
ARMOR
Mounted Maneuver Journal
Summer 2022
Armor 2030
"In the Pursuit
of Mastery"
Headquarters Department of the Army
PB 17-22-3 Distribution A

ARMOR

The Professional Bulletin of the Armor Branch, Headquarters, Department of the Army, PB 17-22-3

ARMOR (ISSN 0004-2420) is published quarterly by the U.S. Army Armor School, McGinnis-Wickam Hall (Bldg. 4), Suite W142, 1 Karker Street, Fort Benning, GA 31905.

Distribution*:* Approved for public release. Distribution is unlimited. Official distribution is made as one copy for each armored brigade headquarters; armored cavalry regiment headquarters; armor battalion headquarters; armored cavalry squadron headquarters; reconnaissance squadron headquarters; or armored cavalry troop, armor company and motorized brigade headquarters of the U.S. Army. In addition, Army libraries, Army and DoD schools, HQDA and Army Command staff agencies with responsibility for armored, direct fire, ground combat systems, organizations and training of the personnel for such organizations may request two copies by sending a request to the editor in chief.

Reprints: ***ARMOR*** is published by the authority of the Chief of Staff, U.S. Army, and is in the public domain except where copyright is indicated. ***ARMOR*** requests that reprinted material carry credit given to ***ARMOR*** and the author. Direct inquiries to Editor in Chief, ***ARMOR***, McGinnis-Wickam Hall (Bldg. 4), Suite W142, 1 Karker Street, Fort Benning, GA 31905.

Features

Departments

By Order of the Secretary of the Army:

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

Official:

MARK F. AVERILL
Administrative Assistant
to the Secretary of the Army
2220906

Armor School Points of Contact

ARTICLE SUBMISSIONS: Articles can be submitted as email attachments to *usarmy.benning.tradoc.mbx.armor-magazine@army.mil.* For all submissions, please include a complete mailing address and daytime phone number.

SUBMISSION POLICY NOTE: We ordinarily do not print articles that have been submitted to, and accepted for publication by, other Army professional bulletins. Please submit your article to only one Army professional bulletin at a time.

GRAPHICS AND PHOTOS: We will accept conventional photo prints or electronic graphic and photo files in no less than 300 dpi PNG or JPG format. (Please do not send photos embedded in PowerPoint and Word.) If you use PowerPoint for illustrations, please try to avoid the use of excessive color and shading. If you have any questions concerning electronic art or photo submissions, contact the Editor in Chief.

UNIT DISTRIBUTION: To report unit free distribution delivery problems or changes of unit address, email *usarmy.benning.tradoc.mbx.armor-magazine@army.mil;* phone DSN 835-2698 or commercial (706) 545-2698. Requests to be added to the official distribution list should be in the form of a letter or email to the Editor in Chief.

EDITORIAL MAILING ADDRESS: U.S. Army Armor School, ATTN: *ARMOR*, McGinnis-Wickam Hall (Bldg.4)**, Suite W142, 1 Karker Street, Fort Benning, GA 31905.**

REPRINTS: *ARMOR* is published by authority of the Chief of Staff, U.S. Army. Material may be reprinted, provided credit is given to *ARMOR* and to the author, except where copyright is indicated. Request all organizations not affiliated with the Department of the Army contact *ARMOR* for reproduction/reprinting permission. Inquiries may be directed to Editor in Chief, ATTN: *ARMOR*, McGinnis-Wickam Hall (Bldg. 4)**, Suite W142, 1 Karker Street, Fort Benning, GA 31905.**

ARMOR* MAGAZINE ON-LINE: Visit the *ARMOR* magazine Website at *www.benning.army.mil/armor/eARMOR/.

ARMOR HOTLINE — (706) 626-TANK (8265)/DSN 620: The Armor Hotline is a 24-hour service to provide assistance with questions concerning doctrine, training, organizations and equipment of the armor force.

ARMOR Editorial Office

Editor in Chief
Lisa Alley (706) 545-9503
Email: lisa.a.alley8.civ@army.mil DSN 835

Writer-Editor
Gary A. Jones (706) 545-8701
Email: gary.a.jones33.civ@army.mil DSN 835

Covers, Art Support, Tanks of the World Feature
Jody Harmon (706) 545-5754
Email: jody.a.harmon.civ@army.mil DSN 835

U.S. Army Armor School

Commandant (ATZK-DF)
BG Thomas M. Feltey (706) 545-2029
Email: thomas.m.feltey.mil@army.mil DSN 835

Deputy Commandant (ATZK-DF)
COL Donald T. Braman (706) 545-2029
Email: donald.t.braman.mil@army.mil DSN 835

Armor School Command Sergeant Major (ATZK-CSM)
CSM Levares J. Jackson Sr. (706) 545-3815
Email: levares.j.jackson.mil@army.mil DSN 835

194th Armored Brigade (ATZK-BAZ)
COL Jason H. Rosenstrauch (706) 626-5899
Email: jason.h.rosenstrauch.mil@army.mil DSN 620

316th Cavalry Brigade (ATZK-SBZ)
COL Ryan T. Kranc (706) 626-8111
Email: ryan.t.kranc.mil@army.mil DSN 620

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

Army Capability Manager-Armored Brigade Combat Team and Reconnaissance (FCFC-CM-ABC)
706.545.2208
COL Jason T. Kidder DSN 835
email: jason.t.kidder.mil@army.mil

Army Capability Manager-Security Force Assistance Brigade (FCFC-CM-SFA)
706.545.5054
COL Paul R. Davis DSN 835
Email: paul.r.davis8.mil@army.mil

CHIEF OF ARMOR'S HATCH

BG Thomas M. Feltey
Chief of Armor/Commandant
U.S. Army Armor School

Armor Standardization and Training Strategy 2030

Today the Armor Branch remains focused on the transition to execution of multidomain operations in a large-scale combat operations context and on the modernization of equipment and organizations with parallel doctrinal updates. These actions are occurring simultaneously with the sustainment of a high deployment tempo. Moreover, the Armor Branch does not possess the luxury of time or a period free of military crises abroad, underscored by the recent Nagorno-Karabakh conflict and the ongoing war in Ukraine. Potential adversaries continue to evolve their own capabilities with the focused purpose of offsetting traditional American supremacy in every domain and across the range of military conflict.

The collective impact of these developments lies in a changed operational environment in which battlefield success derives from small-unit expertise. Army Chief of Staff GEN James McConville noted that "small units need to be able to operate on their own, and if they are not masters of their craft, they are not going to able to do that."[1] High-performing battalions, companies and platoons, however, need skill mastery among the individual Soldiers in these units. For Armor, this goal will be achieved through the Armor Standardization and Training Strategy (Armor Strategy 2030).

This strategy resulted from a self-assessment of the Armored Force over several years, analysis of performance at successive Sullivan and Gainey Cup competitions, and the III Corps Lethality Study. Collectively these efforts highlighted the need to improve platform expertise, including lethality and maintenance, at Soldier level. Despite the existence of proven and established doctrinal procedures and standards governing these areas, they have not been uniformly applied, resulting in great variance in unit combat effectiveness and readiness.

Therefore the Armor School began a comprehensive evaluation of the training provided to Armor and Cavalry personnel. The school identified a need for a holistic strategy to deliver Soldiers and leaders who are experts in their craft for the Army of 2030 and beyond.

Foundational to the Armor Strategy 2030 is the establishment of a system that standardizes the implementation of a readiness-level (RL) progression. This is based on Aviation Branch's Air Crew Training Program standards for crewmember integration. RL progression creates an operational training path through periodic written and hands-on testing by crew position that is documented and travels with Soldiers throughout their careers.

Master gunners will act as the instructor and training-standardization officer for their units. They will conduct and log evaluations of gunners and commanders and facilitate the transition of a Soldier's consolidated records from unit to unit.

The excellent article in this publication by LTC Dan Cannon and LTC John Nimmons ("Readiness-Level Progression: Certifying Expertise in Lethality as a Subset of the Armor Standardization and Training Strategy 2030," Page 5) serves as an excellent primer on the nuances of this subject. Dan and John describe the interdependence of training, leadership and education, and discuss how refinement in some aspects of doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy will support the strategy's implementation. The article also addresses the lessons gleaned from the Aviation Branch's flight-activity categories while implementing our own focus on the four fundamentals of mounted maneuver: shoot, move, communicate and maintain.

We are already beginning to implement changes that support Armor Strategy 2030. The 194th Armored Brigade will soon begin graduating basic trainees already licensed on their platforms, and it is preparing for future implementation of the 19C program of instruction in October 2024. Captains are currently auditing the Master Gunner Course so critical lesson plans and

skills can be included in Basic Officer Leader's Course, Noncommissioned Officer (NCO) Education System professional military education and Maneuver Captain's Career Course. In response to an Armor School request, the Ordnance School is developing advanced 15-level maintenance tasks to facilitate greater involvement by armored crew in the routine maintenance of their platform.

Standardized training that focuses on the individual Soldier will build expertise that can be passed down and measured from generation to generation within our community. Commanders will know that their NCOs are not just experts themselves but are capable of training and coaching their Soldiers. Our goal is to build **mastery** in armored warfare by focusing on continued development of expertise, built upon multiple repetitions under various environmental and combat conditions.

III Corps has volunteered to pilot the RL progression effort of the Armor Strategy 2030. The 316th Cavalry Brigade and 3-16th Cavalry Squadron are developing the products that will certify our leaders at Fort Benning and in III Corps. The pilot will begin in early 2023, lasting six to nine months, providing III Corps personnel the opportunity to innovate and stress the process we have created. In the same year we will use data from the Gainey Cup to evaluate squad and individual Cavalry skills tied to reconnaissance and security missions..

Looking forward, we expect to use both the Gainey and Sullivan Cup competitions to help assess skill mastery and the impact of Armor Strategy 2030.

The Army's Armor Strategy 2030 is a comprehensive approach for producing and sustaining expert Armor and Cavalry soldiers, NCOs and officers for the Army of 2030 and beyond. This strategy focuses on training and certification standardization of Soldiers and leaders across all military-occupational specialties within the Armor Branch. We plan to publish the Armor Training and Standardization Strategy 2030 in the first quarter of Fiscal Year 2023 with immediate implementation.

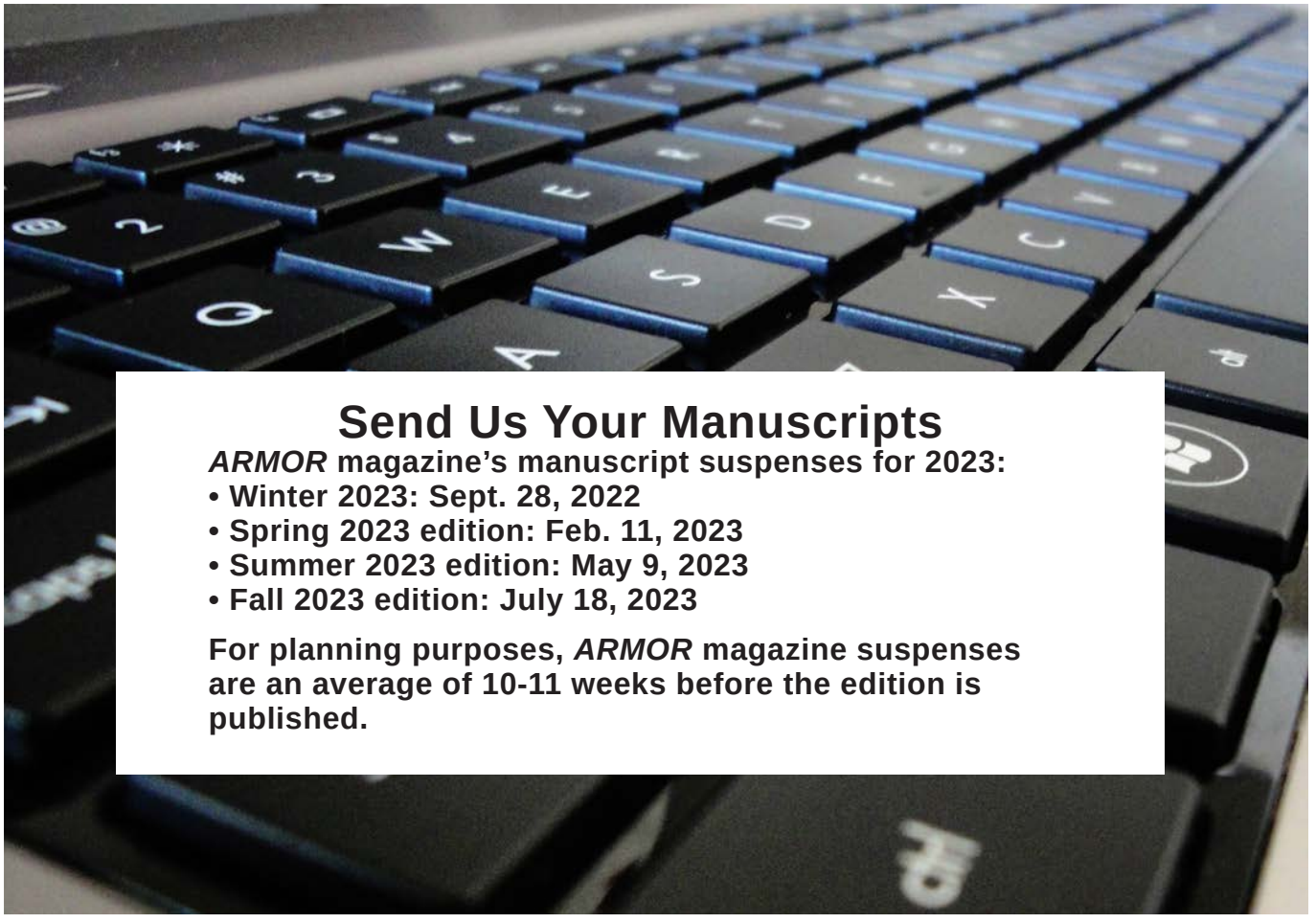
Ultimately this will build a depth in expertise that will take our mounted warriors and Cavalrymen into 2030. As this initiative progresses, we will continue to draw lessons-learned from the operational force to ensure the Armor Strategy 2030 remains effective. This is our moment to drive a way forward to ensure we occupy a position of advantage in 2030.

Acronym Quick-Scan

NCO – noncommissioned officer
RL – readiness level

Notes

[1] "Train Small Units for Big Wars: Gen. McConville," ***Breaking Defense***, March 16, 2021, on-line article accessed Aug. 12, 2022, at https://breakingdefense.com/2021/03/train-small-units-for-big-wars-gen-mcconville/.



Send Us Your Manuscripts

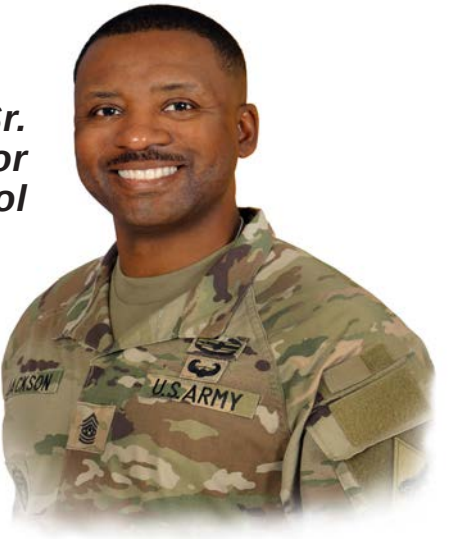
***ARMOR* magazine's manuscript suspenses for 2023:**

- **Winter 2023: Sept. 28, 2022**
- **Spring 2023 edition: Feb. 11, 2023**
- **Summer 2023 edition: May 9, 2023**
- **Fall 2023 edition: July 18, 2023**

For planning purposes, *ARMOR* magazine suspenses are an average of 10-11 weeks before the edition is published.

GUNNER'S SEAT

CSM Levares J. Jackson Sr.
Command Sergeant Major
U.S. Army Armor School



Welcome, Bradley Fighting Vehicle Crewman 19C, to the Armor Family

As we look to integration of the new 19C military-occupation specialty within our formations, I would like to impress upon the force the importance of this monumental addition to the Armor Branch. Our mounted platforms are central to who we are and what we bring to armored combat on the modern battlefield.

Although we have not truly invested in our Bradley Fighting Vehicles to the same degree as the Abrams main battle tank crewmen or reconnaissance and cavalry scouts, the BFV revolutionized mobile protection for our infantry, cavalry, artillery and engineers. The value 19Cs bring to the U.S. Army – in particular to our armored brigade combat teams – is the ability to standardize training that builds lethal experts on the BFV within the Armored Force.

In recent history we have not invested in the training of our BFV crews like we could have. The Global War on Terrorism and counterinsurgency operations, plus our focus on dismounted and aerial operations, has led to a lack of emphasis on the training experience for BFV crewmen. Implementation of the new 19C MOS aligns the Armor community with Defense Department strategies emphasizing a focus on becoming masters at large-scale combat operations. This investment will increase our lethality while addressing the following safety issues across our Armor formations.

Due to the lack of expertise on the BFV, multiple safety incidents have resulted in damage to equipment, injuries to Soldiers and loss of life. In the last three years alone, there have been 16 accidents that have resulted in the deaths of five Soldiers. These incidents and deaths are preventable. Part of how we will address the problem is supported by the III Corps lethality report, which found a direct correlation between BFV proficiency and safety incidents. Command teams have done a great job working to solve many of the issues individually, but as we move forward with the new Bradley crewmember 19C MOS, we can help standardize training focused on improving lethality while reducing risk to Soldiers and their equipment.

Historically 11B infantrymen have been crewmembers for the BFV. Unfortunately this forced them to transition between dismounted and mounted operations with such frequency that some felt there was not the focus on one or the other. As the Army looks to provide our mechanized forces with full dismounted platoons, we look to provide trained experts on the BFV within those same units. This allows the Armor community and our 19Cs to provide the most lethal capability with our dismounted-infantry platoons as part of combined-arms warfare.

We will begin training 19Cs at one-station unit training and continue their road to expertise throughout all Armor professional-military-education courses, continuing through the Maneuver Senior Leader's Course. The designated 19C MOS for the BFV will allow platform expertise. We seek to achieve the technical and tactical platform proficiency necessary to destroy our enemies in mounted warfare.

Ownership, direct emphasis and standardized training dedicated to platform proficiency are the keys to winning the first battle of the next war. Our ability as a mounted-maneuver force to close with and destroy the enemy cannot be achieved if we only focus on the tank. The creation of the 19C is just a piece of the pie that will build the pride in our Soldiers that results in the desire to personally invest in becoming an expert on the BFV.

In addition to our safety and lethality issues, we have struggled to maintain operational readiness of the BFV flight above 85 percent in Fiscal Year 2022. Although that number is a seemingly high percentage, it could be higher if we did not have 111 non-mission-capable BFVs. With these vehicles operational, the Army's OR rating would rise to 92 percent, allowing command teams to train the 28 platoons' worth of BFVs sitting in maintenance bays.

With the Armor Branch's expertise in armored warfare, we can concentrate our efforts on manning and training BFV crewmen to enable the U.S. Army to deploy more proficient and lethal ABCTs in support our geographic combatant commands during LSCO. The 19C MOS will bring BFV platform mastery to our ABCTs. An increase in lethality and readiness, coupled with a decrease in injuries and accidents, are critical to the next war. The future of Armor lethality starts now.

Readiness-Level Progression:
Certifying Expertise in Lethality as a Subset of the Armor Standardization and Training Strategy 2030

by LTC Dan Cannon and LTC John Nimmons

Following 20 years of fighting the Global War on Terrorism (GWOT), today's Army finds itself at a familiar transition point. Similar to two decades ago, a trend analysis conducted on our modern Armored Force identified a clear lethality gap.

Relevancy: the 'why'

The publication of the "Lethality Report on the State of the Armored Brigade Combat Team (ABCT)" – or in common parlance, the III Corps Lethality Study – identified more than 38 areas for improvement due to a distinct decline in crew expertise affecting lethality. Trend lines identified in this study were likewise captured in execution of the 2022 Sullivan Cup, increasing validity of the trend analysis identified in the study.

> "Post-Vietnam military attention turned back to the nation's commitment to [North Atlantic Treaty Organization] Europe. We discovered that the Soviets had been very busy while we were preoccupied with Vietnam. They had revised operational concepts at the tactical and operational levels, increased their fielded force structure and introduced new equipment featuring one or more generations of new technology. … As U.S. forces in Vietnam redeployed, military thinkers recognized the need for a new objective force for a new era. It was an era characterized by the expanded threat in Europe, a growing threat of conflict in the Third World (especially the Middle East), increasing worldwide economic interdependence, greater difficulty articulating political goals for the planners who design military activities to achieve them, and intrusive media probing into all aspects of military operations."
>
> -From ***Camp Colt to Desert Storm: The History of U.S. Armored Forces***, editors George F. Hofmann and Donn A. Starry, Lexington: University Press of Kentucky, 1999

Key focus areas for this study addressed a disparity in unit master-gunner proficiency, a decline in platform-leader competency and gaps within operational training. Supporting data for this trend assessment is drawn from recorded lower gunnery scores, a decline in rotational-training-unit performance across the combat-training centers (CTC), a decline in unit maintenance as measured by operational-readiness (OR) rates and a lack of master-gunner expertise at lower echelons.

This is a shared problem set by and for the operating and generating forces alike. Institutionally, our professional military education (PME) evolved over the past 20 years to meet GWOT demands, and our operational forces' collective training shifted in parallel. The Center for Army Lessons-Learned superseded application of doctrine in combat when our doctrinal publications struggled to keep pace with the ever-evolving asymmetric threat.

A generation of company-grade leaders well remember planning and executing collective-training plans for our units accounting for both deployment and core mission-essential task lists (METLs), and under the same time constraints. The best efforts made in unit-training-plan design often manifested in deployment mission sets that did not match our unit's table of organization and equipment, much less its METL.

As our Army shifts focus back to peer threats in the context of the large-scale combat operations (LSCO) environment, the Armored Force's atrophied core competencies regain relevancy and urgency. In development of our strategy for 2030, the Armor Branch needs a standardized framework for leader development that directly correlates to platform expertise, tactical proficiency in LSCO and fleet readiness. Absence of a standardized system to view the gaps and competencies of our Soldiers means leaders cannot make informed decisions on how to best assess, use and manage talent across the branch. The unclear nature of individualized branch progression creates an opaque system that impacts job satisfaction and retention, prevents the branch from building collective expertise and inhibits talent management.

Design: the 'how'

The Armor Standardization and Training Strategy does not require a retooling of doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy (DOTMLPF-P), but bold advancement of certain components will play a supporting role in the strategy's implementation. The threat template has changed; multidomain operations are changing doctrine; our Army equipment is modernizing. This is all occurring as we work to improve Soldier and crew proficiency in shooting, moving, communicating and maintaining platforms under combat conditions.

Our gap in lethality manifested from a decline in execution with systems and processes provided from the last iteration of DOTMLPF-P. For that reason, the focus of this strategy is on how we train.

DOTMLPF-P approach

While the primary focus of the

"The more intense and difficult the battle becomes because of numbers, weapons ranges, all the lessons cited a moment ago in regard to the Yom Kippur War, the more Soldiers and their leaders become the critical and deciding element. Which is the better tank? The one with the better crew, of course! And so it is and ever shall be that battles are won by the courage of Soldiers, the excellence of the leaders and the effectiveness of the training in their units before the battle begins. Technical developments in new weapons systems increase range, lethality and precision. Increased also is the intensity of the battle, the effects of fatigue, the destruction of battle, the presence and pervasiveness of fear. No amount of technology can be invoked to solve these problems. And so we're back to the Soldiers, their leaders and the excellence of the training of the units in which they fight."

-GEN Donn A. Starry, ***American Military Thought: A Perspective***, U.S. Army Training and Doctrine Command historians' conference, Fort Monroe, VA, Jan. 17, 1989

strategy is on training, a holistic approach across the breadth and depth of DOTMLPF-P must be considered for the strategy to be viable and sustainable, and to properly address the problems previously mentioned. To address the decline in lethality, the strategy focuses on three areas across DOTMLPF-P: 1) developing assessments and revising individual and crew certification; 2) standardizing unit-training-plan development and implementation; and 3) adjusting leader-development models to reinforce desired lethality outcomes. Ultimately a framework that unifies unit training and leader development across the Armored Force is needed to produce Soldiers and leaders who are experts on their platform and can employ them effectively in combat.

Doctrine. Developing the right assessments and certifications requires a comprehensive look at how these processes will be managed. Standardization for when and how proficiency tests occur will require additions to documentation within existing doctrine. This will have a direct impact on revising the Integrated Weapons Training Strategy (IWTS) to account for individual certifications such as annual platform-proficiency exams. More training curriculars will be needed to address reporting requirements, unit-training-plan audits and data input into digital systems of record. Further, refined roles for master gunners at company and battalion levels will need to be refined as the strategy progresses. Finally, all additional leader-development requirements must be codified for uniformity in execution.

Organizations. Part of the strategy addresses enhancing the role of the master gunner at company and battalion levels to ensure adherence to certifications and assessments. The strategy also expands the role of the battalion master gunner in certifying incoming personnel according to the tank and Bradley commander assessments, and emphasizes their role as the senior adviser to the battalion commander on individual and crew proficiency for final certification prior to assuming duties as a tank or Bradley commander.

Training. One of the main outcomes of the strategy is to implement a tank and Bradley certification test for battalion commanders and master gunners to administer before individuals assume their duties. The test functions much like the Army's aviation-commander certification process, where instructor-pilots test incoming personnel to validate their proficiency and expertise levels. For Armor, the test would include a written exam to enforce doctrinal study throughout a career, a physical test of knowledge on respective platforms and a demonstration of functional knowledge inside Advanced Gunnery Training System (AGTS) or Bradley Advanced Training System (BATS). Once administered by the battalion master gunner, a report with scores and a recommendation to the commander for retraining or integration into duty position. This testing process would be universal across the Armor force whereby incoming personnel would have the same requirements regardless of duty station.

