated into several training events that involved urban operations and area security, which was part of our mission set in Korea.

Because of maneuver constraints on the peninsula, the squadron got creative and maximized the use of the Close-Combat Tactical Trainer, combined with Virtual Battlespace 3, to tackle the problem-focused training at combined, mounted and dismounted levels. By linking both of the systems, we were able to conduct missions using the simulated-terrain database of the Korean Peninsula, with all mounted and dismounted elements at the platoon leader's C2. This greatly increased the training value by making the platoon leader, platoon sergeant and other BFV commanders consider the dismounted-scout-squad elements.

Squad live-fire

The Infantry Branch has a long history and knowledge base of training fire teams and infantry squads. Cavalry and armor, on the other hand, do not. So as we entered into a training program

for a scout-squad live-fire, we had to adjust the standard infantry tactics to account for a six-Soldier squad and the fact that the squad leader is a part of one of the teams vs. a separate C2 element.

The concept of the lane was fairly basic for a couple of important reasons. First, none of our Soldiers had previously had the opportunity to conduct this type of training. Second, the range we were able to use for the training was somewhat narrow and not overly long/deep. While that may seem like a limitation, it actually proved beneficial given this was our first iteration of this type of training. With this in mind, we designed a squad movement-to-contact wherein the six-Soldier scout squad – armed with M4s (rifles) and an M240 (machinegun) – would dismount from Bradleys and begin a reconnaissance patrol before beginning to make contact with dismounted enemy OPs while en route to their reconnaissance objective.

After destroying the enemy OPs, the squad continued to move and encountered two squads of enemy within dug-in positions. This represented their disengagement criteria. The squad then broke contact with teams providing covering fire as elements withdrew to prevent themselves from becoming decisively engaged. We also took the opportunity to work in reporting requirements from the squad leader to the platoon leader.
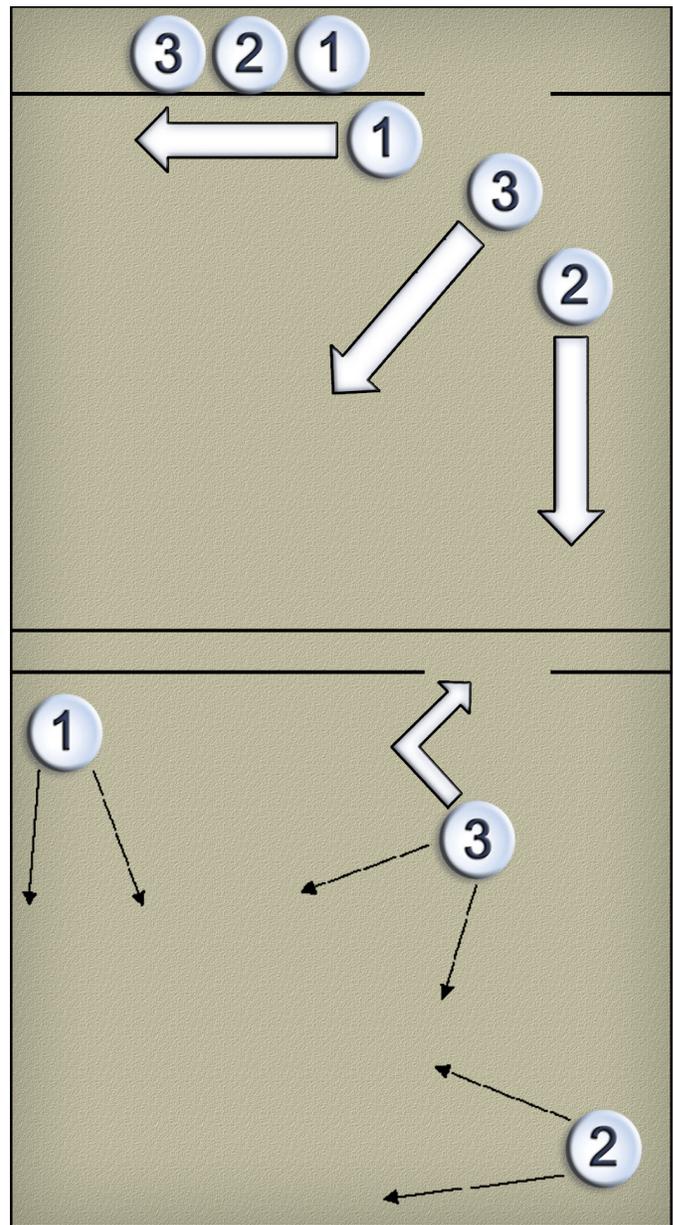
Figure 7. "Enter and clear a room" formations.

The training we conducted was excellent for a number of reasons, not least among them was the fact that this was new training for our scouts. Often in an ABCT, the dismounted scouts don't receive the same focus as the Bradley crew members. Obviously, the armored vehicle is incredibly important to our mission, but the dismounted scout squads need similar focus on their ability to shoot, move and communicate. In planning and executing the training, we allocated enough time for dry, blank and live-fire iterations of the lane, which provided ample opportunity for all members of the scout squad to practice their particular responsibilities. Also, as time permitted,

we ran additional live-fire iterations just to improve muscle memory and begin mastery of the fundamentals.

We have already started to plan the next iteration of the scout squad live-fire. The first step in that process was when all the commanders gathered to conduct an after-action review and identify lessons-learned to apply to the next event. Here are some of the take-aways that could benefit other squad-rons and troops contemplating this type of training:

- Develop a scenario based on a cavalry mission set (i.e., a reconnaissance or a security mission). Do not execute typical infantry missions like attack or defend. Create scenarios where the scouts are on a patrol, conducting local security for a screen, conducting an area reconnaissance or in an OP.

- Incorporate the BFV as you are able. At a minimum, have the squad disembark from the Bradley before beginning the lane. If possible within range safety requirements, incorporate supporting fire. When operating in terrain like Korea, the dismount squads may be working to clear high ground or urban areas, and there may be times when supporting fire from the vehicle would be required.

- If the size of your range allows, create a scenario where the squad splits into two teams for a time and based on distance can only communicate via frequency-modulation (FM) radio.

- Incorporate all the weapons of the scout squad as you are able. This includes the M240 and anti-tank weapons such as the AT-4 and/or Javelin.

- Train your scouts to use their M4A1 on full auto. During basic rifle marksmanship and even most advanced rifle marksmanship, we do not use the full auto function of the rifle. Mostly that's because we're conserving ammunition. However, in a three-Soldier scout team, there are times when one Soldier has to provide covering fire for the two moving Soldiers. An M4A1 on single shot may not provide enough fire. It may be necessary for that Soldier to fire on full auto while providing cover fire. This is another difference from the infantry squad, which has a Squad Automatic Weapon available to its fire teams.

- Incorporate your rifle-mounted 40mm grenade launchers. These will also help to provide covering fire for displacements.

- Plan for a sufficient amount of smoke and train Soldiers how to use it to conceal their movements. It's easy to train a Soldier how to pull the pin and throw a smoke grenade. Many of our Soldiers may have experience using hand-held smoke for signaling purposes. However, that's not the same when it comes to using it for concealment. We learned that our Soldiers were not initially proficient in choosing the best location to throw the smoke grenade, taking terrain and wind into account. Also, they tended to think that once the smoke was going, it was safe to move – regardless of whether there was enough smoke to actually provide concealment. This of course will vary based on wind conditions, but plan and train for more than one smoke grenade each time a scout team breaks contact to displace.

Going into our next iteration, we are developing scout squad tables similar to what we are accustomed to using for Bradley gunnery. Preliminary tables may involve basic weapons proficiency and qualification per existing published standards. Subsequent tables could move to Engagement-Skills Trainer and

Scout skills test	Prerequisite training: • Reports • Armored Fighting Vehicle Identification • Disassemble, assemble, function checks on weapons • FM/HF radio communications • Load radios with simple key loader • Employ LTLM or LLDR • Reload 25 ammo in ready boxes • Reload tube-launched, optically tracked, wire-guided missile
Table I	Weapons qualification: • M4A1 • M240L • AT-4 • Javelin
Table II	Medical-skills lane
Table III	Engagement-Skills Trainer: • Individual scenario • Team scenario
Table IV	Call-for-Fire Trainer: • Grid mission • Shift from known point
Table V	Team live-fire: • Dry/blank/live
Table VI	Squad live-fire certification: • Dry/blank/live

Table 1. Scout-squad training progression.

Call-for-Fire Trainer scenarios. Next, we will execute a scout team live-fire and then a scout squad live-fire. For the culminating event, we will incorporate several performance measures into the design of the range similar to how master gunners use the required performance measures and targetry available to design our Table VI ranges for tanks and BFVs. We believe the culminating squad live-fire should incorporate the following scenarios in the engagements (not necessarily in order):

- Call for fire;
- Casualty evacuation (CASEVAC);
- At least one engagement with the entire squad together;
- At least one engagement where the teams are far enough apart to require FM radio communication;
- BFV incorporated into the scenario;
- At least one chemical, biological, radiological and nuclear engagement; and
- A break contact/displacement engagement.

If at all possible within range restrictions, this event should also incorporate the troop mortars actually shooting in support of the squad. With these established minimum standards, troop commanders in the squadron can now work with Range Control to develop their own squad live-fire scenarios. In addition to identifying initial required performance measures, we are working on a possible scoring methodology so we can have an objective measure of excellence. Using a pop-up target range that can register hit/no-hit along with engagement times, coupled with an observer/coach/trainer (O/C/T) to grade non-kinetic requirements, we can provide a score to each squad.

The result should be a trained and proficient scout squad that can be safely and effectively incorporated into a scout platoon's Table XII and/or a troop CALFEX scenario. And more importantly, a scout squad that can operate effectively in support of the Bradleys and the platoon's overall mission when called on to do so.

Six-Soldier squad strength

The six-Soldier squad as broken down in this article allows dismounted scouts action that is more cohesive. By focusing training specifically on Soldiers and leaders, the squad is able to become a platoon element, capable of accomplishing its mission in support of the platoon based on the commander's intent.

The squad also provides a greater ability to establish security in depth. With more personnel and firepower, the squad is able to maneuver farther from the vehicle platform, thus creating more depth in security missions.

The squad's size also allows a platoon leader the option of establishing either three long-duration OPs or six short-duration OPs. This has proved to be extremely valuable in Korea due to the terrain. The terrain restricted vehicle movement, but we still had the flexibility to deploy the squads into the higher, restrictive terrain for long periods.

The final strength lies in the additional-skill identifiers associated with the dismount squad paragraph and line numbers in the MTOE. When a unit begins to focus on its dismount capabilities, it begins to see Soldier and leader certifications and skill training that are lacking. By sending personnel to the appropriate schools (for example, Reconnaissance and Surveillance Leader's Course, Heavy Weapons Leader's Course, Ranger School, Pathfinder Course and Javelin Course), a unit builds its knowledge diversity and becomes a more flexible and agile fighting force.

In the end, the unit's leaders and Soldiers will be better prepared to actually do the things they say they can do.

Six-Soldier squad weakness

We would be remiss if we failed to identify some of the weaknesses with the design of the six-Soldier scout squad. We don't identify these weaknesses to discourage units from the concept but instead to allow others the opportunity to find ways to overcome them.

First and foremost is CASEVAC. In our opinion, if a squad receives one casualty and must conduct CASEVAC operations, that squad becomes combat ineffective. Between assessing and moving the casualty, along with providing security, the squad's mission shifts from a reconnaissance or security focus to CASEVAC. The most constructive way we have found to deal with this weakness is by placing a deliberate focus on casualty-collection-point and ambulance-exchange-point planning. The question you have to ask is, "How fast can we move the casualty back to a vehicle platform and return to continue mission?"

Another weakness we identified while in Korea specifically was with the weapons loadout. Scout squads have by MTOE more weapon systems than they can easily carry on an extended mission. With Javelins, AT-4s, M240s, Lightweight Laser Designator Rangefinder (LLDR), Laser Target-Locator Module (LTLM), Advanced Single-Channel Ground and Airborne Radio System Improvement Program, high-frequency (HF) radios and ammunition, the six-Soldier scout squad can become overburdened very quickly. Therefore, platoon leaders need to specify a loadout based on what enemy forces they expect to encounter and the squad's specific mission or task. Are they expecting an armored force where the Javelin will be necessary for survival or a dismounted fight where the M240 is a more appropriate weapon? The key to this is a leader who has the knowledge and sound judgment to make a decision on what equipment will increase the chance of mission success.

Finally, because the scout-squad leader is the leader and a member of one of the two teams, he does not have the same flexibility to observe, report and direct as his counterpart in an infantry squad. This can be a concern even though the scout squad's primary mission should not be to conduct fire-and-maneuver in the same way an infantry squad does.

Way ahead

While the current opinions from MCoE seem to define the squad as the three crewmembers of the Bradley plus the three "guys in back," we believe that an organizing method that creates independent maneuverable squads of

dismounted scouts better supports the platoon's mission in environments such as Korea or other urban areas. While this may not be the only solution, we believe it is a viable option right now with our given MTOE.

It's a solution units that will be operating on terrain other than at NTC may consider implementing in their training cycle. We must prepare for the future fight that will involve all weapons and assets, including the dismounted scout squad. If we are going to have a 6x36 scout platoon across the force, we need to develop the ways to fight it.

We believe that this method of organizing, training and employing the scout squad is also an appropriate model for the Stryker cavalry squadron, where they cannot rely on the armor protection and firepower of the Bradley. We encourage other units to add their ideas to further refine this concept and share them with *ARMOR* magazine so we can help shape the future way we fight.

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ACRONYM QUICK-SCAN

ABCT – armored brigade combat team
AG – assistant gunner
BFV – Bradley Fighting Vehicle
C2 – command and control
CALFEX – combined-arms live-fire exercise
CASEVAC – casualty evacuation
DMZ – Demilitarized Zone
FM – frequency modulation
FM – field manual
HF – high frequency
HHC – headquarters and headquarters company
JMRC – Joint Multinational Readiness Center
LLDR – Lightweight Laser Designator Rangefinder
LTLM – Laser Target-Locator Module
MCoE – Maneuver Center of Excellence
METT-TC – mission, enemy, terrain and weather, troops and support available, time available, civilian considerations
MTOE – modified table of organization and equipment
NCO – noncommissioned officer
NTC – National Training Center
O/C/T – observer/coach/trainer
OP – observation post
RAF – regionally aligned force
RoK – Republic of Korea
SOP – standard operating procedures

Overcoming Semantics: How to Deconflict Reconnaissance Fundamentals at Platoon Level

by CPT Patrick M. Zang

Leaders on both sides during the American Civil War relied on their cavalry scouts to get accurate information so they could get to the battlefield first with the most Soldiers and firepower. Providing crucial information to their parent unit remains the overarching mission of modern-day scout platoons just as it was for their Civil War predecessors.

To ensure mission success and provide a relative advantage to the maneuver commander it supports, today's scout platoon must understand the nuances and seeming struggle between the reconnaissance fundamentals of "retain freedom of maneuver" and "gain and maintain enemy contact." On the surface, these two fundamentals appear mutually exclusive. For example, to collect indicators to answer the commander's priority intelligence requirements (PIR) to support timely decision-making, scouts must report all information about the disposition and composition of threat forces rapidly and accurately. The challenge is that scouts must do this while ensuring they don't become decisively engaged because their primary mission to provide reconnaissance would likely stop.

A decisive engagement is when a unit is considered fully committed and cannot maneuver or extricate in the absence of outside assistance. The action must be fought to a conclusion and either won or lost with the forces at hand.

Therefore, the scout platoon, no matter what its attachments, must ensure "reconnaissance does not stop" because it has become "decisively engaged." According to Field Manual (FM) 3-98, *Reconnaissance and Security Operations*,[1] retaining freedom of maneuver means that "tactical mobility and maneuver fundamentally drive the success of reconnaissance tasks.

Platoon leaders consider task-organization, their commander's reconnaissance guidance, movement techniques and scheme of maneuver to retain the unit's ability to maneuver."

Reconnaissance tasks are important because they confirm or deny assumptions about the terrain and enemy that were made during mission analysis and intelligence preparation of the battlefield (IPB) to identify opportunities and maintain agile freedom of maneuver for the brigade.

Another way for a scout platoon to retain its freedom of maneuver is through effective counter-reconnaissance operations, which deny enemy collection efforts. This also helps identify opportunities for the command to seize, retain and exploit initiative. Therefore, commanders change movement techniques and employ multiple assets to make contact with the smallest element possible to avoid becoming decisively engaged. Commanders retain freedom of maneuver by avoiding decisive engagement with a superior force and develop the situation further – consistently balancing the requirement to maintain contact while retaining freedom of maneuver.

Conversely, to gain and maintain contact means "cavalry forces find and sustain contact with the enemy on terms and conditions of their choosing. Using at least one of the eight forms of contact, commanders and staffs plan for and integrate:
- Aerial and ground sensors;
- Manned platforms;
- Unmanned systems;
- Dismounted operations;
- Signals intelligence;
- Human intelligence; and
- Visual observation."

These forms of contact allow scouts to gain contact with the enemy using the smallest element possible. Once units

make contact, cavalry forces maintain contact until specific orders are given, a change of mission occurs, when disengagement or displacement criteria dictate or when the unit conducts a reconnaissance handover with another unit. According to FM 3-98,[2] "Maintaining contact with the enemy provides real-time information of the enemy's composition, disposition, strength and actions that allow staffs to analyze and make recommendations to the commander based on current intelligence."

While on the surface, the doctrinal definitions of the two fundamentals in question leave little room for interpretation, the difficulty lies in transforming the science in it to art. The issue lies in the manner cavalry operations are understood at present. Commanders routinely seek to unburden their staffs by mandating a directed course of action (CoA), thereby almost inherently removing the technique of reconnaissance pull from the lexicon. Also, risk-averse commanders tend to prohibit cavalry formations from deploying on Warning Order 2, especially when they couple their nature with an inability to execute the military decision-making process to standard and in accordance with the one-third/two-thirds rule (allow yourself up to one-third of available time to complete required actions and allow those you lead the remaining two-thirds).

This translates to having only one period of darkness, as opposed to two periods, to maneuver into position and answer the assigned questions. This "rush to failure" forces cavalry formations to "lead with their chin" and to unwittingly transform a zone reconnaissance into a movement-to-contact. The answer to the problem is glaringly simplistic: emphasize the basics and add substance to oft-used buzzwords.

With that in mind, there are six components a scout leader must inherently understand and execute to

deconflict the aforementioned fundamentals.

- First, execute IPB to standard and in accordance with Army Technical Publication (ATP) 2-01.3, *Intelligence Preparation of the Battlefield/ Battlespace*.[3] The scout-platoon leader and platoon sergeant can't blindly accept the analysis of the squadron S-2 and troop commander. They, along with their subordinate noncommissioned officers, must analyze the terrain/enemy to seek positions of advantage and threat weaknesses. Also, IPB is a continuous process; it does not stop at the operations order (OPORD). Scout leaders must continue to refine understanding of the environment to generate options and make recommendations to their commanders.

- Second, the scout leader must understand where he/she fits in the higher concept of the operations. In effect, scout platoons all fall under the umbrella of the brigade's information-collection (IC) plan. Scout platoons need to think of themselves not as belonging to distinct battalions with differing missions but as part of a unified collection front. The scout platoon must understand that its missions are not discrete.

- Third, the scout leader must possess a "master's level" understanding of the doctrinal components of the commander's reconnaissance and/or security guidance (CRG/CSG), and when that's lacking, seek clarity from the commander. Also, the scout leader must ensure the CRG accounts for both mounted and dismounted elements as well as task-organization changes (two- vs. three-section concepts).

- Fourth, the correct implementation of reconnaissance-management techniques (cueing, mixing and redundancy) enable the scout leader to conduct limited economy-of-force missions and gain contact with the enemy while remaining below the detection threshold.

- Fifth, the scout leader must develop a primary, alternate, contingency and emergency (PACE) plan for all planned contact. To properly develop the PACE plan, the scout leader must understand the capabilities and limitations of all assigned, organic equipment. Unfortunately, the past two decades of conflict have bred a generation of leaders who rely on echelons-above-brigade assets and indirect fires to solve all problems. However, in a near-peer or peer-threat fight, these assets will not be in the direct control of platoon-level leaders. As such, it is up to the platoon and troop leadership to set conditions for success in the absence of said enablers.

- Sixth, the platoon must ensure rehearsals and standard operating procedures (SOP) equate to more than slides in a dusty old tactical SOP (TACSOP). The unit TACSOP must be practiced during every training event and updated accordingly during after-action reviews.

Following is an in-depth discussion on these six fundamentals.

IPB

It seems that all maneuver leaders recognize the intrinsic necessity of IPB and its connection to mission success. However, at the Armor Basic Officer Leader Course and Maneuver Captain's Career Course, students are required to regurgitate facts from the higher OPORD with little to no analysis. This trend is more than confounding; it is abjectly criminal and stunts the intellectual growth of junior officers – those charged with the tactical performance of the Soldiers under their charge.

The most glaring example of this is the light and weather-data portion of the OPORD. The officer reads numbers without knowing what they mean. This rapidly increases the speed at which their subordinates stop listening.

The IPB manual is perhaps the most important document to the platoon leadership, as well as one of the easiest-to-follow manuals in existence. Each step of the process possesses its own distinct chapter in the manual, with examples, pictures, graphics, charts and "how-to" guides. According to ATP 2-01.3,[4] each step contains "desired endstates" (for example, what the preparer is to exit each step with, and what is essential to possess prior

to moving forward).

The key deliverable for Step 1 of the IPB process is the "identification of general characteristics of the area of operations (AO) that could influence the unit's mission." Step 1 is often glossed over, resulting in nothing more than a junior leader outlining on a map the extent of the AO while providing no further analysis or considerations of what is significant.

Step 2 of the IPB process, the "so what" portion according to Paragraph 4-3 of ATP 2-01.3,[5] states, "[I]dentify how relevant characteristics of the area of interest will affect friendly and threat operations. … Success results in allowing the commander to quickly choose and exploit terrain, weather and civil considerations to best support the mission." The consequences of failure can result in the commander not having the information needed to exploit the opportunities the operational environment provides.

This process is outlined in Figure 1.

The scout leader must possess an innate sense of the effects of terrain and weather on not only his/her mission, but their effects on the adversary's pending operations, too. As mentioned earlier, the point of IPB is to present relevant and life-saving data to one's subordinates, not fill up lines on an OPORD shell. By developing a graphic-terrain-analysis overlay (GTAO); taking into consideration the entirety of the military aspects of terrain (obstacles, avenues of approach, key terrain, observation and fields of fire, and cover and concealment, or OAKOC); and the military aspects of weather (wind, visibility, temperature, cloud cover and precipitation), the scout leader presents a "fighting product" to the platoon, enabling a disciplined approach to provide an opportunity to maneuver out of contact to a position of relative advantage. (Figure 2.[6])

Also, the GTAO should inform and define the placement of operational graphics.