Materiel. Primarily to make these ideas work, a universal digital system will be needed to maintain records for Soldiers and leaders as they progress through their careers. Ideally, existing systems of record (like Digital Training Management System) are expanded to include gunnery scores, commander-certification-test scores, AGTS/BATS hours and annual examination scores for everyone. For digital test-taking, classrooms, computers and software overhead will be needed to provide tests that are accessible to the entire branch, regardless of duty location.

Leader development. As Soldiers and leaders progress through this system, the accumulated data will allow leaders to assess the needs of each person and tailor training to address deficiencies or atrophied areas of expertise. It will also allow for the identification of top talent and provide career managers and leaders the ability to advise and help officers and noncommissioned officers throughout their careers.

Personnel. Vital to this strategy is placing an emphasis on ensuring master gunners can fill all positions at the company and battalion levels. This requires an in-depth approach to manning to identify unit master-gunner personnel shortcomings and create a revised system that prevents gaps at the unit level. This aspect directly ties to leader development and training subsets and remains foundational to the success of the Armor Standardization and Training Development Strategy.

The model: an aviation leader-development comparison

Readiness-level (RL) progression is the decisive component of this strategy intended to directly address the training subset of the DOTMLPF-P process and,

more importantly, address our atrophy in lethality. RL progression is designed to give confidence to leaders and Soldiers alike in the competence of the individual crewmember and confidence in their platform-specific weapon systems. Standardization created in the application of this strategy creates universal accountability for what and how we are already training across PME and the operational force. We must break from the "starting at zero" cycle of certifying crews exclusively through a collective-training cycle and begin to train and certify the individual crewmember routinely. RL progression is the starting point.

Implementation of this new strategy is reliant on an interdependence among training, leadership and education. The model is similar to our Aviation Branch counterparts because, simply put, theirs is a proven system that consistently achieves technical proficiency and expertise over time and in adverse conditions across the competence continuum. A brief explanation of the aviation model is necessary here for context.

RLs track individual readiness based on specific criteria that spans throughout a career. Readiness aggregates across individuals throughout an organization to assess qualifications for training and to demonstrate proficiency and expertise. The key factor here is the tracking of individual readiness in addition to collective or crew readiness. These RLs transfer with the individual pilot, and rather than being reliant on a stabilized flight crew for certification, an individual's certification is maintained throughout his/her career with exams and check-rides upon arrival to a new unit.

The flight-activity categories (FACs) identify which RL an individual needs based on duty position throughout a career. Standards are clearly defined, coupled with commander evaluations that progress or regress individuals based on their performance.

The Armor model replicates these categories, accounting for individual progression tailored to the needs of the Armor Branch. Progression across the RLs (Figure 2) are facilitated by the company and battalion master gunners on behalf of commanders at each echelon and in accordance with prescribed standards and criteria. This system links to iterations of IWTS within a standardized unit training plan.

Strict adherence to individual and collective tasks up to platoon-level training is required to assess competency and expertise of the individual crewmember to progress across RLs. The intent is that this program runs in the background of steady-state operations. For example, a company may only have a third of its crews in each of the three RL categories at any given time.

Flight-activity categories shift to ***platform***-activity categories (PACs) and align across the RLs by duty position. An individual crewmember's access to resources required to maintain and advance along RL categories is assignment-dependent and accounted for by the PAC in the Armor model. Each duty position is tied to an RL category. PACs 1 and 2 denoted in Figure 2 focus on battalion and below, with PAC 3 focused at brigade and PAC 4 above brigade, including broadening assignments.

Regardless of what job a 19-series Soldier holds throughout his career, self-study becomes an individual requirement of professional development and demonstration of expertise over time to counter the loss of perishable skills.

The addition of skill categories is where we depart from the aviation model. These categories represent the skillsets required of a ground-maneuver crewmember. RL progression tasks for the Armor model are arrayed across the four fundamentals of mounted maneuver: shoot, move, communicate and maintain.

Shoot. This category is solely focused on ensuring platform lethality and is predominately focused on the execution of the gates to live-fire and on sustained readiness requirements according to Training Circular 3-20.0, ***Integrated Weapons Training Strategy (IWTS)***, dated June 2019. Several preparatory tasks not specified in the strategy are codified in this category to set conditions for successful execution of IWTS. Trend analysis suggests that these tasks are not well practiced, take crews on average longer to complete than prescribed by doctrine and are perishable skills.

Finally, specific technical training is included as a requirement nested with the gates to live-fire that support the proper employment of both the platform and associated weapon systems.

Move. This category is focused on maneuver tactics and doctrine. Constrained to not exceed section-level employment of platforms, tasks in this category are codified by collective tasks and associated battle drills that are fundamental to the Armored Force at the tactical level of platform employment. Collective tasks are crosswalked to associated subtasks and the individual tasks that support them.

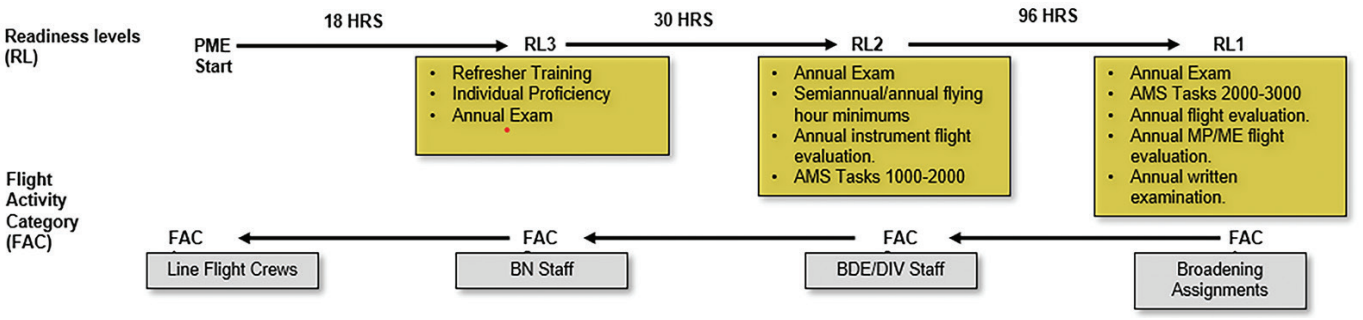


Figure 1. Aviation model.

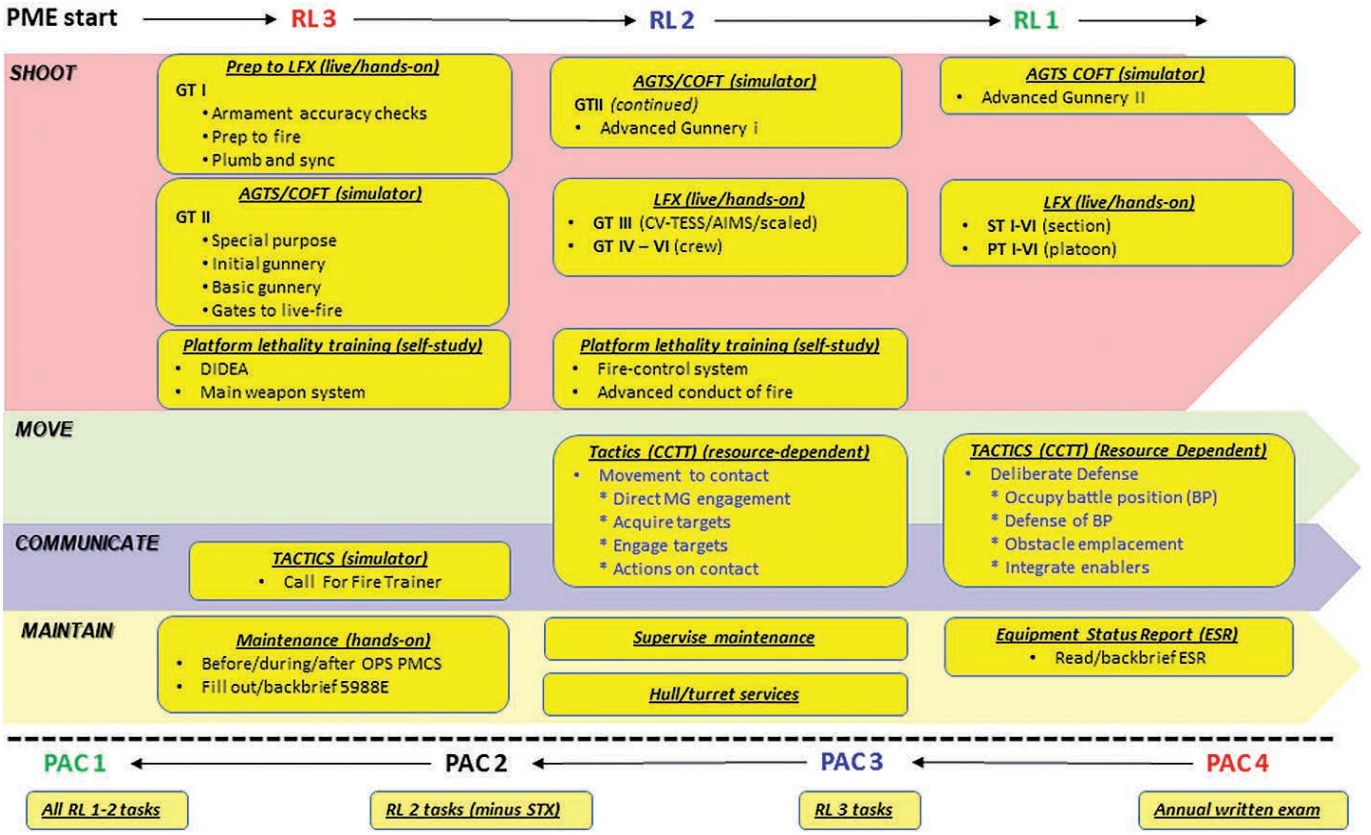


Figure 2. Potential Armor model.

The terminal learning objectives for these tasks are focused on the vehicle commander's and crew's ability to plan for and employ their platform nested within higher mission and intent. Focus for assessments in this category shifts away from lethality to troop-leading procedures and demonstrated ability to fight one's assigned platform. Training and assessment can be resourced and executed either virtually through the Close Combat Tactical Trainer (CCTT) or hands-on, depending on resource constraints.

Communicate. This category assesses a vehicle commander's and crew's ability to communicate from their fighting platform, conduct adjacent unit coordination and employ enablers as part of a combined-arms team. Tasks in this category support collective tasks in the ***Move*** category and are sequentially trained and assessed to enable the gated strategy inherent in the RL-progression model. Training and assessment can be resourced and executed either virtually through simulation or hands-on, depending on resource constraints.

Maintain. Tasks in this category enable all other required tasks. Trend analysis demonstrates a lack of operator familiarity with both maintenance tasks at requisite skill level(s) and processes, specifically with fire-control-system troubleshooting and fault identification. Tasks include application of sustainment systems, tools and processes.

Operator/crew field maintenance tasks are assessed to the ***Apply*** level while higher field-maintenance tasks are assessed at the ***Remember*** and ***Understand*** levels as defined by Bloom's taxonomy (Figure 3). Intent for familiarization of higher field-maintenance tasks is like ***Move*** tasks in that understanding how to maintain one's assigned platform in the context of higher sustainment systems enables crew-level maintenance tasks.

Figure 3. Bloom's taxonomy.

Efficiencies gained: Sustainable Readiness Model

One of the problems this strategy seeks to solve is the disparity in training regimens. While good standards exist in doctrine, they are not universally followed. From inadequate master-gunner manning at company and battalion levels, to changing operational-tempo requirements and to differences in how units interpret

existing training standards, the current system has not produced the expertise needed to maintain high levels of readiness. Also, as opposed to the Army Forces Generation model, the loss of trained personnel and influx of new personnel for permanent-change-of-station cycles during unit rotational-training progressions creates gaps in knowledge and training, requiring more training for units.

Most commonly, this can be seen with sustainment gunneries conducted prior to CTC or regionally aligned forces missions to account for the change-over in personnel. These additional requirements place an unnecessary burden on units as they prepare to deploy and often conflict with fleet-maintenance needs necessary for OR requirements before a deployment. Going forward, this strategy seeks to provide a solution for units that modifies requirements, enforces existing standards and operates in tandem with Sustainable Readiness Model (SRM) manning functions.

RL progression is intended to minimize both time and population of individual crewmembers who require certification on individual tasks and who are immediately prepared to conduct collective training. In context of the SRM, RL progression will maximize commanders' situational awareness on the training and readiness level of each Soldier in their unit, enabling prioritization of people, resources and training time required to meet unit readiness levels C4 to C2. This manifests in giving collective training time back to the unit.

With the RL progression program constantly operating in the backdrop of day-to-day activities, Soldiers complete individual certification/training and, most notably, individual certifications are codified and tracked for each Soldier via a Digital Job Book. This produces flexibility for outside collective training/certification events. Commanders certify training of their units and manage risk. RL progression will assist them in doing both.

For example:

- Better informs commanders of individual crewmember certifications across the gates to live-fire according to ITWS. This in turn allows commanders to make informed decisions in managing risk when addressing turbulent crews.
- Will reduce the population of crews requiring sustainment gunnery.
- Supports leader-development programs by ensuring Soldiers are certified on foundational tasks and are prepared to execute collective training.
- Minimizes time and tasks for newly arrived Soldiers to integrate into collective training as they arrive with a codified RL level from their last duty station.
- Sets conditions for a master-gunner mentorship program at the unit level that can assist in identifying candidates who have an aptitude and higher potential for the master-gunner glidepath.

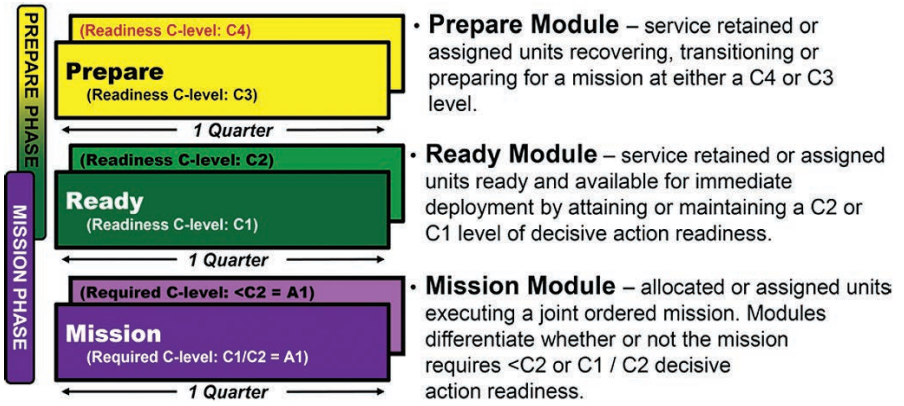


Figure 4. SRMs from Army Regulation 525-29, *Force Generation – Sustainable Readiness*. *(Adapted from Figure 4-1)*

The pilot: Maneuver Center of Excellence and III Corps

The pilot is underway as of Aug. 1, 2022, with the first written exams released to more than 100 Armor Soldiers from across the Maneuver Center of Excellence. Data gathered from this initial pilot will feed refinement of deliverables for the III Corps pilot scheduled for the third quarter of Fiscal Year 2023. Feedback is both warranted and needed from across the force, so don't wait for implementation to be part of the discussion.

LTC Dan Cannon commands 3-16 Cavalry Squadron at Fort Benning, GA. Previous assignments include instructor, Joint Combined Warfighting School, National Defense University, Norfolk, VA; executive officer, 3rd Cavalry Regiment, Fort Hood, TX; observer/coach/trainer (O/C/T), Cobra Team "Best in the Desert," National Training Center, Fort Irwin, CA; commander/writer/instructor, Armor Basic Officer Leader's Course, Fort Knox, KY; and combined-arms company commander, Company C, 1-64 Armor Battalion, Fort Stewart, GA. His military education includes Joint Combined Warfighting School, Air Command and Staff College and Joint Firepower Control Course. LTC Cannon holds a bachelor's of arts degree in psychology from The Military College of South Carolina (The Citadel) and a master's of arts degree in military operational art and science from Air University. His awards and honors include the Bronze Star Medal with Valor Device, Bronze Star with four oak-leaf clusters (OLCs), Defense Meritorious Service Medal with two OLCs and Meritorious Service Medal with three OLCs.

The 3-16 Cavalry Squadron is home to all U.S. Army Armor School functional training courses, including Master Gunner Common Core; all platform master-gunner courses for Abrams, Bradley and Stryker; Maneuver Leader Maintenance Course; Scout Leader's Course; Cavalry Leader's Course; operational new-equipment training for Stryker and Abrams; and field-maintenance new-equipment training for Bradley and Abrams.

LTC John Nimmons is chief of tactics at

the Maneuver Captain's Career Course (MCCC), Fort Benning, GA. Previous assignments include chief of the Commandant's Initiative Group, Headquarters U.S. Army Armor School, where he worked on initial concept development for the Armor Standardization and Training Development Strategy; brigade executive officer, 3rd ABCT. 1st Armored Division, Fort Bliss, TX; squadron S-3, 2nd Squadron, 13th U.S. Cavalry, 3rd ABCT, 1st Armored Division, Fort Bliss; division G-5 Plans officer, 1st Armored Division, Fort Bliss; small-group leader, MCCC, Fort Benning; company/team O/C/T at Joint Multinational Readiness Center, Hohenfels, Germany, with the Warthog Team; commander, Headquarters and Headquarters Troop, 1st Squadron, 9th U.S. Cavalry, 4th ABCT, 1st Cavalry Division, Fort Hood, TX, during Operation Iraqi Freedom (OIF); troop commander, 1st Squadron, 9th Cavalry, 4th ABCT, 1st Cavalry Division, Fort Hood (OIF); and tank-platoon leader and troop executive officer, 3rd Squadron, 3rd Armored Cavalry Regiment, Fort Hood (OIF). LTC Nimmons' military schools include Armor Basic Officer Course, Airborne School, MCCC, Cavalry Leader's Course, Command and General Staff College and School of Advanced Military Studies (SAMS). He holds a bachelor's of arts degree in history from Presbyterian College, a master's in business administration and project management from Norwich University and a master's in military operations from SAMS. His awards and honors include two Bronze Star Medals, Project Warrior Fellowship, Order of St. George bronze medallion and Order of the Iron Pen.

Acronym Quick-Scan

ABCT – armored brigade combat team
AGTS – Advanced Gunnery Training System
BATS – Bradley Advanced Training System
BDE – brigade
BN – battalion
BP – battle position
CCTT – Close Combat Tactical Trainer
COFT – Conduct-of-Fire Trainer
CTC – combat-training center
CV-TESS – Combat Vehicle Tactical Engagement Simulation System
DIDEA – detect, identify, decide, engage and assess
DIV – division
DOTMLPF-P – doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy
ESR – equipment-status report
FAC – flight-activity category
GT – gunnery table
GWOT – Global War on Terrorism
IWTS – Integrated Weapons Training Strategy
LFX – live-fire exercise
LSCO – large-scale combat operations
MCCC – Maneuver Captain's Career Course
METL – mission-essential task list
MG – master gunner
PAC – platform activity category
PMCS – preventive-maintenance checks and services
PME – professional military education
O/C/T – observer/coach/trainer
OIF – Operation Iraqi Freedom
OLC – oak-leaf cluster
OR – operational readiness
RL – readiness level
SAMS – School of Advanced Military Studies
SRM – Sustainable Readiness Model
STX – situational-training exercise

Closing the Lethality Gap: Trend Analysis from Sullivan Cup 2022 and Application of Integrated Weapons Training Strategy (Part I)

by CPT Matthew T. Miller and 1SG Andrew L. Leatherbury

For the first time in four years the U.S. Army Armor School (USAARMS) planned and organized the return of Sullivan Cup from its pandemic hiatus. Though few changes were anticipated for the events that make up the week-long biennial competition, Sullivan Cup 2022 introduced the Bradley Fighting Vehicle for the first time in the event's history.

Fort Benning hosted seven Abrams crews and five Bradley crews from across the U.S. Army. The purpose of the competition was to identify the Army's best Abrams and Bradley crews, showcase the Armored Force's lethality and professionalism, and observe and annotate common trends throughout the operational force.

The Chief of Armor directed that all gunnery events be conducted to standard and according to the Integrated Weapons Training Strategy (IWTS) (Training Circular (TC) 3-20.0) and the Crew Training and Qualification (TC 3-20.31). Previous Sullivan Cup live-fire scenarios were designed to challenge and stress crews through non-standard engagements, including maximum lateral dispersion, increased target presentations and increased ranges. This year's intent was to demonstrate "what right looks like" according to IWTS and gauge vehicle-crew proficiency and adherence to established standards as outlined in TC 3-20.31.

The master-gunner instructors from the Abrams and Bradley master-gunner courses developed the scenarios and prepared the range to meet the directed guidance. The TC 3-20.31 standard scenarios were designed to test the crews' ability to successfully engage and destroy stationary and moving targets in all operational conditions. All 12 crews were evaluated to the prescribed TC 3-20.31 standard, and crew evaluations were vetted through the Maneuver Center of Excellence's (MCoE) Directorate of Training and Doctrine Weapons and Gunnery Branch team to ensure quality control.

Common trends were identified for both Abrams and Bradley crews, and we will break down these trends into the following areas: preparation to fire and conduct of fire.

Preparation to fire

Crews signed for vehicles April 26 and began armament-accuracy checks (AACs), plumb and synch, and prep-to-fire checks. For Abrams crews, there was a general unfamiliarity with conducting AACs and plumb and synch. Select crews took eight hours to complete AACs on their primary tank, requiring constant external support and mentorship from master-gunner instructors. AACs are expected to be conducted during monthly preventive-maintenance checks and services and should be a routine action for the crew.

Within the same motorpool, Bradley crews presented a similar trend of unfamiliarity when executing the prep-to-fire checklist and required external support from the Bradley master-gunner instructors to complete the prescribed tasks.

Crews conducted operations on the Digital Multi-Purpose Range Complex from the evening of April 28 to the morning of May 5. Crews struggled with prep-to-fire tasks prior to Gunnery Table IV and in between Gunnery Table IV and VI. Crews had difficulty properly boresighting their weapon systems in a timely manner. Crews were taking between 45-60 minutes to boresight, though the Gunnery Skills Test boresighting standard according to TC 3-20.31-1 is 22 minutes. Even after more time was spent boresighting, main-gun accuracy proved challenging when observed during live-fire accuracy screening test (LFAST) and zero. Some crews were returned to the boresight line after providing the master gunners' LFAST team with data that was outside normal parameters.

Beyond crews' difficulties with boresighting procedures, several gunners had issues manipulating their control handles. For Abrams, two crews were directed to manually fire their main guns during screening due to gunners inadvertently flinching or jerking the gunner's power-control handle. Bradley crews were taking more than eight rounds to zero the Bushmaster M242.

For both platforms, zeroing the coax proved to be the greatest challenge. Crews were firing 10-or-more-round bursts while attempting to zero – rather than the standard three-to-four-round bursts – and made radical adjustments that either resulted in firing over or short of the zero target. Most crews required more ammunition beyond the authorized 50 rounds of AB86 7.62mm ammunition to complete the process. One crew was unable to properly zero the coaxial machinegun until the night portion of Table VI and only after cadre mentorship.

Manipulation of the fire-control system and control of the gunner's power-control handles can be easily mastered with the use of tracking and manipulation exercises and the sustained use of gunnery simulators. The zeroing and calibration of weapons systems should be deliberately trained, and new crews should be mentored throughout the process until they have demonstrated proficiency.

Several variables need consideration specific to the context of the competition timeline and competing events.

There is risk in observing these trends in a vacuum as competitor crews dealt with competing priorities, preparation for follow-on events and the constraint of operating drawn vehicles. It is important to separate constraints presented in the context of the competition, but the observed trends remain valid when units consider their own operational tempo and collective-training-timeline constraints.

Conduct of fire

Crew fire commands were excellent, and very few crew penalties were assessed. Most scores were affected by poor scanning and engagement techniques. Gunnery Table II, conducted at the Clark Simulations Center, revealed that crews had universally developed poor habits. Crews took the allotted time to identify targets and gunners attempted to lead main-gun targets, though the system already calculates lead as well as using the coax as a point system to "snipe" targets rather than sweeping or using a "Z-pattern." These habits exhibited in the simulators led to decreased scores and carried onto Tables IV and VI.

Crews displayed more issues on both Gunnery Tables IV and VI. Crews lacked defined scanning sectors and consistent scanning techniques, leaving areas of deadspace and reducing crews' ability to detect troops and far targets, accounting for lateral and in-depth dispersion. Once targets were detected, crews took prolonged time to prioritize targets, delaying the engagement process and wasting target-exposure time, resulting in targets going down prior to engaging.

Crews that were able to identify rapidly had trouble accurately hitting targets, resulting in impacts that were over, short or doubtful. Crews also struggled to manage their ammunition properly during engagements, exhausting their ammunition supply prior to the completion of the table. Though main-gun targets were consistent enough to notice a trend, coax engagements severely hindered all crew scores. Machinegun engagement techniques should be a focal point for future training efforts.

Difficulty in consistently engaging targets is attributed to common trends within the operational force. Many divisions, caused by high operational tempos, end up with a single brigade on station. These single brigades, while conducting training at echelon, do not always afford flexibility for battalions to use external crew evaluators. This causes conflicts of interest. Either knowing the crew evaluator or understanding that evaluated crews could possibly serve as the following crew evaluators, many scores are altered to provide a favorable outcome rather than an honest assessment. TC 3-20.31 dictates that "[e]valuations of crew gunnery always come from outside the firing-platoon element, and for qualification purposes, [vehicle-crew evaluators] (VCEs) external to the battalion are required."

Not having the ability or intentionally not using external evaluators ties into another systemic issue: leaders not using the IWTS properly or at all. This trend was confirmed by crew behaviors both on the lane and in the after-action-review room. For example, crews failed to hit a minimum of one troop target within the troop array and insistently wanted credit for engagements, claiming their round strikes were in the target area. However, all targets were functional and went down when hit, as observed by multiple crew engagements prior to and after protest periods.

Moreover, target malfunctions are not grounds for an alibi. Target malfunctions will be accounted for with malfunction break time, and the alternate target will be used for the engagement. TC 3-20.31 identifies the alibi process as "the process used for a crew to overcome a catastrophic event or an unsafe condition that prevented them from executing the engagement to the conditions listed through no fault of its own."

Furthermore, crews attempted to use the alibi process to increase scores though it "is not a means to achieve a higher score to qualify or achieve a higher rating or standing once qualified on the table. A reason to refire an engagement because the crew could have done better. A reason to be negligent in the performance of -10 maintenance functions, prep-to-fire checks, pre-combat checks, pre-combat inspections or armament services." VCEs and master gunners must educate vehicle commanders on the use of an alibi and enforce the standards.

Conclusion

As the Army continues to shift toward large-scale combat operations, crews will need to rapidly analyze and apply doctrinal understanding and experience to faster-paced operations. Sullivan Cup 2022 served as a clear indicator that there are gaps in training. USAARMS, with support throughout MCoE, is working to fill these gaps. The Armor Standardization and Training Strategy 2030 and readiness-level (RL) progression initiatives are frameworks, aligned with IWTS, to improve the four fundamentals for crewmembers across the force: shoot, move, communicate and maintain. The goal is to assist operational units in certifying their crews, enable crew stability by tracking individual readiness levels and maintain sustainment of requisite skillsets.

When crewmembers can properly prepare their platforms for live-fire, we will be able to fully realize the true capability of our Armor Soldiers and their respective platforms. Crews must be fit to fight, trained to competency and confidence in their equipment, and disciplined on how to deliberately prepare their platforms to maximize performance; the results will come in the form of speed and accuracy, ensuring standoff and lethality. It is recommended that readers take lessons-learned into consideration when training their organizations. Finally, we recommend reading upcoming articles on the RL progression model and its implementation to support the Armor Standardization and Training Strategy 2030.

CPT Matthew Miller commands Troop M, 3rd Squadron, 16th Cavalry Regiment, 316th Cavalry Brigade, at Fort Benning, GA. Previous assignments include operations officer, U.S. Army Armor School, Fort Benning, and motorized and mechanized reconnaissance-platoon leader in 2nd Brigade, 3rd Infantry Division, Fort Stewart, GA. His military education includes Armor Basic Officer Leader's Course, Army Reconnaissance Course, Maneuver Captain's Career Course and Cavalry Leader's

Course. CPT Miller has a bachelor's of science degree in business administration and is pursuing a master's of business administration at Auburn University.

1SG Louis Leatherbury, an Abrams master gunner, is first sergeant of Troop M, 3-16 Cav. Previous assignments include division master gunner, 2nd Infantry Division, Republic of Korea-U.S. Combined Division, Camp Humphreys, Republic of Korea; Stryker anti-tank guided-missile platoon sergeant, Company C, 52nd Infantry Regiment, 3rd Brigade, 2nd Infantry Division; chief training developer, Weapons and Gunnery Branch, Directorate of Training and Doctrine, MCoE, Fort Benning; squadron master gunner, 1st Squadron, 14th Cavalry Regiment, Fort Lewis, WA; and troop master gunner, Apache Troop, 1st Squadron, 3rd Armored Cavalry Regiment (ACR), Fort Hood, TX. He has served in every position of a tank platoon, including loader, driver, gunner, tank commander and platoon sergeant, and deployed as a tank gunner supporting Operation Iraqi Freedom (OIF) III with Company D, 2nd Squadron, 11th ACR, and as a tank commander supporting OIF 07-09 with Troop A, 1st Squadron, 3rd ACR. His military education includes Maneuver Senior Leader's Course, Advanced and Basic Leader's Courses, Abrams Master Gunner Course, Basic Instructor Course and Small-Group Instructor Course. 1SG Leatherbury has an associate's of arts degree in general studies from Central Texas College and is pursuing a bachelor's of science degree in environmental science from American Military University. His awards and honors include the Purple Heart, three Meritorious Service Medals and Combat Action Badge.

Maverick Troop manages the Master Gunner Common Core, Abrams Master Gunner Course, Tank Commander's Course, Maneuver Leader's Maintenance Course and the Abrams New Equipment Training Team.

Acronym Quick-Scan

AAC – armament-accuracy check
ACR – armored-cavalry regiment
IWTS – Integrated Weapons Training Strategy
LFAST – live-fire accuracy screening test
MCoE – Maneuver Center of Excellence
OIF – Operation Iraqi Freedom
RL – readiness level
TC – training circular
USAARMS – U.S. Army Armor School
VCE – vehicle-crew evaluator

Sullivan Cup Retrospective

The Sullivan Cup at Fort Benning, GA, in May 2022 pitted 12 competing teams (seven tank teams, five Bradley crews) against each other. The prevailing tank crew was from 1st Battalion, 66th Armor Regiment, 3rd Armored Brigade Combat Team, 4th Infantry Division, and the top Bradley crew was from 3rd Battalion, 67th Armor Regiment, 2nd Armored Brigade Combat Team, 3rd Infantry Division. Other tank teams competing included 1st Battalion, 37th Armor Regiment, 1st Armored Division; 1st Battalion, 252 Armor, North Carolina Army National Guard; 2nd Squadron, 11th Armored Cavalry Regiment; 2nd Battalion, 12th Cavalry Regiment, 1st Cavalry Division; 2nd Battalion, 69th Armor Regiment, 2nd Armored Brigade Team, 3rd Infantry Division; and Q Troop, 4th Squadron, 278th Armored Cavalry Regiment, Tennessee Army National Guard. Other Bradley crews competing included Troop O, 4th Squadron, 278th Armored Cavalry Regiment; 4th Squadron, 10th Cavalry Regiment, 4th Infantry Division; 1st Squadron, 7th Cavalry Regiment, 1st Cavalry Division; and 1st Squadron, 1st Cavalry Regiment, 1st Armored Division.

Figure 1. The best tank crew and the top Bradley crew are pictured. At left is the best tank crew: SSG William Catalan, PFC Frankie Maynes, PFC Tyler Winklebleck and SPC Nikolai Krusenstjerna. At right is the best Bradley crew: SSG Julian Gaitor, SPC Tyler McGinnis and PFC Patrick Sullivan. *(Photo by Patrick A. Albright, Maneuver Center of Excellence Public Affairs Office)*

Figure 2. An Abrams team competes in night crew gunnery during the Sullivan Cup competition at Fort Benning, GA. *(Photo copyright Robert Bell; used by permission)*

Figure 3. Sherman medium tanks participate in a demonstration called Operation Thunderstrike May 2 at Fort Benning, GA, to open the Sullivan Cup competition. Operation Thunderstrike was a combined-arms demonstration of the evolution of armored warfare from World War II to today. Operation Thunderstrike showcased the modern lethality of Abrams and Bradley platforms, mortars and Apache helicopters. *(Photo copyright Robert Bell; used by permission)*

Closing the Lethality Gap: Trend Analysis from Sullivan Cup 2022 and Application of Integrated Weapons Training Strategy (Part II)

by SSG Kurt P. Scapardine

Established in 2012, the Sullivan Cup is the Armor Branch's premier biennial competition inviting the best crews from units across the Army to Fort Benning, GA. Invitations for this competition historically went out exclusively to Abrams crews, but this year, for the first time in the competition's storied history, the Armor Branch invited Bradley crews to compete. They did not disappoint.

The competition saw seven Abrams and five Bradley crews compete. Crews demonstrated their abilities through execution of individual and crew-level tasks over the course of seven events. Heavily weighted among these events were the live-fire events, Gunnery Tables IV and VI, where crews showcased their skill and proficiency on their respective platforms.

Crews competed against each other and according to standards outlined in Training Circular (TC) 3-20.31, ***Training and Qualification, Crew***, dated March 2015. Throughout execution, observed trends specific to the direct-fire engagement process became apparent and are applied here for the purpose of analysis as representative across the greater Armored Force.

Each engagement required members of the crew to use practiced techniques to acquire, engage and destroy the presented target(s). This process is outlined in TC 3-20.31-4, ***Direct Fire Engagement Process (DIDEA)***, and describes the steps of this process in depth: *detect, identify, decide, engage* and *assess*. This article's purpose is to examine and juxtapose the common trends identified during the 2022 Sullivan Cup across the framework of the DIDEA process.

Detect

Target detection was an arduous part of the engagement process for competitors. Crews struggled to detect most targets in the allotted target-exposure time, with troop targets and long-distance vehicle targets being among the most difficult for crews to identify.

Vehicle-crew evaluators (VCEs) observed crew members using erratic scanning patterns during engagements, scanning left-to-right without transitioning to near-to-far, thus failing to account for depth and slope of the range. Crews struggled to identify their left and right limits, failed to effectively scan the space in between, or were scanning in high magnification.

In most instances, the vehicle commander (VC) depended on the gunner to scan and detect targets rather than using their Commander's Independent Viewer, inhibiting full use of the optics capability available on their platform(s). When VCs leveraged their primary sight to double the scanning fields, they scanned in the same direction as the gunner, limiting observation of the engagement area by half.

These techniques were addressed by assigned VCEs during the after-action report (AAR) process between phases and tables. VCEs coached crews on proper scanning methods according to TC 3-20.31-4 and advised them to establish target-reference points, assign sectors and use overlapping scanning to maximize observation of the range. Several crews quickly implemented the coaching from the VCEs and displayed remarkable improvement during their qualification table.

The preceding techniques should be identified before a live-fire event and corrected during simulation(s) training. As outlined in doctrine, simulations give crews ample time and resources to establish effective scanning methods/techniques and build good habits that eventually become forged in their "muscle memory." The instructor-operator of the simulator should constantly monitor for inconsistent scanning techniques of the crew(s) through their training and continually reinforce the use of proper scanning and search methods.

A good baseline to train and evaluate a crew's ability to effectively scan the breadth of their sector begins with TC 3-20.31-4 and should be emphasized in a detailed brigade and/or battalion standard operating procedure (SOP).

Master Gunner Common Core, Tank Commander's Course and Bradley Commander's Course thoroughly train students on the direct-fire engagement process and provide a standard method of engagement for weapons and platforms on the battlefield. Students attending these courses will learn to evaluate direct-fire procedures to identify procedural errors that violate the principles of direct fire; to integrate procedures, duties and responsibilities; and to advise commanders on assigned weapon and ammunition capabilities.

Identify

Throughout the duration of the gunnery tables, crews consistently struggled to understand the prompts that were given to them by the tower and translate those prompts to the type and number of targets presented. Crews also misclassified vehicle targets, often mistaking a truck target for a personnel carrier or vice versa.

A lack of experience was determined to ***not*** be a contributing factor in misclassification. The lack of knowledge in how to manually adjust the image displayed in the thermal sights played a key role in target misclassification.

An immediate solution to this problem begins with the scripts used at gunnery and throughout the gates to live-fire. Scripting should be tactically based and not administrative unless

absolutely necessary. Implementing the use of tactical prompts during simulations training familiarizes the VC and gunner with similar prompts they will receive while on the range. Also, developing familiarization training that details the capabilities and limitations of the sights and controls will build crew members' knowledge of their platforms and enhance proper implementation.

Abrams master gunner and Bradley master gunner courses train students at the mastery level. A portion of these courses focuses on the commander's and gunner's primary sight(s), providing in-depth instruction in the operation, components, capabilities and limitations of each sight.

Decide

Both Abrams and Bradley crews consistently struggled to prioritize their targets, oftentimes engaging the first target they acquired. Target prioritization is described in TC 3-20.31-4 and establishes the order of engagement. Crews are advised to engage near before far, frontal before flank and stationary before moving.

While postured in a defensive fighting position, crews had enough time to acquire both targets and prioritize targets accordingly. However, a common trend found crews consistently engaging moving before stationary or far before near. The assessment is that the absence of target prioritization was a byproduct of the detection process issues described earlier.

Engage

Prior to executing gunnery tables, crews from both platforms were provided a separate day to boresight and conduct live-fire accuracy screening test / zero their gunner's auxiliary sight (GAS) / auxiliary sights, main gun and coaxial machinegun. Crews on both platforms struggled to effectively zero their GAS / auxiliary sights and coax, and engagements suffered as a direct result.

Crews used poor firing techniques during engagements, specifically with their coaxial machinegun. Crews engaged with the coax the same way they would engage with their main guns: by lazing and firing center mass, often missing the target. Crews on both platforms received coaching during AARs that encouraged use of a "Z" pattern while engaging troop targets. Crews that did attempt to use a pattern while engaging troop clusters appeared timid about applying any aggressive movement while the coax was firing.

Moving targets also proved to be problematic for some crews. Once on target, gunners displayed difficulty in applying a smooth and consistent track while attempting to follow the target. Gunners often jerked the hand station while attempting to transition to high magnification, lasing and firing, leading to inconsistent engagements.

Unit master gunners should assess their crews' performance on basic tasks in advance of a gunnery density. They should provide commanders with sound recommendations on more training that will greatly benefit their formation(s). A proven method consists of the integration of gunnery-skills-test tasks into battle rhythm events or by selecting two tasks to perform on "Maintenance Mondays" after preventive-maintenance checks and services is complete. The placement of tracking boards with *basic*, *advanced* and *advanced with switchology* graphics (see Figure 1) in a motorpool or local training area provides crews the opportunity to build fundamental manipulation skills in all their optics.

Assess

Observed across multiple engagements, crews lacked the ability and confidence to assess their engaged targets for themselves and were heavily dependent on the tower to provide an assessment for them. When the crews were able to determine they missed the target, the VC would often fail to provide the gunner with a

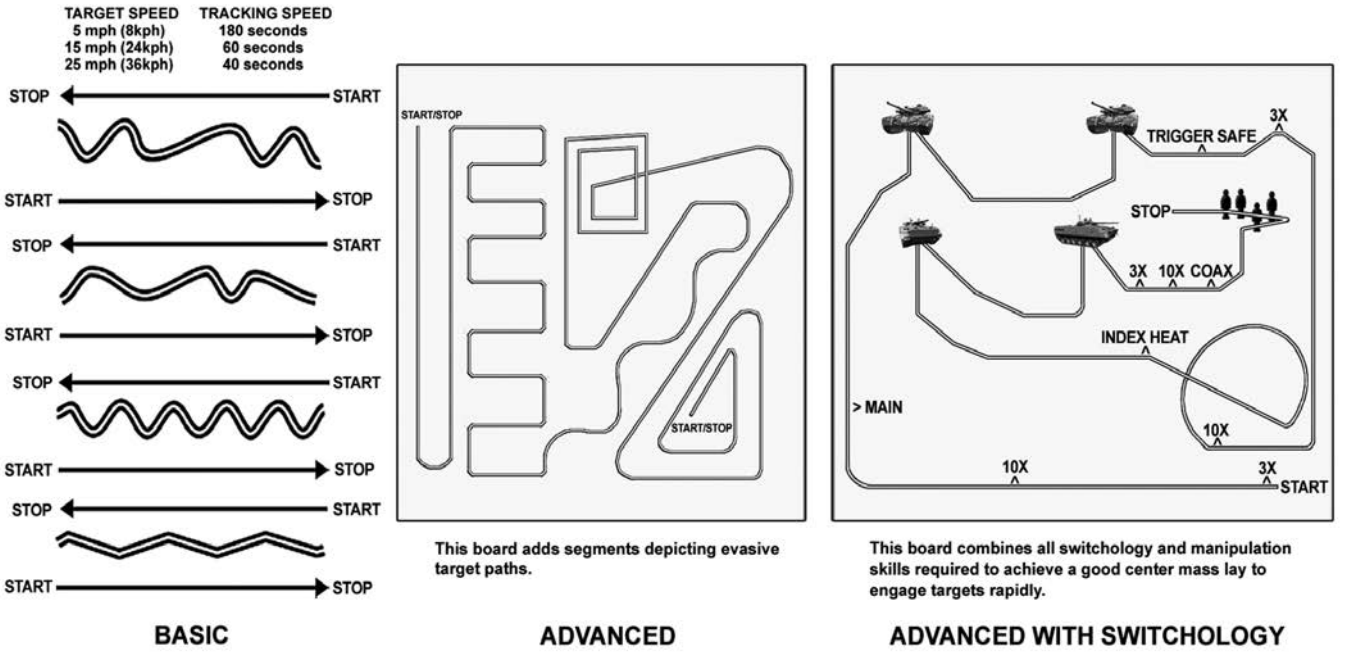


Figure 1.

correction after observing the round impacting short, over, left or right of the target. If a correction was issued, the VC would instruct to gunner to "go up a little bit" and void any frame of reference for the gunner to make an accurate correction.

Standardizing a correction to "a target form" or "half-target form" would provide gunners a known distance to better adjust their fires and enable them to accurately re-engage the target. Outlining this method in a gunnery SOP would establish a solid foundation for all gunnery training.

Proficiency in the live-fire engagement process is a perishable skill. If not trained consistently or integrated into normal battle rhythm, these skills degrade over time. The responsibility to create this proficiency falls solely on the shoulders of all leaders within the formation. They must build repetition in all aspects of training and steadily advance their crews' skills in lethality. The disciplined force, willing to constantly hone their profession and manufacture lethality, will triumph on the battlefield.

SSG Kurt Scapardine serves as a Bradley master-gunner instructor in 3rd Squadron, 16th Cavalry Regiment, 316th Cavalry Brigade, at Fort Benning, GA. Previous assignments include squadron master gunner, squad leader and Bradley Fighting Vehicle gunner in 4th Squadron, 10th Cavalry Regiment, 3rd Armor Brigade Combat Team, 4th Infantry Division, Fort Carson, CO. SSG Scapardine's military education includes Advanced Leader's Course, Bradley Fighting Vehicle Master Gunner and Basic Leader's Course. He is pursuing a bachelor's of science degree in computer science at American Military University. SSG Scapardine's awards and honors include the Meritorious Service Medal and the Order of Saint George.

Acronym Quick-Scan

AAR – after-action report
DIDEA – detect, identify, decide, engage and assess
GAS – gunner's auxiliary sight
SOP – standard operating procedure
TC – training circular
VC – vehicle commander
VCE – vehicle-crew evaluator

Operationalizing Command Maintenance to Train Organizational Systems and Build a Culture of Maintenance Readiness

by MAJ Gary M. Klein

Task Force Strike was preparing for crew-gunnery Table IVs tomorrow, but the commander and executive officer were beginning to get nervous. The battalion's M1A2 crews were conducting live-fire accuracy screening tests (LFASTs). Its M2A3 crews were zeroing their M242 Bushmasters (25mm single-barrel chain-driven autocannons)*, but things were not going well.*

It all started the day before when several vehicles unexpectedly broke down before making it to the range. Some vehicles never made it out of the motorpool, while others broke down for seemingly simple issues. Also, some crews were troubleshooting radios after they were unable to communicate with personnel in the range tower during Table IIIs. Issues continued to pile up, and operational-readiness (OR) rates continued to drop as crews discovered turret, main gun and ancillary-weapon-system faults during LFAST and zero.

After meeting at the maintenance collection point, the commander and executive officer agreed to meet again later that evening to discuss what had gone wrong. In the meantime, the battalion executive officer was researching several questions. The battalion had been conducting command maintenance every week, so why had they not discovered more of their maintenance issues before now? Had they provided enough orders and guidance to their company commanders to ensure Soldiers were conducting all preventative-maintenance checks and services (PMCS) on their vehicles? Had their Soldiers not performed PMCS on their ancillary equipment? Why was there such a large discrepancy between the equipment-status report (ESR) before deploying to the field and today's ESR? The executive officer decided to have some initial recommendations ready for his meeting with the commander so they could mitigate the current volume of maintenance challenges for next month's platoon gunnery.

Incorporating PMCS

Command maintenance is a well-known weekly event where Soldiers conduct PMCS on their vehicles. It often happens on Mondays, or the first duty day of the week, to ensure units maintain their equipment according to the Army's 10-level technical manuals (TMs).

Command maintenance is a great way to incorporate routine PMCS into a unit's battle rhythm. Depending on a unit's operations tempo (OPTEMPO), priorities and depth of planning, command maintenance is also an opportunity to build a broader culture of readiness. Commanders and leaders at all echelons should operationalize command maintenance to deliberately exercise all aspects of their maintenance systems and, as able, achieve additional training objectives, including reporting and command-post operations, communications-systems readiness and rollout exercises.[1]

Admittedly it is challenging to incorporate all the readiness activities in this article every week, but commanders can modulate the specified tasks of each week's command maintenance based on their priorities and the unit's OPTEMPO. If the commander assesses that Soldiers need more time to conduct PMCS, he or she might direct a course of action (CoA) that focuses exclusively on conducting PMCS on their rolling stock that week (Table 1, CoA 1). On the other hand, if a unit is on Red Cycle and is not conducting as much collective training at the time, the commander might choose to conduct everything from PMCS on rolling stock up to rollout exercises (Table 1, CoA 6).

During most weeks, commanders will likely fall somewhere in the middle, selectively conducting some readiness activities but not others.

Figure 1. Troopers from 1st Squadron, 1st Cavalry Regiment, conduct PMCS on their M2A3 Bradleys at Fort Bliss, TX. *(Photo by MAJ Steve Modugno, 2nd Brigade Combat Team, 1st Armored Division, Public Affairs)*

Table 1. CoAs to operationalize command maintenance, with the maintenance tasks mentioned in this article (y-axis) charted against a unit's OPTEMPO (x-axis). Each column represents a CoA where "X" indicates a task the commander decides to execute in that CoA based on his or her priorities.

	OPTEMPO					
	High	<-	Medium		->	Low
TASKS TO EXECUTE	CoA 1	CoA 2	CoA 3	CoA 4	CoA 5	CoA 6
PMCS rolling stock	X	X	X	X	X	X
PMCS ancillary equipment		X	X	X	X	X
More maintenance systems tasks (AOAP, TMDE, MWOs/ SOUMs and combat spares)			X	X	X	X
Communications checks and reporting operations				X	X	X
Command-post operations					X	X
Rollout exercise						X

Maintenance objectives

At a minimum, Soldiers conduct PMCS on their vehicles during command maintenance, but which checks are they conducting? Army TMs include before, during and after, as well as weekly and monthly checks.[2] So, how do commanders ensure their Soldiers conduct all these checks over time?

Without more guidance, Soldiers may only conduct before, during and after PMCS every week to ensure their vehicles are dispatched. However, to ensure all checks are conducted, leaders need to build a battle rhythm to add weekly and monthly checks to their training calendars to ensure these checks are completed as well.

The command-maintenance battle rhythm included in Table 2 is one example of how commanders can implement this idea within their units. Table 2 details a command-maintenance technique whereby a commander incurs some risk by not conducting weekly-level PMCS checks each week, but this time saved enables Soldiers to conduct checks on ancillary equipment and other maintenance systems that might otherwise be overlooked. Arguably, this deliberate decision is better than an alternative, which is that Soldiers may never conduct weekly or monthly checks or may never touch their ancillary equipment.

Soldiers must maintain their ancillary equipment, too. So when do you maintain your communications equipment; weapons and mounts; vehicular weapon systems; chemical, biological, radiological and nuclear (CBRN) equipment; optics; night-vision devices; tents; and other equipment? Like command decisions regarding what PMCS checks to conduct each week, commanders must focus their Soldiers' maintenance efforts on ancillary equipment as well.

Table 2. Monthly/quarterly command maintenance battle rhythm that directs which PMCS checks, ancillary equipment and additional maintenance systems to focus on each week during command maintenance.

Week of the month	PMCS checks	Ancillary equipment to PMCS	More maintenance system focus items
1	Before, during, after	Communications equipment and night-vision devices	AOAP / TMDE
2	Through weekly	Weapons (individual, crew-serve and associated mounts and optics	MWOs / SOUMs
3	Before, during, after	Weapons (M242s, M256s, Common Remotely Operated Weapon Station and associated optics	AOAP / TMDE
4	Through monthly	Generators, trailers and quarterly ancillary equipment (see below)	MWOs / SOUMs
5	Before, during, after	To be determined by C/B/T	Combat spares
Week 4: quarterly ancillary equipment to PMCS	January / April / July / October	CBRN equipment	
	February / May / August / November	Tents and command-post equipment	
	March / June / September / December	BII	

Table 2 details a battle rhythm that emphasizes shooting (weapons), moving (rolling stock and optics) and communicating (communications equipment and generators) while assuming some risk on CBRN, tents, command-post equipment, basic-issue items (BII), etc. This ancillary-equipment PMCS battle rhythm provides clear guidance and predictability for company/battery/troop (C/B/T) commanders to dedicate time on their training calendars to PMCS all organizational equipment.

A benefit of creating a battle rhythm for ancillary-equipment PMCS is that 10-level operator PMCS can be synchronized with 20-level maintainer PMCS to enable services. Some operator checks on ancillary equipment are redundant with 20-level services (for example, M4 10-level functions checks and M4 20-level quarterly services, and PVS-14 (night-vision monocular) 10-level PMCS and PVS-14 20-level semi-annual services).[3] Services must be a team effort among operators,

maintainers and commodity-shop leaders, including arms-room and CBRN noncommissioned officers (NCOs) in charge and officers in charge.