Unfortunately, light and weather analysis rarely moves beyond a regurgitation of numbers that one can easily acquire individually from open-source means. Troopers generally do not care
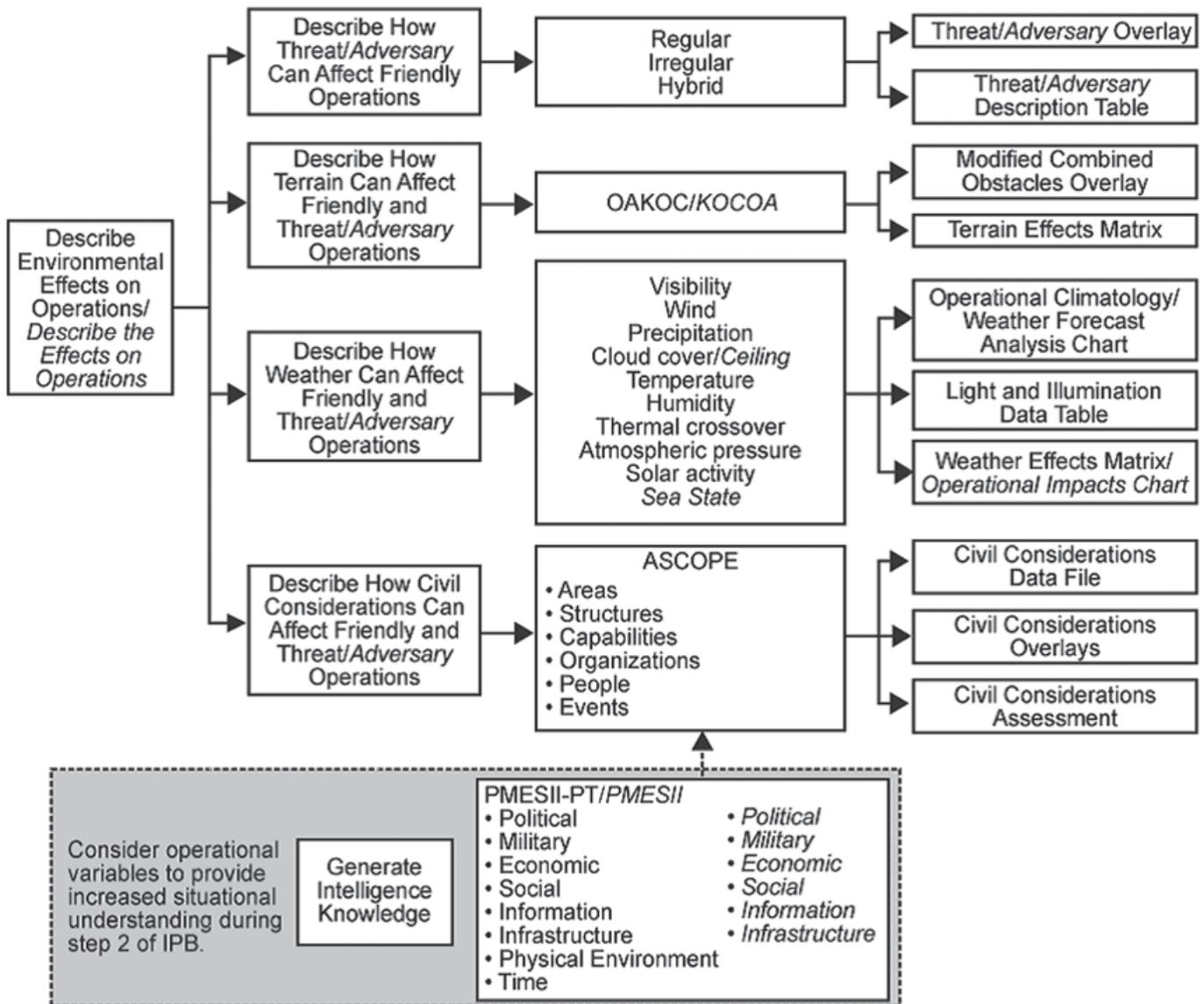
Figure 1. IPB process. *(Adapted from Figure 4-1, ATP 2-01.3)*

about this and fall asleep when the platoon leader briefs the respective times associated with the sun and moon cycles. What is essential, and demonstrates the analysis needed to succeed in battle is, among other things, the direction of the wind so the platoon knows the direction sound and smell will travel. It also helps them determine the impact on battery life of both platoon and Soldier-borne unmanned aerial systems (UAS); the time the thermal crossover occurs so Soldiers can compensate for this phenomenon in allocating equipment during observation plans; and the times when it will be dark to build a graphic-control measure into the plan that allows the platoon to execute a tactical pause and prepare accordingly for limited-visibility operations.

The light and weather-data portion of mission analysis and the OPORD must move beyond a regurgitation of the six-o'clock-news weather report; it must communicate only what is mission-essential to the platoon. This process will enable scouts to better use their surroundings to maintain freedom of maneuver and not risk compromise.

The third step of IPB is the initial analysis of the opponent, known as the evaluate-the-threat/adversary step. The outputs from this step are:

- Creating the threat order of battle;
- Developing the situation template;
- Creating threat capabilities by warfighting function;
- Determining the high-value-target list;

- Updating intelligence/running estimates; and
- Determining requests for Information.

Often leaders at platoon level accept the analysis of the squadron S-2 and their immediate commanders as sacrosanct. However, it is arguable that leaders at all levels must possess a shrewd intuition, capable of challenging their superiors' assumptions, to develop the best product possible. Battles can and will continue to be won prior to combatants squaring off against one another. Junior leaders must do their homework by seeking as much knowledge as possible, through open-source means if necessary, to truly understand how their opponent wants to fight. Only through this, a true and professional "red-hat"
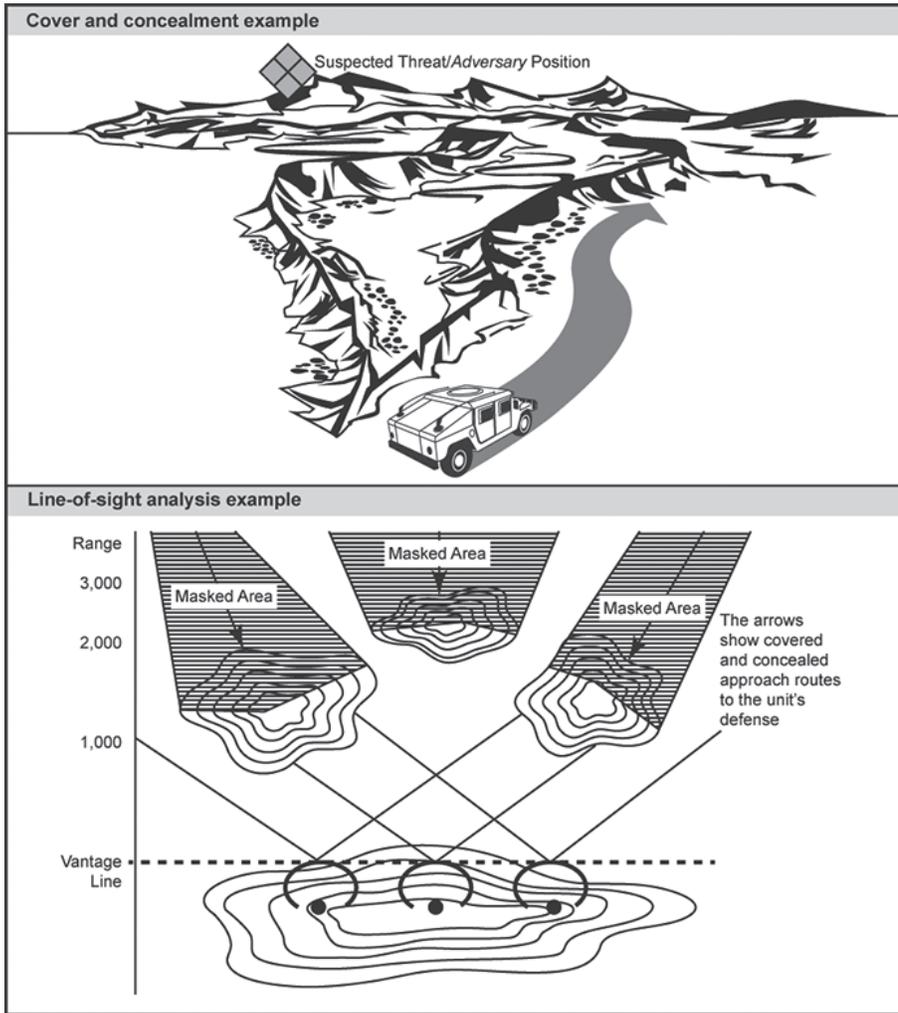
Figure 2. The scout uses terrain to maneuver out of contact with enemy forces to a position of relative advantage, thereby maintaining freedom of maneuver. *(Adapted from Figure 4-12, ATP 2-01.3)*

exercise, can the leader apply the military aspects of terrain and weather to determine a threat CoA (Step 4 of IPB).

Most of the IPB process occurs at echelons above the scope of the platoon-level leader. However, leaders must not fail to evaluate the threat and prepare accordingly. Moreover, they should never merely "hand-wave" critical components of the OPORD. A thorough analysis of the terrain and enemy dictates the forthcoming scheme of maneuver.

A depressing trend is developing among some junior leaders who develop their "blue" plan without taking into account Paragraph 1 of the OPORD. This backward, cookie-cutter approach can cause devastating consequences in a live environment. This is not to say that Paragraph 1 of the OPORD is the "be all, end all";

however, the situation information provided in the first paragraph sets the stage for developing the rest of the OPORD. Providing adequate time and resources to its development enables the scout to gain contact with the enemy on his/her terms while retaining the sought-after freedom of maneuver required to accomplish the mission according to the fundamentals.

Scout's role

Merely reading off the task and purpose of adjacent units and higher echelons of command is an academic disservice. The scout, the "jack of all trades" – who is executing within mission command, supporting at a minimum the brigade commander – must intrinsically understand how his/her organization fits into the larger picture. Devoid of this knowledge, the scout will miss fleeting opportunities and be

unable to maintain freedom of maneuver.

The scout must understand how the brigade commander thinks and his/her endstate, information requirements and decision points. No disrespect to the Army's squadron commanders, but the cavalry squadrons and battalion scout platoons do not serve subordinate interests. Scout platoons exist to "answer the mail" for the brigade or division commander as part of the larger IC plan. Therefore, it is paramount for the scout to understand the operational environment through the brigade commander's eyes.

Scouts need to understand whether they are executing a reconnaissance push or a reconnaissance pull. This single-factor alone aids in the development of the friendly scheme of maneuver and the CRG.

The scout must still understand who the adjacent units are so that, when necessary, support may be requested from local units rather than relying on support from the parent organization. An integrated support architecture (Class I, III, V, maintenance, medical and fires) enables the scout to maintain freedom of maneuver rather than have the scheme of support dictate the scheme of maneuver. To execute mission command as it's doctrinally intended to be, and as scouts claim they have done for generations, the conditions that determine the endstate must first be known. Knowledge of the endstate and knowing where the scout fits into the larger picture enables disciplined initiative to be taken by the scout leader, thereby enabling freedom of maneuver and orienting on the reconnaissance objective.

Understand CRG/CSG

Speaking at the Association of U.S. Army National Meeting in October 2016, Army Chief of Staff GEN Mark A. Milley said the necessity and "willingness to disobey specific orders" is crucial when battlefield realities change and there is no time or functioning channel to consult superiors. To follow the Army chief of staff's "controversial" guidance presented in his quote, the scout is owed detailed CRG and/or CSG. Without it, the scout cannot truly execute and achieve mission command

or, just as importantly, the commander's intent. CRG and CSG are the bread and butter of cavalry operations.

Granted, there is no codified position in doctrine where the CRG is to be placed within the OPORD; however, it's my opinion that the CRG is an extension of the commander's intent and should be briefed immediately following the endstate in Paragraph 3. A second option is to brief the CRG after the concept of the operations and brief changes to the overarching CRG by phase during the scheme of maneuver.

Counterintuitive terms

No matter where it's briefed, the CRG is critically important and often misunderstood. A disproportionate amount of the problem stems from the use of counterintuitive terms (for example, "rapid," "disengage," "displacement" and "bypass"). Another problem is that the "go to" manual for a clear understanding of CRG is FM 3-98,[7] which is viewed by junior leaders as a brigade-level manual.

As I wrote in a previous article entitled "Observations from the Army Reconnaissance Course," published in *ARMOR* magazine's Fall 2018 edition, one of the CRG's emphases is the *tempo* of reconnaissance, which refers to the level of detail and the level of covertness required by the scout platoon to best accomplish its mission. Tempo is described by four terms: rapid, deliberate, stealthy and forceful. *Rapid* and *deliberate* are levels of detail and are mutually exclusive, meaning a scout platoon cannot be rapid and deliberate at the same time. *Stealthy* and *forceful* are mutually exclusive levels of covertness, meaning a scout platoon cannot be stealthy and forceful at the same time. *(Editor's note: See* https://www.benning.army.mil/Armor/eAR-MOR/content/issues/2018/Fall/4Zang18.pdf *to read the article in its entirety.)*

Engagement criteria are protocols that specify the circumstances for initiating engagement with an enemy force. They can be either restrictive or permissive. Scout-platoon leaders must define the size and type of force they expect their subordinate units to engage and avoid. This enables planning the use of direct and indirect fires.
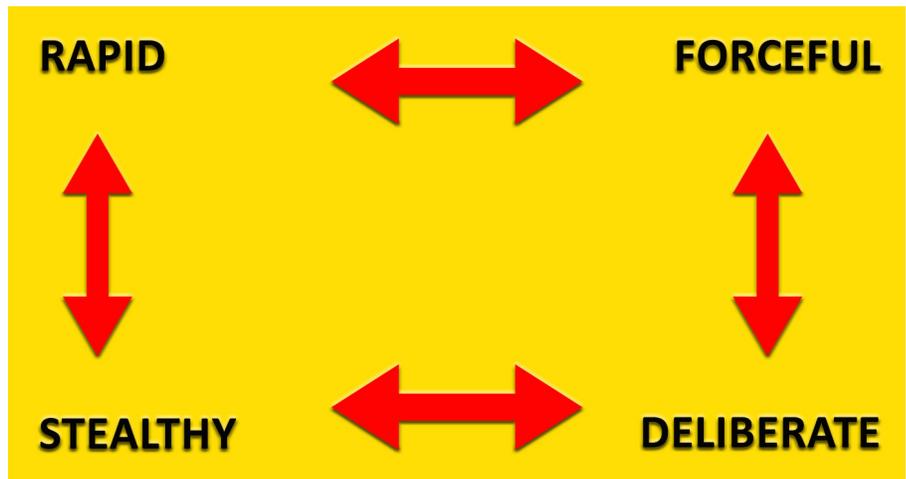

Figure 3. CRG-tempo.

Engagement criteria must be extremely precise to avoid confusion.

Disengagement criteria are protocols that specify when to avoid contact or when to disengage from a fight to avoid becoming decisively engaged while retaining freedom of maneuver. If a scout platoon does not understand or violates its disengagement criteria, it will likely become decisively engaged and have to fight the battle to its conclusion.

Displacement criteria are triggers for a planned withdrawal, passage of lines or a reconnaissance handover between units. Displacement criteria are also conditions that are either event-driven (for example, associated PIR met), time-driven (for example, the latest-time-information-is-of-value trigger met) or threat-driven (for example, identification of enemy reserve).

Recon-management techniques

The scout must inculcate reconnaissance-management techniques, using aspects of all three to gain and maintain contact on his/her terms without becoming decisively engaged. FM 3-98[8] defines *cueing* as the integration of one or more types of reconnaissance or surveillance systems to provide information that directs follow-on collection of more detailed information by another system. *Mixing* is the use of two or more different assets to collect against the same intelligence requirement. *Redundancy* is the use of two or more like assets to collect against the same intelligence requirement. The IC

matrix is the "fighting product" that illustrates an organization's usage of reconnaissance-management techniques.

It is best to consider use of the reconnaissance-management techniques along two lines of effort. First, focus on capabilities rather than assets. By this, the scout should determine what is necessary to observe assigned named areas of interest (NAIs) (thermal capability, aerial assets, etc.) as opposed to requesting specific pieces of equipment.

This ties directly into the second line of effort: work with what one organically possesses. Too often the IC plan relies on assets beyond the scout's control (for example, echelons-above-brigade UAS assets). It is better to think of these assets as contingencies. Based on the weather, changing conditions on the battlefield and changes to prioritization by commanders at echelon, the odds of a platoon-level leader receiving some form of control over the assets such as the Shadow, Predator, etc., is minimal. Worse yet, it provides a false sense of reality.

The National Training Center (NTC), with all lines of support focusing on a single brigade, does not present a realistic appraisal of future conflict. In an environment where all domains of battle are contested by a peer or near-peer threat, these division-and-above assets will be used to conduct the deep fight against strategic high-value and high-payoff targets. Therefore, the scout must return to reliance on their "leather personnel carriers" and imple-
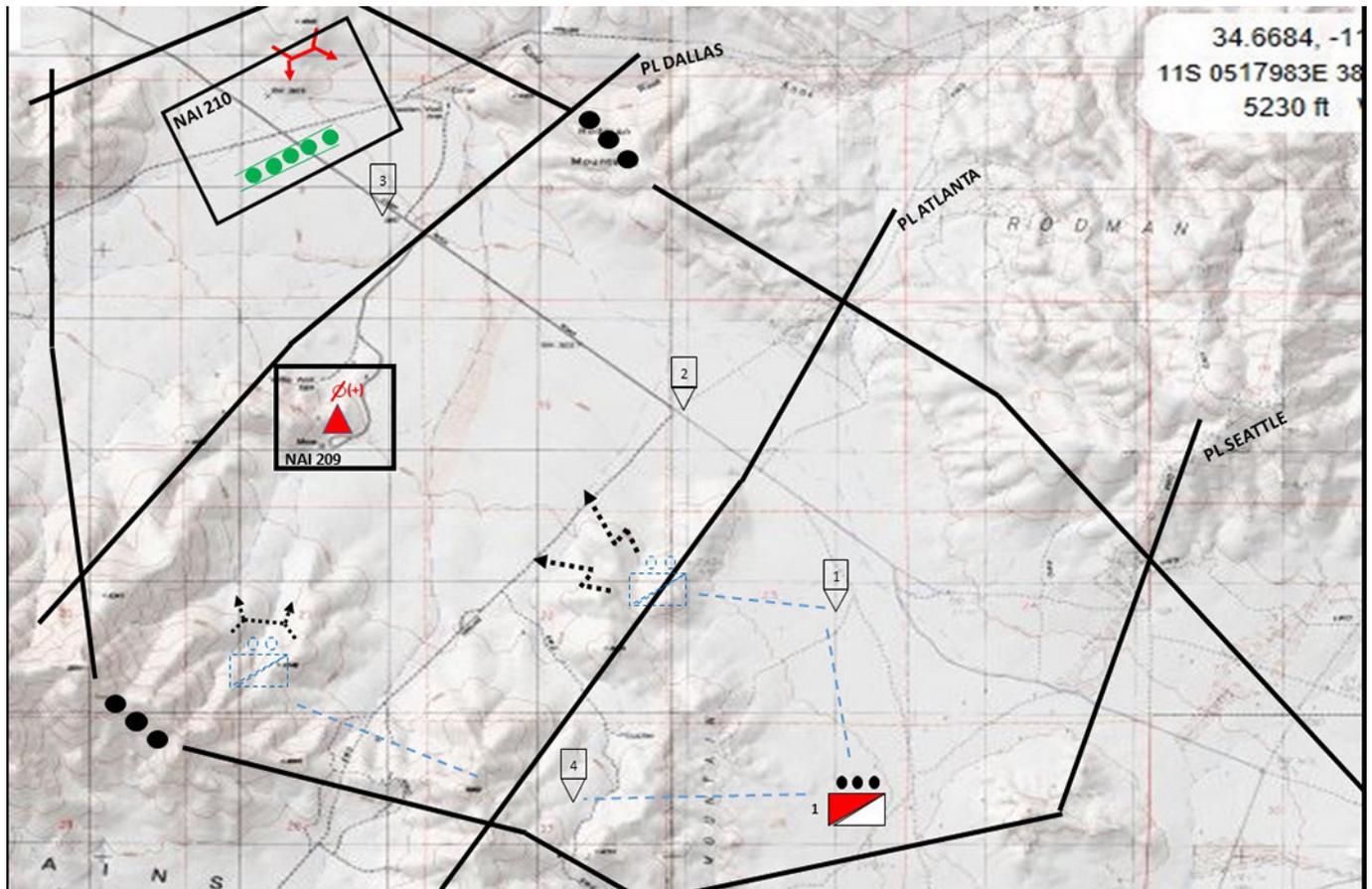
Figure 4.

mentation of the "all-weather scout."

With that in mind, platoon-level leaders must plan and account for their dismounted element. The dismounts are not mere "crunchies" in the back of the vehicle. They are combat multipliers, capable of extending the width of the screen, stealthily infiltrating to an NAI in support of an area reconnaissance or clearing an intervisibility line to provide local security for the mounted element.

Figure 4 helps understanding of reconnaissance-management techniques. In the diagram, 1st Platoon is operating in a two-section concept. Both sections are currently relying on their mounted platforms to conduct reconnaissance of NAI 209 to confirm or deny the presence of an enemy observation post (OP) that may serve as early warning to the templated obstacle and enemy mounted element at NAI 210. In this example, since both elements are mounted and using the same capabilities, this constitutes redundancy.

In Figure 5, the southern mounted element has elected to position itself in a hide position to deploy its dismounted squad to establish an OP. This is an example of mixing, in which the platoon uses both mounted and dismounted elements, each with separate capabilities to collect against the same NAI.

In Figure 6, a low-level voice intercepts (LLVI) team, attached to the platoon headquarters, received signals intelligence about enemy voice transmissions in vicinity of the platoon's southern boundary. Given this, the platoon leader changed his task-organization from a two-section to a three-section concept and allocated the platoon's Raven to the southern section. This is an example of cueing, in which the information received by the LLVI team triggered the follow-on collection by other platoon assets (one section and the Raven).

PACE plan

The scout must be prepared to decisively fight and win a battle without becoming decisively engaged. To meet the commander's intent, the scout must integrate elements from throughout the organic platoon/troop as well as from across the brigade combat team. It is insufficient for a scout to solely rely on indirect fires to destroy enemy elements (particularly mounted elements). The scout must increase lethality with dismounted anti-tank capabilities (Javelin, AT-4 and Carl Gustav) and employ such assets to destroy and harass threat forces.

The scout leader must account for all enemy templated on the situational template during the scheme-of-maneuver-development portion of the OPORD process. Also, the scout needs to possess more than one means to account for said enemy. This is not to state there must be four proposed means to handle the enemy presented, but more than one CoA and plan must be present. For example, if the platoon is established in a screen with dismounted OPs to the front and flank against an armored threat, the plan could be:

- M777;

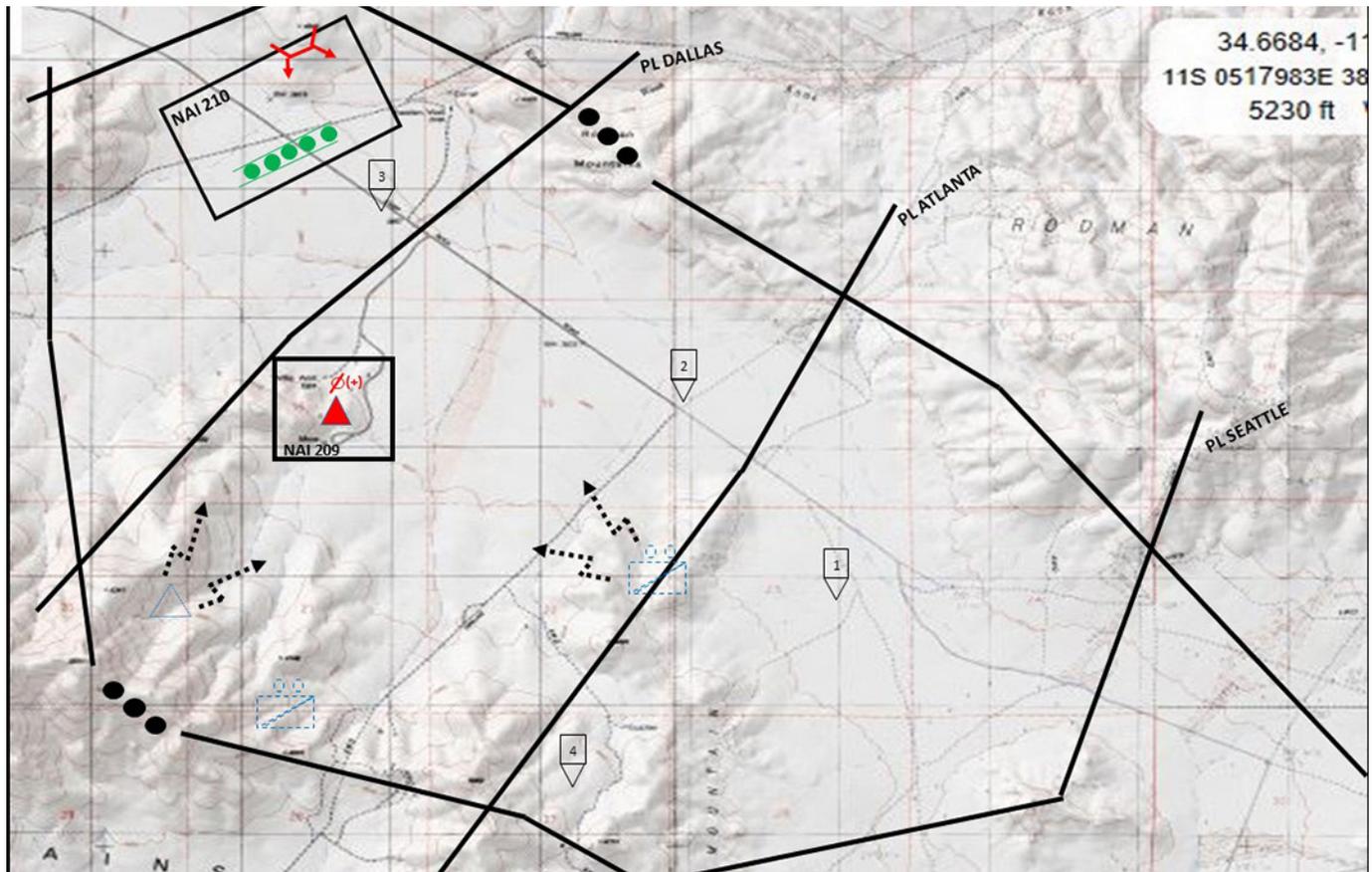- Dismounted Javelins;

- 120mm mortars; and

Figure 5.