Some organizations struggle with ancillary-equipment services because they do not enable their commodity shops with operator assistance. Operators should conduct PMCS under the supervision of commodity-shop subject-matter experts to increase Soldier proficiency on their equipment and drastically reduce the time required to complete ancillary services. By creating a battle rhythm for PMCS ancillary equipment, leaders are dedicating time to directed services.

Finally, what systems does your unit's leadership use to ensure your organization stays current on its other maintenance systems: the Army Oil Analysis Program (AOAP); test, measurement and diagnostic equipment (TMDE); maintenance work orders (MWOs)/safety-of-use messages (SOUMs); and combat-spares inspection? Leaders likely cover these topics in weekly maintenance meetings, but command maintenance is an ideal time to capitalize on engaged operators and leaders so the required actions are completed while Soldiers are already fully engaged in the motorpool.

Commanders should incorporate reporting requirements to ensure leaders are doing their research to determine when these maintenance requirements are due so that Soldiers anticipate and execute the necessary actions to meet required suspenses. Just like ancillary services, the suspenses for these maintenance systems should be added to C/B/T training calendars to ensure they are synchronized with the unit's training and other requirements. By emphasizing these maintenance systems during command maintenance, commanders can proactively address these requirements when Soldiers are already focusing on equipment maintenance.

Maintenance reporting and command-post operations

Depending on the commander's priorities and time available, leaders may wish to add reporting and minimally manned command-post operations to command maintenance to maintain or improve readiness in command-and-control systems and processes. While Soldiers and leaders at the platoon-and-below-level are executing the tasks necessary to achieve command-maintenance objectives, leaders at C/B/T-and-above echelons should be supervising these actions to coach, teach and ensure their units maintain high maintenance-readiness levels.

One way to achieve this – while simultaneously building proficiency at communications systems, reporting and battle tracking – is to establish very simple C/B/T, battalion/squadron, and maybe even brigade-level command posts. To ensure the priority remains on maintenance, command posts should be an economy-of-force effort during command maintenance, but they should also have enough manning to accomplish a few key tasks: receive and send reports, battle-track maintenance efforts and provide communications expertise to enable communications-systems troubleshooting. A unit can likely achieve these objectives with one radiotelephone operator (RTO), one battle NCO and one signal-support-systems specialist (military-occupation specialty 25U).

Command maintenance is a great opportunity to train on reporting, including building RTO proficiency and unit-reporting standing operating procedures (SOPs). At a minimum, command posts at echelon need an RTO to send and receive reports on radios and Joint Battle Command-Platforms (JBC-Ps). Ideally, command posts should include a battle NCO to enable the team to update trackers, proactively seek out information, provide assistance to subordinate units and maintain a maintenance common operating picture (COP). Finally, having one 25U Soldier on hand to troubleshoot radios and JBC-Ps is extremely valuable to help maintain and teach communications equipment techniques to other Soldiers.

Command maintenance is a low-threat environment to train RTOs and battle NCOs. It's also an ideal time to build familiarity and experience with reporting formats and SOPs. Report formats should mirror, or at least be modified versions of, reports from the unit's tactical SOP (TACSOP). Example reports might include using command-update brief (CUB) formats for mid- or end-of-day situation reports (SITREPs) and slant-reporting SOPs (for instance, tanks/Bradleys/Bradley fire-support teams/M1064s/M88s).

Table 3 is an example command-maintenance timeline that includes a mid-day JBC-P SITREP and an end-of-day CUB via frequency modulation (FM) radio. Given the weekly frequency, command maintenance is an outstanding opportunity to achieve sets and repetitions on reporting and command-post procedures.

With a command post capable of receiving and sending reports, the next step is to build and update a COP nested with the unit's TACSOP. Two trackers pertinent to command maintenance and part of a unit's larger COP are a combat-power tracker and the unit's communications-status (COMSTAT) tracker.[4]

As Soldiers execute PMCS on their vehicles, they should report via radio and JBC-Ps. This allows the battle NCO to update and track the maintenance readiness of their vehicles while validating the communications systems associated with each vehicle and updating the COMSTAT as each crew checks in. Vehicle crew members should report the status of PMCS and their vehicle's OR (fully mission-capable or non-mission-capable, and any new faults discovered).

Then, the command post can compile this information and compare it to the unit's Global Combat Support System-Army (GCSS-A) ESR to update the unit's combat-power tracker. Battle-tracking maintenance like this enables leaders to receive initial notification of changes to the ESR based on that week's equipment maintenance and inspection worksheets (DA Form 5988-Es).

To maximize communications training during command maintenance, leaders may choose to communicate using a combination of encrypted radio and JBC-P systems to build proficiency and

Table 3. Command maintenance timeline, presenting events and specified tasks to prepare for and execute command maintenance. The timeline includes four critical events to enable command maintenance: printing 5988s the prior week, mid-day JBC-P SITREP and end-of-day FM CUB to test those systems and a leadership walk-through to inspect the status of the work.

Time	Event
No later than end-of-day Friday	C/B/T executive officers coordinate and receive all blank 5988s for next week's command maintenance
6:30 a.m.-7:30 a.m.	Physical training
8:45 a.m.	C/B/T executive officers issue 5988s to platoons and a fresh ESR to their command post
9 a.m.	Battalion/squadron command-maintenance formation
9:10 a.m.-4 p.m.	Command maintenance
No later than 1:30 p.m.	C/B/Ts submit mid-day SITREP via JBC-P
3 p.m.	Battalion/squadron leadership walk-through
3:30-4 p.m.	Commanders' maintenance synch via FM (using TACSOP CUB format)
4:30 p.m.	Battalion/squadron closeout format

validate these systems. In addition to validating the radios are operating properly, reporting using encrypted radios on frequency-hop (FH) cypher text (CT) is a great technique to ensure units' communications- security (COMSEC) systems are fully functional and efficient. Leaders sometimes overlook their COMSEC systems until they deploy to the field, overlooking questions such as:

- How many COMSEC custodians do you need in your unit?
- Where are they assigned?
- Have your Soldiers established accounts/systems to draw and issue COMSEC efficiently and effectively?

If a company only has one COMSEC custodian, it will take "forever" to load new COMSEC during command maintenance when communications keys change. This same challenge would be exacerbated when the company is dispersed across an operational area during collective training or combat operations. So, command maintenance is a great opportunity to learn in a forgiving environment and build repetitions.

Similarly, battalion S-6 personnel sometimes find themselves with insufficient accounts and systems in place to draw new COMSEC and share them across subordinate units' simple-key loaders. Having all crews turn on their radios, validate or load new COMSEC keys and report command-maintenance progress via FM (FH CT) validates the unit's COMSEC readiness.

In addition to using FM systems, leaders should incorporate reporting via JBC-Ps to validate those systems as well. This is another system that brigade-and-below units almost always include in their primary, alternate, contingency and emergency communications plan. However, maintaining JBC-P OR rates is challenging without emphasis and supervision. Commanders should incorporate JBC-P reporting into command maintenance as a forcing function to track JBC-P OR rates. This can be as simple as operators sending a test message from each JBC-P system or a more thorough SITREP as referenced in the command-maintenance timeline of Table 3.

Troubleshooting JBC-P problems in the field is much more difficult than in the motorpool because of the relative shortage of operator-level JBC-P troubleshooting expertise. Common challenges range from simple misunderstanding of proper start-up and shutdown procedures to the inability to troubleshoot potential JBC-P wiring faults and the availability of JBC-P repairs parts. Communications-systems repair parts are usually centralized at the battalion S-6 shop in garrison and command posts in the field. With the proper planning, standards and supervision, these potential challenges – low JBC-P OR rates and operator-level troubleshooting expertise – can be addressed during command maintenance to increase unit readiness in the field.

Culture of readiness: rollout exercises

Finally, commanders may wish to use command maintenance as an opportunity to test a subordinate unit's overall readiness. To this end, leaders can order units to conduct simple, no-notice rollout exercises during command maintenance. Some preparation is required, but leaders at all echelons can randomly select subordinate units to rollout to the field with no prior notice, challenging their Soldiers and leaders to own all aspects of readiness and create a culture of maintenance excellence. Commanders can give these units a simple tactical task to conduct during rollout exercises such as conducting a short convoy or establishing an assembly area in a close-in training area.

Rollouts test subordinate units' ability to maintain their systems, enable leaders to check readiness, ensure that maintenance systems of record (GCSS-A) reflect reality and encourage competitiveness between units to prove their readiness. Rollouts test various unit systems, from its ESR to

Figure 2. Soldiers from 1st Battalion, 35th Armor Regiment conduct PMCS on their M1A2 Abrams tank at Fort Bliss, TX.
(U.S. Army photo by MAJ Steve Modugno, 2/1 Armored Division Public Affairs)

testing communications systems at distance, and its ability to execute basic tactical tasks. Leaders should know which vehicles are capable of deploying to the field and which can't based on its ESR.

However, a rollout will test the accuracy of a unit's ESR, sometimes revealing previously unknown faults or issues. Also, leaders will often discover inefficiencies in simple tasks or systems such as drawing weapons from the arms room, the system used to fill radios across the unit or the storage systems used to store ancillary equipment.

Finally, rollouts can be used to train and test a unit's proficiency in basic tactical tasks such as movement techniques, high-frequency radio-communications tests, reporting procedures, establishing a retransmission station, establishing an assembly area, etc. If conducted frequently enough, commanders will find that their subordinate units will take pride in their ability to execute these tasks and they will compete to see how quickly they can complete these tasks to standard.

To ensure Soldiers can rollout on short notice, leaders should consider standardizing the creation of monthly alert dispatches. Alert dispatches (DA Form 5987-1-E) can be authorized for extended periods of time depending on local command orders or policies.[5] To ensure the frequency of PMCS, and quality control and quality assurance checks, standard dispatches (DA Form 5987-E) are usually only authorized for up to seven days. So it's wise for commanders to implement more controls on the use of month-long 5987-1-E alert dispatches. Common controls include requiring company commanders to collect and secure their C/B/T's alert dispatches to manage when they are used. Also, Soldiers should be required to have a valid Form 5988-E and complete PMCS on the same day they use an alert dispatch.

Either way, creating monthly alert dispatches makes it easier to conduct alert rollouts and minimizes the requirement for equipment records parts specialists (ERPS) to create dispatches during command maintenance since ERPS clerks need to be conducting maintenance on their own equipment at that time.

Conclusion

Most Army units conduct command maintenance in some way, shape or form, but the specifics – PMCS frequencies, what equipment is maintained and the depth of systems exercised – often vary from one unit to the next. Commanders and leaders at all

echelons should operationalize command maintenance to exercise all aspects of their maintenance systems while seizing the opportunity to achieve additional training objectives on communications systems, command-post operations and simple tactical tasks during rollout exercises. Command maintenance is a great way to incorporate routine PMCS into a unit's battle rhythm, but it is also an opportunity to build a culture of maintenance and readiness.

After struggling through crew gunnery due to maintenance issues, Task Force Strike's commander and executive officer decided to be more prescriptive with weekly command-maintenance tasks. Battalion orders now directed what checks to conduct each week on what equipment while requiring reporting and periodic rollout exercises to validate their ESRs. Soldiers and leaders bemoaned these changes at first, but they realized the wisdom and enjoyed the fruits of their labor at their next gunnery. Higher OR rates at platoon gunnery enabled them to train on their own vehicles; spend less time fixing faults that could have been discovered before deploying to the field; and focus more on shooting, moving and communicating.

MAJ Gary M. Klein is the brigade executive officer, 2nd Armored Brigade Combat Team, 1st Armored Division, Fort Bliss, TX. His previous assignments include squadron executive officer and operations officer, 1-1 Cavalry, Fort Bliss; plans officer, 1st Armored Division, Fort Bliss; Maneuver Captain's Career Course (MCCC) small-group leader, Command and Tactics Directorate, Maneuver Center of Excellence, Fort Benning, GA; troop senior observer/coach/trainer, Operations Group, Joint Readiness Training Center, Fort Polk, LA; and commander, Troop B and Headquarters and Headquarters Troop, 1st Squadron, 33rd Cavalry Regiment, Fort Campbell, KY. MAJ Klein's military schools include the Advanced Military Studies Program, Command and General Staff Officer Course, MCCC, Armor Basic Officer Leader's Course and Ranger, Airborne and Air-Assault Schools. He has a bachelor's of science degree in biochemistry from the University of Michigan, a master's of arts degree in military operations from the School of Advanced Military Studies and a master's of science degree in medicinal chemistry from the University of Illinois-Chicago.

Notes

[1] This article uses the term "rollout exercise," but some leaders might call these "deployment readiness exercises (DREs)" or "emergency DREs (EDREs)." The author deliberately chose not to use the term *DRE* because AR 525-93, ***Army Deployment and Redeployment***, October 2019, Paragraphs 3-6 to 3-9 (***Conducting a Deployment Readiness Exercise***) state that DREs must include load teams and other unit-movement related tasks, which is beyond the author's recommendation for command maintenance. That being said, FM 7-0, ***Training***, June 2021, Paragraph F-8 (EDRE) states that "[c]ommanders [can] vary the scope and complexity" of EDREs based on mission variables, which might signal an addition or change to future regulatory language.

[2] Commanders need to know if any of their equipment has multiple manuals to ensure Soldiers are conducting checks on all subcomponents. For instance, an M2A3 Bradley Fighting Vehicle has both hull and turret TMs. The hull TM is 9-2350-294-10-1, while there are two turret TMs: TM 9-2350-294-10-2-1 and TM 9-2350-294-10-2-2.

[3] Operator 10-level M4 functions checks satisfy nearly 50 percent of the quarterly services requirement. See TM 9-1005-319-10, ***Operator's Manual for Rifle, 5.56 mm, M16 and M4***, August 2016, and TM 9-1005-319-23&P, ***Unit and Direct Support Maintenance Manual for Rifle, 5.56 mm, M16 and M4***, April 2019. In the 10-level TM, Work Package 10 in Chapter 2 covers operator functions checks, and Chapter 2, Section III of the -23&P covers quarterly PMCS requirements. Also, operators can conduct two-thirds of a PVS-14 180-day service, which has three requirements: 10-level PMCS, purging (must be conducted by direct-support mechanics) and a 10-level resolution test. See Section III of TM 11-5855-306-23&P, ***Field Maintenance Manual for Monocular Night-Vision Device AN/PVS-14,*** September 2013, and TM 11-5855-306-10, ***Operator Manual for Monocular Night Vision Device AN/PVS-14***, October 2010.

[4] See Gary M. Klein and Ragan T. Rutherford, "The Armored Brigade Combat Team Cavalry Squadron's Combat Trains during Large-Scale Combat Operations: Balancing Maintenance, Recovery, Freedom of Maneuver," ***ARMOR***, Fall 2020 edition, for an example combat-power tracker that was successfully used during command maintenance and at the National Training Center.

[5] See DA Pam 750-8, ***The Army Maintenance Management System Users' Manual***, August 2005.

Acronym Quick-Scan

AOAP – Army Oil Analysis Program
BII – basic-issue item
CBRN – chemical, biological, radiological and nuclear
C/B/T – company/battery/troop
CoA – course of action
COMSEC – communications security
COMSTAT – communications status
COP – common operating picture
CT – cypher text
CUB – command-update brief
DRE – deployment-readiness exercise
EDRE – emergency deployment-readiness exercise
ERPS – equipment records parts specialist
ESR – equipment-status report
FH – frequency hop
FM – frequency modulation
GCSS-A – Global Combat Support System-Army
JBC-P – Joint Battle Command-Platform
LFAST – live-fire accuracy screening test
MCCC – Maneuver Captain's Career Course
MWO – maintenance work order
NCO – noncommissioned officer
OPTEMPO – operations tempo
OR – operational readiness
PMCS – preventative-maintenance checks and services
RTO – radiotelephone operator
SITREP – situation report
SOP – standing operating procedure
SOUM – safety-of-use message
TACSOP – tactical SOP
TM – technical manual
TMDE – test, measurement and diagnostic equipment

At First Sight: Russian Armor/Mechanized Battalion Tactical Groups in Ukraine War

by MAJ Gonzalo Báez

The Russian battalion tactical group (BTG) was born of the "New Look" military reforms that began in 2007. The Russian army's transition undoubtedly reflected its experience in the Chechnya War (1994-2000).

In that asymmetric war in the Caucasus region, brigades and divisions proved to be oversized, slow-reacting units with obsolete equipment, antiquated tactics and an inability to combine their weapons with the speed that modern combat demands.[1] Those large organizations were conceived by the previous Soviet army system at the beginning of the Cold War to fight against the armored and mechanized forces of the North Atlantic Treaty Organization (NATO).

During the Battle of Grozny (December 1994-March 1995), with their doctrine outmoded and rusty, Russian armored and mechanized forces were initially repulsed in that capital city. They suffered heavy casualties and were forced into an operational pause. Among other things, Russian troops lacked combat readiness, and they were surprised by the unexpected resistance of the Chechens, who forced two long months of heavy fighting.

Only after suffering heavy losses, the Russian army decided to change its tactics to oppose the Chechen special groups that combined anti-tank weapons, boobytraps, snipers and machine-gun crews from almost every building. At that time, after losing around 225 armored vehicles (including 62 tanks) and more than 1,500 soldiers, the Russians unleashed the largest air and land attack since World War II in Grozny, producing 1,370 casualties among Chechen soldiers, with about 27,000 civilians killed.[2]

From that raw experience, according to a U.S. Army publication,[3] profound doctrinal changes were made to the Russian army, including reorganization and modernization of its forces in general. In addition to conflicts in the satellite countries, the Russian army took note of the lessons-learned by the United States in Iraq and Afghanistan. Therefore, the BTG concept was created in search of a new kind of organization with more expeditionary capacities to project forces based on new technologies.

Moreover, other experts and defense Internet sites[4, 5, 6] indicate that Russia seeks to replace the old model of massive, rigid and pure organizations the Soviet army had, explaining that regiments and battalions are ideal for maintaining the army during peace, especially in its daily tasks. However, to have real capabilities for combat, more flexible and autonomous organizations are needed to face a modern enemy in the multidomain spectrum.

The new organization was put to the test in 2008 with the first BTG deployed on the border with the Republic of Georgia, using a special formation under Russian Army Command No. 58. The direct dependency on such a command was atypical, since the normal way would have been to operate at brigade level. Soon a second type of BTG was formed with light materiel for air-assault operations and high-readiness strategic mobility to anticipate and occupy key terrain that favored Russia.[7]

The BTG represents a departure from the Soviet model, giving more importance to the quality of technology than to quantity of equipment. However, this latest concept is strongly questioned after analyzing the current 2022 campaign in Ukraine. Russia currently has more than 60 brigades or similar formations organized, mostly with two BTGs each.[8] Russian Defense Minister Sergei Shoigu has said that by August 2021 there were 168 BTGs in the Russian armed forces, indicating that this type of organization was the standard and perhaps the main change in Russian land doctrine.[9]

Aware of their shortcomings in conventional weapon systems, the Russians sought greater independence at

Comparison: Russian BTG vs. U.S. Army CAB

The U.S. Army reorganized its land battalions at the beginning of the new century into strike units that were the centerpiece of low-intensity-conflict doctrine. Named combined-arms battalions (CABs), the units were able to deploy in a very short time as a part of an expeditionary force. Thus Armor and mechanized CABs were formed based on two M-1 Abrams tank companies and one M2 Bradley mechanized company capable of launching tube-launched, optically tracked, wire-guided, or TOW, 2B missiles.

Like Russian BTGs, Americans have very robust organic scouting forces at battalion level, equipped with scouting vehicles, drones and a forward-support company connected to the dependent brigade.

Unlike Russian BTGs, CABs' indirect-fire support is provided by heavy 120mm mortars, which have a maximum range of eight kilometers.

Nonetheless, the U.S. Army rewrote its doctrine in 2017, departing from low-intensity-conflict scenarios to a large-scale operations model and focusing its land forces into better-equipped Army divisions. So, in addition to mortar fire, CABs also have a robust fire-support system with artillery from its dependent brigade or division.

And worth mentioning: the best close-air support in the world from other American agencies.

Acronym Quick-Scan

BTG – battalion tactical group (Russian army)
CAB – combined-arms battalion

the tactical-unit level, covering with artillery what they didn't get from aviation. (Aviation is more expensive, very complex to coordinate and synchronize with land maneuver.)

In short, the BTG concept was conceived as a combined-arms unit, capable of rapid deployment to deter and react quickly to crisis situations on the multidomain modern battlefield. To that end, the BTG combines the power of Russia's armored forces with its artillery massed fires, antitank weapons systems, reconnaissance drones, some degree of electronic-warfare (EW) capacity, engineer platoons and logistics support.

Organization, tactics during Crimean campaign

During the Crimean campaign (2014-2015), each BTG had about 700 to 800 soldiers (900 if reinforced) and about 100 vehicles in a mix of armored, mechanized and wheeled. This almost doubles the capacity of an American combined-arms battalion, although it also falls way short of the U.S. brigade combat team's firepower.

The BTG's mission during that campaign was to control key areas in the conflict zone. Toward this goal, Russian forces, acting without official recognition from their country, relied on pro-Russian militias to gain greater freedom of action within their limited means. BTGs would attack the enemy's rear guard in offensive operations while protecting their own flanks and rear area with pro-Russian militias.[10]

At that time, the standard BTG fought segregated from brigades of the Russian army. It was common practice to deploy only 50 percent of a BTG, while the other half of the unit remained in Russia. BTGs were comprised of one or two tank companies (preferably T-72 or T-90 tanks), one mechanized company, one mechanized-artillery battery, one anti-aircraft artillery company and another antitank formation. This structure was reinforced with an engineer team, some portable drone teams and a chemical-, biological-, radiological- and nuclear-capable reconnaissance group.

The BTGs only had two or three combat companies, so they had to synchronize their actions with irregular forces to complete their combat power.[11] In the event of war, Russian law prohibits the use of conscript soldiers in combat units – such as the BTGs – from being deployed outside their homeland. For this reason, their presence in the BTGs was minimal and limited to low-risk logistics tasks.[12] In replacement, professional soldiers were used, with troop levels that did not exceed 200 men in each BTG.

BTGs can move quickly to a theater of operations via trains, using two strategies: 1) deploying with soldiers' own equipment and vehicles; or 2) deploying with just soldiers and their personal equipment. (The soldiers would fall in on their heavy equipment right in the crisis zone.[13]) The pre-positioning system has problems, such as being forced to use unfamiliar equipment. For example, a unit normally equipped with T-62 or T-72 tanks could end up using more modern models without training or time for familiarization by the soldiers who will crew the tanks.[14]

BTGs were intended to be equipped with modern surveillance and information-gathering systems to give them the ability to fight in complex operational environments favorable to asymmetric enemies. BTGs employed drones because they could obtain information in real-time, thus reducing the uncertainty of war while providing a guide for artillery fire from the unit's 152mm guns. The BTGs also have equipment that will protect against standard EW, possibly with frequency hopping and encrypted communications.

However, this renovation/modernization of equipment also had its shortcomings in the 2014-2015 campaign. The most notorious was the BTGs' inability to maneuver along different axes of advance. This vulnerability also made it difficult to practice the principle of economy-of-force since there were not enough assets.

In addition, other factors such as logistics and those linked to command, control and communications (C3)[15] affected the BTGs' performance. In the case of logistics, as happens in all armies, the BTG is mobilized mostly on wheels, which limits operations on good routes. Nonetheless, since the Vietnam War, modern armies now also use helicopters and other air assets to support logistic maneuver. However, this hasn't been the case for the Russian army during the first phase of its 2022 campaign in Ukraine.

As for the C3 used by BTG commanders, it has been far from the ultramodern battle-management systems seen in NATO forces. BTG commanders and their staffs lacked assets to quickly transmit, in near-real-time, the tactical situation and mission-type orders with digital cartography and artificial-intelligence software. In addition to that, during the 2014-2015 campaign, communications with the paramilitary forces were not easy to establish due to the lack of interoperability.[16] Furthermore, cellphones and satellite phones were used to support military operations, even when these non-encrypted systems are easily affected in modern war.[17]

Incredibly, the same shortcomings

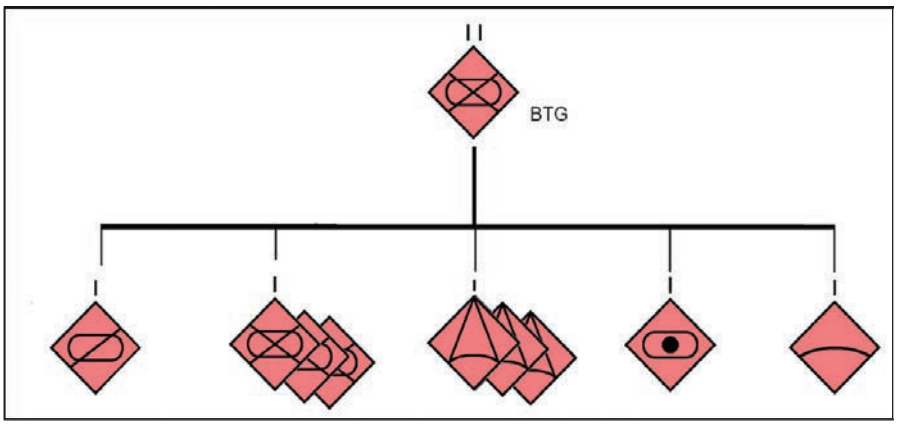


Figure 1. BTG organization. *(Graphic by MAJ Amos C. Fox, originally published in* ***ARMOR*****'s** *July-September 2016 edition)*

have been observed in the current operations of 2022. Russian soldiers have been observed stealing Western-made Ukrainian cellphones to communicate more securely with other comrades or with their families in Russia.[18]

Aside from the logistics and C3 issues, another Russian deficiency was the lack of artillery forward observers. Despite having drones at hand, the mission fell to company commanders, overloading their tasks and causing poor precision as a result.[19]

Finally, a ***Jane´s Defence*** analyst noted an important difference between U.S. and Russian doctrine. U.S. combat units' maneuver was backed by artillery support, while Russian units maneuver to support artillery movements in search of better positions where they can be more lethal. This method is debatable and can be recognized as valid in some situations. However, such an approach further reinforces the need of a good target-acquisition system. It is almost certain that in their 2022 operations, BTGs improved this shortcoming by incorporating specific teams for this mission.[20]

Regarding the Russian tactics used in 2014-15, which were framed in a low-intensity conflict, BTGs were used mostly to isolate targets in urban areas. This was preferred instead of direct decisive confrontations, which could expose the BTGs to easy destruction by antitank platoons aware of the Russian lack of close security for their vehicles.[21]

The Battle of Debaltseve (July 2014-February 2015) is an example. On that occasion, Russian President Vladimir Putin wanted to liberate this city and use victory to negotiate better terms. A single reinforced mechanized brigade of the Ukrainian army was defending a road junction in the town of Debaltseve, which is the gateway to Ukraine from the east. In opposition, the pro-Russian forces concentrated large volumes of artillery which supported the assault forces of T-90 tanks and other mechanized vehicles. This forced the Ukrainian forces to retreat in disorder. Despite the success, the pro-Russian armored forces were unable to exploit their local victory, possibly due to their reliance on dismounted militias for close security.[22]

First analysis of BTGs in 2022 campaign

Helene Cooper, Eric Schmitt and Julian E. Barnes point out in their ***New York Times*** article that European militaries no longer fear Russian land forces as they did in the past because the (partial) results of the Russian operations launched Feb. 24, 2022, did not go as expected.[23] The idea is shared by many analysts, such as David Petraeus (former director of the Central Intelligence Agency), who questioned Russia's real capacity to confront NATO.[24]

Unlike the 2014-15 campaign, Russia's current one has turned out to be a large-scale conflict that presents its forces framed in robust organizations such as combined-arms armies built with divisions made up of brigades, which at the same time are organized as BTGs.

That being the case, Mark Cancian, adviser to the Center for Strategic and International Studies in Washington, DC, notes that a typical BTG might have three motorized-infantry companies totaling 30 infantry fighting vehicles, either *boyeva mashina pekhoty* (BMP)-2 or BMP-3. The BTG completes its maneuver force with one or two tank companies of 10 tanks each (T-72, T-80 or T-90). In addition, the unit's fire support is ensured by a half dozen mortars, self-propelled howitzers, flamethrowers, multiple-rocket launchers and even up to six medium-range Pantsir S-1 air-defense systems, which NATO would not normally deploy in a battalion. Days before the invasion, Cancian claimed that BTGs could fight in any type of terrain and sustain a maneuver 155 miles deep.[25]

This current organization is undoubtedly more robust than those observed during the 2014-15 campaign. However, it is still too early to make a detailed analysis of the 2022 campaign due to the lack of historical information. It is possible to identify some shortcomings in the current operations by observing the whole picture of the conflict. These shortcomings are being well exploited as vulnerabilities by the Ukrainian resistance.

Logistical shortcomings in 2022 campaign

The first consideration is logistics, specifically in terms of standardization. The ***NATO Logistics Handbook*** establishes, among its policies and principles, that the standardization of equipment and services has a direct impact on sustainability of operations. Thus, it also has a straight-line effect on combat efficiency. Standardization favors the interoperability of the main equipment among different branches, making interchangeability and common procedures possible.[26]

Apparently, as it´s been seen, Russian forces don't always meet these parameters for the following reasons:

- BTGs are formed to fulfill specific missions or to participate as combined-arms units throughout the entire campaign, already organized and trained. Consequently, the commander must configure the force during planning to make the mission feasible. From what has been observed of the Russian BTG organization, at first sight we can say that it has a very ambitious mix of equipment unsupported by any organic logistics capability. Instead, it depends on its brigade's logistics battalion.
- On the other hand, BTGs combine many artillery pieces and a variety of very different vehicles, whether wheeled or tracked, which may be armor, infantry or artillery combat vehicles. BTGs also include anti-aircraft systems as particular as the Pantsir-S1 or land radars. In short, so much diversity can transform the concept of combined arms into one of combined problems.
- Finally, logistics maintenance is overloaded, affected by the low standardization of the equipment and a lack of personnel to sustain the mission. The biggest logistical load for a BTG is undoubtedly its artillery and tank shells. This represents a problem of volume, weight and security (to move it). Logistical diversity instead of standardization adds to this challenge for the BTGs.

In general, tanks are more complex when it comes to maintenance. In fact, the less technology they have, the

more difficult it is to support them. To mitigate this issue, modern Western tanks are built in a modular way with digital computers capable of anticipating technical problems. Unfortunately, this is not the case for Russian tanks of the 1970s-80s. There is no way a T-72 crew can repair its own mechanical problems because the tank's electronic subsystems are not interconnected or governed by a main computer like the modern generation of main battle tanks (MBTs) have. Therefore many abandoned vehicles have been observed during the current Ukrainian campaign. Although difficult to generalize, the repeated appearance of videos and images of broken-down or abandoned tanks casts doubt on the Russian logistics system.

It´s worth it to say that these shortcomings are being well-exploited as vulnerabilities by the Ukrainian resistance, which has high morale, knowledge of its territory and its enemy, and is resolved to push the invader back from its frontiers.

Terrain and weather conditions

The second consideration that explains some of the vulnerabilities of the Russian forces relates to terrain and weather conditions. The region of conflict is coming out of winter and getting into spring. This causes thaws and therefore mud, which creates difficult terrain for armored and mechanized forces to maneuver in.

For this reason, BTGs must face some challenges pushing their capacities to the limit. On one hand, their tracked vehicles will be able to better overcome these conditions. However, their logistics line and combat-support wheeled vehicles will be tied to roads that are usually easily interdicted by artillery, drone attacks and all kinds of obstacles. Helicopters can help the logistics maneuver challenges, but they are not going to be the first choice for a division commander since they are always scarce.

The Ukrainian mud is well known to the Russians. It was expected that the roads would become narrow avenues of death with little room for maneuver, as Philip G. Wasielewski, Center for Strategic and International Studies, stated a few days before the massive invasion. In his article, the author said that if the operation began between January and February, it would have the advantage of frozen terrain to facilitate the cross-country movement of mechanized forces, although they would also face extreme-cold temperatures that also can kill or defeat soldiers as well. Furthermore, Wasielewski said, if the campaign extends into March (as happened), the mechanized forces would have to deal with the infamous *rasputitsa* (the name of the frozen mud when it melts), which would become a sea of mud.[27]

Now, how does mud affect BTG operations? Of course, mud tactically limits BTGs in doing what they know best, as Cancian indicated: fix the enemy in the front and attack them from the flanks because armor mobility is severely affected by mud. Tanks and mechanized vehicles get sucked in when they fall into a swamp, but pulling them out exposes more vehicles to destruction by enemy fire. Mud can also affect gears, deteriorating joints or even cause a road wheel to become stuck, regardless of the movement of the rest of the bearings. This generates overheating of the internal parts of the wheel that can melt or break. Then, replacing a wheel can take two hours or more, and sometimes it is impossible to do in combat.

Despite this, it remains to be analyzed why abandoned or damaged vehicles were not recovered by the brigade logistics teams or simply destroyed by their crews or by the Russian artillery itself. Instead of that, vehicles were abandoned only to become trophies of war for the Ukrainian forces. In some cases, the abandoned vehicles have been used by the Ukrainians to fight back.

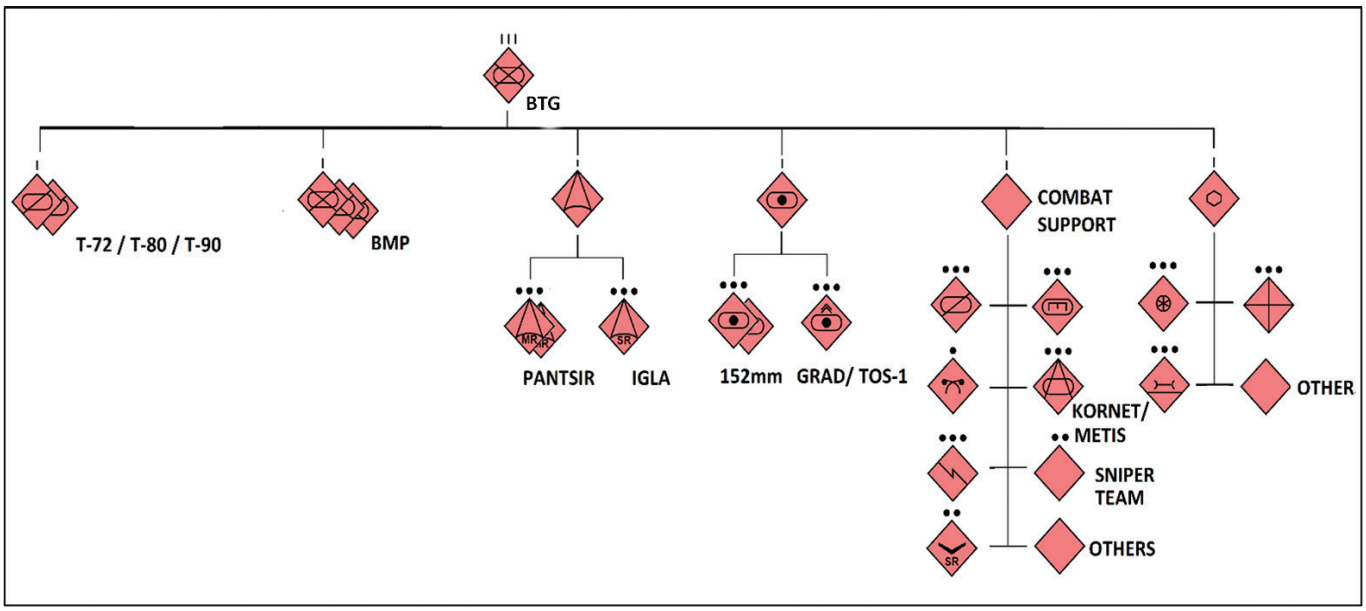


Figure 2. Possible BTG organization showing the mixture of weapons systems seen in the actual campaign. *(Graphic by MAJ Gonzalo Baez)*

Outdated technology against game-changer weapons

According to Cooper and Schmitt of the ***New York Times***, Russian forces had stopped their advance on almost all fronts at beginning of the third week of war. Until then, many BTGs were presumed to have lost up to 20 percent of their combat power. Others suffered combat attrition and needed to be replaced to reorganize their forces. In addition, the authors said that, in general terms, no mechanized unit had been able to advance more than 150 miles during the first phase of the campaign.[28]

Simultaneously, Russia has reinforced from the most distant points of its geography, using long-range fires to damage as much civilian infrastructures as possible. But modern missiles like the Iskander (mobile short-range ballistic missile system) or Kalibr (Russian cruise missile) have not been used as much as unguided munitions. The unguided munitions have caused severe collateral damage.

As the multiple-axes attack progressed, it was very challenging to any outsider analyst to predict Putin´s main intentions in this war. Was Kyiv the initial center of gravity? Does Putin want to cut off Ukrainian access to the Black Sea? Is he now reorienting his forces to push in the Donbass region to strike harder or just to maintain the gains done in 2015? There are many questions without answers.

When it comes to the current campaign in Ukraine, there are many facts that have yet to be fully studied. However, the current lack of technology in the Russian armored and mechanized forces is an unquestionable fact. The reality on the ground in Ukraine is far from the image Russia wanted to convey to the world May 9, 2015, when the then-new T-14 Armata MBT and its corresponding T-15 Armata heavy infantry fighting vehicle were presented. They were Russia's first 5th-generation armored vehicles designed to protect the crew by placing them in an armored bubble inside the vehicle chassis. The T-14 Armata tank featured:

- A sophisticated remotely controlled tower for high-definition vision via its sights (perhaps the first to be installed on a tank);
- A threat alert system;
- Active countermeasures coordinated by radar;
- A highly complex modular multitype armor;
- A high power-to-weight ratio in its engine; and
- A 125mm cannon that is the largest caliber operational in the world.

The T-15 debuted as a huge infantry tracked vehicle, featuring the same protection as the T-14 tank, which is not typical for vehicles of its kind.[29]

However, the Ukraine war has revealed the harsh reality of the Russian tank and mechanized fleet, which this author previously described in an article in ***Military Review***[30] as follows: "Since World War II and until the 1980s, the Russians had maintained a stock of thousands of tanks (it was known that the sum of all the tanks in the world did not equal that of the URSS [sic][31]). At the time, this number was reduced to only about 4,500 units. Among them, we can highlight some 300 T-80 (about 30 years old) that are being modernized to a standard similar to NATO tanks. Also notable are some 500/600 T-90 tanks (in some cases 25 years old) and T-72s that have been upgraded with active protection systems, modern firing computers and thermal cameras (but with towers designed more than 30 years ago). The rusticity of Russian tanks allows irregular or precarious forces to operate them in hostile environments and with little logistics."

Finally, will the sheer numbers of Russian armor outweigh the technology of modern antitank weapons? Will man-portable antitank weapons like the Javelin make a difference? Who knows? But there is no doubt that if you inject thousands of them into an army, they will have an impact. Russian BTGs are currently fighting against sophisticated man-portable weapons such as the Javelin (portable antitank missile system), Next-Generation Light Antitank Weapon, AT-4 (unguided antitank weapon) and the Panzerfaust 3 (semi-disposable recoilless antitank weapon).

Some critics think the design of the main Russian tank adds to the challenge it faces against the antitank weapons the Ukrainians are using. The vulnerability with the Russian tank

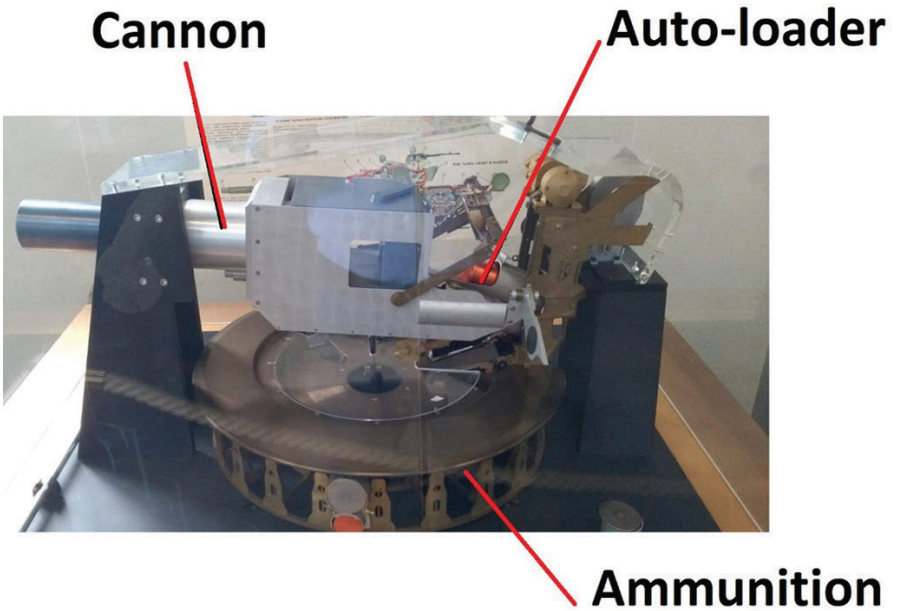


Figure 3. Mock-up of the Russian T-72 auto-loader displayed in France's Armor Museum. The ready-to-use-shells (there are 22) were severely criticized for causing the destruction and ejection of the turret when the tank is hit. However, with little storage space available in the tank, the crew is forced to place the other 17 projectiles elsewhere, like in the turret´s interior wall, which make them much more dangerous than those placed in the floor. *(Photo by MAJ Gonzalo Baez)*

design relates to its automatic loader, which places the ammunition in the lower part of the turret, causing ejection/destruction if the tank is hit by enemy fire.

Other systems like the Stinger (a portable air-defense system that operates as an infrared homing surface-to-air missile that can be fired from a variety of infantry launchers, military ground vehicles and helicopters) or the Starstreak (portable British short-range surface-to-air missile) have been game-changers for the Ukrainians in their anti-access area denial against the Russians.[32]

In short, with the logistical problems described preceding, a territory that makes any movement difficult during this season of the year, a highly prepared adversary army that is reinforced with thousands of high-precision weapons, have created a difficult scenario for the Russian BTGs to overcome in the current campaign.

Conclusion

The BTG model has been an improvement of the Russian land-warfare doctrine, highlighting the need to fight as combined-arms units in the modern multidomain environment. Although their structures have been modernized, deeper changes remain to be made to the heart of the Russian army's armored and mechanized force.

Until now, the new Russian doctrine tried to change the concept of quantity (preferred by the Soviets) for another of quality (imposed by the new era), but it seems the Russians have not achieved that goal.

Instead of launching thousands of third-generation vehicles, it would have been much better to operate with a new generation of armored and mechanized brigades, equipped mainly with the Armata tanks and infantry fighting vehicles. These new systems, if well-combined with artillery and aviation, could have won valuable targets and survived modern threats, whether in rural or highly urbanized areas.

In addition, the current BTG organizations represent a logistical challenge to sustain operations. It is not good to pack such varied combat power into a tactical organization as small as a task force. Instead, it would be much better to do so at the brigade level, since it will be backed by its logistics battalions or by the division level's logistics resources.

Finally, Russia needs to review the new BTG organizations or revalue the best card up its sleeve: its nuclear weapons. Even when the biggest nuclear stockpile can dissuade anyone, those weapons are not effective when it's time to gain territory.

MAJ Gonzalo Báez is an officer in the Argentinian army. He serves an invited professor in the Brazilian army's Command and Staff War College (Escola de Comando e Estado Major do Exército Brasileiro), Rio de Janeiro, Brazil. MAJ Báez's previous assignments include invited student at the Brazilian General Staff and Command College; national political adviser for the secretary of the general staff of the Argentinean army; armor instructor/course manager, Argentinean Cavalry School; and course manager, Tank TAM2C Crew Operations Course, Argentinean Cavalry School. His military schools include Colegio Militar de la Nación (Military Academy), Buenos Aires, Argentina; general-staff officer, Escuela de Guerra (War College), Buenos Aires. MAJ Báez holds a bachelor's of arts degree in applied mathematics from Argentina's Military Academy, and he has completed a micro-master's in supply-chain analytics at the Massachusetts Institute of Technology. His awards include the Medal of Merit from the Argentinean army chief of staff on two occasions. MAJ Báez is the author of ***The Tank. More than a War Machine,*** *a book is about the technical evolution of what MAJ Báez believes is the most complex and important land system in modern warfare.*

Notes

[1] Sam Cranny-Evans, "Wild East: Russian and U.S. formations in Eastern Europe," ***Jane´s Defence Weekly***, London, United Kingdom, March 2019.

[2] I. Faurby and Marta-Lisa Magnusson, "The Battles of Grozny," ***Denmark: Baltic Defense Review***, No. 2, 1999, https://caucasus.dk/publication1.htm.

[3] U.S. Army, ***Russian New Generation Warfare Handbook***, Fort Meade, MD: Asymmetric Warfare Group, 2016.

[4] CPT Nicolas J. Fiore, "Defeating the Russian Battalion Tactical Group," ***ARMOR***, Spring 2017 edition, https://www.benning.army.mil/armor/eARMOR/content/issues/2017/Spring/2Fiore17.pdf.

[5] Kyle Mizokami, "How Russia's Battalion Tactical Groups will tackle war with Ukraine," ***Popular Mechanics***, February 2022, https://www.popularmechanics.com/military/weapons/a39193732/russian-battalion-tactical-groups-explained/.

[6] "Battalion Tactical Group," ***Global Security***, 2022, https://www.globalsecurity.org/military/world/russia/army-btg.htm.

[7] Cranny-Evans.

[8] Scott Boston and Dara Massicot, "The Russian Way of Warfare," RAND Corporation. 2017, https://www.rand.org/content/dam/rand/pubs/perspectives/PE200/PE231/RAND_PE231.pdf.

[9] "Battalion Tactical Group."

[10] Cranny-Evans.

[11] Fiore.

[12] Cranny-Evans.

[13] Ibid.

[14] Fiore.

[15] Cranny-Evans.

[16] Fiore.

[17] Ibid.

[18] Cranny-Evans.

[19] Jack Detsch and Amy Mackinnon, "The Ukrainians Are Listening: Russia's Military Radios Are Getting Owned," ***Foreign Policy***, 2022, https://foreignpolicy.com/2022/03/22/ukraine-russia-military-radio/.

[20] Cranny-Evans.

[21] Fiore.

[22] Ibid.

[23] Helene Cooper, E. Schmutt and Julian E. Barnes, "As Russia's Military Stumbles, Its Adversaries Take Note," ***New York Times***, March 2022, https://www.nytimes.com/2022/03/07/us/politics/russia-ukraine-military.html.

[24] Courtney Kube and Corky Siemaszko, "Here´s what seasoned U.S. military figures, experts are saying about Putin´s invasion," NBC News, February 2022, https://news.yahoo.com/putin-says-ukraine-attack-military-201230042.html.

[25] Mark F. Cancian, senior adviser, International Security Program at the Center for Strategic and International Studies, https://www.csis.org/people/mark-f-cancian.

[26] ***NATO Logistic Handbook***, 2012, https://www.nato.int/docu/logi-en/logistics_hndbk_2012-en.pdf.

[27] Philip G. Wasielewski, "Russia's

Possible Invasion of Ukraine," Center for Strategic and International Studies, January 2022, https://www.csis.org/analysis/russias-possible-invasion-ukraine.

[28] Cooper and Schmitt, "As Russia Pounds Ukraine, NATO Countries Rush In Javelins and Stingers," ***New York Times***, March 2022, https://www.nytimes.com/2022/03/04/us/politics/russia-ukraine-weapons.html.

[29] MAJ Gonzalo Baez, "The T-14 Armata," Buenos Aires: Revista del Suboficial del Ejército Argentino, Dic-2015, https://es.scribd.com/document/537078905/EL-ARMATA.

[30] MAJ Gonzalo Baez, "Porque hay que tener tanques de guerra en el nuevo milenio," ***Military Review***, January 2020, https://www.armyupress.army.mil/Portals/7/military-review/Archives/Spanish/Baez-por-que-hay-que-tener-tanques-de-guerra-en-el-nuevo-milenio-SPA-Q1-2020.pdf.

[31] *URSS* is an alternative spelling of *USSR* (Union of Soviet Socialist Republics). Within the old Soviet Union, *URSS* was the preferred abbreviation until World War II, when it was replaced with *USSR*.

[32] Cooper and Schmitt.

Acronym Quick-Scan

BMP – *boyeva mashina pekhoty*
BTG – battalion tactical group (Russian army)
C3 – command, control and communications (Russian)
EW – electronic warfare
MBT – main battle tank
NATO – North Atlantic Treaty Organization

Enhancing Russian Tank Survivability:
Tank-Support Combat Vehicle Enters Tank Battalions

by Dr. Lester W. Grau and Dr. Charles K. Bartles

Pundits have declared the obsolescence of the main battle tank since the 1973 Arab-Israeli War, when defending antitank (AT) grenade launchers and antitank guided missiles (ATGMs) inflicted significant losses on Israeli armor.[1] Although U.S. tanks played a key role in Operations Desert Storm and Iraqi Freedom, the United States fought Operation Enduring Freedom in Afghanistan for 20 years without deploying a single tank (and not much artillery). However, when decisive combat decides the fate of international and national powers, tanks are a necessary component of conventional maneuver war under nuclear-threatened conditions.

Modern maneuver combat is seldom a single-tank-on-a-single-tank contest. Rather the coordinated application of artillery, armor and infantry firepower, and maneuver at the decisive point and time decides the outcome. Theoretically the Soviet armored attack is a highly choreographed, lethal ballet determined by an artillery schedule involving massive artillery fired in phases, behind which tanks advanced on line, followed closely by infantry fighting vehicles (IFVs) and dismounted infantry. The artillery would rain a moving curtain of fires to the front and flanks of the tanks, while the IFVs and dismounted infantry would protect the tanks from enemy AT weapons and enemy infantry. The tanks in turn would protect the IFVs and dismounted infantry from enemy tanks.

The theory was good, but there were problems with the choreography. Tank commanders do not want to attack slowly against the enemy's main defensive line but want to breach it rapidly. Soviet *boyeva mashina pekhoty* (BMPs) were hard-pressed to keep up with the tanks, and dismounting infantry for the final assault can bog down the attack significantly. BMP armor is not as robust as tank armor, particularly in the close fight. Artillery fire may be on or off target and on time or too early or late. A large gap can appear between the tanks and infantry at the crucial time, and artillery fire may not be able to engage the forward enemy without endangering the tanks, while the IFVs and dismounts struggle to close the gap. Tanks had to fight as a member of the combined-arms team to survive, but they could not afford to slow down and lose the attack's momentum.

What was required were equally armored and equally mobile "almost-tanks" equipped to destroy enemy AT weapons, strongpoints, helicopters, infantry and tanks. They would attack on line with the tanks and ensure the successful outcome to the lethal ballet by providing close-combat support. They were not tanks since they lacked the tank main gun. However, they were better armored, armed and powered than the BMP IFV.[2]

Initial research, design

The initial project research and design work to create *boyevaya mashina podderzhki tankov* (BMPTs) began at the Chelyabinsk Tractor Plant in 1982, but it was suspended due to the collapse of the Soviet Union. The Russian need for a BMPT again surfaced during their initial defeat in urban combat in Grozny on New Year's Eve 1994. Therefore, BMPT research and design started again in 1998. Successful tests of the new fighting vehicle concluded in 2006. The test model demonstrated good fire density from its cannon, machinegun and automatic grenade launcher combination linked to its battlefield surveillance systems enabled rapid detection of enemy low-signature AT weapons. In addition, it mounted four ATGMs.