- Mobile Gun System/Anti-Tank Guided Missile + Abrams/Bradleys.

The scout will not always possess the capability to harness the entirety of these weapons systems; however, it's critically important the scout move beyond the pedantic viewpoint of a PACE plan only relating to communications. A leader, particularly a reconnaissance and security leader, must be prepared to accomplish the commander's intent and establish conditions for the future success of the higher headquarters through many means. Also, the goal is to place the enemy into more forms of contact simultaneously than he/she can adequately handle.

Rehearsals

Rehearsals need to move beyond cliché as one of the first things to be cut due to time constraints in the troop-leading procedures (TLP). Also, units must move beyond using the cop-out "per unit SOP" during the TLP and OPORD process. An SOP is only useful and possesses a chance to survive first contact if it is practiced. Merely putting an SOP together immediately before

an NTC rotation to appease the observer/coach/trainer is academically lazy.

At a minimum, all organizations should rehearse actions on contact (mounted and dismounted, against direct, indirect, UAS and improvised explosive devices) and actions on the objective. Furthermore, how a rehearsal is conducted is just as important as merely conducting one.

Rehearsals need not be cumbersome at platoon level. The platoon must maximize its time and effectiveness to develop a shared understanding. A recommendation is for the platoon to conduct, at a minimum, two rehearsals. The first rehearsal should be conducted as if the "gods have favored you" and no friction arises. This allows platoon members to build confidence in the plan briefed.

Once the platoon knows the plan, a "dirty run" occurs through use of the platoon sergeant (or, if possible, the troop executive officer or first sergeant). During this iteration, a leader assumes the "red hat" and injects friction into the already established plan

to work through contingencies and identify areas that require intellectual energy to defeat the enemy. I recommend that during this iteration the platoon come in contact from enemy forces, be assessed a casualty (so as to rehearse the casualty-evacuation plan), be presented a significant maintenance issue and be placed in varying degrees of chemical, biological, radiological, nuclear and high-yield explosives threat.

While there will more than likely not be enough time to fully develop each scenario, the charge of the "red hat" is to focus on what is most probable (according to the IPB analysis) to prepare the platoon for that eventuality, thereby establishing an environment where the platoon can retain its freedom of maneuver.

Conclusion

The reconnaissance fundamentals of "gain and maintain enemy contact" and "retain freedom of maneuver" appear at first glance to be mutually exclusive and at odds with one another. However, through a disciplined
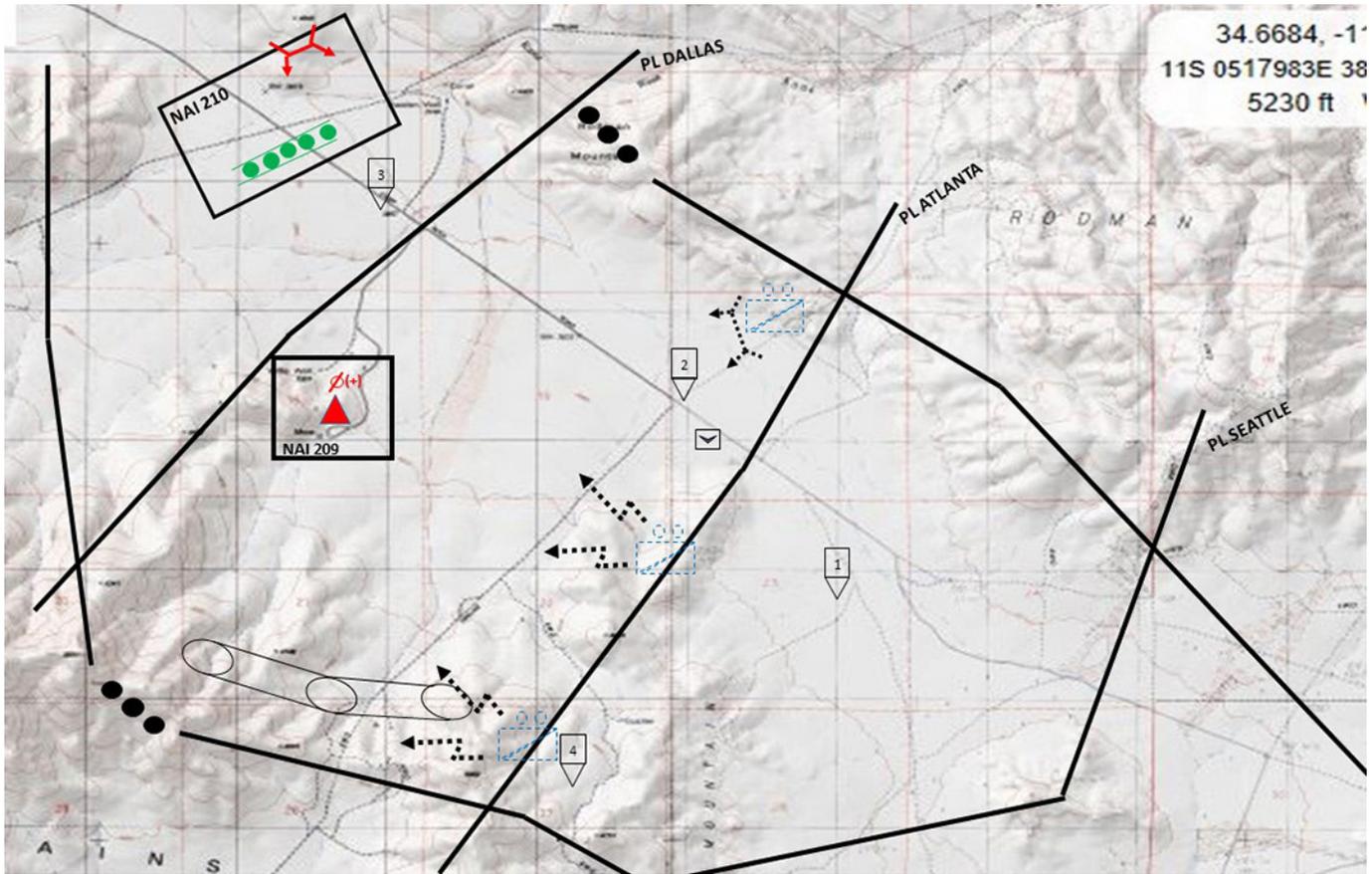
Figure 6.

approach and reliance on the fundamentals, platoon-level scout leaders can place their organizations in a position of relative advantage to achieve success and the commander's intent while not violating the fundamentals. By conducting a to-standard IPB, understanding where their element fits into the higher concept of the operation, inculcating CRG/CSG, using reconnaissance-management techniques, developing a PACE plan for contact with the enemy and holding rehearsals, platoon-level leaders will find themselves well situated to win the first contact of the next war.

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Notes

[1] FM 3-98, *Reconnaissance and Security Operations*, July 1, 2015.

[2] Ibid.

[3] ATP 2-01.3, *Intelligence Preparation of the Battlefield*, November 2014.

[4] Ibid.

[5] Ibid.

[6] Ibid.

[7] FM 3-98.

[8] Ibid.

ACRONYM QUICK-SCAN

AO – area of operations
ASCOPE – areas, structures, capabilities, organizations, people, events
ATP – Army technical publication
CoA – course of action
CRG – commander's reconnaissance guidance
CSG – commander's security guidance
FM – field manual
GTAO – graphic-terrain-analysis overlay
IC – information collection
IPB – intelligence preparation of the battlefield
KOCOA – key terrain, observation and fields of fire, cover and concealment, obstacles, avenues of approach
LLVI – low-level voice intercept
NAI – named area of interest
NTC – National Training Center
OAKOC – observation and fields of fire, avenues of approach, key terrain, obstacles, cover and concealment
OP – observation post
OPORD – operations order

PACE – primary, alternate, contingency and emergency
PIR – priority intelligence requirement
PL – phase line

PMESII – political, military, economic, social, information, infrastructure
PMESII-PT – political, military, economic, social, information, infrastructure, physical environment, time

SOP – standard operating procedures
TACSOP – tactical standard operating procedures
TLP – troop-leading procedures
UAS – unmanned aerial system

Junior Officers Community

Armor and Cavalry junior officers looking for a professional space to connect with like-minded leaders about improving themselves and making their units more effective may wish to check out Junior Officer (JO) (http://cjo.army.mil).

JO is an on-line space dedicated to the professional development of Army junior officers and the organizations they lead. In JO, junior officers can find an array of leader development resources, including:

• Blog: Original articles on topics relevant to junior officers. New content from junior officers is welcome.
• Document database: A repository of professional documents written by other junior officers and shared to help others.
• CCLPDs: Mobile-friendly leader professional development modules with short videos, articles and discussion questions.
• (Coming soon) On-line leader challenge: Put yourself in the shoes of a junior officer facing a tough dilemma with no clear right answer.
• On-line forums: A members-only space where junior officers can share ideas and insights.

For organizations looking to professionally develop their junior officers in person, the Center for Junior Officers (U.S. Military Academy, West Point, NY) will provide a custom training package. Options include:

• Leader challenge: Video-based leader development program with discussion.
• Great-teams exercise: Share and learn from others' experience on a great team.
• Dogtag exercise: Build a visual plot of professional experience to reveal new aspects and talents of your team members.
• Third-generation leadership talk: A concept that focuses on impacting leaders who have yet to come into service.
• Company-level leader interviews: Share your experience with a leadership challenge.
• Leader/visual metaphor exercise: Identify current values reflected in the organization and discuss future development.
• Leadership psychology talk: Presentation on a wide range of topics related to the psychology of leadership.

The Center for Junior Officers is an officially sponsored Army unit that supports junior officers across the force. To find out more, email info@jo.army.mil.

Understanding the Tempo of Reconnaissance

by CPT Nathan Sitterley

The term *tempo*, as defined by Army Doctrinal Publication 3-90, *Offense and Defense*, is a rate of speed and rhythm of military operations over time with respect to the enemy. The doctrine should also relate tempo to the capabilities and supporting efforts within an organization. This definition, though different than the definition of the tempo of reconnaissance, does relate. Tempo generally controls or alters the rate of the operation to maintain the initiative for offensive operations. This type of "tempo" is what most Army leaders are familiar with.

Visualization is key when it comes to tempo. Field Manual (FM) 3-98, *Reconnaissance and Security Operations*, includes an "X" chart that describes the two sets of tempo: *rapid and forceful*, and *stealthy and deliberate*. The purpose of this article is to 1) examine where we can actually apply tempo within reconnaissance operations; and 2) familiarize commanders with a few more reconnaissance tempos that are acceptable to mitigate risks.

Before jumping into the reconnaissance tempo, commanders and scouts must identify the framework of reconnaissance. This is once again different than the sequence of offensive and defensive operations. Although not in the doctrine, the framework of

reconnaissance builds a reconnaissance mission sequentially. This is mainly used as a planning tool to help sequence and give left and right limits to subordinates from the commander. This overview should help simplify reconnaissance planning.

Offense / defense operations sequence

- Gain and maintain threat contact;
- Disrupt;
- Fix;
- Maneuver; and
- Follow through.

Reconnaissance framework

- Planning and preparation;
- Infiltration/insertion;
- Counter-reconnaissance;
- Transition to security operations;
- Reconnaissance handover/information collection; and
- Consolidation and reorganization.

This informal sequence illustrates chronological events that must be executed to accomplish the mission sequentially. Understandably, reconnaissance must allow for flexibility within the plan. It must have decision points for commanders to answer. Reconnaissance tempo will help determine

commanders' decision points if we apply it correctly within the framework. Note: tempo operates within the operational timeline and gives guidance about how much time and exposure scouts have to collect and gather detailed information.

Tempo overall helps commanders assume risk. However, to understand inherent risks within the operational environment, commanders must have situational awareness to make calculated decisions. This balances the scale for the art and science of mission command when giving the commander's reconnaissance guidance (CRG) to your subordinates. Commanders should rarely allow platoon leaders to create their own tempo that is not realistic, feasible, calculated nor synchronized with his or her reconnaissance operation. This is not the platoon leader's role.

What tempos mean

Let's deep dive into what these tempos mean. There are two axes according to our chart. The Y-axis describes the amount of detail a scout is going to collect. Detail includes the amount of time it will take for an element to be as thorough as possible and meet all the critical tasks when it comes to certain forms of reconnaissance operations. The X-axis describes the level of covertness and willingness to fight the enemy to gain this information. Information is the raw data that must be analyzed. This then turns into intelligence and is shared vertically and horizontally. The art of gathering and collecting information has higher risks than forming intelligence. Therefore, tempo helps commanders reduce or mitigate certain risks while his or her scouts collect those information requirements.

Rapid and forceful. This describes the level of information to be more quickly collected. All information collection should be complete and be in accordance with the unit reporting standard operating procedures. *Rapid* also uses the lack of time as a critical factor
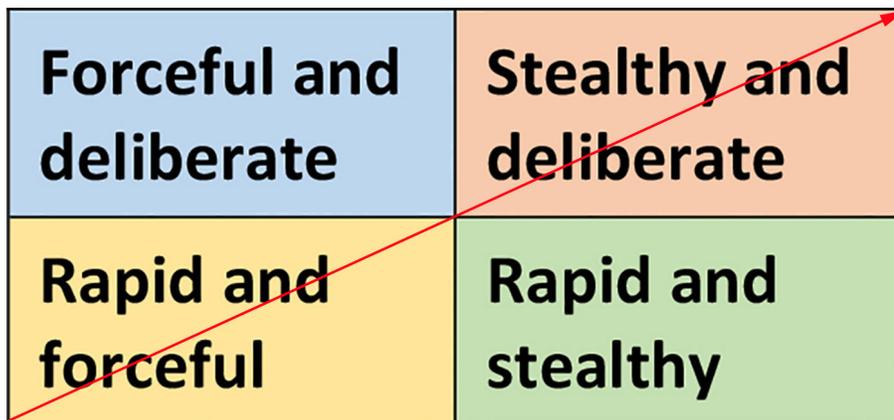

Figure 1. The Y-axis describes the amount of detail a scout is going to collect. The X-axis describes the level of covertness and willingness to fight the enemy to gain information.

within the mission variable (e.g., mission, enemy, terrain, troops available, time and civilian considerations, or METT-TC). *Forceful* describes the willingness to fight and the level of covertness of the element. Commanders must give aggressive or discreet engagement criteria to their subordinates to help preserve combat power and avoid decisive engagements.

An example of rapid and forceful tempo would be a mounted section conducting a hasty route reconnaissance using a rapid way of calculating the radius of a curve. This allows the commander to assume risk on certain radii of curves that would or would not permit the turning radius of their largest supporting vehicle or follow-on units. The reconnaissance framework this falls under is during infiltration/insertion and at times during information collection based on the mission variables.

Stealthy and deliberate. At most, scouts should be moving at one kilometer per hour during this tempo. This is once again based on the commander's scheme of information collection. During this type of reconnaissance tempo, the commander must be descriptive in his or her information collection plan. All lateral routes, key terrains, ford sites, etc. will be reconnoitered in accordance with Annex L and his or her scheme of information collection. This tempo generally fits in during counter-reconnaissance near a named area of interest, target area of interest, obstacles or built-up areas.

This is where commanders must break down their priority intelligence requirements (PIR) according to FM 3-98. Being more descriptive in the information requirements does not hurt your subordinates. It allows him or her to meet your intent when it comes to that specific detail of that particular PIR.

Rapid and stealthy. To some this is an unfamiliar tempo. To state it simply, this occurs when moving from Point A to Point B. Collection of information is limited to maintain stealth. Compromise to the infiltration or exfiltration is unacceptable. It is one of the fundamentals to perform continuous reconnaissance. Scouts are going to gather information about certain routes or

Figure 2. A scout from Troop A, 3-4 Cav, scans the horizon in search of the enemy counter-reconnaissance force in Pohakuloa Training Area on the Big Island of Hawaii during Operation Raider Strike 2015. *(Photo by CPT Nathan Sitterley)*

possible areas of a cache site, but this is not their mission. This is what we like to call little "r" or little reconnaissance in support of the big "R" or big reconnaissance. This part of the mission requires little detail-gathering because it lacks reconnaissance objectives and possibly cover/concealment. This generally happens within the infiltration/insertion sequence after crossing the line of departure.

Forceful and deliberate. This tempo may contradict certain subject-matter experts when it comes to reconnaissance. If we examine this carefully, sensitive-site exploitation falls within this tempo. Scouts do go into built-up areas within their capable means. They do cordon off areas to gain deliberate information on the population as well as key infrastructures.

Urban operations, no matter how small, are among the most risky operations. To mitigate risks, commanders must specify the information requirements as well as enforce the latest time information of value for his or her subordinates. This particular tempo usually occurs during the information collection and consolidation framework of reconnaissance. Remember, you and your subordinates cannot collect everything. You must prioritize your information requirements here.

This article should explain a little bit of the nuisances of planning for the tempo of reconnaissance within CRG. Commanders must assess the

reconnaissance tempo and apply it within the reconnaissance framework. Overall, tempo helps commanders assume risks and maintains a sense of situational awareness on the battlefield.

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Order of St. George and two-time nominee for the General Douglas MacArthur Award.

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Reconnaissance Pull in the Offense: a Mexican-American War Case Study

by MAJ Nathan A. Jennings

Reconnaissance by cavalry formations is a critical enabling function for brigades and divisions executing decisive action in unified land operations. Doctrinally defined as a proactive action to collect information about threats, infrastructure, terrain, weather and society, the forward action is typically divided into two techniques: pull and push. While the former, according to Field Manual (FM) 3-98, *Reconnaissance and Security Operations*, gains "an understanding of enemy weaknesses" to "pull the main body to positions of tactical advantage," the latter is employed when commanders have a "thorough understanding of the operational environment" and "push reconnaissance assets" into "areas of operation to confirm, deny and validate planning assumptions."[1]

Though it remains important for cavalry formations to master both techniques, cursory assessment of American conflicts since the onset of mechanization reveals that scouts are pushed during offensive campaigns far more often than they meaningfully pull their higher echelon. World War II, the Persian Gulf War and Operation Iraqi Freedom, for example, all featured regiments and squadrons that were compelled to adopt rapid and forceful information collection based on operational and political demands placed on their higher headquarters' tempo. In this context, the aim by most cavalry units to conduct deliberate and stealthy movement is historically unrealistic; ground reconnaissance actions in future conflicts will likely remain accelerated and aggressive to inform advanced-stage planning and execution.

Monterrey campaign

One instructive example of reconnaissance pull, however, can be found in the 19th Century, when the U.S. Army invaded northern Mexico during the Mexican-American War. In that conflict, a small expeditionary force of 3,550 Soldiers under future U.S. President GEN Zachary Taylor crossed the Rio Grande, defeated larger Mexican armies and captured the provincial capital of Monterrey to secure American control of Texas. Throughout his advance – which required

Figure 1. CPT Charles A. May's squadron of 2nd Dragoons (now 2nd Cavalry Regiment) slashes through enemy lines in an attack at Resaca de la Palma, TX, May 9, 1846, a battle that climaxed the opening campaigns of the Mexican-American War. The cavalry squadron's bravery proved that the 2,500 American soldiers under GEN Zachary Taylor had enough self-confidence and pluck to shatter the Mexican force of 6,000 and eject it forever from Texas. Thereafter throughout the war, the U.S. Army never lacked daring. May's attack order was simple and effective: "Remember your regiment and follow your officers." *(U.S. Army in Action Series; painting commissioned by the U.S. Army and in the public domain)*

maneuvering deep into unfamiliar and hostile territory – the general relied on volunteer cavalry in the form of federalized Texas Rangers to constantly inform his movement. These scouts effectively fulfilled the modern Army's imperative for reconnaissance units to "enable all units to seize, retain and exploit the initiative across the range of military operations."

The requirement for Lone Star scouts in the Monterrey Campaign, which lasted from April to September 1846, began with Taylor's initial offensive along the Rio Grande. As veterans of the Wars of the Texas Republic, the Lone Star scouts' expertise in mounted warfare proved critical as the American expedition marched into unfamiliar terrain and grappled with the much larger Mexican army. The volunteers' contributions during the forcible entry reflected traditional functions of light cavalry in the post-Napoleonic era as they explored far ahead of the infantry and artillery columns to identify trafficable routes, deflect opposing scouts and report enemy presence. Their familiarity with desert navigation and Mexican culture, in addition to their native horses' acclimatized endurance, allowed them to patrol farther than the unprepared U.S. dragoons.

This type of wartime augmentation by locally recruited partisans held a commonplace role in 19th Century warfare. Known alternately as irregular or auxiliary cavalry, the Texas Rangers' amateur status reflected their informal tradition and temporary activation in contrast with the professionalism and permanency of the branches of most nation-state armies. Similar to allied Indians serving the U.S. Army, Russian Cossacks in Europe or the Silladar Native Horsemen of British India at that time, Texas volunteers supplanted the American regulars' mobility deficiency with region-specific skills.[2]

A former Texas Ranger named Samuel Walker, originally from Maryland, organized and led the first scout company to ride south. After beginning active service with an inauspicious start when a Mexican patrol overran their forward camp April 28, Walker and his volunteers gained national fame when they re-established communications between the American main army at Port

Isabel and a forward infantry outpost on the Rio Grande. The act required the Texans to break through a substantial Mexican screen, which had stymied Taylor's remaining dragoons, to make contact with the isolated battalion. Abner Doubleday, a U.S. artillery officer with the army, praised the "gallant" Walker in his journal, noting that "in spite of the dangers and obstacles he succeeded in executing his daring project."[3]

On May 7, 1846, the war moved beyond skirmishing and into main-force combat when Taylor decisively defeated the Mexican Army of the North at the Battle of Palo Alto and followed with another bloody victory at Resaca de la Palma the next day. The general accomplished these feats through innovative positioning of "flying artillery," or mobile light cannon, along the frontlines that enabled it to fire directly into the opposing infantry ranks. LT Napoleon Dana, 7th U.S. Infantry Regiment, called the victory "a horrid spectacle" and "remarkable and brilliant," while noting that "grape and canister shot had literally mowed them down."[4] Texas scouts resumed reconnaissance duty as the shattered Mexican army retreated south.