In 2007, the Russian ground forces acquired their first BMPTs. Kazakhstan ordered its own BMPTs in 2013 and began manufacturing them under license in 2014.[3] Russia deployed BMPTs to Syria in 2017, where combat testing, particularly in urban combat, proved quite successful.[4] After an interlude, the Russian ground forces began introducing BMPTs into formations and units in 2018. The BMPT

Figure 1. The Russian army's BMPT-72. In this photo the turret has been modified from earlier models, with armor surrounding the ATGM tubes and some other changes, but the hull retains the grenade launchers. *(Photo copyright Vitaly Kuzmin. Licensed under a Creative Commons Attribution-NonCommercial- International License NoDerivatives 4.0.)*

went through more successful field testing during Exercise Kavkaz 2020. Apparently, an anti-helicopter and anti-unmanned aerial vehicle (UAV) mission became part of the BMPT requirements during this exercise.

Algeria has ordered more than 300 BMPTs.[5]

Nicknamed the Terminator-2, the BMPTs have T-72 and T-90 chasses, corresponding to the tank armament of the receiving unit. Terminator-2s mounted on the T-14 Armata chassis are possible when the T-14 goes into full production.[6]

Terminator-2 characteristics[7]

Weapons

- Four Ataka 9M120m laser-guided AT missiles (AT and high explosive to 6,000 meters);
- Two 30mm 2A42 coaxial cannon (200-300 rpm to 4,000 meters);
- Three AGS-17 automatic grenade launchers (400 rpm to 1,700 meters).

Tactical-technical characteristics

- Combat weight: 48 tons;
- Length of chassis: 6.7 meters;
- Width between side skirts: 3.8 meters;
- Height of the commander's panoramic sight: 3.4 meters;
- Ground clearance: 0.4 meters;
- Engine: V12 V-92S2 diesel turbine;
- Engine power: 1,000 horsepower;
- Highway speed: up to 65 kph;
- Highway range: 550 kilometers;
- Negotiated grade: up to 30 degrees;
- Negotiated ditch: 2.7 meters;
- Can submerge 1.2 meters in water, 1.8 meters with preparation and snorkel five meters of water.

Russia is still experimenting, but the optimum mix of BMPTs to tanks appears to be about one per tank platoon (1:3 ratio of BMPTs to tanks). In practice this has resulted in the Russians experimenting with a nine- to 10-vehicle BMPT company. (Reports on the exact number of BMPTs in the company vary.) The BMPT company can fight as a company, be broken into platoons and attached to tank companies, or they can have single BMPTs attached to tank platoons.

Likely, the ideal organizational structure for any given situation is still being determined. Although Russia does plan on adding BMPTs companies to tank battalions, it is unlikely that Russia intends to add a BMPT to every tank battalion, and BMPTs will likely be a niche capability found in a small percentage of Russia's tank battalions.

Incorporation of the BMPT will produce changes in Russian tank-battalion deployment and routine. For example, the attack frontage of the tank battalion should expand to accommodate the extra vehicles. Extra fuel and different types of ammunition will add to logistics support. Separate and combined tank and BMPT training will require planning, range space and support.

Soviet/Russian tanks have had three-man crews since the introduction of the T-64 tank in the early 1960s. The smaller, lower-silhouette tanks proved themselves in combat, but tank battalions had to supplement them with motorized riflemen to assist with tank security since it is difficult to conduct maintenance, prepare positions, eat, man the tank continually and get sufficient crew rest with a three-man crew. The five-man BMPT crew may offer some assistance in this effort.

Battalion-level maintenance will adjust to the new vehicles, expand their spare-parts stockage, and learn to maintain new weapons and optics. Barracks and motorpool space are an immediate garrison concern.

BMPTs in combat

During the attack, BMPTs will normally be in the first echelon of the tank-battalion combat formation. The BMPTs will probably deploy singly between tanks in one line. If needed, it is possible to place some BMPTs between tank platoons in a tank company or on exposed flanks. After the main body has penetrated the enemy main defensive line, some BMPTs may join the battalion commander's reserve and execute missions during the continued attack. BMPTs are a logical choice in an assault group in an attack on urban terrain.[9]

Figure 3 depicts an attacking 31-tank battalion equipped with a 10-BMPT company and reinforced with a motorized rifle company and a mortar battery from the parent motorized rifle battalion. The depicted self-propelled howitzer battalion is part of a larger brigade artillery group and positioned well forward to provide artillery support to the attack. The tank battalion is attacking a portion of a defending enemy battalion task force. The enemy force within the attacking battalion-task-force sector is a company task force plus a platoon of an adjacent company task force to the north. The accompanying motorized rifle force will dismount only when required. Russian UAVs are flying in reconnaissance support. Individual BMPTs secure the battalion flanks while interspersed on line between the attacking tank platoons. The first and second tank companies are fully deployed on the line. The third tank company is minus a tank platoon and a motorized rifle squad that constitute the tank battalion reserve.

The immediate mission is the rear boundary of the defending enemy company. The commander determines the width of the attack frontage based on his mission, the terrain, the degree of enemy defensive preparations and the enemy AT weapons strength. The commander may expand the width of the attack sector due to the presence of 10 more combat vehicles in his formation. The tempo of the attack should speed up since the combat power of the BMPT offsets the need for the follow-on infantry fighting vehicles to stick as close to the tanks as before. The faster attack should achieve the immediate mission line earlier, or the mission line itself may be deeper. This will be closely coordinated with the artillery.

After penetrating the forward prepared defense, the need for concentrating the bulk of the BMPTs in the breakout sector lessens. Tanks are ideal for the pursuit. However, the opening flanks of the expanding breakthrough need to be secured, and BMPTs are ideal for that mission. Should the pursuing tanks be hit with a counterattack or a meeting battle, BMPTs in the tank column or those

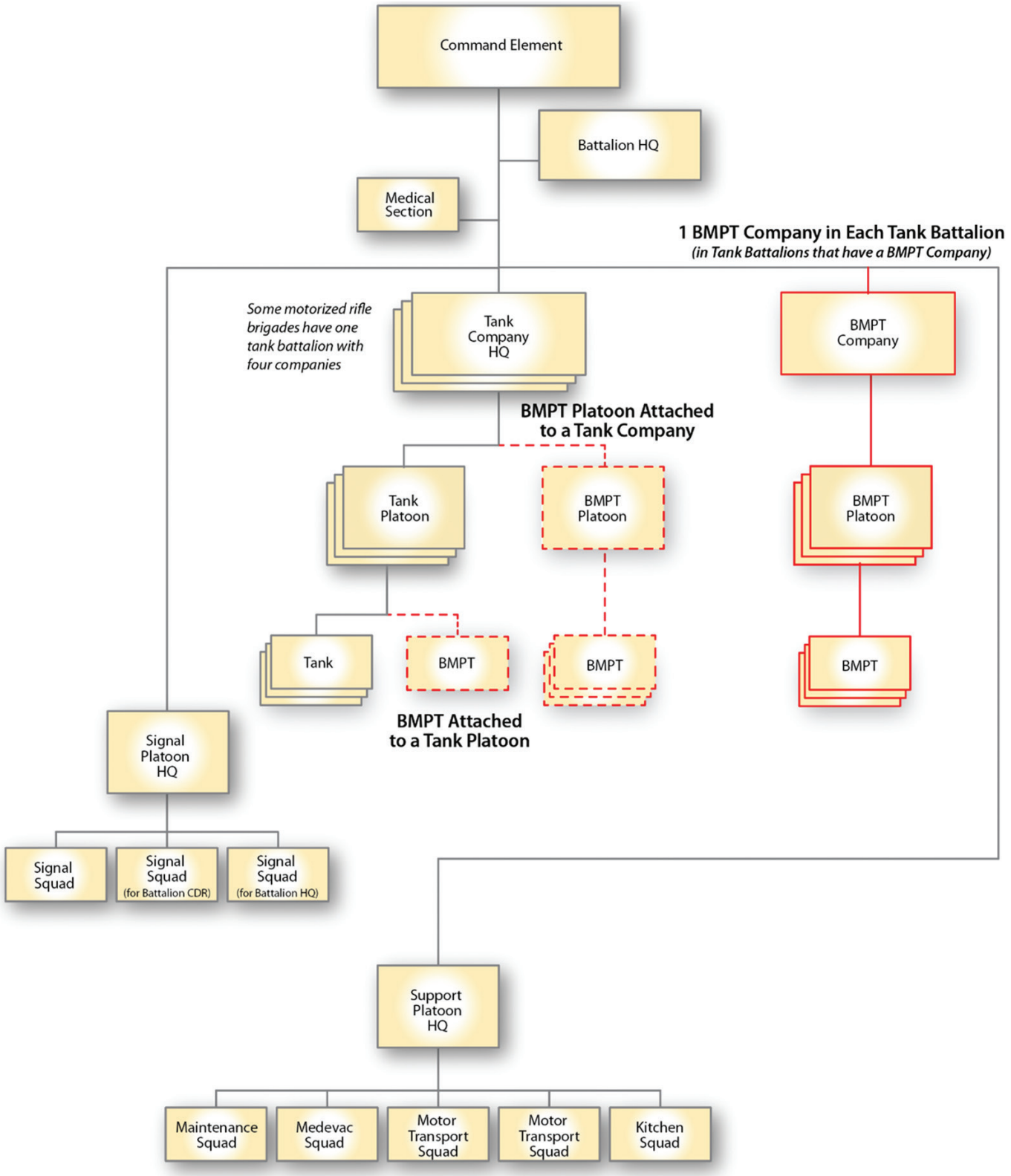


Figure 2. BMPT integration into a tank battalion. *(U.S. Army graphic by Dr. Charles K. Bartles)*

covering the tank advance from commanding heights can be decisive. Should the commander dispatch a forward detachment, BMPTs provide required speed, protection and combat power.[10]

Vital role for BMPT

BMPTs may perform a vital role in conventional maneuver war under nuclear-threatened conditions, but their use in internal conflicts also needs consideration. Missions, troop composition, assets and terrain may differ. However, BMPT deployment retains interesting possibilities. Tank units in internal conflicts are often decentralized, and consequently BMPTs may deploy for decentralized missions

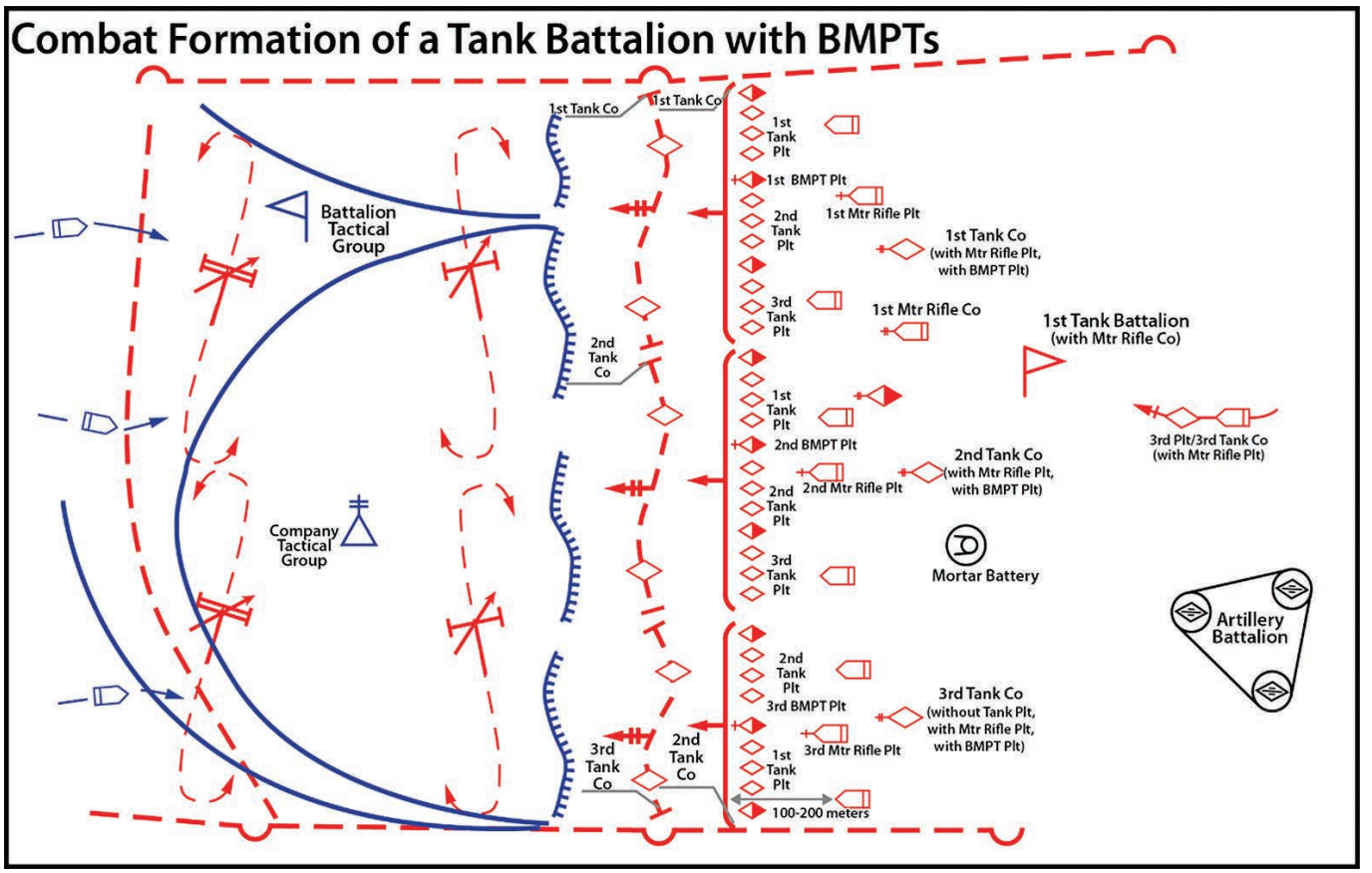


Figure 3. Deployment of attacking tank battalion equipped with BMPT and reinforced with a motorized rifle platoon (variant).[8] *(Graphic first published in **Армейский Сборник** (**Army Digest**), September 2021 edition; redrawn and translated into English by Dr. Charles K. Bartles)*

as well. They can rout illegal armed formations, seize objectives and urban areas, control territory and provide defensive fire support.

Further, BMPTs can also seal off an area, combat car bombs, cover or escort vehicle convoys and secure important facilities. They can cut roads, interdict supplies, prevent replacements and participate in the destruction of enemy pockets. BMPTs performed successfully in the internal conflict in Syria where subunits reinforced with BMPTs provided unhampered troop movement and maneuver, protected humanitarian relief and civilian transport, conducted road patrols and secured bridges and crossing sites.[11]

Figure 4 shows a railroad-bridge defense by a Russian company tactical group using all its motorized rifle platoons, reinforced by the battalion mortar battery, a brigade air-defense platoon, a crew of the brigade UAV company and a BMPT platoon:

- First motorized rifle platoon mans defensive positions on the east side of the river;
- Second motorized rifle platoon mans defensive positions on the river's west side;
- Both rifle platoons cover the perimeter and the water approach at riverbends;
- Mixed anti-personnel and AT minefields on the perimeter and barbed wire obstacles on the bridge banks protect the crossing site;
- East and west perimeter checkpoints control the crossing;
- Roving guards patrol the track on both sides of the bridge;
- The defending platoons have alternate prepared fighting positions;
- Third motorized rifle platoon is in reserve, prepared to launch a mounted or dismounted response to an enemy probe;
- The three BMPTs take positions on higher ground or hidden in the woods at the northern and southern ends of the defensive sector.
- An enemy squad is moving into the area from the northeast.

Conclusion

Given the amount of urban warfare, large numbers of Russian tanks reportedly lost to ATGMs and problems that the Russians have had fielding infantry personnel during its 2022 invasion of Ukraine, the environment appears ripe for the use of BMPTs. Surprisingly, the first reports of the system entering combat did not occur until two months after the start of the conflict. The system would have been better suited to the urban warfare that characterized the first few weeks of the invasion.[13] Reports about the success (or failure) of the BMPT in the Donbas have yet to surface, but if successful, the BMPT could be part of the Russian answer to the proliferation of ATGMs and its own dwindling personnel.

Dr. Les Grau, a retired U.S. Army infantry lieutenant colonel, is the Foreign Military Studies Office (FMSO)'s research director. Previous positions include senior analyst and research

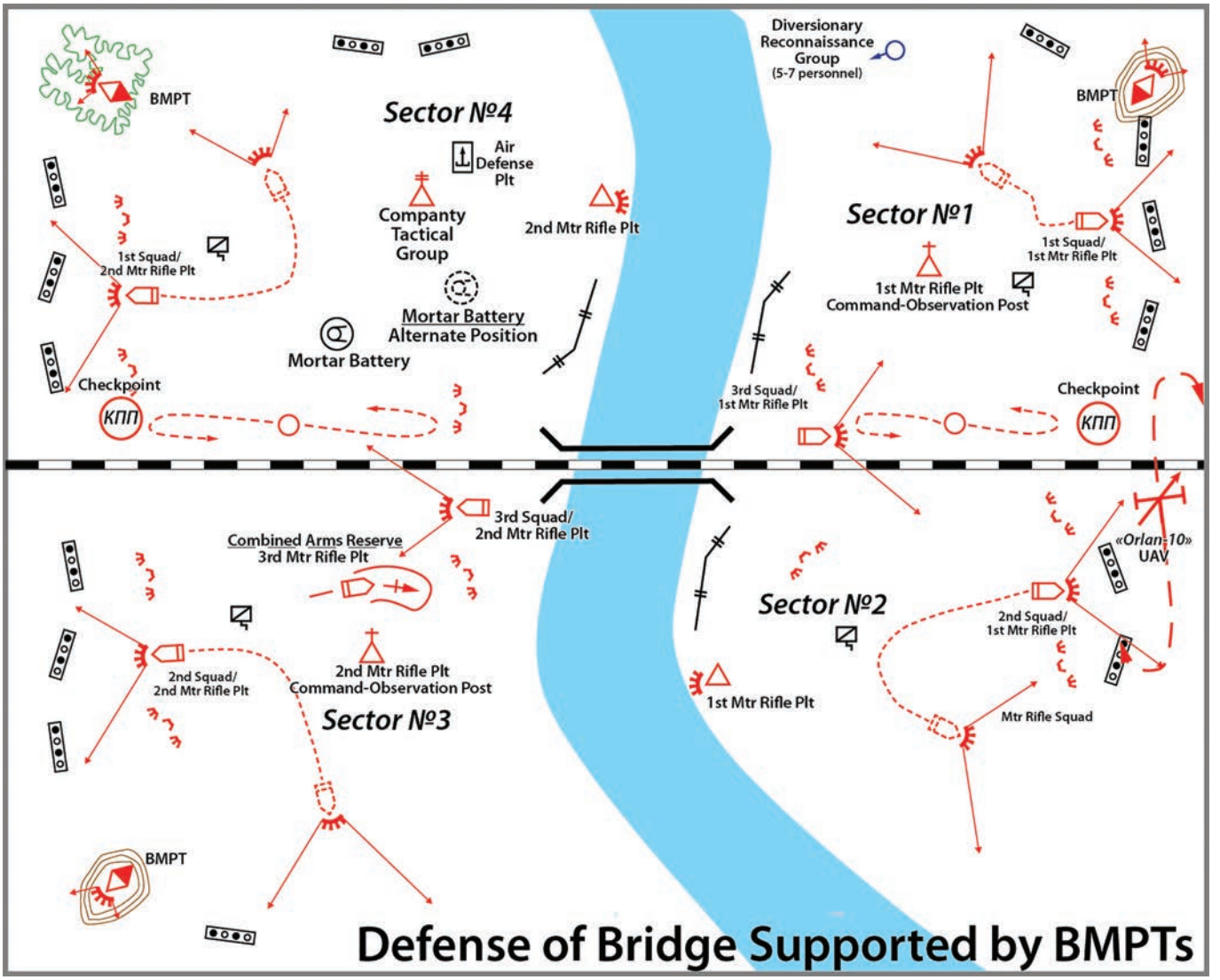


Figure 4. Defense of a bridge supported by BMPTs.[12] *(Graphic first published in* ***Армейский Сборник*** *(**Army Digest**), September 2021 edition; redrawn and translated into English by Dr. Charles K. Bartles)*

coordinator, FMSO, Fort Leavenworth, KS; deputy director, Center for Army Tactics, U.S. Army Command and General Staff College, Fort Leavenworth; political and economic adviser, Allied Forces Central Europe, Brunssum, The Netherlands; U.S. Embassy, Moscow, Soviet Union; battalion executive officer, 2-9th Infantry, Republic of Korea and Fort Riley, KS; commander, Headquarters and Headquarters Company, 1st Support Brigade, Mannheim, Germany; district senior adviser, Advisory Team 80, Republic of Vietnam; and platoon leader and battalion S-3, Berlin Brigade. His military schooling includes U.S. Air Force War College, U.S. Army Russian Institute, Defense Language Institute (Russian), U.S. Army Command and General Staff College, Infantry Officer Advanced Course and Infantry Officer Basic Course. He has a bachelor's of arts degree in political science from the University of Texas-El Paso; a master's of arts degree in international relations from Kent State University; and a doctorate in Russian and Central Asian military history from the University of Kansas. His awards and honors include U.S. Central Command Visiting Fellow; professor, Academy for the Problems of Security, Defense and Law Enforcement, Moscow; academician, International Informatization Academy, Moscow; Knowlton Award; Legion of Merit; Bronze Star; Purple Heart; and Combat Infantry Badge. He is the author of 13 English-language books on Afghanistan and the Soviet Union and more than 250 articles for professional journals. Dr. Grau's best-known books are ***The Bear Went Over the Mountain: Soviet Combat Tactics in Afghanistan*** *and* ***The Other Side of the Mountain: Mujahideen Tactics in the Soviet-Afghan War****.*

Dr. Chuck Bartles is an analyst and Russian linguist at FMSO, Fort Leavenworth. His specific research areas include Russian and Central Asian military-force structure; modernization, tactics and officer and enlisted professional development; and security-assistance programs. Dr. Bartles is also a space-operations officer and lieutenant colonel in the Army Reserve who has deployed to Afghanistan and Iraq, and has served as a security-assistance officer at embassies in Kyrgyzstan, Uzbekistan and Kazakhstan. He has a bachelor's of arts degree in Russian from the University of

Nebraska-Lincoln, a master's of arts degree in Russian and Eastern European Studies from the University of Kansas and a doctorate degree from the University of Missouri-Kansas City. He is the co-author of the book ***The Russian Way of War: Force Structure, Tactics and the Modernization of the Russian Ground Forces*** *(Mentor, 2017).*

Notes

[1] The Israelis reportedly lost more than 400 tanks, with another 600 damaged but returned to combat. Arab tank losses were estimated at 2,500. The Soviet Sagger ATGM and shoulder-fired RPG-7 inflicted heavy armor casualties when deployed in the defense-in-depth. See George W. Gawrych, "The 1973 Arab-Israeli War: The Albatross of Decisive Victory," Leavenworth Paper 21, 1996.

[2] For a history of the development of the BMPT and the specifics of the Terminator -2, see Lester W. Grau, "Preserving Shock Action: A New Approach to Armored Maneuver Warfare," ***ARMOR***, September-October 2006 edition, https://apps.dtic.mil/sti/pdfs/ADA456423.pdf and Lester W. Grau and Charles K. Bartles, "A New System Preserves Armor Dominance of the Future Battlefield: The BMPT Terminator-2," ***ARMOR***, April-June 2015 edition, https://community.apan.org/wg/tradoc-g2/fmso/m/fmso-monographs/195073.

[3] Grau and Bartles, "A new system. …"

[4] M. Yurshin, A. Hazarenko and A. Chogovadze, "Tank Survivability: Employment of Tank Support Combat Vehicles under current conditions," ***Армейский Сборник*** (***Army Digest***), September 2021,

[5] Anton Lavrov and Alexsei Ramm, "They'll be back: Terminators get a year for testing," ***Izvestia,*** https://iz.ru/1124767/anton-lavrov-aleksei-ramm/oni-eshche-vernutsia-termina-toram-dali-god-ispytanii, Feb. 15, 2021.

[6] Yurshin, Hazarenko and Chogovadze.

[7] Ibid.

[8] Ibid.

[9] Ibid.

[10] Ibid.

[11] Ibid.

[12] Ibid.

[13] Sergey Ptichkin, "The Armed Forces of the Russian Federation used the BMPT 'Terminator' for the first time during the special operation," ***Rossiyskaya Gazeta***, May 18, 2022; https://rg.ru/2022/05/18/vs-rf-vpervye-primenili-v-hode-specoperacii-bmpt-terminator.html.

Acronym Quick-Scan

AT – anti-tank
ATGM – anti-tank guided missile
BMP – *boyeva mashina pekhoty* (Russian infantry fighting vehicle)
BMPT – *boyevaya mashina podderzhki tankov* (Russian tank-support combat vehicle)
CDR – commander
FMSO – Foreign Military Studies Office
HQ – headquarters
IFV – infantry fighting vehicle
Plt – platoon
UAV – unmanned aerial vehicle

Figure 5. The first model of BMPT-72. Note the unarmored ATGM tubes, hull-mounted grenade launchers above the tracks and Active Protection System tubes barely visible at the base of the turret. *(Photo copyright Vitaly Kuzmin. Licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.)*

Figure 6. A Russian army BMPT-72 with a T-80 and T-90. *(Photo copyright Vitaly Kuzmin. Licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.)*

Figure 7. The latest model of BMPT-72 destined for the export market. Note the redesigned turret and lack of forward-facing grenade launchers. *(Photo copyright Vitaly Kuzmin. Licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.)*

Enabling the Brigade Combat Team:
Headquarters and Specialty Company Commanders Maximize Scarce Resources

by CPT Alfred J. Flores, CPT Dallas Hopkins, CPT Jeffrey Nielsen, CPT Jordan R. Scanlan and CPT Jennifer St. Remy

The commanders of headquarters and headquarters company (HHC), headquarters and headquarters troop (HHT), headquarters and headquarters battery (HHB) and the military-intelligence company (MICo) of a brigade combat team (BCT) are uniquely situated to influence their unit's combined-arms fight during large-scale combat operations (LSCO).

While serving in these roles, the authors of this article served together during National Training Center (NTC) Rotation 21-09, and they collected tactics, techniques and procedures (TTPs) to share with other BCTs. By training together prior to deployment, task-organizing their elements effectively, positioning themselves to facilitate cross-boundary communication and coordinating directly via the Joint Battle Command-Platform (JBC-P), these commanders maximized scarce resources for their entire BCT.

BCT fight

The BCT fight is complicated and requires close coordination and synchronization across multiple warfighting functions to execute well.[1] Fortunately a BCT is organized into seven subordinate battalions that each have key leaders available to identify and solve friction points.

As peers (and key leaders) in their respective battalions, the HHC, HHT and HHB commanders should train together prior to deployment and coordinate directly during operations to assist the

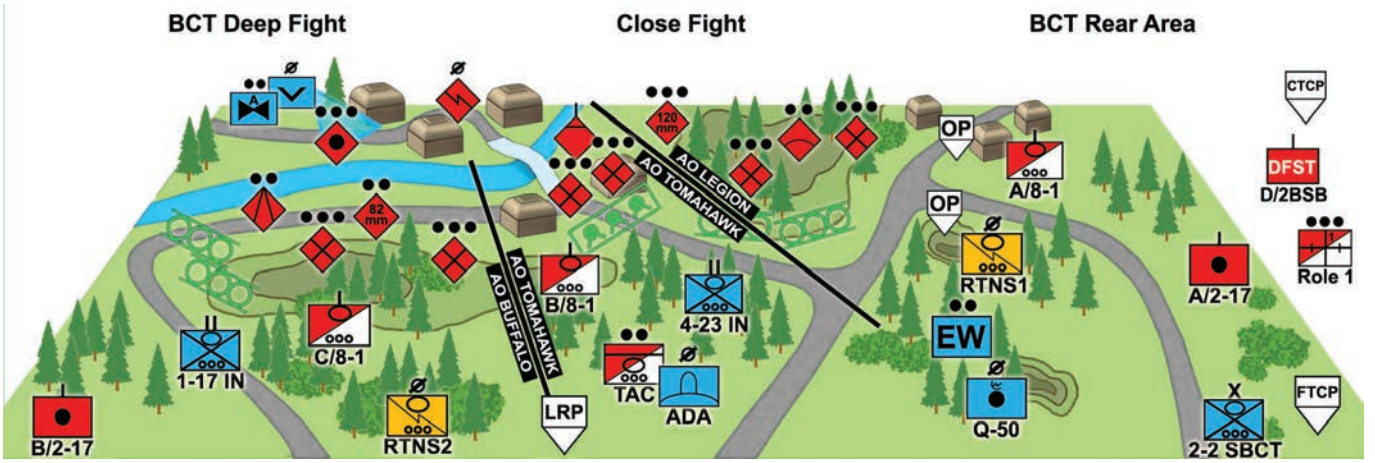


Figure 1a. The BCT fight.

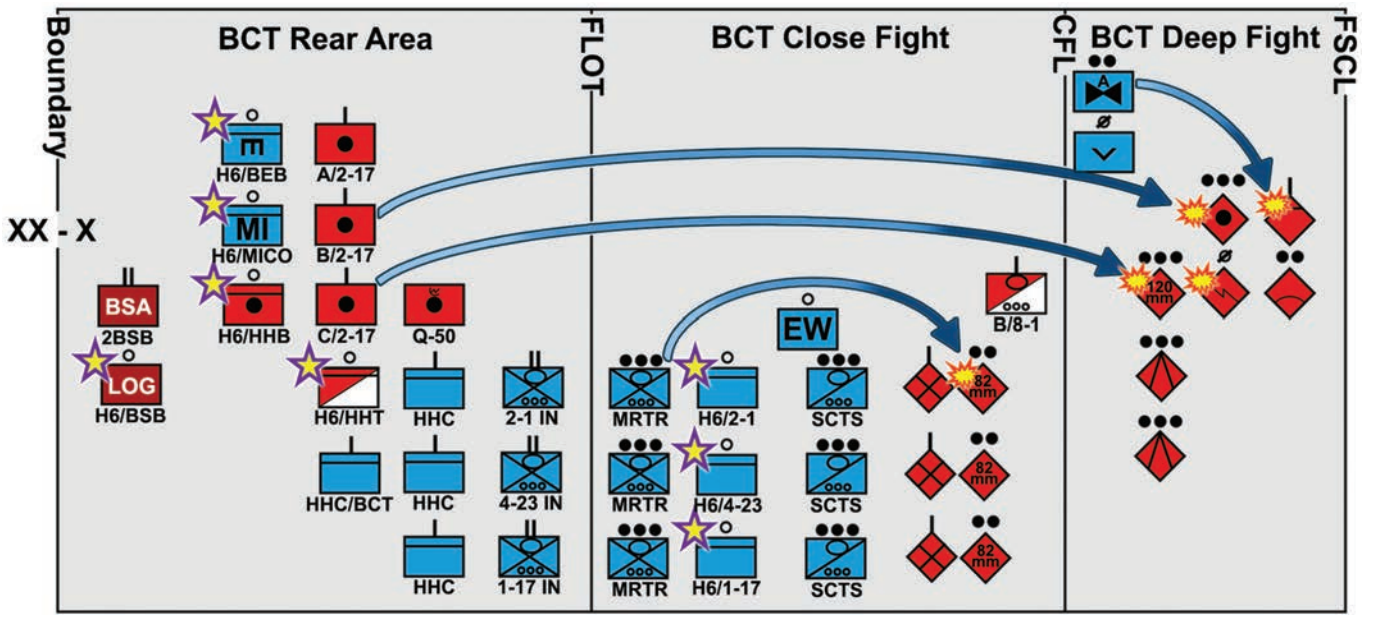


Figure 1b. Task-organization.

battalion and BCT staffs in synchronizing critical assets to meet the brigade commander's intent. When battalions plan in isolation, they frequently default to assigning their "headquarters and headquarters" (HH) commander to their own forward-support company (FSC) to try and "get parts for the battalion."

This course of action indicates a lack of synchronization between the battalions and their peer units in the BCT rear area and is a sub-optimal course of action for the entire brigade. Instead, the HHC commanders can synchronize the close fight; the HHT, HHB and MICo commanders can synchronize the deep fight; and the HHT, HHC/brigade engineer battalion (BEB), HHC/BCT and HHC/brigade-support battalion (BSB) commanders can synchronize the rear area.

To operate as a team, specialty commanders and battalion/BCT staffs need to understand "the BCT fight." A common LSCO operational framework is to split the BCT areas of operation (AO) into a close fight (where the maneuver battalions make direct-fire contact); the deep fight (where reconnaissance and fires assets shape the future close fight); and the rear area (where command and sustainment nodes operate).[2] This framework enables the BCT to engage the enemy across all domains using multiple forms of contact.

Figures 1a and 1b are example sketches of the reconnaissance, fires, counter-fire, attack aviation, electronic warfare, command and sustainment assets arrayed in a BCT fight.

The blue lines in Figure 1b highlight the effects of friendly units in an AO relative to their enemy targets. The yellow stars highlight recommended HH commander locations relative to the forward line of own troops (FLOT) and coordinated fire line (CFL) to maximize their ability to influence each AO. Arraying the HHB/HHC/HHT commanders with the entire BCT AO in mind enables them to act with greater independence and efficiency, and it synchronizes all six warfighting functions for the brigade commander.

Figure 2. HHT snipers train to call-for-fire in the close-deep fight at Yakima Training Center in May 2021. *(U.S. Army photo by CPT Jeffrey Nielsen)*

Deep fight: Sensor-shooter loop

The BCT deep fight includes everything from the CFL to the division fire-support-coordination line (FSCL). The key prosecutors of this fight include the cavalry-squadron commander, fires-support battalion commander and brigade executive officer to synchronize the staff. The deep fight is inherently complex because it requires the careful synchronization of assets across the intelligence, maneuver, fires, protection and command-and-control (C2) warfighting functions to decide, detect and deliver effects on the enemy. While the BCT and battalion staffs are responsible for most of this synchronization during the operations process, the HHT, HHB and MICo commanders can set conditions for unit success through training at home station and direct coordination in the field.

A key initial step among the HHT, HHB and MICo commanders to improve the BCT fight is to conduct capabilities briefs to and from each of their units. In a combined-audience setting among themselves, the staff primaries – the MICo platoon leaders, the counter-fire radar-section leader and the reconnaissance-troop commanders – should each brief their equipment, task-organization, capabilities and key planning considerations when detached from their parent units. These conversations will enable the leaders and subject-matter-experts present to establish shared TTPs and conduct better planning in the field.

If able, the HHT, HHB and MICo commanders can recommend and resource a fire-support coordination command-post (CP) exercise through their respective battalion leaders to validate their military decision-making process (MDMP), troop-leading procedures (TLPs) and current operations together. This training event pays dividends both for individual company/troop/battery mission-essential task proficiency and overall BCT staff readiness, according to Training Circular (TC) 6-0.2.3, ***Training the Mission Command Warfighting Function for Battalions, Brigades and Brigade Combat Teams***.[3]

In the field, the HHT, HHB and MICo commanders can continue to facilitate the BCT deep fight by coordinating directly to fill in any coordinating instructions not completed by their respective staffs. These three leaders can establish shared JBC-P, very-high-frequency and frequency-modulation networks to ensure mutually supporting effects are synchronized/nested with the battalion and BCT commander's intent.

A successful TTP is for these three commanders to conduct one touchpoint per day to confirm the location and task-organization of their detached units; compare intelligence and fires matrices for synchronization; and prepare shared recommendations to provide up the chain of command. This peer-to-peer coordination has the potential to exponentially increase the BCT's ability to answer priority intelligence requirements, identify high-payoff targets (HPTs) and maximize effects on the enemy that directly support other combined operations.

The BCT's ability to shape the deep fight directly impacts its success in the close fight by desynchronizing and reducing the enemy's combat power prior to direct-fire contact.

Figure 3. CPT Jeffrey Nielsen (left), the 8-1 Cavalry HHT commander, conducts TLPs with 2LT James Donnelly, medical-platoon leader, at NTC during September 2021. *(U.S. Army photo)*

Close fight: HHC kill teams

The BCT close fight generally stretches from the FLOT to the CFL. The key prosecutors of this fight include the maneuver battalion commanders, the brigade/battalion operations officers, and maneuver-company commanders.

A common technique is for maneuver battalions to assign their HHC commanders to the combat trains command post (CTCP) as an alternate CP, but we observe two shortfalls with this technique:

- The CTCP generally lacks the redundant tactical-internet systems (Command Post Computing Environment and Advanced Field Artillery Tactical Data System) to function as an alternate CP; and
- The CTCP has enough leader presence provided by the FSC that another commander is redundant. An alternate technique is to assign the HHC commander with his/her organic scouts and mortars to create an "HHC kill team" (HKTs).

HKTs have multiple benefits for the battalion and BCT. Maneuver-battalion HHC commanders are usually second-time commanders with the requisite training and experience to operate on shorter timelines and with less guidance. This naturally makes them good as higher control for their organic scouts, as scout platoons will often step off early in the battalion's operations process. HHC commanders can position themselves to give refined guidance to the scouts in stride while communicating directly with the mortar platoon and tactical-operations center (TOC) to detect targets and deliver effects.

The increased communication and controlled maneuver enables the HKTs to destroy HPTs beyond the maneuver company's AOs but prior to the CFL using observation posts (OPs), small unmanned aerials systems, signals-intelligence collection teams and mortars. Suitable targets for HKTs include enemy OPs, dismounted squads, antitank crews, motorized-vehicle sections, individual fighting vehicles and individual unprotected main battle tanks. This capability creates a battalion-level "deep-close" fight that shapes enemy formations prior to direct-fire contact without adding work to the battalion staff.

This technique incurs a small amount of risk to the maneuver battalions' ability to manage its command and sustainment nodes in the rear area. This risk is best mitigated by following our recommendation on rear-area cross-unit coordination.

Support area: Maximizing scarce resources

The BCT rear area includes everything between the FLOT and the next higher headquarters' support activity or

boundary. The key prosecutors of this fight include the engineer-battalion commander, support-battalion commander and unit command sergeants major. The key tasks associated with facilitating rear-area activities are terrain management, local security, logistics and route clearance.

BCT staffs often prioritize their Step 7 of MDMP, orders production, by completing as much of the close and deep fight plan as possible while delegating rear-area tasks to the BEB. However, the BEB does not organically possess the excess combat power to conduct these tasks alone and is unlikely to receive supplementary maneuver units during LSCO. Fortunately, the HHT, HHB, HHC BEB and HHC BSB commanders are available to share scarce resources to accomplish these tasks.

These commanders have inherent duties and responsibilities that align them well to coordinate across adjacent units. The HHT commander manages long lines of communication to reach the recon troops through other unit AOs. The HHB commander manages radar sections across the full BCT AO. The HHC BEB commander coordinates as many as 12 subordinate elements when assigned responsibility for attached enablers and the BCT TOC. The HHC BSB commander secures the brigade-support area (BSA) in direct coordination with unit FSCs. Their individual unit capabilities can combine the rear area into an effective battlespace that is synchronized and secured without pulling combat power away from the close fight or deep fight.

The first step in fighting a successful rear area is terrain management. The BCT rear area experiences friction when nine retransmission sites, seven CTCPs, seven battalion TOCs, four Role I's (unit-level medical care), three position areas for artillery and one brigade TOC compete for scarce suitable terrain. In the absence of planning, these assets tend to cluster together forming massive, unsecured assembly areas that concentrates the enemy's HPT list into one enticing target.

Figure 4. Medics conduct a mass-casualty training event while operating a Role 1 shared to support two battalion AOs at the Yakima Training Center in August 2021. *(U.S. Army photo by CPT Jeffrey Nielsen)*

A simple yet effective TTP to synchronize each of these nodes is for the HHT, HHB, HHC BEB and HHC BSB commanders to directly compare/share their individual common operating pictures (COPs) twice daily to identify where critical sustainment and C2 nodes are going to run into each other. While these commanders should not adjudicate which unit gets priority for terrain, they can provide unified recommendations that inform their battalion and BCT staff to manage terrain according to planning factors distinct to each unit's requirements and capabilities. This minor amount of synchronization will prevent critical BCT assets from jumping locations just to be bumped off by another unit and waste crucial time finding a new location.

These commanders can play a similar role in maximizing scarce resources by maintaining a rear-area COP reported via JBC-P to each other and their higher headquarters. As each unit prepares for, executes and assesses its routine movements across the BCT's ground lines of communication, it can confirm security and manage traffic. This task is very easy for rear-area commanders to accomplish. The alternative – delaying a convoy or altering its route – can cause fratricide or trigger convoys to stack on each other along narrow routes.

A successful TTP is for the HHT commander and headquarters section, operating out of the cavalry CTCP, to conduct a section-sized route reconnaissance-and-security patrol during their routine logistics packages. If the BCT has an attached military-police platoon, the BEB's HHC commander can coordinate for it to provide route security, route management and local-population engagement. Combined, these procedures can increase the efficiency of the BCT's rear area, enabling the nodes established there to better support the close and deep fights, and buy back precious combat power that would otherwise be expended securing units that have the ability to secure themselves.

Conclusion

The BCTs of today and tomorrow are tasked with synchronizing multiple assets across all six warfighting functions to achieve maneuver and effects in multiple domains. The headquarters and specialty-company commanders within a BCT are critical assets, with the potential to positively influence the BCT's ability to fight in the deep, close and rear areas during home-station training and in the field. Therefore, these key leaders should be trained to work together parallel to the chain of command and deliberately arrayed across the BCT fight as HKTs, deep-fight coordinators and rear-area responsible officers.

In the face of greater complexity and competing priorities, these changes will increase the BCT's lethality without adding more requirements to the battalion and BCT staffs.

CPT Alfred Flores is the Raptor 14/09 military-intelligence (MI) observer/coach/trainer at the Joint Multinational Readiness Center (JMRC), Hohenfels, Germany. Previous assignments include MICo commander, Company D, 14th BEB, 2nd Stryker Brigade Combat Team (SBCT), Joint Base Lewis-McChord (JBLM), Tacoma, WA; infantry rifle-company commander, Company A, 4th Battalion, 23rd Infantry Regiment, 2nd SBCT, JBLM; and targeting officer/team chief, Brigade Intelligence Cell Mobile Command Group, HHC, 2nd SBCT, JBLM. CPT Flores' military schools include infantry one-station unit training, Airborne School, Emergency Medical Technician Basic Course, Ranger School, MI Basic Officer Leadership Course, Joint Human Intelligence Interrogation Management Course, Biometrics Operations Specialist Course, Company Intelligence-Support-Team Course, Rifle Marksmanship Instructor Course, Foreign Disclosure Officer Course, MI Captain's Career Course and North Atlantic Treaty Organization Military Engineering Multinational Advisory Course. He has a bachelor's of science degree in multimedia arts and animation from The Art Institute of California – Los Angeles. CPT Flores' awards and badges include the Meritorious Service Medal (MSM), Ranger Tab, Combat Infantry Badge and Expert Infantry Badge (EIB).

CPT Dallas Hopkins is a team leader, Troop A, 3rd Squadron, 3rd Security Force Assistance Brigade, Fort Hood, TX. His previous assignments include commander, HHC, 14th BEB, JBLM; commander, Company A, 1st Battalion, 17th Infantry Regiment, JBLM; assistant operations officer, 1-17 Infantry, JBLM; and executive officer, Army Military Working Dog School, Joint Base Lackland, TX. CPT Hopkins' military schools include Airborne School, Military Police Basic Officer Leadership Course, Infantry Basic Officer Leader's Course (IBOLC), Maneuver Captain's Career Course (MCCC), Cavalry Leader's Course and Ranger School. He has a bachelor's of science degree in kinesiology allied health from the University of North Texas. CPT Hopkins' awards include the MSM.

CPT Jeffrey Nielsen is the brigade operations trainer, Mustang Team, 7th Army Training Command, JMRC. Previous assignments include commander, HHT, 8th Squadron, 1st Cavalry Regiment, JBLM; commander, Company C, 4th Battalion, 23rd Infantry Regiment, JBLM; battle major, 7th Infantry Division, JBLM; and battalion logistics officer, 1st Battalion, 325th Airborne Infantry Regiment, Fort Bragg, NC. CPT Nielsen's military schools include U.S. Military Academy (USMA), IBOLC, Airborne School, Ranger School and MCCC. He has a bachelor's of science degree in mathematics and environmental engineering from USMA. CPT Nielsen's awards include the MSM.

CPT Jordan Scanlan commands HHC 1-17 Infantry, 2-2 SBCT, 7th Infantry Division, JBLM. His previous assignments include rifle-company commander, Company B, 4-23 Infantry, 2-2 SBCT, 7th Infantry Division; brigade/battalion assistant S-3, 4-23 Infantry, 2-2 SBCT, 7th Infantry Division; aide de camp to the commander, Research, Development and Engineering Command, Natick Laboratory, Natick Soldier Systems Center, MA (now reflagged as Combat Capabilities Development Command under Army Futures Command); and rifle-platoon leader; Company C, 1st Battalion, 327th Infantry Regiment, 1st BCT, 101st Airborne Division (Air Assault), Fort Campbell, KY. CPT Scanlan's military schools include IBOLC, MCCC, Ranger School, Airborne School, Sabalauski Air-Assault School, Maneuver Leader Maintenance Course and Combat Lifesaver Course. He has a bachelor's of arts degree in political science from Pacific Lutheran University. CPT Scanlan's awards and badges include the MSM with 1st oak-leaf cluster, Ranger Tab and EIB.

CPT Jennifer St. Remy commands Headquarters and Service Company, 7th Infantry Division, JBLM. Her previous assignments include commander, Company A, 2nd BSB, 2-2 SBCT, JBLM; support operations/transportation officer, 2nd BSB, 2-2 SBCT; support-operations planner, 2nd BSB, 2-2 SBCT; battalion S-4, 52nd BEB, Fort Carson, CO; and executive officer, Company B, 704th BSB, 4th Infantry BCT, Fort Carson. CPT St. Remy's military schools include Ordnance Basic Officer Leader's Course, Unit Movement Officer Course, Support Operations Course (PH I) and the Logistics Captain's Career Course. She has a bachelor's or arts degree in law and society from Pennsylvania State University, a master's of science degree in acquisition in supply-chain management from the University of Maryland Global Campus and a master's of business administration degree in business management from the University of Maryland Global Campus. CPT St. Remy's awards include the MSM.

Notes

[1] "Deep Maneuver," Part 5, ***Large-Scale Combat Operations Volume I***, Fort Leavenworth, KS: Center for Army Lessons learned.

[2] Field Manual 3-96, ***Brigade Combat Team***, 2021.

[3] TC 6-0.2, ***Training the Mission Command Warfighting Function for Battalions, Brigades and Brigade Combat Teams***, July 2019, Figures 1-5 and 2-2.

Acronym Quick-Scan

ADA – air-defense artillery
AO – area of operations
BCT – brigade combat team
BEB – brigade engineer battalion
BSA – brigade-support area
BSB – brigade-support battalion
C2 – command and control
CFL – coordinated fire line
COP – common operating picture
CP – command post
CTCP – combat-trains command post
EIB – Expert Infantry Badge
EW – electronic warfare
FLOT – forward line of own troops
FSC – forward-support company
FSCL – fire-support coordination line
FTCP – field-trains command post
HH – headquarters and headquarters
HHB – headquarters and headquarters battery
HHC – headquarters and headquarters company
HHT – headquarters and headquarters troop
HKT – HHC kill team
HPT – high-payoff target
IBOLC – Infantry Basic Officer Leader's Course
JBC-P – Joint Battle Command-Platform
JBLM – Joint Base Lewis-McChord
JMRC – Joint Multinational Readiness Center
LOG – logistics
LRP – logistics release point
LSCO – large-scale combat operations
MCCC – Maneuver Captain's Career Course
MDMP – military decision-making process
MI – military intelligence
MICo – military-intelligence company
MRTR – mortar
MSM – Meritorious Service Medal
NTC – National Training Center
OP – observation post
SBCT – Stryker brigade combat team
TC – training circular
TLP – troop-leading procedure
TOC – tactical-operations center
TTP – tactics, techniques and procedures
USMA – U.S. Military Academy

Mobile Protected Firepower: An Opportunity

by LTC Ben Ferguson and CPT Lennard Salcedo

Defense news sources reported in 2016 that the Army was interested in developing a lightweight ground-combat vehicle to accompany infantry brigade combat teams (IBCTs) and keep them relevant in large-scale combat operations (LSCOs) against a near-peer threat.[1] Originally referred to as a light tank, Army officials named the new concept mobile protected firepower (MPF); this approach was intended to dissuade servicemembers from viewing it as a tank-like vehicle and then employing it the same way as the M1 Abrams main battle tank (MBT).

The development of MPF presents an opportunity to bridge a capability gap that was created when the M551 Sheridan Armored Reconnaissance/Airborne Assault Vehicle retired from service. The M551 had earned admiration for its effective operational capabilities – and disdain for its technical shortcomings. As MPF meets testing milestones and prepares to integrate into IBCTs, commanders at the brigade level and below must ensure the know-how to employ the platform correctly or they will face a steep learning curve against adversaries at the cost of Soldiers' lives.[2] MPF's tactical and strategic potential can better enable the IBCT to execute its mission set while augmenting its ability to defeat a larger spectrum of enemy capabilities.

Why do we need MPF?

MPF's purpose is to defeat targets that could compromise the IBCT's effectiveness. This capability is necessary to defeat enemy prepared positions, to destroy enemy armor vehicles, to close with and destroy enemy forces and to ensure freedom of maneuver and action for the infantry. The plan is for MPFs, by means of organic protection and firepower, to augment the IBCT's ability to conduct combined-arms maneuver with growing technologies. MPF, with scalable armor packages, provides the IBCT a flexible and tailorable response in contested and various locations to mitigate the enemy's ability to exploit previous capability gaps within the IBCT.

With the addition of a light armored force, IBCTs will see improvement in three planning factors. First, their ability to provide strategic reliability when facing motorized or mechanized near-peer threats will be enhanced. Second, they will be better able to respond to increased threats with dedicated firepower. Finally, the lethality of IBCTs will be improved through their gaining an organic combined-arms maneuver capability comparable to a Stryker brigade combat team (SBCT) and an armored brigade combat team (ABCT).

MPF provides a unique capability to enable the IBCT to fight as a strategic combined-arms team.[3] IBCTs use uparmored humvees for mobility and protection, typically armed with a .50-caliber machinegun, Mark 19 Automatic Grenade Launcher or tube-launched, optically tracked, wire-guided (TOW) missile. While this system has proven invaluable during multiple decades of service, it will be increasingly incapable of effectively filling the same role in the next major conflict. Even with Common Remotely Operated Weapon Stations (CROWS) and the Improved

Target Acquisition System (ITAS), the humvee is outclassed by near-peer formations that use air-droppable fighting vehicles with improved fire-control systems for fire-on-the-move. These near-peer fighting vehicles are armored, maneuverable and casualty-producing; they can mitigate the IBCT's strategic maneuver significantly.