Reconnaissance pull into Mexico

Taylor elected to build on his battlefield success with a deeper invasion of Mexico to solidify American control of Texas and compel territorial concessions. However, he and his commanders had little intelligence concerning routes and enemy disposition to their front. To inform his planning, the general dispatched a combined force of dragoons and Texans May 19 to locate the Mexican retrograde. This force included a newly arrived volunteer company led by another former Ranger, CPT John Price. CPT William Henry of 3rd U.S. Infantry Regiment recalled how the riders followed the retreating enemy for almost 60 miles and then "fell in with the rearguard of the army and attacked them." The task force suffered two wounded in the skirmish and subsequently reported the enemy position to Taylor.[5]

Events continued to develop south of the Rio Grande, while the newly

annexed state of Texas mobilized two full mounted rifles regiments of 10 companies each, numbered 1st and 2nd respectively, to address Taylor's mobility requirement. The general had begun his advance west from Matamoros throughout the first and second weeks of June, and a third company of Texas scouts, under famed frontier fighter CPT Ben McCulloch, joined the army May 23. He joined the others in a field camp that Samuel Reid, a scout from Louisiana in McCulloch's company, compared to "a Hottentot hamlet" and an "Indian village." On June 5, Taylor dispatched Price's men to provide route security for 1st U.S. Infantry Regiment's march to the town of Reynosa 60 miles up the Rio Grande.[6]

On June 12, the Texans began concerted forward patrols to inform and "pull" the Army's columns into unfamiliar territory. McCulloch's company, in particular, rode southeast toward Linares to, as reported by Reid, "gain information touching the number and disposition of the enemy." They also hoped to ascertain if a passable southern approach to Monterrey existed to support "the line of march for a large division, with its artillery and wagons." Aware of possible observation by "Mexican spies," the scouts feinted toward Reynosa and then cut cross-country to the Linares Road after nightfall. After finding that direction impassable for the expedition's logistical and artillery trains, they returned to report findings and established a temporary camp with 1st U.S. Infantry at Reynosa.[7]

The Texans' region-specific capabilities made them uniquely suited to shape Taylor's scheme of maneuver throughout the invasion. In one instance, which revealed the advantage of previous border experience during the Texas Republic's many wars against Mexico, McCulloch's reconnaissance party leveraged cultural familiarity against an enemy patrol. The Ranger captain first deceived the enemy by hailing them in Spanish before opening fire and capturing a mail carrier. He then translated a captured map and questioned local civilians, which yielded intelligence on the dearth of water and forage ahead. This conversancy in the Spanish language represented another of the Texans' unique skills.[8]

Forward and proactive information collection by mobile scouts, so critically needed to maneuver cumbersome 19th Century infantry and artillery regiments through foreign landscapes, made the Lone Star auxiliaries an indispensable asset during the American advance into Mexico. Taylor himself later reported of McCulloch that "his valuable services as a partisan and spy were greatly needed." He went on – in language uncharacteristically generous for a Regular Army officer speaking of disdained volunteers – to note that "the services rendered by MAJ McCulloch and his men, particularly in

reconnoitering … were of the highest importance."[9]

The American general continued to advance his infantry regiments west along the Rio Grande toward Camargo, Mier and the provincial capital of Monterrey through early July with McCulloch's men riding ahead. The newly arrived 2nd Regiment, Texas Mounted Rifles, now followed the invading column's trail, passing through Reynosa on July 24, while 1st Regiment, Texas Mounted Rifles, continued its march from south Texas toward Matamoros. McCulloch again proved useful during this movement with another

reconnaissance, this time focusing on the northern "China Road." When the scouts disqualified the use of that way due to restrictive terrain, Taylor noted that the Texans had "given valuable information touching on one of the routes to Monterrey."[10]

By late August, the main infantry brigades, artillery companies, engineer detachments, McCulloch's and Price's scouts and, more importantly, the 10 mounted companies of 2nd Texas had consolidated at Camargo. This placed most of the expeditionary force about halfway to the strategic objective at Monterrey. Taylor then employed

Figure 2. Overview map showing U.S. forces' movements into Mexico. Movements of units mentioned in this article are on the central-eastern side of Mexico. *(Map courtesy of Wikimedia,* https://upload.wikimedia.org/wikipedia/commons/thumb/0/0b/mexican–american_war_%28without_scott%27s_campaign%29-en.svg/2000px-mexican–american_war_%28without_scott%27s_campaign%29-en.svg.png*)*

McCulloch to assess the next route, this time to Mier and Cerravlo, while reporting that 2nd Texas was "rendering useful service as escorts." The veteran Ranger company also officially reorganized into 1st Texas Regiment under another famous Texan, COL John Coffey Hays, during this time.[11]

While 2nd Texas provided close support to the army's infantry brigades, the eight companies of 1st Texas secured the army's southern flank. Taylor noted that the mounted regiment was "on its march from Matamoras, having taken San Fernando along its route, which passed through a part of the country not before examined." A journalist from *The Picayune* (New Orleans) newspaper reported the Texans would "take up the line of march again tomorrow and move for a town called China, about 150 miles from this place." He also noted that "at China, the regiment will probably join the main body of the army." Reid simply called the maneuver a "long scout." This circuitous movement cleared a large tract of enemy Mexican guerrillas while preventing an organized surprise attack against Taylor's extended lines of communication.[12]

On Aug. 19, the American column veered away from the Rio Grande and toward the prize of Monterrey. While most of 1st and 2nd Texas moved as intact regiments, the general retained McCulloch's company and another led by former Ranger G.A. Gillespie to explore the remaining route to Monterrey. The scouts patrolled southwest and arrived at the town of Cerralvo Sept. 5 with the lead infantry regiments close behind. The long train of American foot and cannon units soon closed in and established a temporary camp. The 1st Texas, still guarding the army's southern flank, skirmished against Mexican cavalry to the south during this period, losing three men but fulfilling its mission.[13]

On Sept. 15, the twin Texan regiments consolidated as a volunteer brigade of mounted rifles under nominal command of Texas Gov. James Henderson and moved to converge with the main column at Marin. PVT James Holland, a volunteer enlisted scout from Harrison County, TX, recalled that a detachment of "about 100 men were ordered

in advance as spies."[14] McCulloch's and Gillespie's companies remained detached from the *ad hoc* brigade to work directly for the commanding general. As Taylor's trusted scouts, they patrolled ahead to meet their parent regiment in Marin. Once there, Taylor issued the order of battle and the plan for the expected assault on Monterrey.

On Sept. 14, while leading the American advance, McCulloch's riders conducted effective counter-reconnaissance by defeating a larger Mexican cavalry force near Marin. Reid described how the enemy horsemen "opened fire with their *escopetas*, or carbines, which was returned by our boys in a most spirited manner." He then wrote that "the Mexicans staggered under our fire and retreated into the town in the greatest confusion." With the Mexican scouts in retreat, the Texans advanced to occupy the town Sept. 15, only 25 miles from the provincial capital. Though just a skirmish, this engagement underscored the lethality of the Texans' Colt revolvers and degraded the Mexican commander's ability to observe the invader's approach.[15]

The American army arrived in Marin in separate brigade columns over the next few days, while Taylor again employed his Texans to scout ahead, this time as his personal escort to facilitate a commander's reconnaissance. As chronicled by Dana, "As soon as GEN Taylor arrived at his camp, he and an escort of dragoons and two companies of Texas Rangers went to reconnoiter the enemy's positions." This action facilitated the final refinement of the battle plan as the commander and his staff officers saw the objective for the first time. On Sept. 18, the full Lone Star Brigade arrived at the American camp, bringing the expedition to more than 6,000 men.[16]

The expedition began its final march south toward Monterrey Sept. 19. Taylor ordered the "Texas mounted troops" to "form the advance … except for two companies to compose the rearguard." This directive preserved the infantry and dragoons from fatiguing advance and rearguard security duties while retaining them in close-order formation for the impending assault. The Texans' sequence of march as the

army's vanguard consisted of Gillespie's company, McCulloch's company, 1st Texas Regiment and 2nd Texas Regiment. Taylor followed with three infantry divisions comprised of regulars, followed by several volunteer infantry regiments.[17]

The consolidated weight of the American army now advanced inexorably toward its objective. As remembered by Walter Lane, a young Texas Revolution veteran riding with 1st Texas, the invasion force marched "as if it were like the ocean's swell" and "formed a noble and imposing pageantry." Most Soldiers were eager to participate in what they expected to be the culminating battle of the war. Another scout recounted how the Mexican cavalry "in proud array, with lances bright," contested the advance. The Texans were soon "charging at full gallop," and the enemy was "seen to wheel and retreat toward the city."[18] When the Texans reached the hill overlooking Monterrey, they halted to allow Taylor's staff engineers, which included future Confederate GEN Robert E. Lee, to conduct a final assessment of the daunting fortifications.[19]

This final act of counter-reconnaissance on behalf of the expedition allowed the line regiments to deploy unmolested from line-of-march to attack positions along advantageous approaches. In the following days, the consolidated army – relatively unscathed and unfatigued in large part due to the Texans' reconnaissance-pull actions – would attack and capture one of Mexico's greatest urban centers with a bold plan that fixed the garrison to the east while enveloping from the west. Despite its massive fortifications and more than 10,000 defenders, which one Soldier called a "second West Point in strength," Monterrey would soon fall under a series of bloody assaults that swiftly led to its capitulation.[20] The American army then proceeded to occupy the city and the entire Rio Grande corridor in hopes of compelling diplomatic concessions.

Follow-on operations

After the capture of Monterrey, the Lone Star mounted brigade emerged as a liability for Taylor in the next phase of the conflict. In addition to the

army no longer requiring their forward reconnaissance services, the volunteers' indiscipline and brutality toward Mexican civilians had become a liability for stability operations. As their excesses threatened to rouse the indigenous populace, the general complained in exasperation that "the mounted men of Texas have scarcely made one expedition without unwarrantedly killing a Mexican."[21] With the war seemingly won, he dismissed most of the Texas volunteers to return to their homes on the western frontier.

However, the American occupation force soon learned that major combat operations were far from over. In January 1847, suspicious of a Mexican counter-offensive and again lacking proficient scouts, Taylor re-enlisted McCulloch's proven company to screen the vast expanse of Mexican territory to the south. As the invading army spread out to patrol and guard Monterrey, and its surrounding infrastructure and approaches, it remained vulnerable to concentrated attack. The Texans patrolled the southern flank of the army throughout the next month. They soon provided critical intelligence about the approach of a large retaliatory force under Mexico's president, Antonio Lopez de Santa Anna.

On Feb. 22 and 23, the American force of 5,000 Soldiers repelled the Mexican army of 16,000 soldiers in a bloody and indecisive engagement. Called the Battle of Buena Vista, McCulloch's Rangers performed light-cavalry functions before, during and after the engagement, earning special commendation from the commanding general. Ohio officer Luther Giddings later credited "that trusty and accomplished scout, CPT McCulloch" for providing the critical notice of Santa Anna's unexpected approach. The timely information collection and reporting allowed Taylor to rapidly reposition his army to defendable terrain just prior to the battle, which allowed him to defeat the larger

Figure 3. Mexican territorial claims relinquished in the Treaty of Guadalupe Hidalgo are shown in white. *(From the National Atlas of the United States; public domain)*

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Mexican force and provide political leverage to leaders in Washington, DC.

Past lessons, future insights

The reconnaissance and security efforts by Texan mounted volunteers in the Monterrey Campaign reveal an obscure, thought relevant, historical example where well-armed, highly mobile and proactive cavalry forces pulled an American field army to victory. By executing route reconnaissance, counter-reconnaissance and mobile guard operations, the Lone Star scouts enabled the advancing infantry brigades and artillery companies to, as described by U.S. Army doctrine, "achieve positions of relative advantage" across 200 miles of challenging and unknown terrain.[22] The volunteers achieved this through clear understanding of the commander's intent, tactical ability to fight for information and focus on timely and accurate reporting.

The 1846 invasion of northern Mexico offers several lessons for the modern U.S. Army. First, when brigades, divisions, corps or joint task forces advance into unfamiliar terrain and unpredictable situations, they need reconnaissance elements that are trained and equipped to "pull" them into the fight. While most ground reconnaissance efforts will likely be pushed by advancing formations with relatively developed plans, cavalry forces must prepare for the eventuality when degraded information environments require forward scouts to inform immature plans at tactical and operational levels. These instances will require mobile elements, like the Texan volunteers in northern Mexico, to "work over a broad area to develop the enemy situation."[23]

The second lesson of the campaign is fundamental to all cavalry operations. The success of the Texas volunteers – in addition to many other examples since – indicates that ground reconnaissance forces must possess adequate firepower, mobility and, in the 21st Century, passive and active protection to allow them to aggressively fight for information. If reconnaissance

actions in past wars revealed the cost of failing to develop a versatile range of "scouting" capabilities, the uncertainty of the future will compel squadrons to arm to negotiate it. By equipping for both pull and push missions against the most capable threats, U.S. cavalry formations will, as mandated by GEN Mark Milley, 39th Chief of Staff of the Army, enable "sustained land operations across the spectrum of conflict and win in ground combat."[24]

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BATTLE ANALYSIS

The Saga of OZ 77 in the Arab-Israeli War of 1973:
a Small Armor Unit's Fight in a Large-Scale Combat Operation

by retired LTC Lee F. Kichen

The Arab-Israeli War of 1973,[1] otherwise known as the Yom Kippur War, began Oct. 6 with surprise attacks by Egypt and Syria on the Sinai Peninsula and the Golan Heights, respectively. Israel's survival hinged on the outcome of its fight with Syria. The ensuing four-day fight was the largest tank battle since World War II.

It was not a fight between divisions or brigades separated by long ranges; for the Israeli Defense Forces (IDF), it was a series of short-range engagements fought by small units and, at times, individual tanks. IDF commanders operated largely on their situational awareness rather than strict adherence to their superiors' plans. With Israel facing an immediate and perilous threat, the IDF's culture allowed for the maximum degree of freedom of action and command initiative."[2]

The OZ (the Hebrew acronym for courage) 77th Armored Battalion, commanded by LTC (later BG) Avigdor Kahalani, would conduct a classic area defense culminating with the Battle of the Valley of Tears. Despite overwhelming odds, the fight Oct. 9 turned the tide of the Golan Heights Campaign in Israel's favor.

Strategic and operational situation

The Arabs' strategic goal was to regain territory lost during the Six-Day War of 1967. Had Syria regained the Golan Heights and reached the Jordan River and the Sea of Galilee, it would have posed, within 24 hours, an immediate threat to settlements in northern Israel.[3]

Facing a two-front war, Israel's main effort would be a defense on the Golan Heights and an economy-of-force operation on the Sinai Peninsula as the supporting effort. The 120 miles between the Suez Canal along the western Sinai and Israel's southern border provided the strategic depth it lacked on the Golan Heights and allowed enough time to deploy its strategic reserves, mount a successful defense on the Golan and then counterattack into Syria.

Figure 1. The battlespace, Valley of Tears, Israel. *(Courtesy Wikimedia Commons)*

Battlespace

The total area of the Golan Heights is about 1,800 square kilometers, with Israel controlling some 1,200 kilometers. It is bordered by Mount Hermon on the north and by the Yamouk River on the south. It is 70 kilometers from the north to the south, and its width varies from 12 to 26 kilometers.[4]

Israel built a well-constructed network of bunkers along the Purple Line (the 1967 ceasefire line) that provided overhead cover protection from both direct and indirect fire. These bunkers were strongpoints with concertina wire, tank traps and firing points for infantry and armor. Forward of the bunkers were minefields along the routes from Syria. The 17 bunkers were formidable; however, Israel had too few soldiers to adequately defend the entire length of the bunker line.[5]

The IDF constructed a line of three-tiered ramparts – e.g. tank-gunnery platforms along the low ridges of the western valley. The ramparts provided superb interlocking fields of fire, cover and concealment, and observation. The bottom tier at ground level completely obscured ground to Syrian forward observers. On the middle tier, tanks were hull down behind earthen berms. On the top tier, Centurion tanks with their main guns at maximum depression could engage targets on the low ground at close range. The forward slope of the rampart was steep enough to block a direct assault.[6]

An anti-tank ditch just behind the Purple Line would be the first major obstacle encountered by the Syrians. The ditch was 3.5 to four meters wide, 2.5 meters deep and 1.2 meters high on the Israeli side. Forward of the trench were wide minefields.[7]

The terrain on the northern Golan generally favored the defender and limited high-speed armor operations. Volcanic rock restricted well-defined avenues of approach. The northeastern-most part of the sector, with slopes greater than 45 degrees, was impassable by combat vehicles. The remaining northern sector was key terrain, blocking access to Mount Hermon with its critical electronic-warfare sites and the B'not Yaakov Bridge across the Jordan River. The terrain also guarded the concentration of Israeli settlements to the west.

The terrain in the south, mostly covered by grasslands, would prove favorable for the attacker. It was in this sector that Syria destroyed the IDF's 188th Armored "Barak" Brigade.

Prelude to war

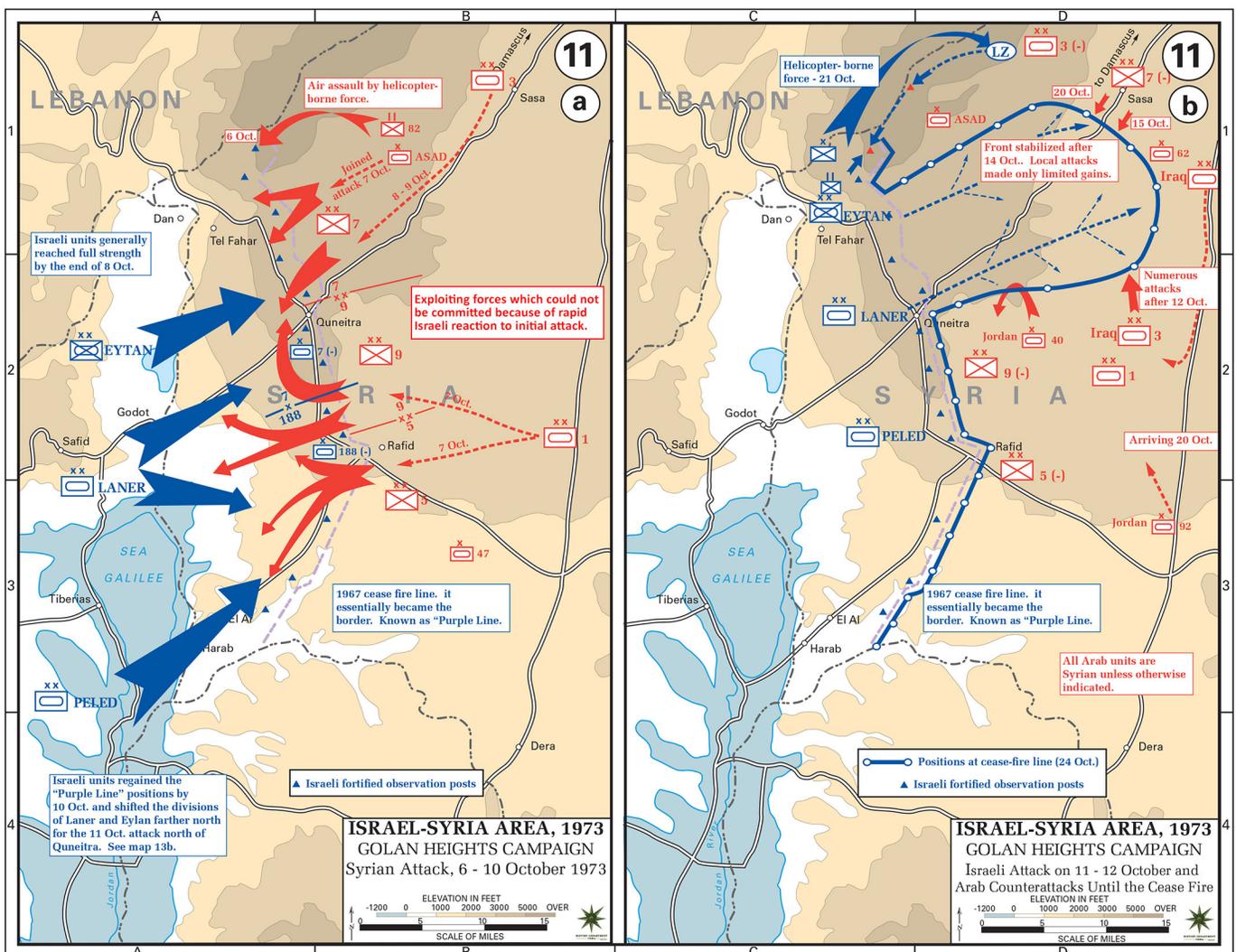Israel's rapid and decisive victory in the Six-Day War produced an unattainable

Figure 2. Israel-Syria area (Golan Heights Campaign), 1973. *(Map courtesy Department of History, U.S. Military Academy)*

standard of excellence it failed to replicate in 1973.[8] Conventional wisdom held that it would be foolhardy for a coalition of Arab forces to challenge Israel in another major war. However, Egypt and Syria, after the Six-Day War, focused on rebuilding and retraining their forces. Syria employed Palestinian guerrillas to attack Israel. To avoid a large-scale Israeli retaliation, these attacks were sporadic and limited in scope.

Egypt began a "war of attrition" along the Suez Canal, designed to force Israel to return a portion of the Sinai. U.S. diplomacy resulted in a ceasefire between Israel and Egypt in August 1970.[9] With tensions intensifying, the Soviet Union increased its support to Syria, sending 30 SA-4 anti-aircraft battalions manned by Soviet technicians, five squadrons of MiG-21 fighters with Soviet pilots, and 1,200 T-55 and T-62 tanks.[10]

Syria, in October 1972, substituted its forces for the Palestinians and initiated small-scale combat operations known as "battle days," targeting Israeli fixed defenses on the Golan and yielding rich information on IDF dispositions. The deputy commander of the IDF Reserve 240th Armor Division, at a senior officers' conference in January 1973 – assessing the significance of the "battle days" tactics – declared, "If they begin to move, it will be difficult to stop them. They will likely cause many casualties … because of the absence of strategic depth. [T]herefore they will likely be able to reach the B'not Yaakov Bridge within hours."[11]

Tactical situation

The Arabs were ready for war by the end of September; the IDF detected higher-than-usual Syrian activity such as canceling leaves, activating reservists and impounding civilian vehicles. MG Eli Zeira, the IDF intelligence chief, insisted that Syria would not initiate major combat operations alone and that Egypt, preoccupied with internal issues, would not engage in military adventurism. Despite this estimate, IDF Chief of Staff LTG David Elazar ordered OZ 77 from the Sinai to the Golan Heights, where it would become the reserve and counterattack element for 188th Armored Brigade, the only IDF unit permanently stationed on the Golan.[12]

Kahalani and his commanders, unfamiliar with the Golan's terrain, conducted an extensive reconnaissance until the arrival of the main body.[13] This reconnaissance allowed him to identify the few avenues of approach available to the Syrians and assess the IDF's overall defensive plan. Over the next few days, Syria moved ground forces to battle positions east of the Golan and SU-7 aircraft occupied forward bases, which challenged the IDF's intelligence services' assessment of a low probability of war.[14]

By Oct. 3, the intelligence was incontrovertible that hostilities were imminent when the Syrians massed along the Purple Line and families of Soviet military advisers departed Damascus. Kahalani on the following day briefed his company commanders on the situation and quizzed them on their understanding of the mission and their roles.
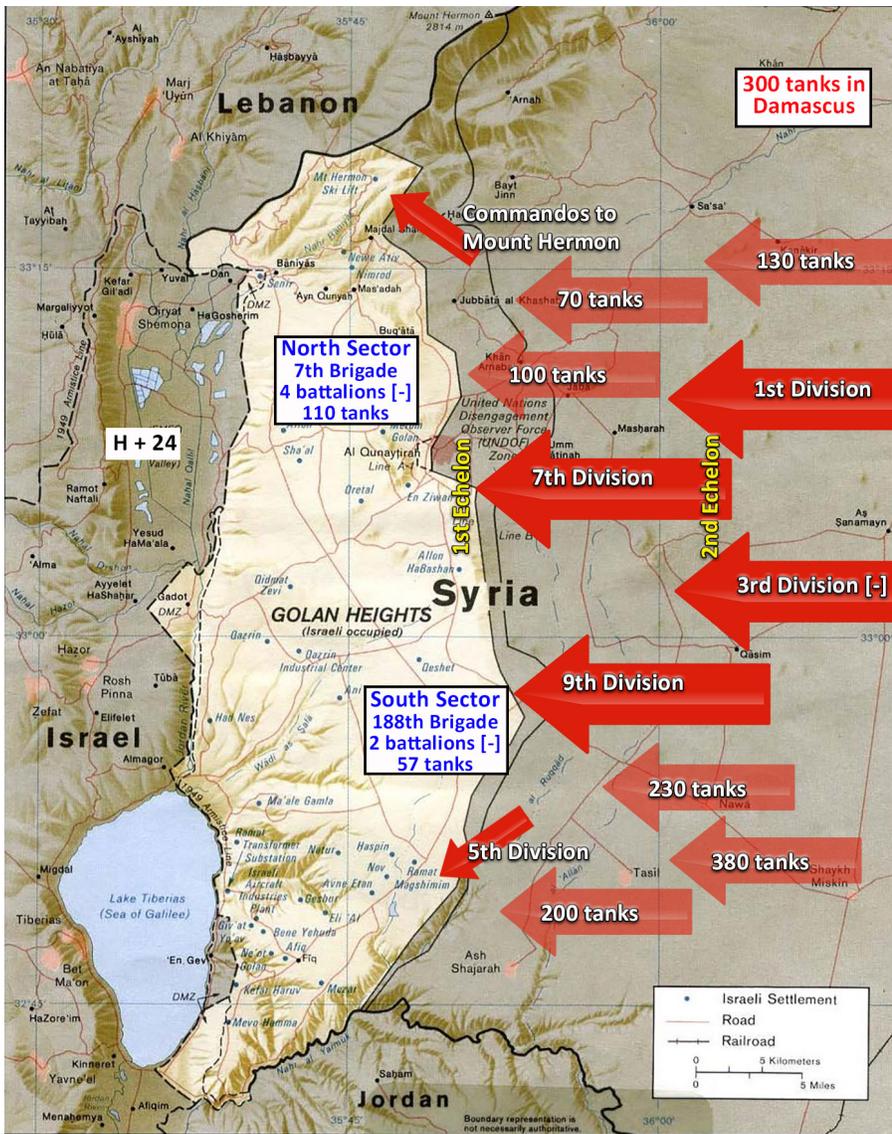
Figure 3. Reconstructed Arab attack plan, with units and tank strength shown in the campaign theater as of noon Oct. 6, 1973. The Syrian-Egyptian offensive plan was based on 1) fully surprising Israel; 2) mustering absolute superiority in numbers; 3) dividing the IDF's resources by attacking the Golan Heights and Sinai Peninsula simultaneously; 4) reaching the Jordan River within 24 hours; and 5) capturing the Jordan River's slopes before the IDF reserve forces reached them. The breakdown of Syria's tanks is problematic, so tanks are not noted as assigned to a specific division; Kahalani estimated in a 1979 interview that Syria had 1,700 tanks; the point is that Israel was greatly outnumbered. *(Based on briefing provided to author by retired BG Gideon Avigor, IDF, and LTC Hayim Danon, IDF Reserve)*

Only Kahalani and two noncommissioned officers were combat veterans in the battalion; most of the platoon commanders and two company commanders had recently joined the battalion.

Kahalani's message to his soldiers was simple: if their leaders became casualties, OZ 77 soldiers would continue the fight to save their homes and country.[15] On Oct. 5, Yom Kippur Eve, Elazar issued Alert Gimmel recalling from leave the regular forces and mobilizing reservists.[16] Many soldiers reported late to their units because the 24 hours between sundown Oct. 5 and sundown Oct. 6 are the holiest of the year for Jews.

Raphael Eitan, 36th Division commander, early in the morning of Oct. 6, ordered COL Avigor Ben-Gal's 7th Armored Brigade to move north.[17] Eitan returned OZ 77 with five companies and a platoon to 7th Armored Brigade as its reserve.[18] Kahalani designated a company (-) of seven tanks as his reserve. Also organic to 7th Brigade were 82nd Armored Battalion and 75th Armored Infantry Battalion (+) with a tank company from OZ 77.[19] The Armor School Battalion would later reinforce the brigade. Before it moved to defensive positions in the northern sector, 7th Brigade was in an assembly area behind 188th Armored Brigade.[20]

Syria deployed a mix of 950 T-55 and T-62 tanks, 600 artillery pieces and 70,000 troops. How many tanks Syria deployed is problematic. Kahalani in a 1979 interview said Syria had 1,700 tanks.[21] Following Soviet tactics, the first echelon consisted of three infantry divisions: 7th, 9th and 5th, with 1st and 3rd Armored Divisions in the second echelon.

The IDF was woefully overmatched by the Syrians. The IDF's Northern Command, responsible for the Golan Heights, would muster only 7,000 soldiers. The 7th Armored Brigade had 105 modified Centurion tanks, while 188th Armored Brigade had just 76. Northern Command deployed only 50 self-propelled howitzers and scattered infantrymen from 1st Infantry "Golani" Brigade along the outpost and bunker lines. The 7th Armored Brigade was responsible for the Kuenitra to B'not

Yaakov Road, with 188th Armored Brigade covering the southern sector of the Golan.[22]

The quality of IDF tanks vs. Syrian tanks was a wash. The IDF's advantages included superior gunnery training, accuracy of the Centurion's L7 105MM main gun and the Centurion's survivability. However, the T-62 had a longer cruising range, faster road speed, was easier to maintain and possessed a night-fighting capability.[23]

The Syrian scheme of maneuver was classically Soviet, beginning with preparatory aircraft and indirect fires, followed by attacks on a broad front designed to further disperse IDF units deployed along the 70-kilometer front. After preparatory fires, 7th and 9th Infantry Divisions would penetrate north of Kuneitra, with 5th Infantry in the south at Rafid. One armor division would exploit the penetrations, with another armor division in reserve.[24]

The Israeli defensive plan was to conduct an area defense for the first 24-36 hours, attrit Syrian combat power and provide time to fully mobilize reservists and counterattack into Syria.

Arab attack, defense and victory at Valley of Tears

Syria began its attack with 100 aircraft and 655 artillery pieces. The Syrian infantry divisions synchronized their movement with the aerial and artillery fires, while Syrian air defense denied the Israeli Air Force air superiority.

Despite the intensity of Syria's fires, they were largely unobserved fires, causing only a few casualties and little damage to dug-in tanks and artillery.[25]

Ben-Gal detached two companies from OZ 77. He attached one to 75th Armored Infantry Battalion and placed the other under his command at the road junction at Wasset, a few kilometers west of Kuneitra.[26] Since this position was not contiguous with the main body and he had an inexperienced company commander, Kahalani sent his deputy to assist in this operation. Throughout the Syrian campaign, habitual unit relationships were severed, often while on the move, to form new units. Although this practice put unit cohesion and command-and-control at risk, the well-trained IDF units managed what would otherwise be unmanageable chaos.

Kahalani then moved the rest of OZ 77 toward Kuneitra and Booster Hill. To his two least experienced commanders, he gave specific guidance, locations for their vehicles, their orders and actions upon contact. He then positioned himself in a location where he could best observe his units. To the more experienced commanders, he gave them mission-type orders to move into their positions.[27]

The supporting artillery batteries, after 12 hours of fighting, lacked ammunition to cover the antitank ditch. As darkness fell, OZ 77 tanks – which had no night-vision capability – were

Figure 4. T-55 and T-55 bridge in a tank ditch. *(From briefing provided to author by retired BG Gideon Avigor, IDF, and LTC Hayim Danon, IDF Reserve)*

unable to engage Syrian tanks at long ranges. All that was available to the Israelis at night were the tank commanders' handheld night-vision devices and a limited number of illumination rounds.[28] The minefields and antitank ditch slowed the advancing Syrian tanks, allowing Kahalani to engage them at close range – sometimes at less than 300 meters. Light from burning Syrian tanks somewhat improved OZ 77's ability to acquire more enemy tanks.

Kahalani positioned himself in the center of the formation and up front to provide maximum control of his units and to improve his situational awareness. However, Kahalani, facing unacceptable losses by fighting in the dark, withdrew from the ramparts in preparation for a daylight fight.

Oct. 7 dawned with more than 100 destroyed Syrian tanks on the valley floor; however, another 80 to 90 Syrian tanks were advancing toward Kahalani.[29] With daylight, the Israeli tanks reoccupied the ramps and temporarily regained the advantage by rendering the Syrian 78th Armored Brigade combat-ineffective. The cost of this victory was high: Kahalani lost one company commander, nine platoon leaders and tank commanders, and one soldier.[30] Before the end of the campaign, he would lose all but two company commanders. The 7th Armored Brigade was left with only 35 of its original 105 tanks.

During the "battle pause," OZ 77 recovered its damaged tanks and evacuated them to the rear, and obtained serviceable tanks and pick-up crews for the next engagement.

Kahalani marveled at the bravery of his OZ 77, yet it was he who inspired them by his calm radio transmissions and by moving from position to position where he was always visible to his soldiers.[31] Throughout the campaign, Kahalani and his company commanders fought from the front and, by their example, soldiers repeatedly rallied to fight on. "Sometimes the soldiers are young and afraid," he said in an interview after the battle. "But they will follow the leader who is with them. … They need leaders who are between them and the enemy."[32]

On Monday, Oct. 8, Kahalani "… was busy impeding moderate-strength enemy offensives across the front. … I was ordered to capture the valley below our positions," he said. The Syrians reacted by violent and accurate close-air-support artillery fire and, for the first time, Sagger antitank guided missiles. Kahalani requested and received permission to once more withdraw from the ramps overlooking the valley.

Before the battalion withdrew, the brigade commander ordered his reserve Tiger Company, commanded by CPT Meir Zamir, to Kahalani's southern flank as a counterattack force. Zamir, on his own initiative, delayed counterattacking and took up a hasty defense when he realized that Syrians had penetrated the Israeli defenses. Zamir's company at close range destroyed 30 tanks and two companies of armored infantry.[33]

OZ 77's next mission was to defend the northern outskirts of Kuneitra and prevent the brigade from being outflanked.[34] By the end of the day, 7th Armored Brigade held Hermoniet and Booster Hills, the ground on the north and south of the Valley of Tears. Nearly out of fuel and ammunition, Kahalani sent his tanks back to emergency resupply points.

The next day, OZ 77 fought what became the pivotal battle of the Syrian campaign. Syria now had 160 tanks facing 20 tanks from 7th Armored Brigade. Ben-Gal's control of the brigade was rapidly collapsing because of the intensity of the Syrian attack, the heavy losses among his senior subordinate commanders and his troops' sleep deprivation.[35]

"The commanders had no control over their subordinates. Our tanks, even if they held on, would fight as individuals," commented Ben-Gal.[36]

With the destruction of 188th Armored Brigade to his south, Ben-Gal assumed command of the remnants of 71st Armored Infantry Battalion and 74th Armored Battalion. Kahalani at one time or another would command elements of those two battalions and the Armor School Battalion.[37] Kahalani positioned the remaining tanks of his battalion and those from 75th and 82nd Armored Battalions in a hasty U-shaped defense.[38]

Kahalani, down to seven tanks, faced elements from Syria's fresh 3rd Armored Division. LTC Yossi Ben-Hanan, a former battalion commander in 188th Armored Brigade, voluntarily returned from his honeymoon and gathered 13 repaired Centurions and pick-up crews. Moving to Booster Hill, he attacked the flank of the advancing 81st Brigade, soundly defeating it and causing its demoralized soldiers to abandon their tanks and flee to the rear.[39]

Ben-Gal ordered Kahalani to retake the ramp overlooking the Valley of Tears. As he moved toward the ramp, he destroyed at close range three enemy tanks; another vehicle destroyed the fourth tank.[40] Chaos reigned with three battalion headquarters operating on three separate frequencies, while individual tank crews waged private wars firing at whatever they saw. The brigade communications officer may have saved the day getting the surviving tanks on Kahalani's command frequency.

The next engagement would be OZ 77's culminating point. Kahalani had to block the Syrians from taking the Kuneitra-Mas'ad road.

"I knew that if they (Syrians) took the hill, they were headed to Galilee," Kahalani recalled. "I understood the situation; it was quite [desperate]. … I had my seven tanks and found four or five more."

Kahalani crested the hill alone. At that point, "I saw 150-160 tanks racing," he said. "I decided to attack. I gave the order, [but] no one would move. I gave the order (again), and no one moved. I told my men that 'we are Jews and we are better than them, are you cowards?' When I started moving, I saw some other tanks moving. God let me reach the hill before that mass of tanks gets [sic] there, because otherwise they slaughter us."[41]

Fearing that he would be out of ammunition, Kahalani ordered his crews to fire only at moving combat vehicles. Kahalani seized the opportunity to counterattack the advancing 70th Republican Guards Tank Brigade through the seam between its two battalions, which forced them to withdraw.[42] At the end of the fight, Ben-Gal looked down at the Valley of Tears and saw

some 260 tanks and hundreds of armored-personnel vehicles abandoned.

In the distance Kahalani saw the dust trails of withdrawing Syrians.[43] He radioed Ben-Gal: "We are in control, artillery has stopped."

Ben-Gal to Kahalani: "You are a national hero, you saved Israel."[44]

The victory at the Valley of Tears allowed Northern Command to reconstitute and attack deep into Syria. When 7th Armored Brigade came within artillery range of Damascus, the ceasefire of Oct. 22 ended the campaign.

Battle analysis

Israel, although numerically inferior to the Syrians and surprised by a "short notice" attack, successfully defended the Golan with its superior gunnery skills, movement techniques, flexible command structure and mentally agile commanders and soldiers. Elazar's early decision to deploy OZ 77, and shortly thereafter the rest of 7th Brigade, provided the additional combat power needed for a successful area defense that denied Syria access to the east-west roads leading into northern and central Israel.

Kahalani considered his detailed reconnaissance and terrain analysis a key combat multiplier. Effectively using natural and manmade obstacles built after the Six-Day War, Kahalani gave the Syrians the illusion of Israel having more forces.[45]

Ben-Gal, Kahalani and the other battalion commanders adroitly used their reserves to conduct limited and local counterattacks to regain key terrain. According to Kahalani, "You must always maintain (a reserve). … It gives you flexibility. … You must be prepared to change from the defense to the offense (and) regain the initiative." An agile reserve enhances the defender's ability to cover a wide frontage."[46] Despite overwhelming odds, Israel's superb gunnery and movement techniques negated Syria's quantitative advantage in tanks.

Israeli armor units were extremely vulnerable to Syrian infantry operating at night with antitank guided missiles (ATGM). Inexplicably, 7th Armored Brigade never used the Golani Infantry Brigade or 75th Armored Infantry

Figure 5. An improved Israeli Centurion tank at the Israeli Armored Corps Museum. This tank was considered in many respects superior to the Soviet T-54/55 the Syrians deployed in the Golan Heights Campaign. *(Courtesy Wikimedia)*

Battalion to suppress the ATGM teams. Although the effectiveness of the Sagger and the RPG-7 rose to mythical proportions immediately after the war, a post-war analysis found that tanks were the more effective antitank weapon. Ninety percent of Arab tanks and 70 percent of Israeli tanks were destroyed by tank fire.[47] Had the Syrians effectively massed their antitank fires, the outcome may have been different.

Although many tank commanders, including Kahalani, didn't know their crews, their training soon compensated for their initial lack of familiarity with each other. At the beginning of the war, there was only enough ammunition stocks in the northern sector to support 188th Armored Brigade. Ammunition shortages throughout the campaign attenuated the combat power of IDF armor formations. Consequently, IDF tanks carried only a third of its basic load. Tanks pulled from storage were not boresighted and had to be calibrated at the beginning of combat operations.[48]

There was a huge imbalance between the tactical performances of the IDF and the Syrian army. Although force ratios overwhelmingly favored the

Syrians, this quantitative advantage was irrelevant because of their tactical ineptness. Syrian forces repeatedly conducted frontal attacks and rarely maneuvered. Their meticulously planned offensive and centralized control precluded improvisation by its commanders. When they did maneuver, their movements were slow, tentative and predictable. Conversely, the IDF commanders, operating within a more permissive command-and-control environment, were able to quickly move their elements to critical points on the battlefield. By outflanking the Syrians and attacking their formations on their approach routes, the ensuing traffic congestion set-up a lucrative target environment for IDF armor.

Kahalani's leadership and the motivation of his soldiers were decisive. Israel's soldiers weren't fighting for some abstract principle – since the War of Independence in 1948, they have fought for Israel's survival. When imploring his reluctant tankers to follow him in the last battle in the Valley of Tears, Kahalani invoked their sense of nationhood. To this end, Kahalani ensured that each soldier understood he or she shared in the responsibility of defending the country.

The IDF did not adopt mission command until 2006. However, Kahalani and his subordinates throughout the defensive phase of the Golan campaign demonstrated the power of a mission-command type of philosophy. OZ 77 exemplified the importance of unit cohesion and mutual trust. Kahalani's trust in his soldiers and they in him was unbroken. His persistent display of disciplined initiative consistently provided OZ 77 and 7th Armored Brigade opportunities to exploit Syrian weaknesses. When the battle seemed lost, Kahalani used mission orders to rally his soldiers. Although prudent risk-taking is a principle of mission command, with Israel's survival at stake, Kahalani had no other choice than to risk it all at the Valley of Tears.

Retired LTC Lee Kichen served in command and staff positions in armor, armored-cavalry and mechanized-infantry units in the United States and overseas. He also served on the Army Staff and Training and Doctrine Command staff. LTC Kichen's military schooling includes Air War College (non-resident), Command and General Staff College, Armor Advanced Officer Course and Armor Officer Basic Course. He holds a bachelor's of arts degree in history from the University of Massachusetts-Amherst, a master's of social-sciences degree in sociology and political science from Pacific Lutheran University and a master's of arts degree in counseling psychology from Chapman College. His awards and honors include the Legion of Merit (one oak-leaf cluster) and Meritorious Service Medal (two oak-leaf clusters).

Notes

[1] Known in Israel as the Yom Kippur War and by the Arab nations as the Ramadan War. Although Egypt and Syria were the major belligerents, Iraq, Morocco and Jordan played limited roles near the end of the war.

[2] Uzi Ben-Solomon and Eitan Shamir, "Mission Command Between Theory and Practice: The Case of the IDF," *Defense and Security Analysis*, No 2, June 2011.

[3] Chaim Herzog, *The War of Atonement: The Inside Story of the Yom Kippur War*, Yorkshire, UK: Front Line Books (imprint of Pen and Sword Books, Ltd.), 2018.

[4] Reserve MG Giora Eiland, *Defensible Borders on the Golan Heights*, Jerusalem: Jerusalem Center for Public Affairs, 2009. The author viewed this terrain in May 2018 from Bunker 107, which overlooks the Valley of Tears, location of OZ 77's final fight.

[5] Kenneth M. Pollack, *The Arabs at War: Military Effectiveness, 1948-1991*, Lincoln: University of Nebraska Press, 2004.

[6] Jerry Asher with Eric Hammel, *Duel for the Golan: The 100-Hour Battle that Saved Israel*, Pacifica, CA: Pacifica Military Press; originally published by William Morrow and Company Inc.

[7] Email from retired BG Gideon Avidor, IDF, to the author, subject: "Ramps and IDF armor battalion operations," April 12, 2019.

[8] Avraham Adan, *On the Banks of the Suez*, Novato, CA: Presidio Press, 1980, cited in George W. Gawrych, *The Arab-Israeli: The Albatross of Decisive Victory*, Leavenworth Papers No. 21, Fort Leavenworth, KS: Combat Studies Institute.

[9] Central Intelligence Agency (CIA), *The 1973 Arab-Israel War: Overview and Analysis of the Conflict*, September 1975.

[10] CIA. Pollack, citing many sources, indicated Syria had as many as 1,650 Soviet tanks on hand.

[11] Jerry Asher with Eric Hammel, *Duel for the Golan: The 100-Hour Battle that Saved Israel*, Pacifica, CA: Pacifica Military Press, originally published by William Morrow and Company Inc.

[12] Avigdor Kahalani, *The Heights of Courage: A Tank Leader's War on the Golan*, Santa Barbara, CA: Greenwood Press, 1973. Battalion personnel were airlifted and bused to Sinai while an advance party drew combat vehicles from prepositioned stocks.

[13] Avigdor Kahalani, *A Warrior's Way*, Bnei-Brak, Israel: Steimatzky, 1999.

[14] Gawrych. Many believed these movements were training exercises.

[15] Kahalani, *Heights*.

[16] Asher and Hammel.

[17] MG Yitzhak Hofi commanded Northern Command, which had responsibility for the Golan Heights. The 36th Division was wartime or provisional headquarters commanding 7th Armored Brigade, 188th Armored Brigade and 74th Infantry Brigade. IDF task-organization and boundaries from division to company changed often and on the fly throughout the battle. See Asher and Hammel.

[18] Avigdor Kahalani interview by Geoffrey G. Prosch, *Military Review*, Vol LIX, No. 10, October 1979. "I do have the perception, as a commander, that you must have a reserve. This gives you flexibility."

[19] Avigor Kahalani, *A Warrior's Way*; Samuel Katz, *Israel's 7th Armored Brigade: Fire and Steel*, New York: Pocket Books, 1995.

[20] Asher and Hammel.

[21] Kahalani interview.

[22] CIA.

[23] Pollack.

[24] Pollack; Herzog.

[25] Asher and Hammel; Katz.

[26] Kahalani, *A Warrior's Way*.

[27] David Lemelin, *Command and Control Methodology: A Sliding Scale of Centralization*, master of military art and science thesis, Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1996.

[28] Although Israeli tanks were equipped with xenon searchlights, they were used sparingly to preclude Syrian tanks from adjusting their fire off the searchlight.

[29] Kahalani, *A Warrior's Way*.

[30] Katz.

[31] Kahalani, *Heights of Courage*, and Kahalani interview.

[32] Kahalani interview.

[33] Herzog.

[34] Kahalani, *A Warrior's Way*.

[35] Abraham Rabinovich, *The Yom Kippur War: The Epic Encounter that Transformed the Middle East*, New York: Schocken Books, 2004; Hertzog.

[36] Avigor Ben-Gal quoted in Dani Asher, ed., *Inside the Northern Command: The Yom Kippur War on the Syrian Border*, American edition, Lexington, KY: University Press of Kentucky, 2004.

[37] Kahalani assumed command of 71st Mechanized Infantry Battalion after both its commander and deputy commander were killed; in Asher.

[38] Katz.

[39] Kahalani, *A Warrior's Way*; Katz; Asher.

[40] Rabinovich.

[41] Kahalani interview, *The Story of Avigdor Kahalani*, Friends of Israeli Disabled Veterans.

[42] Pollack.

[43] Hertzog.

[44] Kahalani, *A Warrior's Way*.

[45] Kahalani interview.

[46] Kahalani interview.

[47] CIA.

(Editor's note: The United States recognized Israeli sovereignty over the Golan Heights in March 2019 – the first country to recognize the Golan as Israeli territory – while the rest of the international community still considers it Syrian territory occupied by Israel.)

LEGENDS OF ARMOR

"MUSA"
"On The Road To Damascus"
Major General Moshe Peled
Israeli Armour Corps
1926 - 2000

Implementation of Quadcopter Unmanned Aerial Systems into Reconnaissance Platoons

by SGT Christopher Broman

During the past 18-plus years of conflict in the global war on terrorism, the U.S. military has witnessed the effectiveness of unmanned aerial systems (UASs) in a variety of mission sets. In the beginning, these systems were large and expensive, which initially allocated them to the role of theater-level or battlespace assets. As the years have progressed, miniaturization has allowed these assets to filter down to the squadron and troop levels with systems such as the RQ-11 Raven.[1] As mass production increases and their uses expand, these systems are becoming both smaller and relatively inexpensive to produce.[2] As a result, between 2004 and 2008, the number of UAS deployed globally increased from around 1,000 to 5,000 systems.[3]

This widespread availability has been demonstrated best not by near-peer threats but by non-state actors such as the Islamic State in Iraq and Syria (ISIS). During the battle for Mosul, ISIS flew more than 300 missions in one month, using off-the-shelf drones that cost as little as $650, mainly quadcopters.[4] Of those missions, about 1/3 were armed strikes, with the remaining missions being intelligence, surveillance and reconnaissance (ISR).[5] This demonstrated both the ready availability of these assets and their effectiveness, especially in urban settings. Despite this, most U.S. troop-sized elements still have only one UAS asset readily available: the RQ-11 Raven system. Instead, each cavalry troop should be operating two quadcopter drone systems per platoon in addition to having the Raven.

Why platoon level?

The use of UAS at platoon level is not an unknown concept in reconnaissance operations. Both Field Manual Interim (FMI) 3-04.155, *Army Unmanned Aircraft System Operations*, and Field Manual (FM) 3-20.98 have chapters on platoon elements using UAS to conduct operations. The manuals describe how UAS can be assigned to reconnaissance platoons to conduct detailed recon of danger areas, assist with route recons or be used for contact-by-fire.[6] Concerning UAS elements being controlled by the scout platoon, the manual states, "[T]his relationship allows the platoon the most flexibility. The platoon leader can integrate the capabilities of the UAS into the reconnaissance plan in a seamless manner. He [or she] can then respond quickly to mission/target changes."[7]

Unfortunately in many cavalry troops, the use of UAS, specifically the Raven, isn't seen as a primary sensor system critical to conducting key reconnaissance tasks. This treatment of UAS elements as an ancillary system means that integration of their employment into troop operations is not only ineffectual but often non-existent.[8] Units often don't conduct battle drills with their Ravens, meaning that the crews don't get practice putting their drones into operation quickly during regular operations.[9] For most crews, the only time they bring their Ravens out of the box is either for an inventory or for their 150-day flight for recertification.[10]

More problems such as trying to clear restricted operating zones and commanders worrying about losing systems that were designed to be "thrown away" if lost often means that systems simply sit on supply-room shelves.[11] This lack of use means platoons don't get to practice integrating the troop UAS into their reconnaissance plans.

There are also challenges for the units that do use their UAS systems. With only one Raven team per troop-sized unit, the asset is often prioritized for use against named areas of interest or even farther forward of the platoons to look for possible threats. While it is extremely important to get this type of intelligence, it often means that unless a platoon is part of the main effort, it cannot use UAS assets in support of its mission. Even with the Raven team under operational control (OPCON) of a platoon, the platoon's leader runs into the same problem of prioritization if operating in two- or three-truck sections.

For example, if all three platoons are running two sections, the troop commander has to divide the use of one UAS element among (potentially) six maneuver elements. This doesn't even include the possibility of dismounted teams. To change this lack of UAS integration, each platoon needs to have two UAS systems organic to its modified table of organization and equipment (MTOE). By having two systems available, the platoon leader can either have each section use one to aid in its reconnaissance tasks, or use one for close-in ISR support while the second moves in advance of the platoon. In either case, the platoon can use the drones in conjunction with other assets, such as the Long-Range Advanced Scout Surveillance System (LRAS3), to create redundancy in its operations.[12]

For example, picture a scenario where the scout platoon is tasked with route reconnaissance and has two UASs as part of its organic composition. The platoon leader designates Drone A to operate one to two kilometers forward of the maneuvering sections, while Drone B operates directly in front of and to the sides to help clear dead space and laterals. Drone A detects a manmade obstacle and begins overwatch. The platoon leader can maneuver either a truck with an LRAS3 or dismounts with Lightweight Laser Designator Rangefinders onto the site. Now, he or she can detach Drone A to continue searching forward of the platoon or have it stay on station for redundancy of sensors, while Drone B is free to conduct other tasks.

If the platoon leader is instructed to

bypass and hand over overwatch to a follow-on element, he or she can have a drone maintain recon while the mounted and/or dismounted elements collapse from their positions. Once done, the elements can move out with one drone still scanning forward as the platoon moves and the other drone watching the area until the handover is complete. Then it can be retasked.

The preceding scenario illustrates why independent operation of two UAS drones at platoon level is beneficial. By having these as readily available assets, platoons can involve them during planned training exercises or during "sergeant's time" in the field. This will increase leadership's understanding of their function, and it will give the operators increased confidence in the equipment and their abilities.

Yet, while the Raven is an important tool in the ISR arsenal, it is not the best UAS asset for the platoon. Instead, a UAS quadcopter design would be most beneficial.

Why quadcopters?

A quadcopter is a UAS drone that uses four motors to power two pairs of counter-rotating, fixed-pitch blades located at its four corners.[13] The motors do not require complex mechanical control linkages to operate because variations in motor speed allow it to maneuver. This simplifies aircraft design and operation.[14] Research has shown that the "most versatile and mechanically easy to construct autonomous aerial vehicle is a quadrotor helicopter."[15] This ease of construction and use is why they have been become highly popular in commercial markets. A simple search on a retail store's Website showed more than 30 different types of quadcopters available with prices ranging from $30 to $3,000.[16]

The most obvious advantage of the quadcopter design is its increased agility over conventional planes. Quadcopters are so agile that the Drone Racing League flies quadcopters over the seats and through the concourses of the Miami Dolphins stadium at speeds approaching 80 mph.[17] This agility means that a quadcopter UAS could fly in environments where a Raven could not, such as within heavily forested areas or vertically dense cities. Where a

Raven can only fly over the woods to look for enemy locations, hoping to see them through the foliage, a quadcopter can fly under the canopy to find hostile positions. They can also be flown inside buildings and compounds to help quickly see if there are potential booby traps or ambush sites before execution of a breach.

The quadcopter's ability to hover just feet off the ground while providing real-time imagery day or night would be invaluable to reconnaissance platoons. During route reconnaissance in Afghanistan, scout-platoon dismounts have to clear culverts for the presence of improvised explosive devices before

trucks can move forward. While LRAS3s or Ravens can search the area, they can't look low enough to actually see inside the culverts. Therefore dismounts must still try to safely get eyes on. However, a quadcopter that can hover just outside the culvert's opening can get the same intelligence without having to involve a dismount. This keeps Soldiers safe. This same capability can be used to inspect other structures such as bridges, too.

This kind of use of quadcopters is already employed in the civilian sector.[18] The hover and low-level flight ability of these drones also means operators can train themselves and others on basic

Figure 1. SPC Michael Kobart (left) and SGT David Vidrine, both with Troop A, 3rd Squadron, 71st Cavalry Regiment, 1st Brigade Combat Team, 10th Mountain Division (Light), inspect the Gen4 InstantEye during training in Baghdad, Iraq. The InstantEye gives Soldiers the ability to see what is around them without endangering personnel. *(U.S. Army photo by SGT Cheryl Cox)*

operations inside large open spaces such as drill floors.

Advantages over Raven

A quadcopter has many advantages over the Raven because of its vertical take-off and landing capabilities, especially when it comes to launch and recovery. The difficulty of launching the Raven in zero wind conditions is increased and requires the crew to throw the system from atop a vehicle or building.[19] The system also requires a clear area to launch safely. Landing must also be made in a clear area, and the system "lands" by stalling about 10 feet off the ground before falling and breaking apart (designed to come apart with easy reassembly).

Instead, a quadcopter can take off easily in calm or windy conditions, and it can pierce the densest forest canopy as long as there is a small hole. A quadcopter drone can not only take off from the operator's hand, but it can land by hovering just a few feet away, allowing the operator to grab it safely from the air. This means that a Bradley crew could launch and recover its UAS just by cracking the top hatch enough to set the quadcopter outside the Bradley.

Regarding the ISR mission, quadcopters have an advantage as well. Both traditional and quadcopter systems have day and night camera operations, but systems like the Raven must continuously circle the target. A quadcopter can instead hover just behind cover and rotate in place to change its view. Many systems come naturally equipped or can have payloads of gimbaled cameras attached to the drone to increase its surveillance ability. The InstantEye family of quadcopters not only can have gimbaled cameras attached, but they can also mount white or infrared floodlights to illuminate targets. They can also mount a 10x zoom video camera.[20]

This ability to attach mission-specific payloads and the increased agility of these platforms are a few of the reasons why the Navy and Marine Corps Small Tactical Unmanned Aircraft Systems Office (PMA-263) ordered 800 InstantEye systems in February 2018.[21] The purpose of the 800 systems is to include them organically into infantry squads to enable ready-to-use UAS capabilities at squad level.[22] The system ordered is the Mk-2 GEN3-A0, which is considered "expendable" since it does not store digital data onboard.[23] It requires only a single operator; can go from stowed to operational in 30 seconds; has a two-kilometer range; and weighs only 1.2 pounds.[24] This same system was also tested by the troopers of 3rd Squadron, 71st Cavalry Regiment, overseas during their deployment for Operation Inherent Resolve.[25]

While there are significant benefits to the quadcopter design, there are disadvantages. The Raven battery gives it a flight time between 60 to 90 minutes on a single charge.[26] Currently systems like the InstantEye Mk-2 GEN3-A0 only have enough battery capacity for about 30 minutes.[27] While industry leaders are currently looking at hybrid power or fuel cells to solve this issue, it may be awhile before they match comparable flight times to traditional UAS like the Raven.[28]

Probably a more significant issue is that of electronic warfare and/or cyber threats. In 2009, newspapers across the country had headlines describing insurgents grabbing Predator drone feeds, using $26 software to access unsecured communications links.[29] Later in 2011, the drone fleet was affected by a virus found on classified and unclassified computers at Creech Air Force Base, NV.[30] An increased awareness of these threats led to Department of the Army to order Soldiers to cease all use of the Dajiang Innovation family of quadcopter drones in May 2017, citing "increased awareness of cyber vulnerabilities" as the reason.[31]

Many drones immediately return to a designated point if they lose their control signal.[32] This means that enemy actors could use specialized jammers to create an operational area where our drones cannot operate, not dissimilar to the U.S. military's use of phone jammers overseas. This kind of ability is already being seen in operational theaters. On April 10, 2018, the **New York Post** reported that Russia was jamming the Global Positioning System (GPS) components of U.S. drones in Syria.[33] Another similar problem is that drone operations rely heavily on GPS data to know where the ground-control station, the enemy and the UAS are located. Enemy actors could "spoof" the GPS information being received, resulting in the system going to either false-target locations or areas where the enemy could capture the asset.[34] A possible answer would be the use of the already available simple-key loader devices to encrypt drone GPS systems.[35]

Regardless, as technology advances, both the Department of Defense and manufacturers will need to ensure that their drones can face these threats to operate on future battlefields.

How to implement

The Army should designate a mix of Active Component and National Guard squadrons as testing units. These should be a mix of light (such as airborne), medium (Stryker and infantry brigade combat teams) and heavy (armored-cavalry regiments and armored brigade combat teams) squadrons to encompass all aspects of cavalry operations. These units should have two or three trained Soldiers per platoon who receive necessary training in flight and systems management, overseen by a squadron master trainer.

The master trainer would be responsible for both the quadcopters and assets like the Raven. Each platoon would receive two quadcopter UAS systems and start receiving training from the troop trainers. For the MTOE, the drones should be assigned to the section leaders' crews. This would ensure that in either the two- or three-truck section, the UAS would be in the maneuver elements to maximize reconnaissance assets forward.[36]

The troop could then plan force-on-force reconnaissance missions, using both platoons to maintain its UAS proficiency and to start learning how to avoid UAS. With the rise of enemies such as ISIS now using UAS against us, it is imperative that reconnaissance platoons understand how best to counter these operational threats.

The troop should also integrate drone reconnaissance into these missions, using the Raven system to support one of the platoons with its task, or to act as a third party and try to find any opposing-force (OPFOR) maneuvering elements within its designated reconnaissance area. This would give troop

and platoon commanders the experience of using the troop's Raven asset to aid in reconnaissance plans. Proficiency should reach a level where the troop can plan a reconnaissance mission with the UAS available, which is habitually integrated in the plan to ensure redundancy and continuous reconnaissance.

While this process is occurring, squadrons would be taking lessons-learned from across the various line units to create a unit standard operating procedure (SOP) for employment of the Raven and quadcopters UAS. The squadron should also start practicing integration of the brigade's organic UAS asset: the RQ-7 Shadow aerial-reconnaissance platoon.[37]

The increase of UAS assets in the area of operations will require deconflicting airspace with conventional fixed- and rotary-wing aircraft. This will be a key task for the squadron tactical-operations center.

The Marines experienced this issue during the Sea Dragon 2025 Integrated Training Exercise. Solutions they found were the use of brevity codes to automatically bring UAS down to either a restricted altitude and/or grounding flights if low-level close-air-support was needed, and developing a five-line radio call (to provide pertinent information for air assets) to submit to higher to get company-level UAS to fly higher than 1,000 feet above ground level.[38]

The culminating event for the squadron would be to go to a training center to conduct a force-on-force operation with UAS integration from squadron to platoon level. This could either be done as part of a brigade rotation or as a stand-alone event. During this event, a Shadow aerial-reconnaissance platoon should be OPCON to the squadron. Once all the squadrons finish their rotations, an evaluation of lessons-learned from both the squadrons and the OPFOR should be conducted. The Army could then take this information and create a cavalry-squadron UAS SOP and best practices for all cavalry units to use going forward.

The final key to the implementation process is getting leadership the resources to best access the incoming UAS feeds. Currently, most troop and platoon leaders do not have the capability to watch drone feeds from any UAS asset inside their vehicles while moving. A possible solution could be the installation of viewing systems such as the One-System Remote Video Terminal (OSRVT) into vehicles. This laptop-like system has an adaptor kit, so it can operate from almost every Army vehicle.[39]

In 2015, a Stryker brigade used the OSRVT system, installing it from brigade to company level during a rotation at the National Training Center, Fort Irwin, CA.[40] If these systems are able to view feeds from quadcopter UAS, then installing them into the vehicles of the section leader, platoon sergeant and platoon leader would enable the leaders to view footage from UAS systems organic at all levels of a brigade. These systems should also be installed in the vehicles of the troop commander, first sergeant, executive officer and the TOC to enable the same capability. Even if the platoons do not get their own UAS, the troop and platoon leadership should still be equipped with drone-viewing systems to better integrate the UAS assets they already have.

Other alternatives could include using radio systems such as the Harris Corp's RF-335, which is designed to support full-motion video from nearby drones, a capability that could even be used by dismount-team leaders away from vehicle-based systems.[41]

Conclusion

While the "standard-issue cavalry scout" will always be the Army's primary reconnaissance sensor, that scout will need other systems to help increase effectiveness, namely drones. The use of drones on the battlefield will grow exponentially during the next 10 years as technology advances. As an indicator of this, U.S. Special Operations Command requested more than $74 million for the 2019 fiscal year (FY) to procure a variety of UAS, including $10 million for 527 nano-sized vertical take-off and landing UASs.[42]

The Army's "cargo-pocket" ISR program is already looking at deploying pocket-sized aerial-surveillance devices to the squad level.[43] In the future, these will be essential to small-team operations such as a dismounted listening posts/observation posts, but at the platoon level, it will still be essential to have an organic UAS asset that can provide real-time intelligence on the move. As stated in the ***Reconnaissance and Scout Platoon*** manual, "UASs provide additional information needed by the platoon leader to determine which routes and cross-country terrain best accommodate reconnaissance operations."[44]

While there are currently multiple UAS already available, none of these can match the agility and employability of the quadcopter UAS. They are more agile, simple to deploy and can operate even in dense vegetation and complicated urban terrain. Quadcopters also have the capability to land on terrain or buildings, and they can be used as a remote video sensor, something no Raven could even attempt. Simply put, the addition of quadcopter UAS into the platoons would only increase their ISR capabilities and overall lethality.

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ACRONYM QUICK-SCAN

FM – field manual
FMI – field manual interim
FY – fiscal year
GPS – Global Positioning System
ISIS – Islamic State in Iraq and Syria
ISR – intelligence, surveillance and reconnaissance
LRAS3 – Long-Range Advanced Scout Surveillance System
MTOE – modified table of organization and equipment
OPCON – operational control
OPFOR – opposing force
OSRVT – One-System Remote Video Terminal
SOP – standard operating procedure
UAS – unmanned aerial system

Managing 0-100 Feet Above Ground Level: Aviation Employment, Airspace Management in Decisive-Action Fight

by MAJ Adam S. McCoy

I've served as the brigade aviation officer (BAO) observer/coach/trainer at the National Training Center (NTC), Fort Irwin, CA, for more than 19 rotations, and the question I am asked above any other is, "How do we manage airspace while integrating fires and aviation?" The fact is, airspace management is complicated and becoming increasingly difficult to manage.

New developments in unmanned aerial systems (UAS), combined with our desire to push micro-UAS to the platoon and team level, have made the first 100 feet of airspace within a designated area of operations the most congested and difficult block to manage. As brigades increase aerial system capability, their responsibility to integrate, synchronize and deconflict airspace users within their boundaries also increases; thus, the investment in the air-defense and airspace management/brigade aviation element (ADAM/BAE) must be greater.

Home-station training
Airspace management starts with home-station training during brigade collective training, supported by division headquarters and the combat-aviation brigade. The brigade must develop and implement an integrated aviation-employment strategy for both attack- and lift-aviation support. Integration of liaison officers (LNOs) from the combat-aviation brigade into the ADAM/BAE is critical for the operational success of the brigade combat team

Figure 1. The 1st Stryker BCT, 25th Infantry Division, conducts an air-assault mission Feb. 8, 2019, at NTC. Integration of LNOs from the combat-aviation brigade is critical for the BCT's operational success during collective-training events. *(U.S. Army photo by MAJ Adam McCoy)*

(BCT) during collective-training events. Professional military education (PME) and a firm doctrinal foundation is the way forward.

Due to the confines of restricted airspace and training area availability, airspace management during home-station training is often done with far less rigor than required for the unit to develop and test the airspace-management portion of its standard operating procedure (SOP). To be successful with airspace management during decisive action:

- Brigades must have trained it. Brigades must understand how to develop a unit airspace plan (UAP) and how it transitions to the airspace-control order.
- A division-level headquarters is able to and responsible for leveraging its G-3-Air and air-support operations centers to ensure certification of BCT ADAM/BAEs, as well as the fire-support cell, during home-station training to maximize brigade training time at combat-training centers (CTCs).
- PME for Soldiers within the ADAM/BAE is just as important as field training. However, there is a general lack of PME attendance – for example, at the ADAM/BAE, Digital Master Gunner or Joint Firepower courses – which plays a significant role in functional and operational understanding.

Also, airspace doctrine (Field Manual (FM) 3-52, *Airspace Control*, and Joint Publication 3-52, *Joint Airspace Control*) is not well understood by airspace users or managers, including fire support and ADAM/BAE cells and maneuver units.

Planning

For the brigade to integrate, synchronize and deconflict aviation operations, and synchronize airspace users in support of ground maneuver, brigades must conduct the planning and the battalions must refine it. While that sounds intuitive for most, from experience I can say many staffs are unwilling to be directive with subordinate units – primarily due to concerns with battalion-commander or operations-officer personalities – while citing "mission command" or "decision-point tactics" as the reason for the lack of detail. However, mission command does not mean the brigade should hand subordinates an incomplete plan with the idea that subordinate commanders can/should figure it out. As a former "Bronco 07" and mentor of mine once said, "Brigade has a six-to-one planning overmatch over any battalion in the Army."

This is not a design flaw in our organizational structure. It's designed to support continuous combat operations. Battalions deserve the opportunity to provide bottom-up refinement, but the

time available for refinement can only occur if the brigade has invested in staff processes and planning repetition. Synchronization of echelons-above-brigade (EAB) assets and brigade enablers is the responsibility of the brigade staff and inevitably of the commander. Aviation and airspace planning, not unlike ground-maneuver planning, also falls to the brigade staff for integration, and repetition is the only way to improve. There is no "magic sauce" or shortcuts in detailed planning.

Attack-aviation employment

Development and implementation of an integrated aviation-employment strategy simplifies the BCT's UAP and promotes integration between fires and aviation in support of combined-arms maneuver (CAM). Aviation employment in close-friendly contact is one of the fastest means by which BCTs complicate the maneuver, airspace and fires plans. To reduce operational friction, simplify the airspace plan and reduce fire-mission processing time in a degraded communications environment. BCTs should consider an integrated aviation-employment strategy that minimizes the usage of airspace-coordination measures and airspace-coordination areas (ACAs) for attack aviation. For this strategy to work, BCTs should enable aviation as a maneuver

Figure 2. An AH-64 attack helicopter lands at the aviation tactical assembly area (TAA) for rearmament and refuel during live-fire operations at NTC. *(U.S. Army photo by MAJ Adam McCoy)*

Figure 3. A simulated chemical strike on the aviation TAA at NTC is conducted as part of training Sept. 14, 2018. *(U.S. Army photo by MAJ Adam McCoy)*

force with appropriate maneuver and graphic-control measures.

During the maneuver plan's development, BCTs often use AH-64s "over the shoulder" or in close-friendly contact in conjunction with a combined-arms battalion (CAB). This method of employment is required occasionally to provide the necessary combat power at the decisive point or to the decisive operation. However, detailed direct-fire control measure (DFCM) planning must be conducted.

In addition to DFCM planning, a robust communications architecture – including a detailed UAP with multiple air corridors and ACAs – must be developed. Then it must be rehearsed and deconflicted with fires to function well. Employment of the AH-64 as a "mobile fires platform" in support of close-friendly contact minimizes AH-64 lethality due to limited maneuver space within ACAs. AH-64 lethality is also reduced as the evolving situation on the ground becomes more complex as enemy and friendly forces mix. To maximize the AH-64's capability, BCTs are far better off to treat them as a maneuver force, enable them and employ them out front.

AH-64s employed in a shaping operation on the flanks or forward of the coordinated fire line (CFL) provide commanders lethality and observation beyond the capabilities of organic systems or scouts. This method offers attack weapons teams increased

freedom of maneuver and lethality while reducing coordination requirements and shortening fire-mission processing times in support of CABs. Integration is still required to ensure operational success. Suppression of enemy

Figure 4. An AH-64 helicopter supports the Fort Hood, TX, leader battlefield circulation to Blackjack Brigade. *(U.S. Army photo by MAJ Adam McCoy)*

ARMOR ⚔

air defense in the form of indirect fire or electronic warfare is necessary to support AH-64 maneuver, requiring synchronization and integration by the BCT staff and the aviation fire-support officer. As a best practice, Shadow UAS flown in front of AH-64s cued to an electronic intelligence platform can assist the BCT in identifying enemy air-defense artillery radar and targeting.

Lift-aviation employment

Lift-aviation planning is often overlooked and underdeveloped by the brigade staff during the military decision-making process (MDMP). In retrospect, after direct-fire contact is made, staffs quickly recognize their shortfalls in lift planning. Lift planning, like attack planning in a decisive-action operation, requires a fundamental shift in employment methodology. Point-of-injury pickups for medical evacuation (MEDEVAC) and casualty evacuation (CASEVAC) – as well as ring-route support for utility and cargo aircraft – are still conducted on a case-by-case basis, but they occur far less than in the counterinsurgency environment. In decisive-action operations, MEDEVAC and CASEVAC operations are primarily used to support patient transfers from air ambulance exchange points (AXPs) or Role I to Role II medical-support locations.

Bulk-commodity distribution at the brigade echelon is conducted mainly by logistical trains using unit and supply-point distribution vs. CH-47 ring route. Utility and cargo aircraft still have a role in combat resupply, but due to consumption rates of classes of supply during large-scale combat operations (LSCO), their role has shifted to support emergency resupply of finite commodities or battlefield reconstitution. While aerial resupply/air movement support may be trending downward for utility and cargo platforms in the decisive-action training environment, requests for aerial retransmission and air assault have increased. Tempo, range, enemy contact and terrain make communication one of the single most difficult challenges for units to overcome in decisive operations. UAS as well as the UH-60M are uniquely suited to extend a BCT's communications capabilities.

Aerial retransmission can undoubtedly enhance a brigade's communication architecture, but if not sequenced correctly with event triggers, it can negatively impact a brigade operation during a critical phase. In addition to aerial retransmission, the commander's willingness/need to exploit the opportunity and seize key terrain in front of an advancing enemy force has made air-assault operations critical for Stryker BCTs, and it is beneficial for armor BCTs. Detailed planning is the only way to synchronize these operations.

Airspace planning for lift aviation during MDMP is initially conducted as course of action (CoA) development. It is refined during CoA analysis (wargaming). There are multiple methods brigades can use to plan for the employment of lift aviation to enable air movement, aerial retransmission, air assault, MEDEVAC or CASEVAC while also remaining deconflicted with surface fires:

- The most critical aspect of airspace planning is to ensure the process is codified in writing within the brigade SOPs. Planning for lift aviation should (generally will) involve the support operations officer or sustainment representative, brigade-level S-4, S-1, medical officer, aviation LNO and BAO. Like attack-aviation planning, lift planning should be complete following the development of the maneuver plan as part of shaping or sustainment operation in support of the decisive operation.

- To support MEDEVAC or CASEVAC operations, air AXPs developed by the brigade within each CAB's battlespace affords the brigade the ability to integrate and synchronize aviation assets and airspace in support of patient transfers without directing Role I medical locations.

- Air movement in support of combat resupply and battlefield reconstitution integrated and synchronized through logistic resupply points (LRPs) allows the brigade to further develop airspace in support of sustainment operations.

- Air movement to unit maintenance command posts or combat train command posts is an option for the brigade.

- Proximity to the forward-line-of-own troops and constant survivability moves of those elements can prove problematic and make it difficult, but not impossible, for the brigade when planning.

- The use of LRPs and air AXPs whose locations are directed by the brigade and tasked through mission orders allows the brigade to develop air routes through the CAB's battlespace, remaining deconflicted from primary assigned aircraft and DFCMs while supporting a permissive fires environment.

In LSCO, brigades generally play a much more active role in air-assault planning as well. Air-assault operations against a near-peer threat with an integrated air-defense system requires support above the battalion echelon, but that is generally easier to say than execute. In addition to the threat, units find themselves well inside the 96-hour planning window more often than not. Due to mission complexity and shortened timelines, air-assault operations are incredibly resource (read *leader*) intensive to execute. The most successful brigades have a firm understanding of FM 3-99, *Airborne and Air Assault Operations*, and FM 3-04, *Army Aviation,* integrating air-assault operations into their SOPs and using the weight of the brigade staff.

The BAO is not the sole brigade staff officer responsible for planning an air assault, and CoA development is generally the latest step in MDMP when a brigade decides to execute air-assault operations. Airspace planning at the brigade to support an air-assault operation should get the aircraft through the brigade consolidation area, a CAB's maneuver space into an ACA's initial point or release point, or the aviation task force's own battlespace. Aviation LNOs from the combat aviation brigade or aviation battalion task force (ABTF) are key to mission planning and ultimately mission success.

Liaison officers

There is little utility in sending the wrong LNO from an aviation brigade or ABTF to support a BCT. LNOs sent to a BCT are an investment by a combat aviation brigade commander.

Qualifications for these officers are stated in Training and Evaluation

Outline (T&EO) Task 01-BDE-436: "The aviation brigade commander must implement an LNO certification program at home station to ensure that aviation LNOs are proficient in the full spectrum of air-ground integration. Fully qualified aviation LNOs should be captain's career course graduates and have pilot-in-command experience. They should possess a strong knowledge of the aircraft and the units in the aviation brigade." LNOs must be aircraft agnostic and, in addition to a strong working knowledge of aircraft within the brigade, he or she must also have a strong MDMP foundation.

Although the T&EO suggests that the LNO be a career-course graduate, some of the best LNOs I've ever seen were warrant officers.

In most cases, the LNOs sent from an aviation unit to a BCT serve in the plans section. As planners, they afford the aviation commander maximum lead time on upcoming missions and have access to products as they are developed. Resources permitting, an LNO in the support-operations shop improves the commodity/aviation interface.

LNOs aside, there is no substitute for a commander-to-commander dialogue to shape and develop the plan early to maximize aviation integration.

Conclusion

Development and implementation of an integrated aviation-employment strategy simplifies the BCT's UAP and promotes integration between fires and aviation in support of CAM.

Airspace management is an investment that starts at home station. Airspace management during home-station training must be conducted with rigor or the necessary foundation can never be built. Having the division headquarters integrated into brigade collective-training events can provide an external assessment and facilitate the required rigor at home-station training. ADAM/BAE personnel have a PME requirement that cannot be overlooked and should be a brigade investment. CTCs should not be the first time the brigade employs joint fires.

Develop the ground-maneuver plan first and then build the aviation-maneuver plan that supports it with the necessary airspace required to meet the operational endstate. Employment of AH-64 Apache attack helicopters in the "over the shoulder" role or in close-friendly contact is difficult to manage in a degraded communication environment, and it is the fastest way to complicate the airspace plan and often induce unnecessary operational friction. Employment of attack aviation

Figure 5. View of the Central Corridor at NTC as an 11th Armored Cavalry Regiment (Blackhorse Regiment) helicopter moves through it Jan. 20, 2019. *(U.S. Army photo by MAJ Adam McCoy)*

on the flanks and forward of the CFL with brigade artillery and organic aerial sensors – as well as cavalry scouts and EAB enablers – simplifies the UAP, and it decreases fire-mission processing time while allowing CABs increased small-UAS employment agility.

Lift aviation provides the brigade commander with opportunities that are unexploitable by any other means. Lift aviation provides commanders the ability to rapidly expand the security zone, seize key terrain in front of an advancing enemy force, move critical classes of supply quickly, reduce communications gaps, improve mission command and reduce the died-of-wounds rate after contact is made. Airspace must be deliberately planned at the brigade level, and it must have allocated airspace to prevent friction with indirect fires.

Integration of the right LNOs is critical for aviation integration within the BCT. Undervaluing the position by resourcing the BCT with an individual who lacks working tactical-aviation knowledge – or one who cannot plan for all airframes within a combat aviation brigade – is a disservice to the BCT and the aviation unit.

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The Nature of Warfare:
Has Clausewitz Maintained Relevancy?

by MAJ Chaveso Cook, MAJ Charles Slider and MAJ Terron Wharton

What is the nature of warfare? Wess Roberts, in his managerial classic **Leadership Secrets of Attila the Hun**, says that for humans "conflict is the natural state."[1] Warfare is man's natural state writ large, the extension of individual conflicts to the overarching body politic. Over time, societies grind themselves toward conflict at an individual level, and this natural order of man translates over to the body politic writ large.

A few theorists have tried to capture those sentiments regarding our understanding of warfare – namely Carl von Clausewitz, a prominent theorist, who captured these sentiments in his seminal work **On War**. War, he states, is "different than anything else."[2] When attempting to understand past wars, scholars often cite aspects of Clausewitz's theories and their significant role in explaining war's nature. One could contend that Clausewitz's ideas find the most relevance on the World War I battlefield, and his theories provided the philosophical underpinnings for much of the strategic thought and

grand campaigning of the early 21st Century.

Undoubtedly, Clausewitz's theories continue to provide a useful foundation for the study of warfare. However, one must never forget that, like human beings, warfare is not immutable. Warfare is an extension of man's natural state, and just as man and society change over time, so goes the nature of war. While World War I demonstrates a near-textbook case of Clausewitz's principles, those same theories arguably provide less utility in the current state of limited, small-scale warfare and even large-scale combat operations of the future unless viewed through a different context.

This article's purpose is to illustrate this contextual disunion and provide viewpoints for a new theoretical use.

Fascinating 'trinity'

One of Clausewitz's most prominent ideas is his "trinity." In the simplest terms, Clausewitz saw war as an interplay among policy, passion and probability. The interaction between elements shapes and defines the very nature of warfare.

Policy. War is an extension of policy. Policy derives from government, with war subordinate to policy and subject to reason. Interestingly, in World War I, we saw the inverse: policies of the time grew out of the necessities of winning the war. Whole-of-government approaches arose to maximize the promulgation of national will with regard to victory at almost all costs. The national will became the center of gravity – everything else was subordinate.

Competing nations searched to find the balance, but the desire for military victory overshadowed everything. Economic policy became geared toward strategic military success, and both the Allies and the Central Powers "understood the geometry and modern style of warfare through a bloody process of mutual education."[3] In Germany, the Hindenburg Plan arose as a national production plan overseen by the government to support the war efforts.[4] Conservative estimates say the Allies spent $80 billion more on the war than the Central Powers, even with America's late entry.[5]

In the end, the pendulum swung too

Figure 1. Map of military alliances of Europe in 1914. The years preceding the start of World War I were marked by smaller wars and arms races. *(Map courtesy of Wikimedia)*

far, and instead of war supporting policy, war became policy. For Germany, this swing was unsustainable and, ultimately, irrecoverable. Once political, economic and social conditions in Germany approached fatal deterioration, the German military leaders, now the virtual rulers of Germany, were forced to give in and cease hostilities.[6] Thus, allowing war to become policy instead of a method at a achieving specific policy aims, and the subsequent failure as a result, reinforces Clausewitz's point.

Passion. Next, passion concerns the people, a blind force that exists in "primordial violence and enmity."[7] World War I's large-scale death, suffering, violence and casual indifference to it all at a national level had yet to be seen in human history. In metaphorical fashion, World War I simply represented the ferocity of individual human nature. States personified what psychologist Stanley Milgram would come to call humanity's "banality of evil."[8]

Probability. Probability is the trinity's final element and represents the effects of random chance on the other two elements. In *On War* we read that

when war is "no longer theoretical but becomes a series of its own actions, reality supplies the data from which we deduce the unknown."[9] However, all the predictive analysis in the world could not have predicted conditions on the World War I battlefield. In fact, most leaders on both sides thought the war would be over in very short order or would follow the European tradition of limited casualties from a national perspective.

The casualty rates begged to differ. War contains millions of variables that cannot be controlled or accounted for: the rifle that misfires, the supply convoy that took a wrong turn in the dark or the staff officer who drew a boundary line 800 meters from where it should have been, thereby creating a point of penetration between his own units. In the end, these small, random acts of chance can have just as much of an effect on warfare's outcome as a dedicated people or brilliant strategy.

Guns of August
Clausewitz's trinity provides the underpinnings for the rest of his thoughts on warfare. Later in his work, Clausewitz

proposed the concept of **absolute war**, a philosophical construct centered on achieving political victory by military force aimed at the total destruction of the enemy's forces and military capacity.[10] Clausewitz identified three reciprocal actions as part of absolute warfare: the maximum use of force, the disarmament of the enemy and the maximum exertion of strength.[11]

Absolute warfare is often confused with **total warfare**, which sees a nation mobilize every aspect of its society in support of warfare, often to the point where the distinction between military and civilian capacity is nearly indistinguishable. World War I is widely considered the first modern instance of total war. Despite absolute war and total war being different things (one a construct, the other an approach), the reciprocal actions are observable in both.

The first reciprocal action involves employing sheer force by both numerical and motivational superiority. Clausewitz posited that the side undeterred by bloodshed would gain the upper hand if the other side restrained

itself.[12] Application of force must be achieved, as comparative figures of strength, or "war by algebra," would not be enough.[13] This first manifested in 1914 as nations began to mobilize. All the governmental and military leaders of the belligerent nations planned as if "the dread of loss would ensure failure; [one] can assume that troops who are not afraid of losses are bound to maintain superiority over others who are more sparing of blood."[14] In adherence with first reciprocal action, those involved automatically accepted the fact that there would be heavy losses, so much so that when the casualty rates began to climb, "they were not seen as horrifying as they were seen to be a measure of national resolve."[15]

The second compels coercing the enemy to forego war by placing them in a situation that is "even more unpleasant than the sacrifice you call on him to make."[16] As the Great War continued, it became apparent that to exert the maximum number of casualties, both sides would have to move toward attrition warfare. Clausewitz would argue that one side would have to dominate the other to point of submission and loss of will. However, the irony is that both belligerents would recognize this and continue to sink resources lest all past efforts came to naught. As such, World War I certainly became a bloody test of wills.

Author T.D. Pritcher reminds us of the Clausewitzian position that war's object is destroying the enemy's will to fight. Destruction of morale capacity, rather than physical forces, is the key to victory.[17] The machinegun, massed artillery bombardments, poison gas and other technological advancements, combined with a disregard for casualties, resulted in a loss of life that will remain one of the greatest stains in human history. However, no matter how stubborn nations are as political entities, nations as a collection of people have limits. As America entered the war, the tide began to reverse. Toward the end of the war, the Germans were surrendering in droves. Between July and November of 1918, 760,000 deaths, coupled with an estimated one million deserters or service refusals, drew the war to a close.[18] Their morale had been broken, German will destroyed, as their spring offensives of 1918 failed.

The third reciprocal action is the totality of means. Belligerents reached a grand crescendo of destruction as each ramped up their manufacturing capabilities to equip their forces with more and more capacity for destruction, all in an effort to impose their nation's will on another. Millions of artillery shells were fired for a singular offensive alone. The use of poisonous gas in various forms was a direct conflict with the Hague Treaty of 1899 and the Hague Convention of Land Warfare of 1907, but both the Central and Allied Powers used it. In explaining why one would do so, a corps commander almost quotes Clausewitz's idea of reciprocity by saying "war is about incapacitating more of our enemies than they do of us, and if this can only be done by our copying the enemy in his choice of weapons, we must not refuse to do so."[19]

World War I also saw unrestricted submarine warfare, which directly contributed to the United States' entry into the war as Germany devolved to sinking anything near their island enemy's coastal zone. The use of offensive and defensive power simply grew to a "degree rare in the history of war."[20]

Next, a look at World War I trench warfare is imperative. The Western Front alone saw 475 miles of opposing trench lines that extended from the North Sea all the way to Switzerland. To the east, one would find 1,000 miles of trench lines, though by similar manning standards the distance would make it seem to be more sparsely defended. Barbed wire and field fortifications ruled the day, taking away a great deal of the maneuver. In Book VII of *On War*, we find the quintessential point of Clausewitzian theory applied to trench warfare in World War I as he states that "a well-prepared, well-manned and well-defended entrenchment must be considered an impregnable point."[21] Though the Germans were the first to dig in, both sides determined that defilade and cover would limit the effects of destructive weaponry. "No man's land" was born.

Michael Howard describes this eventuality between combatants, saying, "There will always be an impassable zone of fire deadly in equal degree to both foes."[22] Hew Strachan captures the effects of this on the grandest of scales, stating that the stalemate years of World War I created a classic dilemma for its leaders to debate "whether to save lives by pulling back to a better position or to hold ground and risk greater losses."[23] Arguably, World War I strategy became heavily dependent on defense. Clausewitz predicted all this, believing that defenders would hold fast to their defensive advantage to the point of non-maneuver, a prediction that came through as "the battle smolders away like damp gunpowder" from 1915-1917.[24]

Analyzing World War I via the lenses of the three reciprocal actions, trench warfare in the defense and the paradoxical trinity shows the early transcendence of Clausewitz's theories. "The skepticism for strategic maneuver, the dogged refusal to be put off by heavy casualties, [among others were] all familiar Clausewitzian principles deployed to justify the continuation of attacks" in World War I.[25] Some would say that he even predicted the outcome of World War I as the genesis of World War II: "in war, the result is never final."[26]

Figure 2. Canadian troops advance with a British Mark II tank at the Battle of Vimy Ridge, 1917. *(Photo courtesy of Wikimedia)*

Armor

Figure 3. Aerial view of the ruins of Vaux-devant-Damloup, France, 1918. Belligerents reached a grand crescendo of destruction as each ramped up their manufacturing capabilities to equip their forces with more and more capacity for destruction. *(Photo by Edward Steichen, public domain, National Archives and Record Administration record 1444144)*

Though Clausewitz died 73 years before its beginning, warfighters still gain understanding of the Great War through his theories on warfare. Clausewitz's work was long seen as "the ultimate foundation upon which every [military] regulation in Europe had been reared."[27]

War ~~never~~ changes

While his theoretical perspective is foundational, Clausewitz could not have factored in the massive influence current technology plays in influencing the strategic, operational and tactical aspects of warfare. Increases in technological advancements have all but leveled the playing field. Global Positioning Systems (GPS), encrypted communication, unmanned surveillance and computer network intrusion – capabilities once reserved for the most

powerful nation-states – are all available at low or no cost to anyone.

He could also not predict the seismic shift in the international environment caused by World War II, the Cold War, the American Hyperpower Period, the rise of transnational terrorism and globalization.[28] Clausewitz's international environment was defined by Great Power competition in continental Europe. While countries rose and fell in power and prominence in an almost cyclical fashion, there was never enough disparity for one to run roughshod over the others for very long.

Today, Great Power competition, at least via open warfare, is a distant memory, considered mostly in thought experiments and wargames. Norrin Ripsman and T.V. Paul indicate that international competition has shifted

national security from the battlefield to the boardroom as globalization has made traditional rivals economically entwined with varying degrees of separation.[29] In other words, most open warfare is bad for business, as corroborated by Nobel-prize winner Joseph Stiglitz.[30] As such, military matters now occur in limited fashion, mostly by proxy, with limited means for limited ends.

As the combat environment has changed, so has most of the utility found in Clausewitz's principles. While Clausewitz's views on the trinity and the three reciprocal actions may have textbook application in World War I, they fail to translate in several areas to modern conflict. Examples from the wars in Iraq and Afghanistan (Operations Iraqi Freedom and Enduring Freedom respectively, as well as New

Dawn), conflicts such as Somalia (Operations Restore Hope and Gothic Serpent), and movements such as the Arab Spring illuminate the disparity.

Breaking news

The average Briton only knew their nation was at war in Europe. They may have known casualties were high, but not necessarily how high. They never saw the effects of massed artillery, poison gas or the rampant disease that tore through trenches. Most got their information from either the newspaper or their nation's leaders, but, minus firsthand accounting, there was no way for the average citizen to independently verify or challenge what they were being told.

Leaders could stoke or quench national passions to support their own ends by controlling the flow of information. As policy aims changed, leaders could manipulate passion (to an extent) to support those policy aims. As such, when Clausewitz's trinity was first proposed, policy and passion remained relatively in balance. The Internet changed that dynamic forever.

Today's 24-hour news cycle and information democratization can shift passions to influence or shift policy before policy has been given the chance to work, especially due to constant and rapid changes.[31] Had German soldiers conducted mass executions during World War I, the average French citizen would have no idea unless there was a person able to relay the story firsthand or the French government saw it useful to release. As the Islamic State in Iraq and Syria (ISIS) marched across those two countries, ISIS' brutality was beamed directly to not only those in Iraq and Syria but to the entire world's masses.

The Arab Spring protests provide another example of how governments no longer have the biggest hand in controlling passion. Nearly all the nations affected by the Arab Spring had large or total control on the media, information and the ensuing narrative. What they could not control was social media, and the visceral nature of conflict has remained burned in the minds of the international community.

With nothing more than a cellphone and an Internet connection, any person today can become a reporter with global reach – with their views, opinions and stories accessible to millions without filter or oversight. During the Arab Spring, individuals beamed images from the streets, protests and government crackdowns directly to billions of people worldwide – from average citizens to cabinets, judges, generals, presidents and prime ministers. Instead of a government controlling passion in support of policy, the people on the ground used information technology to harness passion and subsequently shift the policies of multiple governments – and ultimately upended the social, political and economic order of their own nations as well as a large swath of the Middle East.[32]

Roll the dice

Increase of technological means in modern warfare reduces one of the core variables of the trinity: chance. At the turn of the 19th Century, an assassin eliminated a dictator, propelling the world into unscrupulous conflict. Prior to the assassination, a cable sent to the assassin failed to reach him in time, thus thrusting major nations of the modern world into World War I. In the 21st Century, the speed of communications and platforms would have eliminated or limited such a costly action and prevented massive military and civilian casualties throughout World War I.

Information technology created tools resulting in vastly increased situational awareness and understanding. As the availability of information increases, the effects of chance decreases. Today, world leaders are able to contact each other within minutes due to the increases in communication devices, reducing doubt of pre-emptive strikes, major troop movements and policy changes influencing adjoining nations. Videoteleconferencing enables senior civilian officials and military leaders alike the ability to interact without hindrance of distance, allowing presidents, prime ministers and generals access to advisers anytime or anywhere, lessening the potential likelihood of uninformed decisions.

Chance can never be eliminated completely, of course. A vehicle will always fail to start, a gun will always jam or the network stacks may go down as one headquarters tries to send an update to another. However, modern technology such as GPS, global communications, satellite technology and others drastically reduce information gaps and the fog of war that once greatly enabled chance, especially from the perspective of Clausewitz.

Figure 4. A protester holds a placard in Tahrir Square referring to Facebook and Twitter, acknowledging the role played by social media during the 2011 Egyptian Revolution. *(Photo courtesy of Wikimedia)*

All or nothing

Earlier wars were ones of extremes: the maximum application of violence, greater will and totality of means was not just about ensuring victory, as the loser often faced complete destruction.[33] As such, every war posed an existential threat to the participants, with a loss potentially meaning the end of the loser's nation. Such was life in the world of Great Power competition.

Today's battlefield is defined by small-scale actions, limited engagements, irregular participants, counterinsurgency and proxy conflict. As such, there no longer is a clear "winner" or "loser," nor is there always-definitive policy outcomes, either in the short or long term. Columbia political scientist Dr. Page Fortna argues that this trend began with the Cold War.[34] As such, a country "losing" in today's conflicts does not equate to destruction or extinction. Should the war effort in Afghanistan utterly collapse in defeat in 2019, people in Chicago, New York, Los Angeles or even arguably DC will continue to live as they always have. Citizens are not going to worry about the government crumbling, being subjected to hostile forces marching through the streets or the American way of life coming to an end.

If there is no threat of extinction, then what need is there to exert maximum force? Why bleed generations dry? Why increase taxes and institute rationing? Why watch hundreds of thousands of caskets return from the front? If the cause is limited, then so are the gains. In that sense, it no longer is wise for any nation to go "all in."

Will to power

The second reciprocal action concerns disarming enemies by removing either their physical capacity or the will to wage war.[35] While this often involved a large amount of physical destruction, it did not have to. Disarmament could be achieved by achieving a position of relative advantage, either tactically, operationally or strategically. However, in any case, physical proximity was always a factor: proximity between forces or between a force and an opposing center of gravity. In either case, there were physical limitations to power projection governed by logistics and lines of communication. Range was never infinite in Clausewitz's day.

That is not the case today. What need is there for a field army when one state can push a button and send a conventional, or even nuclear, missile into the heart of a rival's territory? Moreover, what is the need for a missile when a single man with an explosive vest can achieve the same effect at the right time and place, or by an offensive cyber operation shutting down a power or communications grid? Technology, both in terms of weaponry and its enabling of globalization, has reshaped what it means to have positional advantage. Coupled with passion, it has also changed not only how national will can be affected, but also by whom.

For example, in 1992, President George H.W. Bush sent U.S. forces to Somalia as part of Operation Restore Hope in an effort to restore order to Somalia and provide humanitarian assistance. In August of the following year, the United States launched Operation Gothic Serpent aimed at capturing Mohamed Farrah Aidid. Gothic Serpent culminated Oct. 3-4, 1993, in the ill-fated raid that became known as the Battle of Mogadishu. The overall casualties were nowhere near those of World War I (19 U.S. servicemembers and about 800-1,000 Somalis killed). However, the images of dead U.S. soldiers being dragged through the streets that were broadcast globally over television were cataclysmic. On Oct. 6, President Bill Clinton ordered military operations halted, with a full withdrawal by March 1994.

Technology, in the form of global media and satellite communication, gave the Somalis a relative advantage that force of arms could not. In turn, it snuffed the American will to fight in Somalia and resulted in a change in U.S. policy.[36]

While the second reciprocal action remains valid, the methods to achieve it are fundamentally different. Social media, the Internet, precision weaponry and global reach of both state actors (via power projection) and violent non-state actors (via transnational crime, smuggling and radicalizing actors already within a state), coupled with an aversion to casualties, have radically altered the amount of resources, effort and violence it takes to achieve relative advantage. Actors, both state and non-state, can now achieve relative advantage and force capitulation from multiple domains as opposed to solely on the battlefield, and do it relatively cheaply compared to the resources expended during World War I.

Just because you can …

The absence of the fear of extinction and changes in relative advantage combine to affect the third reciprocal action: totality of means. As stated before, why put forth maximum effort and suffer maximum casualties for limited outcomes? Also, if relative advantage can be achieved with less resources in a domain outside the battlefield (which can incur massive costs in terms of people and national treasure), then why bother with open warfare? Based on the first two, it is only logical that totality has changed as well.

The Law of Armed Conflict now holds *proportionality* as a tenet. By definition, belligerents must only use the minimum force necessary to gain military advantage, as opposed to all means at their disposal.[37] Limited aims give way to limited war, resulting in limited means. Massed artillery bombardments have been replaced by precision weaponry. Special Operations task forces deploy in the place of field armies.

Pictures of civilian casualties resulting in the Allied firebombing of Dresden during World War II were not shown on the evening news around the globe. Pictures of civilian casualties in Iraq and Afghanistan are only a Google search away.

It is important to note that while technology can negatively affect national will, it can also harden resolve. Al-Qaeda believed that the Sept. 11, 2001, attack would cause the United States to withdraw its forces and influence from the Middle East, so al-Qaeda invested a significant amount of resources and planning into the attack. Instead of destroying U.S. will, the attack brought about the only Article V invocation in North Atlantic Treaty Organization (NATO) history and initiated the Global War on Terrorism.[38]

Instead of ending a nation, the 9/11 attacks produced major combat operations in Iraq and Afghanistan, poured billions of dollars more in military aid into the region and generated Special Operations counter-terrorist efforts across Africa, the Middle East and the Indo-Pacific region. In the end, al-Qaeda saw much of its capacity destroyed, and while it remains, it is a shadow of its former self.

For Clausewitz, totality equated to victory. Today, technology and globalization have introduced complexities such that totality does not guarantee victory and, in fact, can ultimately lead to defeat.

Conclusion

Clausewitz provided the most solid foundation for modern military philosophy. Even unfinished, his work revolutionized how professionals viewed warfare and strategy. If Clausewitz did not continue to have relevance, this article could not exist. However, the world is not incontrovertible. While Clausewitz's ideas on the trinity and reciprocal actions still have relevance, what has changed is their application.

The interplay between passion and policy is still very much a critical factor for those leading nations. Chance can still wreck even the most carefully coordinated operations. Endless debates have occurred in Congress and the Oval Office over troop levels in Iraq and Afghanistan. America was not all-in for limited war. National will to fight still matters as America learned (to its detriment) in Somalia, and as al-Qaeda learned through its destruction in Afghanistan and Iraq. Means remain important, as misapplication of means can lead to defeat via passion shifts as quickly as it can occur due to military losses.

Clausewitz and his ideas will always remain relevant. The trinity and reciprocal actions will always have a place on both the battlefield and strategy sessions. However, to continue reaping their benefits, we must shift and adapt them to modernity.

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Figure 5. The north face of Two World Trade Center (south tower) immediately after being struck by United Airlines Flight 175. Al-Qaeda's attacks on the United States on 9/11, instead of ending a nation, galvanized it to action in the Middle East. *(Photo courtesy of Wikimedia)*

University. His awards and decorations include two Military Outstanding Volunteer Services medals for sustained community and organizational investment; a bronze-level MG Robert McClure Medal; and the 2016 Secretary of the Army Diversity and Leadership Award, given to one officer yearly for commitment to equal-opportunity practices, Army Values and the professional development of others.

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ACRONYM QUICK-SCAN

ABCT – armored brigade combat team
CGSC – Command and General Staff College
GPS – Global Positioning System
ISIS – Islamic State in Iraq and Syria
JBLM – Joint Base Lewis-McChord
NATO – North Atlantic Treaty Organization
O/C/T – observer/coach/trainer
SAMS – School of Advanced Military Studies
USMA – U.S. Military Academy

Deception: the Operation We Avoid

by CPT Andre C. Aleong

In the opening months of 1944, aircraft from the German Luftwaffe conducted multiple reconnaissance flights over the English Channel. After-action summaries from missions would later report sighting large masses of armored vehicles postured as a potential invasion force. As these missions continued, the German army became confident they had determined the timing and locations for the eventual Allied invasion of northern France. Armed with their newly acquired information, they immediately moved reinforcements to augment defenses at a major port region known as Pas de Calais.

Much to their dismay, the Allies never landed at Pas de Calais and instead landed in Normandy. In time, the Germans would learn that the Allies deliberately deceived them and that the large masses of vehicles they sighted were actually decoys. This military operation, known as Operation Bodyguard – along with another operation known as Operation Anadyr (Russian) – shared one thing: they were deliberately planned deception operations that enabled armies to achieve a tactical advantage over their foe.

Although these operations occurred during the modern era of warfare, the concept of deception is not new, as examples of deception operations date back to the Middle Ages. As we examine our Army today, we can conclude that deception operations are not as prevalent as they were in the past, and that units no longer place the same amount of emphasis on planning and executing deception operations. Current trends at combat-training centers (CTCs) such as the Joint Multinational Readiness Center (JMRC) indicate that units seldom conduct, and often completely avoid, deception operations.

Habitually, commanders and staffs visit JMRC and commence the requisite steps associated with the military decision-making process (MDMP). As the staff transitions into course-of-action (CoA) development, priorities center around planning a CoA that nests with criteria such as "massing effects" and "synchronizing combined-arms maneuver." Rarely do units account for deception and view it as an operation that enables mission success.

On the contrary, we see a different trend when we observe armies from allied or partnered nations when they conduct operational planning. Armies from partnered nations, especially those from Eastern Europe (Poland, Ukraine and Romania), usually incorporate deception into their military operations.

When the British execute "the combat estimate," the military equivalent of our MDMP, deception is a necessary criterion for a valid CoA. In the earliest stages of their planning cycle, they challenge their leaders to use their imagination and resource a deception plan.

Why do we not see U.S. rotational training units (RTUs) place the same amount of emphasis on deception that our allies and partners do? Observations from observer/coach/trainers (O/C/Ts) at JMRC continue to show that deception is an operation that is perpetually underused, and it is a skill where RTU level of proficiency has deteriorated. We trace the cause of this to three factors: 1) we do not understand the importance of deception; 2) we do not discuss deception at length at the institutional level; and 3) we do not evaluate or observe deception as a mission-essential task (MET).

Why is deception important?

Military deception (MILDEC) facilitates mission success by convincing opposing forces (OPFOR) to take certain actions based on perceived friendly actions. Joint Publication 3-13.4, *Military Deception*, defines MILDEC as "actions executed to deliberately mislead adversary military, paramilitary or violent extremist organization decision-makers, thereby causing the adversary to take specific actions (or inactions) that will contribute to the accomplishment of the friendly mission."[17]

Ideally, when units effectively employ MILDEC, it forces the enemy to prematurely commit its forces and expose its scheme of maneuver, which enables friendly forces to gain time and space to refine CoAs based on newly acquired information on enemy actions. MILDEC also extends a unit's freedom of maneuver to conduct follow-on actions such as disruption or isolation of enemy forces.

The Battle of Cowpens is a classic example where such actions occurred. At Cowpens, a portion of the Continental Army deliberately engaged a numerically superior force with the intent of disrupting the British army for a specified period. Forces conducted a bold feint, followed by a planned retreat, to draw out a larger force and successfully led their adversaries to a larger force

Figure 1. A British army decoy battle position during Rotation 19-04 Allied Spirit X. *(Photo by CPT David C. Hale, Timberwolf Maneuver Team)*

in waiting. This tactic allowed the Continental Army time to conduct a double envelopment that isolated the British army and secured victory.

Modern examples of deception illustrate that future potential threats are also employing deception operations. During the recent conflict in Crimea, separatist-backed forces used tactical and strategic deception to mislead Ukrainian forces. At the tactical level, forces conducted exercises close to the Ukrainian border, which served to distract Ukrainian forces and enable Special Operations Forces and conventional forces to infiltrate Crimea. Once inside Crimea, deception operations continued as forces disguised themselves as civilians and humanitarian workers. At the strategic level, misinformation campaigns aired on news and social-media outlets with the intent of subverting the Ukrainian government and creating an environment of distrust with the populace.

This concept, commonly referred to as *maskirovka*, has a prominent presence in Russian military doctrine.

Maskirovka is "the art of deception – to elevate the complete set of actions and conditions that fall short of war that enables battlefield victories to be decided before tanks and infantry close in battle."[2]

In the preceding examples, armies fought in a scenario where they did not initially hold a tactical advantage over their foe or they preferred to fight small engagements until they acquired information from their enemy. In both instances, they relied on deception to make limited contact until they gained a position of relative advantage. To achieve deception, both armies had to commit forces and assume some level of tactical risk.

Why are U.S. units that come to CTCs uncomfortable with assuming such tactical risk? Recent conflicts, starting with the Persian Gulf War, created a culture where our army enjoyed an overmatch against its opponents. This fostered an environment where units needed to conduct significantly less analysis with respect to risk mitigation. Emerging threats, especially in Crimea,

demonstrate this will not always be the case. We may likely face an enemy where we both will share parity across multiple domains – including cyber, electronic and air warfare. Inculcating leaders to plan and execute MILDEC operations is vital if we intend to combat a near-peer enemy.

Institutional level – learning MILDEC early

When leaders attend the Armor Basic Officer Leader's Course and Maneuver Captain's Career Course (MCCC), the program of instruction provides little discussion on the subject of deception. Blocks of instruction outline deception techniques such as a feint, but they do not include practical application of MILDEC.

At the noncommissioned-officer level, leaders share the same experience during their time attending the Advanced and Senior Leader's Courses. During rotations at JMRC, the benefits of planning and employing deception operations are not usually immediately apparent until training units observe
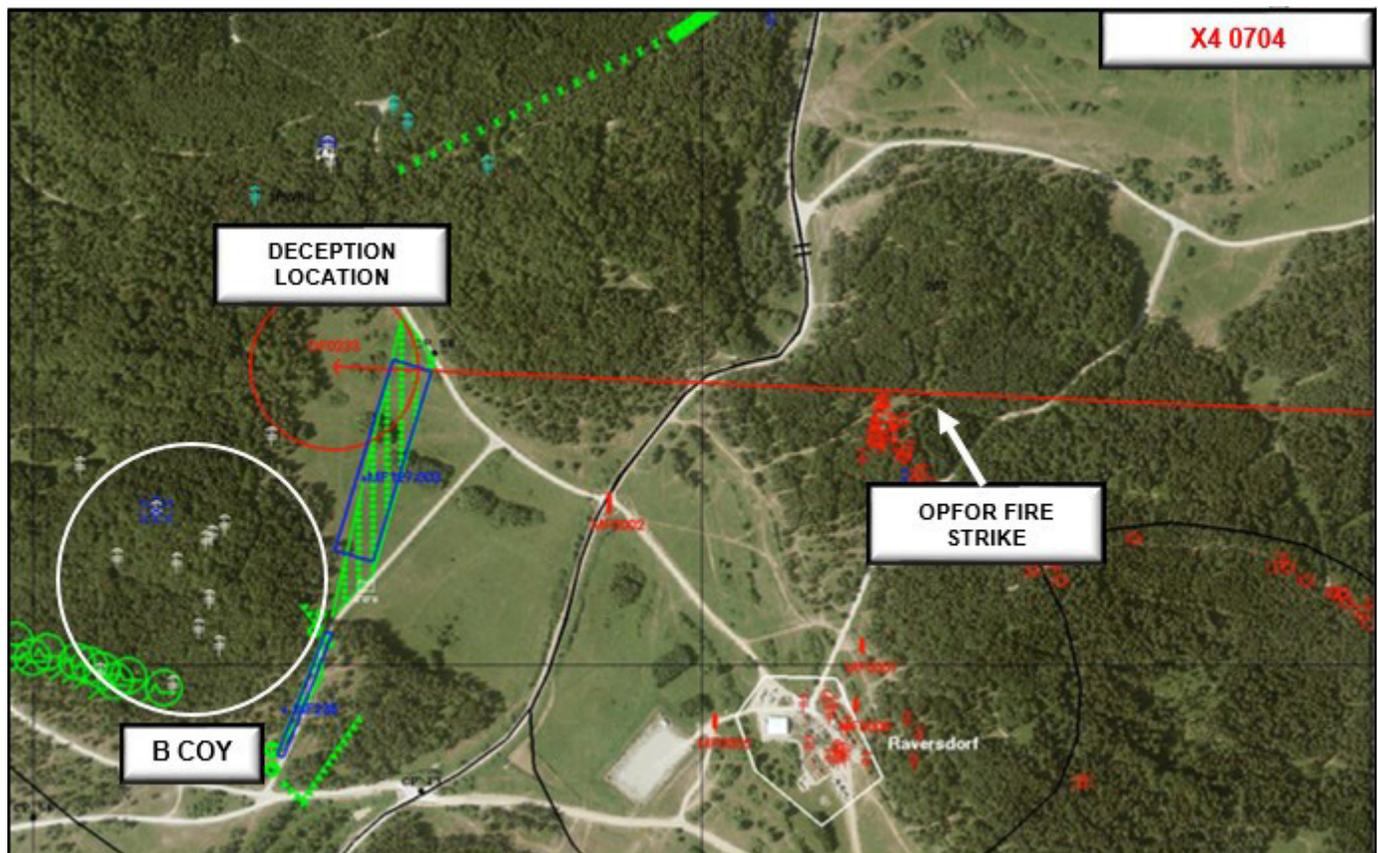

Figure 2. JMRC instrumented system playback of an OPFOR fire strike against the British army's decoy battle positions during Rotation 19-04 Allied Spirit X.

RTU from other nations execute MILDEC and see the tangible results that deception operations produce.

Multinational units that plan and execute deception operations succeed because they execute deception at all echelons and indoctrinate their subordinates to understand its significance. During rotations at JMRC, multinational units have continued to use small-scale deception techniques such as deliberately creating dust trails with armored vehicles to deceive the enemy of the location of their defensive belts or their direction of attack.

Another technique most recently seen at JMRC during rotation Allied Spirit X involved a British infantry battalion digging and constructing decoy battle positions, which included constructing dummy silhouettes and placing ration heaters adjacent to fighting positions to create a false thermal signature. The results of their labor effectively deceived the OPFOR, leading them to fire several BM-21 indirect-fire missions at the British decoy battle positions.

These tactics allowed units to achieve surprise and regain the initiative despite the fact that OPFOR outnumbered them and possessed superior assets such as attack aviation.

The trend of MILDEC operations at CTCs does not only pertain to multinational units. As we have seen over the last few decades, OPFOR at all three CTCs are experts in the art of deception. To achieve the same level of proficiency, we should educate our leaders as early as possible and encourage them to train on MILDEC during professional military education (PME).

Is deception a metric we care about?

For units to attain proficiency with MILDEC, we should also use existing systems to track progress. O/C/Ts at CTCs currently assess unit performance based on METs outlined in training evaluation and outlines (TE&Os). In some cases, units are not aware that several battalion METs list deception as a performance measure.

None of the TE&Os for all three brigade combat team formations currently list deception as a critical or leader task. This discourages units from planning deception operations because deception is not a performance measure that units must accomplish to achieve proficiency on their assigned MET. To incentivize units to train on deception and illustrate its importance, we can elevate MILDEC planning from a performance measure to a critical task.

What is the fix?

To reverse the trend of unit tendencies to avoid planning and employing deception operations, change should start at the institutional level. Presently, leaders receive blocks of instruction on what defines deception operations during PME. However, military schools do not mandate deception as a task that leaders must plan and execute prior to graduation. We can expand the curriculum to include deception as a critical task that is necessary for a student to complete to graduate from a PME course.

MCCC provides a great venue where we can implement this CoA. For students at MCCC, each small-group instructor bases pass or failure of an OPORD brief on a series of tasks outlined in a rubric. Tasks include developing graphic-control measures, developing a plan that uses all enablers and verbally briefing the decisive point. Including deception as a critical task that a student should plan during company phase of MCCC can achieve the goal of making our leaders more proficient with MILDEC.

The intent behind this proposal is not to force students to develop grandiose plans, but rather encourage ingenuity among our leaders during the earliest stages of their military careers. Finally, we can expand current systems such as our TE&Os to stress MILDEC as a factor that necessitates mission success and dictates unit proficiency with a mission task. TE&Os provide a product for CTCs to focus collection on unit trends, but other methods exist to socialize and inform the force. During after-action reviews, O/C/Ts can leverage the OPFOR to share their lessons-learned and share how they coach their subordinates at the lowest level to perform deception operations.

Warfare continues to change, and while new threats are challenging leaders to avoid maintaining the status quo, deception is not a new or revolutionary concept. As Sun Tzu stated, "All warfare is deception." His comment applied then, and it still applies today.

CPT Andre Aleong is the task-force senior analyst for the Timberwolf Maneuver O/C/T team, JMRC, Hohenfels, Germany. Previous assignments include commander, B Troop, 1st Squadron, 1st Cavalry Regiment, 2nd Armored Brigade Combat Team (ABCT), 1st Armored Division, Fort Bliss, TX; assistant operations officer, 1st Squadron, 1st Cavalry Regiment, Fort Bliss; and tank-platoon leader, mortar-platoon leader and executive officer, 2nd Battalion, 5th Cavalry Regiment, 1st ABCT, 1st Cavalry Division, Fort Hood, TX. His military schooling includes Armor Officer Basic Course, Maneuver Captain's Career Course, Cavalry Leader's Course, Joint Firepower Course, Airborne School and Air Assault School. CPT Aleong holds a bachelor's of arts degree in history from the University of Hawaii in Manoa. His awards and decorations include the Order of St. George, Silver Spurs.

Notes

[1] Joint Chiefs of Staff, Joint Publication 3-13.4, **Military Deception**, Joint Doctrine Publications, Feb. 14, 2017; accessed March 8, 2019.

[2] J.B. Vowell, "Maskirova: From Russia With Deception," **Real Clear Defense**, https://www.realcleardefense.com/articles/2016/10/31/maskirovka_from_russia_with_deception_110282.html; accessed March 8, 2019.

ACRONYM QUICK-SCAN

ABCT – armored brigade combat team
CoA – course of action
CTC – combat-training center
JMRC – Joint Multinational Training Center
MCCC – Maneuver Captain's Career Course
MDMP – military decision-making process
MET – mission-essential task
MILDEC – military deception
O/C/T – observer/coach/trainer
OPFOR – opposing force
PME – professional military education
RTU – rotational training unit
TE&O – training evaluation and outline

BOOK REVIEWS

The First Day on the Eastern Front: Germany Invades the Soviet Union, June 22, 1941 by Craig Luther; Lanham, MD: Stackpole Books (Rowman and Littlefield); 2018; 504 pages; $23.76 hardcover.

Craig Luther has undertaken a bold task here in his effort to capture the first day of the largest land battle in history June 22, 1941: the start of Operation Barbarossa. Truly this was a day for the world to hold its breath, far more so than the later battles of Stalingrad or Kursk.

Luther's first venture onto the Eastern Front battlefield was his very readable tome on Army Group Center. (It is not an oxymoron to call that book both a tome and eminently readable, for it was both.) In that work, Luther implicitly perhaps saw the campaign of Army Group Center in Clausewitzian terms, that the war could only be truly decided along the axis of Army Group Center and the potential of its drive to destroy the heart of the Bolshevik regime by the capture of Moscow.

Here with ***The First Day on the Eastern Front***, Luther gives a broad panoramic snapshot of one day across 100 miles of the huge battlespace that would become the Eastern Front. Luther's book is the antithesis of Sun Tzu's overused aphorism of the highest skill being, in essence, avoiding the fight. Here Luther captures shock and awe, a shock and awe the likes the world had never seen and will unlikely see again except for a nuclear conflagration. What we have here is the brutal punch in the mouth, followed by a knee to the face or groin. There is little Jomini subtlety here.

Luther's approach here to writing on the first day of the invasion is both practical and sensible in that he goes from Army Group North to Army Group Center to Army Group South and their various sub-elements spearheading the invasion. ***The First Day*** neatly captures the dynamics of three widely varying terrain compositions facing the three Wehrmacht army groups and how that impacted the first day's fighting. There are two shared terrain characteristics that dominate the first day: 1) there were perhaps more rivers to cross than originally forecast and 2) the border defenses on certain axes of advance were more robust than scholarship has attributed. Generally, the scholars' concept has been that with the Soviet move to the west – thereby their various land acquisitions from September 1939 onward – meant that the new frontiers were poorly protected. Luther doesn't dispute that but notes that time and time again the Wehrmacht ran into defensive zones and field fortifications that were much stouter than previous works had noted. Now that was indeed fascinating.

If there is one other thing to note, the Germans discovered on the very first day that Russian roads, in a word, were non-existent in the Western European sense.

Everyone "knows" the broad outlines and the particulars of the opening moves of Barbarossa, but Luther's work, with his detailed research and drilling down into archives, will make the opening moves fresh and give the reader a sense of being there. Like in his Army Group Center book, Luther extensively mines unit journals of all sizes, as well as journals and letters from Wehrmacht members, Luftwaffe and the diplomatic corps of the various powers. Luther's writing allows him to weave together disparate strands without needing to be so heavy-handed or clumsy that he is forced to label parts of the book DIME-influenced (diplomacy, information, military and economics). But the reader will see the connection.

One could declaim that Luther's book has dull repetitiveness to it – that the tales of the first day, be they after-action reports, staff journals or personal reminiscences, become numbingly indistinguishable. In a factual sense, this bears a ring of truth, for many of the small-unit actions and Luftwaffe strikes flow into one another. Yet what Luther has shown is that despite the sameness, there were, first, appreciable differences in how the three German groups' events unfolded June 22, 1941. Second, these "repetitive" vignettes, multiplied by the hundreds to thousands, declaim why Luther chose this one day to detail, for this one day is the apex of modern warfare in scope, audacity and sheer numbers. This one day stands out like no other in military history. By the vast compilation of events, Luther has opened a window like no other in the works on the Eastern Front – and perhaps even in the writing of military history.

The part I like best in the book? The Day 1 air war, as this is the first book to talk about the Soviet reaction other than having their airfields shot up and planes smashed on the ground *a la* Pearl Harbor, or the oft-repeated vignettes of bomber formations being destroyed *en masse*. The conclusion that stands out here in the Wehrmacht journals and letters is this was a psychological shock to the Ost Front soldier when he had expected this foe would break soon as all the others did.

Luther has contributed mightily with this work to the war in the East. It is indeed a difficult book to put down. We as both an Armor community and those of us fascinated by the Eastern Front can but hope Luther turns his considerable talents to the Ukraine Campaign of 1941.

LTC (DR.) ROBERT G. SMITH

Spearhead by Adam Makos; New York: Random House; 2019; 341 pages; $28 hardcover.

Can former enemies who faced one another in battle find forgiveness and closure at war's end? Adam Makos, author of New York Times bestseller ***A Higher Call***, examines this question in his latest offering titled ***Spearhead***. Makos answers this question through the story of two tankers – U.S. Army Pershing tank gunner Clarence Smoyer and German panzer crewman Gustav Schaefer – who began as bitter wartime enemies before becoming close

friends in their final years. Rounding out the book are a host of supporting personalities including fellow Soldiers, Wehrmacht soldiers and German civilians.

Makos did his homework while writing **Spearhead** by incorporating many first-person interviews and primary research documents to weave a compelling tale covering the last months of World War II in Europe to the present era. The account contains many period photographs of the men and women profiled within its pages that put a human face on a terrible moment of human history. Makos includes several simple but useful maps that further enhance the storyline's tactical details.

Prospective readers should take heed, as this account is no sanitized vision of battle. The author does not shy away from revealing the true face of ground battle in unflinching detail. However, Makos frequently contrasts war's inherent brutality against the unexpected moments of man's humanity revealed in this story.

At its core, **Spearhead** is an engaging and highly detailed description of 20th Century warfare as told through harrowing moments of armored combat interspersed by the routine day-to-day life of Soldiers on the Western Front hoping to see the next sunrise. **Spearhead**, however, is much more than just another book on World War II that is easily read and just as easily forgotten. What sets this work apart is Makos' examination of the bonds shared by all combat veterans as described through individual acts of mercy. If there is a lesson to be learned from this story, it is of the power of forgiveness and an unquenchable desire for reconciliation when the guns fall silent.

LTC CHRIS HEATHERLY

Ghosts of Fallujah by Coley D. Tyler; Athens, GA: Deeds Publishing; 2018; 201 pages with maps and photographs; $19.95.

Coley Tyler links his personal experiences, observations and thoughts with precision in **Ghosts of Fallujah** to excerpts from Steven Pressfield's **Gates of Fire**, which conveys the story of Spartan warriors who fought during the Battle of Thermopylae; his personal interactions with the late retired LTG Harold G. Moore and reading of **We Were Soldiers Once … and Young**; and his reliance on augmentation of facts and events documented by editor-journalist Matt McAllester, an embedded reporter with Task Force 2nd Battalion, 7th Cavalry Regiment, during the Second Battle of Fallujah.

Tyler delivers an insightful and captivating perspective of his assignment as the battalion fire-support officer for Task Force 2-7 Cav (also known as the Ghosts), 1st Cavalry Division. His reflection on what motivated him as a cadet at the U.S. Military Academy; serve as a field-artillery officer in the U.S. Army; and select Fort Hood, TX, to serve with 1st Cav Division as his first duty assignment describes a journey toward "duty, honor, country." His portrayal of individual backgrounds, relationships and actions offer the reader an opportunity to associate with unit leaders and Soldiers. This accentuates the words and thoughts extracted from **Gates of Fire** and **We Were Soldiers Once … and Young**. Tyler's assessment of unit achievements and individual displays of courage highlight the level of commitment required to persevere in a chaotic environment.

For Vietnam War veterans, military historians or occasional readers of military history, this report of the Second Battle of Fallujah may be reminiscent of the heavy urban combat that Soldiers and Marines encountered in the 1968 Battle of Hue City. That 30-day battle resulted in the defeat of an estimated 5,000 Communist fighters in the city of Hue, Vietnam. Tyler's

accounting of the planning, preparation and execution of the Second Battle of Fallujah (code-named Operation Al-Fajr or "the dawn") from Nov. 7 to Dec. 23, 2004, during Operation Iraqi Freedom likewise depicts the synergy between U.S. Army and U.S. Marines Corps units against an Iraqi insurgency stronghold. The 2-7 Cav's gallant contributions to Regimental Combat Team (RCT) 1 aided in defeating more than 3,000 opposing fighters and significantly degraded the Iraqi insurgency's momentum in Anbar Province.

Tyler simplifies military jargon to allow a reader with no military experience or exposure to understand terms of references and language. He explains tactics, techniques and practices employed by platoon- and company-sized mounted and dismounted units to navigate through the confined environs of Fallujah, Iraq. He expounds on the success of integrated ground and air/fire support before and during ground assaults by RCT-1. He illuminates the ongoing command, control, communications, computer, intelligence, surveillance and reconnaissance among maneuvering forces throughout the operation. He effectively communicates the words and reactions associated with commanders exercising the art of command and science of control during engagements to achieve the desired outcomes of the battle. His presentation of maps, photographs and timelines descriptively support the narrative about the importance of the Second Battle of Fallujah.

Ghosts of Fallujah is a recommended read for small-unit leaders and others seeking a short but entertaining non-fictional book over a four-day weekend. This paperback book is a must-read while sitting on the back deck, turret or hull of an Abrams, Bradley, Stryker or Paladin – or in a foxhole, at the range or downrange.

COL WILLIAM A. WYMAN JR.
U.S. ARMY RESERVE

ACRONYM QUICK-SCAN

RCT – regimental combat team

61ST CAVALRY REGIMENT

FORGING DESTINY

The black pall represents the unit's military lineage to 601st Tank Destroyer Battalion and the regiment's determination, strength and support to accomplish the unit's military operations. The 10 stars suggest the campaign participation during World War II. Red and white are the colors used for the Cavalry's guidon. The crossed rifle and saber suggest the combined arms and the lineage of the major elements used to create 61st Cavalry Regiment. The dagger symbolizes the unit's military readiness, the early warriors and the dismounted reconnaissance troop. The distinctive unit insignia was approved Dec. 14, 2005.

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Armor and cavalry troopers thrive in conditions of ambiguity, uncertainty, and complexity; comfortable away from the main body --- out front or on the flanks --- and decisive when leading it. We operate with a mission command mentality always seeking opportunities to seize, retain, and exploit the initiative; creating and preserving freedom of action for our force while denying the enemy options.

Armor and cavalry leaders combine the superior capabilities of our equipment with the ingenuity of our Troopers to find, fix, close with and destroy the enemies of our nation through combinations of mobility; precise, lethal, and overwhelming firepower; and devastating shock effect.

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