Armor company-teams were a frequent request from 18th Airborne Corps prior to 2018; this consisted of a company-team of mechanized infantry and tanks accompanying an IBCT for a Joint Readiness Training Center (JRTC) rotation. These individual ready companies (IRCs) were even aligned for deployments after the Sheridan's retirement left 82nd Airborne with no armored force to accompany it on contingency missions.

Combatant-command commanders are still able to create these teams from forward brigades – such as the deployment of Bradley Fighting Vehicles to Syria to support allied operations or the deployment of Task Force 1-63 Armor during Operation Iraqi Freedom.[4] This task force deployed to northern Iraq with 173rd Airborne Brigade in 2003 to conduct reconnaissance-in-force and to demonstrate Coalition resolve. Given that 173rd and the unit (then stationed in Germany) had trained together, commanders and planners were able to synchronize and work effectively to deter enemy forces from seizing Kirkuk oil fields.

These instances demonstrate the ability to integrate these formations, but they were not nearly as efficient as an organic armored asset aligned with that IBCT could have been. The IRC concept and effectiveness do compare with that of a company of MPFs that is co-located within the same division and can frequently train with the unit to ensure successful integration.

Limitations of current weapon systems

MPF will keep the IBCT strategically relevant in LSCOs by providing the capability to defeat these threats and to ensure freedom of action and maneuver. An infantry platoon can employ organic anti-tank weapon systems or rely on the battalion weapons company TOW missile trucks to counter these threats at a significant trade-off.[5]

First, these systems lack a maneuverable fire-control system. The ITAS and TOW missile, the Command Launch Unit, Javelin and the AT-4 are all capable weapon systems that require a dedicated team to operate; they become increasingly difficult to employ when under direct or indirect fires:

- TOW missiles require the gunner to track the missile onto its target undisturbed for whole seconds that could instead be better spent displacing to the next firing point.
- Javelins require an appropriate firing position for a top-down attack.
- AT-4s have no guiding system.

Second, these weapon systems have minimal protection. Their portability enables the infantry to maneuver through restrictive terrain and set ambushes for enemy forces; these benefits quickly become burdens if enemy forces can identify and disrupt maneuvering infantry.

While these weapon systems are integral to the infantry platoon, they are no replacement for the protection MPF will offer in engaging armored targets or enemy strongpoint defenses. MPF fills the capability gap by providing a survivable platform capable of delivering vehicle- and bunker-destroying rounds. At 105mm with a variety of round types, the fully stabilized main gun is more than capable of neutralizing bunkers and defeating light enemy armored forces that an IBCT might encounter in theater.

Also, MPF preserves the infantry's organic anti-tank assets by directly filling that role. This enables commanders to better reserve their assets for the appropriate situation and so to maneuver their units more effectively.

MPF enables commanders to appropriately scale their responses to armed conflicts. Within the current brigade combat team (BCT) configurations, the only MPF-like alternatives are the M1 Abrams MBT or the M1128 Mobile Gun System (MGS). The MGS, while suitable in its initial employment in the Global War on Terrorism (GWOT), has lost its utility within the SBCT.[6]

The Dragoon variant of the Stryker, with its 30mm gun and the CROWS-Javelin upgrade, will enable future SBCTs to have more fighting-vehicle-like capabilities and the limited capacity to destroy enemy vehicles when stationary. This upgrade makes the SBCT more formidable, but it still lacks the firepower and fire-control system MPF can bring to the fight. The M1134 Anti-Tank Guided Missile Stryker, along with the dual role of antitank and anti-air capabilities of the Mobile Short-Range Air-Defense Stryker, partially mitigate the capability gap left by the Army's decision to divest the MGS in April 2021.[7]

The other MPF-like alternative is the M1 Abrams MBT. The venerable M1 is a proven platform capable of destroying all types of targets. However, its increasing weight and logistic requirements make strategic deployments more resource-intensive. Until the Army can field the Next-Generation Combat Vehicle and mitigate some of these issues with current design and technology, it will have to expend considerable resources in moving tanks and armor assets from forward-deployed ABCTs to react to conflicts in different areas of interest and areas of operation (AoRs).

Contrasting improvements offered by MPF

Given these considerations, the Army has limited capability for projecting armored combat power to potential theaters of combat. Even if strategic lift assets support the rapid deployment of tanks, the Pacific theater's dense jungles and various islands or the lack of heavy bridges in Africa could impede the M1's effectiveness. MPF's lighter weight allows it to be more transportable and more maneuverable in such environments. Thus commanders and planners can scale their responses in their respective combatant commands to respond to various types of conflicts more effectively. In multi-domain operations (MDO), MPF is an essential enabler in ensuring that IBCT units retain their freedom of maneuver and can contribute to the joint forcible entry maneuver into contact.

MPF will enable IBCT subordinate units to conduct effective

combined-arms maneuver. IBCTs, as compared to SBCTs and ABCTs, currently have limited ability to conduct combined-arms maneuver against an LSCO threat. The latter formations have dedicated firepower with fire-control systems that enable them to maneuver and fight on the move. Based on JRTC rotations that previously used armor enablers from other units, IBCTs typically continued to maneuver without IRC tanks until they met the criteria to pull assets forward.[8]

Reportedly, battalions were already at 70 percent combat power after initial engagement with the opposing force (OPFOR)'s indirect and direct fires from the OPFOR's infantry and fighting vehicles.[9] The accompanying tank force often found itself unable to occupy templated support-by-fire positions due to its delayed movement, friendly infantry's displacement in the enemy's engagement area and difficulty maneuvering in restrictive terrain.

One of MPF's major benefits is the ability to maneuver across restrictive terrain with the IBCT. At lower weights, the vehicle is capable of maneuvering with and directly supporting infantry so that commanders will immediately have necessary capabilities. Their improved maneuverability will present the enemy with a complex tactical dilemma. While the vehicles could still become mired, MPF's ability to enable friendly forces to defeat armor and strongpoint defenses are worth the risk. Humvees have often filled this role, but they are incapable of effectively firing on the move and have significantly less survivability, making them less viable in combined-arms maneuver than MPF. Consequently, maneuver battalions will improve their lethality and ability to win enemy engagements.

Recent historic use of light armor in infantry formations

First fielded during the Vietnam War, M551 Sheridan tanks replaced the M113A1 Armored Cavalry Assault Vehicle (ACAV) (an M113 with three machineguns that had turret shields) and M48 Patton tanks in Cavalry squadrons. With its lower weight and 152mm rounds, the Sheridan was expected to perform better as an armored-Cavalry team.[10]

The M551's performance unfortunately failed to inspire total confidence. While maneuvering was easier, crews dealt with design flaws that caused casualties.[11] For example, the aluminum armor made it just as vulnerable to mines as the M113A1 had been and more vulnerable than M48s. Uncased rounds corroborated this, as vehicles hit by mines and sometimes even significant antitank fire could cause propellant to spill inside the vehicle, prompting crews to bail out before the enemy could knock the vehicle out. The electronics inside caused problems in-theater as crews found systems not to be mission-capable when they were in environments with high moisture – again, this was in Vietnam. The doctrine did not match the employment; the vehicle was arguably not as well-suited for assaulting into ambushes as the Cavalry team of ACAVs and Patton tanks.[12]

Following Vietnam, the Sheridan still proved the utility for light armor during Operation Just Cause. The Army retired M551s into OPFOR units while maintaining a battalion (4th Battalion, 68th Armor, later 3rd Battalion, 73rd Armor Regiment) in 82nd Airborne Division. Paratroopers, together with M551s, deployed to Panama; they operated as a combined-arms team against a surprised enemy force.[13] Following a heavy drop that resulted in one inoperable Sheridan, the platform effortlessly destroyed barriers to enable the infantry to maneuver.

Snipers, machinegun teams and enemy ambushes failed to decisively engage paratroopers, as the Sheridan would quickly dispose of them with its improved fire-control systems and 152mm high-explosive, anti-tank (HEAT) or canister rounds. The strategic deployment of a combined-arms teams of fires, infantry and armored assets enabled a swift end to Operation Just Cause.

The 3-73 Armor demonstrated the utility for MPF capabilities in operations Desert Shield and Desert Storm. Following a massive intra-theater air insertion of the entire battalion with 82nd Airborne Division, M551s easily destroyed strongpoint defenses and secured ports for 24th Infantry Division and the U.S. Marines. These M551s had the tank thermal-sight upgrade and were able to fight accurately at night, alleviating enemy pressure on the infantry. Machinegun nests limited friendly maneuver only briefly as 152mm rounds, followed by heavy machinegun fire, destroyed multiple positions. These defenses would have otherwise reduced combat power and logistical support for friendly forces if not for MPF-like capabilities.

While the Army knew it needed to replace the Sheridan to keep pace with advancing capability demands, it was nonetheless intent on maintaining the positive capabilities the Sheridan had provided; it would make significant strides in this effort in the 1980s until the Gulf War. It started with the XM8 Armored Gun System (AGS).[14] The air-droppable AGS could deliver capabilities like those of the M551, but it could do so more reliably, as it was equipped with the proven 105mm cannon. However, the budget could not support its production in 1996, and the program was cancelled.

During GWOT, the Army tested the MGS viability as a replacement for MPF-like capabilities in IBCTs, which ultimately never resulted in the MGS integrating into IBCTs. The Army accepted risk by not replacing the M551 earlier, as GWOT remained the strategic priority for the upcoming years. The once-acceptable capability gap became one the focus points of the Army's modernization efforts as the Army prioritized MDOs and LSCOs.

MPF's utility

Skeptics of MPF may wonder if IBCTs truly need MPF in their formations. While historic trends show that appropriate doctrine and employment of armor are paramount to success, senior leaders continually emphasize how MPF is not a light tank; consequently, commanders do not immediately employ MPFs in front-line battles with other enemy armored forces.[15] MPF will operate optimally when its use is aligned with the Army Armor Branch mission statement, closing in and destroying enemy by fire, maneuver and shock effect.[16]

MPF's mobility can enable light infantry to maneuver more effectively. This platform is more conducive than previous generations to combined-arms maneuver, and it can allow for the relief of infantry caught in decisive engagements in restrictive terrain. The horsepower-to-weight ratio allows the vehicle to negotiate various restrictive terrains that would otherwise mire an MGS or an M1 Abrams.[17]

The M1A2C Abrams is also approaching higher weights that limit both its mobility on Air Force transports and its ability to maneuver through infrastructures such as European bridges or the current M60 Armored Vehicle Launched Bridge. MPF's mobility would allow it to displace rapidly to support other maneuver battalions as well as react to threats to lines of support better than humvees or Mine-Resistant Ambush-Protected All-Terrain Vehicles (M-ATVs). MPF is likely more maneuverable than humvees and M-ATVs as a tracked vehicle, and it is definitely more lethal with its ability to fire on the move; the other vehicles in the IBCT are not designed with such sophisticated fire-control systems.

While they could probably engage on the move, their effectiveness is limited at best. Situations where tanks cannot maneuver to support infantry assaults will likely become less frequent as MPF crews and leaders learn their vehicles' limits and are able to provide commanders with realistic capabilities so planners can better determine where MPF needs to be to make operations successful.

Skeptics may state that the logistic requirements for MPF could encumber the IBCT's mobility. In these instances, MPF maintenance and resupply would become a frequent task for MPF leadership and operational-control units to manage. But the requirement for more logistic support and planning should not be a factor in why this platform should not be integrated into IBCTs. Leaders from ABCTs and SBCTs will be able to use their experience to help the IBCT better plan for integration along with the appropriate doctrine, standing operating procedures (SOPs) and mission-specific considerations.

Like the K-series modified table of equipment, the consolidation and central management of MPFs is paramount to success. Like the weapons company in an IBCT or a weapons troop within an SBCT, central management will enable MPF crews to learn best practices in tactics, logistics and leadership prior to their attachment to an IBCT. MPF companies will then be able to deploy with some of their organic logistic support, knowing what they need to request and at what frequency to enable the unit to properly support their operations. This will become drastically more important as IBCTs begin converting light BCTs that maneuver motorized-infantry battalions, which need firepower to keep pace with their units. Thus, the MPF's logistic footprint should not be treated as a limiting factor but a planning factor for leaders to consider and develop both the proper SOPs and tactics, techniques and procedures (TTPs) to ensure success.

MPF brings necessary firepower to the IBCT's fight. The 105mm cannon, the coaxial 7.62mm machinegun and the externally mounted .50-caliber machinegun are the primary armaments for MPF. The IBCT can only benefit from precision firepower that the fire-control system can bring to the fight. The main gun will likely use legacy rounds the MGS used:

- HEAT rounds for fighting vehicles;
- Sabot rounds for tanks;
- High-explosive plastic for obstacles; and
- Canister for massed infantry.

This sort of firepower can provide commanders with the ability to respond to various threats that would have taken a dismounted antitank team or a TOW humvee into the fight. MPF has a unique ability to better react to contact than the other teams. Antitank teams and humvees function well in the ambush, but they are drastically less likely to destroy the enemy when responding to an aggressive armored threat. Under pressure, it can be difficult for these teams to properly acquire a target. The Carl Gustav rockets or AT4s may not guarantee an immediate kill, meaning the vehicle could potentially engage friendly forces and reduce combat power. Javelins and TOWs have a higher probability of kill, but they still require the gunners or crew to remain vulnerable to direct and indirect fires. MPF can fight better on the move, allowing these teams to function under significantly less duress to destroy armored threats.

MPF will bring better protection than other vehicles in the IBCT, but it is important to note that it cannot bring the same level of protection a tank might field. Given that MPF will use scalable armor packages to augment its survivability, commanders must understand MPF has been deliberately named to not give the impression of a main battle tank. These packages, like the urban upgrades the Abrams received during GWOT (Tank Urban Survival Kits), will further enable the vehicle to fight alongside IBCT units in cities.[18]

Contrary to some opinions, tanks and armored vehicles have fought and will continue to fight in cities. Their commitment to the fight must be well regulated, but MPF-like platforms have enabled more effective and efficient fighting within cities. Rather than avoid this reality, our Army should embrace the concept and continue to refine armor employment within cities and megacities.

MPF will likely not be able to push through rocket-propelled grenade volleys or survive tank rounds. Instead, it will be capable of offering enough protection to survive enemy fighting vehicles to augment dismounted troops' survivability. The addition of active protection systems such as the Trophy System will serve to improve its survivability against antitank guided missiles and even against rocket-propelled grenades; together these can enable MPF, along with dismounted infantry, to continue the fight both in open and mounted AoRs. While the crew is (relatively) safe from small-arms fire and higher caliber rounds, MPF will have the capability to engage with the combined-arms team, enabling them to better mass effects in the right times and spaces to defeat enemy attacks and defenses. MPF can regulate what was once a haphazard fight with the enemy forces, supporting dismounted

commanders by providing more options to react to contact and defeat enemy forces.

Shock effect is the element that will truly make MPF invaluable to commanders at any echelon. The ability to deliver precision direct fires from terrain previously thought of as too restrictive for armor to maneuver through will continually shrink as MPF integrates and receives upgrades. Enemy strongpoint defenses that would have otherwise pinned infantry units down will continue to dwindle; this is exactly the way history's first tanks broke stalemates in World War I.

Next-generation enemy vehicles and upgraded older platforms will become less destructive threats to the infantry as MPF – and supported infantry or mounted antitank teams – will be able to effectively engage and destroy these targets. The multiple tactical dilemmas given by these "spontaneous" combined-arms teams will force them to make hard decisions that will allow IBCTs to remain strategically viable against more enemy formations. As the Army codifies the primary method for deploying MPF to theater, its insertion along with IBCTs will become easier to plan and will begin to integrate shock effect to break the enemy's tempo and conduct successful operations.

Conclusion

Since the end of World War II, the Army has continuously tried to maintain MPF-like capabilities. Even as these initiatives dwindled during GWOT, the need for this capability continues to resonate with IBCT leaders today; it is something they know will augment their operations and generate options for them to react to contact. MPF is a capability that must be maintained for IBCTs to remain formidable as the Army transitions to MDO and LSCO.

After the delay during GWOT, it seems the Army is working toward closing the capability gap. It is worth thinking about future MPF augmentations considering what was discussed above regarding MPF's utility. What will the Army do to maintain and upgrade overmatch in fire, mobility, protection and shock effect?

One likely upgrade depends on the ability to integrate more unmanned ground vehicles, unmanned aerial vehicles and artificial intelligence (AI) networks into the force.[19] Robots that could automatically seek refueling stations, conduct resupply and return to crews is just one of hundreds of opportunities that could secure integration between people and machines. This would undoubtedly put less risk on Soldiers conducting resupply and present less of a target to enemy forces. Unmanned ground vehicles and unmanned aerial vehicles could also be used to mitigate the need for scouts with MPF or combined-arms teams. On-board AI could help generate synopses for radio transmissions during engagements or help crews slew the turret to their next most dangerous targets.

MPF's doctrine development is just as important as its acquisition. It is likely to be used just like an Abrams by virtue of its aesthetic, which could prove detrimental to its integration into the combined-arms team. This is no different from commanders in World War II receiving a tank-destroyer company and proceeding to use it as though they were Sherman tanks. The accompanying doctrine and TTPs must match the mission set and intent for MPF, or its misuse may deter future investment into making the platform better suited for supporting IBCT operations.[20]

The IBCT can undoubtedly continue to fight without an MPF platform to support its maneuvers. However, this comes with unnecessary risks that MPF can mitigate. There is a reason why MPF is one of many iterations (Stuart, Chaffee, Bulldog and Sheridan tanks) in the endeavor to have a light armored platform that can deliver precision fires.[21] The ability to field combined-arms teams is important in maintaining overmatch with near-peer threats and in responding to various threats.

This platform will enable the IBCT to remain tactically formidable and strategically mobile while reducing casualties that would occur if the troops did not have direct fire support to counter strongpoint threats and armored threats. The transition from counterinsurgency to LSCO is the perfect opportunity to invest in a capability that will help accomplish the mission, implement a better combined-arms team into IBCTs and mitigate casualties through fire, maneuver and shock effect in the next armed conflict.

*(**Editor's note**: This article was originally published by the Association of the United States Army in its Landpower Essay series; used by permission.)*

LTC Ben Ferguson commands 3rd Battalion, 81st Armor Regiment, 199th Infantry Brigade, Maneuver Center of Excellence, Fort Benning, GA. His previous assignments include professor of military science, Boston University; observer/coach/trainer (Cobra 02), Fort Irwin, CA; squadron operations officer, 6th Squadron, 1st Cavalry Regiment, Fort Bliss, TX; squadron executive officer, 6-1 Cavalry, Fort Bliss; Army congressional liaison, U.S. House of Representatives and Joint Staff J-33 operations officer, Washington, DC; and commander, Company A, 3rd Battalion, 8th Cavalry Regiment, Fort Hood, TX. LTC Ferguson's military schools include Command and General Staff College, Inspector General Course, Armor Captain's Career Course, Armor Basic Officer Leader's Course, Airborne School, SLC and CLC. LTC Ferguson has a bachelor's of arts degree in history from Kings College and a master's degree in public policy management from Georgetown University. His awards and honors include the Bronze Star Medal with V device and the Purple Heart.

CPT Lennard Salcedo is a plans officer for 3-81 Armor, 199th Infantry Brigade, Fort Benning, GA. His previous assignments include maintenance-control officer, 1st Squadron, 14th Cavalry Regiment, 1st SBCT, 2nd Infantry Division, Joint Base Lewis-McChord, WA; platoon leader, 1-14 Cavalry, 1-2 SBCT; and squadron adjutant, 1-14 Cavalry, 1-2 SBCT. CPT Salcedo's military schools include Air-Assault School, Armor Basic Officer Leader's Course, Army Reconnaissance Course, Stryker Leader's Course and Maneuver Leader's Maintenance Course. He has a bachelor's of science degree in psychology from the U.S. Military Academy, West Point, NY. He is a master's of

business administration candidate from the University of Wisconsin Consortium.

Notes

[1] Sydney Freedberg Jr., "Big Guns for Light Infantry: Mobile Protected Firepower," ***Breaking Defense***, Aug. 11, 2016.

[2] John Stone, ***The Tank Debate: Armour and the Anglo-American Military Tradition***, Abingdon, Oxford: Harwood Academic Publishers, 2000.

[3] Ibid.

[4] Brian Maddox, "Checkmate on the Northern Front: The Deployment of Task Force 1-63 Armor in Support of Operation Iraqi Freedom," ***ARMOR***, September-October 2003.

[5] Randall Steeb et al., ***An Exploration of Integrated Ground Weapons Concepts for Armor/Anti-Armor Mission***, Santa Monica, CA: RAND 1991.

[6] Ryan Morgan, "The Army is getting rid of its Stryker Mobile Gun System after 15 years," American Military News, May 12, 2021.

[7] Ibid.

[8] Craig Triscari, "Fighting Light/Heavy in a Restricted Terrain," Center for Army Lessons Learned No. 98-10.

[9] Ibid.

[10] Donald Snedeker, ***The Blackhorse in Vietnam: The 11th Armored Cavalry Regiment in Vietnam and Cambodia, 1966-1972***, Havertown, PA: Casemate, 2020.

[11] Ibid.

[12] R.P. Hunnicutt, ***Sheridan: A History of the American Light Tank, Volume 2***, Brattleboro, VT: Echo Point Books & Media, 1995.

[13] Ibid.

[14] "M551 Sheridan Light Tank," ***The Army Historical Foundation***, accessed June 16, 2021, https://armyhistory.org/m551-sheridan-light-tank/.

[15] Sydney Freedberg Jr., "MPF: Light Tank Competitors BAE & GD Head for Soldier Tests," ***Breaking Defense***, Oct. 19, 2020.

[16] Mission statement, U.S. Army Fort Benning and The Maneuver Center of Excellence, last modified Nov. 15, 2021.

[17] Eric Tegler, "Two Light Tank Prototypes Battle for the Future of Army Firepower," ***Popular Mechanics,*** accessed March 7, 2021.

[18] Kendall Gott, ***Breaking the Mold, Tanks in Cities***, Fort Leavenworth, KS: Combat Studies Institute Press, 2006.

[19] P.W. Singer, ***Wired for War: The Robotics Revolution and Conflict in the 21st Century***, New York: Penguin Books, 2009.

[20] Stone.

[21] Bruce Gudmundsson, ***On Armor***, Westport, CT: Praeger Publishers, 2004.

Acronym Quick-Scan

ABCT – armored brigade combat team
ACAV – (M113A1) Armored Cavalry Assault Vehicle
AGS – (XM8) Armored Gun System
AI – artificial intelligence
AoR – area of operations
BCT – brigade combat team
CROWS – Common Remotely Operated Weapon Station
GWOT – Global War on Terrorism
HEAT – high-explosive anti-tank
IBCT – infantry brigade combat team
IRC – individual ready company
ITAS – Improved Target Acquisition System
JRTC – Joint Readiness Training Center
LSCO – large-scale combat operations
M-ATV – Mine-Resistant Ambush-Protected All-Terrain Vehicle
MBT – main battle tank
MDO – multi-domain operations
MGS – Mobile Gun System
MPF – mobile protected firepower
OPFOR – opposing force
SBCT – Stryker brigade combat team
SOP – standing operating procedure
TOW – tube-launched optically tracked wire-guided (missile)
TTP – tactics, techniques and procedures

Do Armored Cavalry Regiments Make Cavalry Divisions Obsolete?

by Michael McCabe

Armored cavalry regiments (ACRs) are a proven asset on modern battlefields, but do they make cavalry divisions redundant or obsolete? This is not a question of whether armored cavalry itself is relevant, but it's rather an administrative/managerial question that simultaneously addresses the pride and prestige of cavalry's heritage.

This article will make the case that generic armored cavalry divisions are indeed unnecessary, but that cavalry divisions can still fill an important, yet hard to retain in peacetime, role without sacrificing their existing advantages.

Limitations for reconnaissance

The first, most obvious use for cavalry, both air and armored, is reconnaissance. Reconnaissance is the sea in which conventional forces swim, so cavalry is utterly necessary to actively shape the battlefield. This is something sniper platoons and long-range surveillance (LRS) teams have less capacity to do.[1] ACRs excel at this mission, and they currently support other brigades with their scout squadrons. ACRs are also capable of regiment-sized reconnaissance and screening operations, which will be invaluable in large-scale combat operations against a peer opponent such as Russia or China.

The problem in justifying the existence of cavalry divisions for reconnaissance work is that the regimental method works better for supplying brigades with squadrons, and most reconnaissance and/or screening in a peer conflict will not require the use of an entire cavalry division operating as a single unit. At best, the cavalry division would tie several independent regiments under one flag, but it offers

nothing new or meaningful.

ACRs can still integrate anti-weaponry (particularly anti-drone and anti-missile) and non-nuclear electromagnetic pulse weapons without requiring a division-sized force, and on the open plains, armored divisions and corps will be the backbone of America's armies. Any gaps large enough to require a division of cavalry to plug are a serious enough threat to require the use of an armored division. Attempting to strengthen cavalry divisions by adding more tanks would not ameliorate the situation; it would merely make the cavalry into a cheap, redundant imitation of said armored divisions. Armored cavalry as it is today simply cannot replace armored divisions on a large scale and thus are better suited to scouting, screening and shaping the battlefield, both physically and cyber/electronically, as regiments before the tanks deliver the knockout blows.

Limitations for convoy escort

Another use for armored cavalry is in escorting columns and convoys along roads. In the Vietnam War, 11th "Blackhorse" ACR smashed many roadside ambushes, helped form cordons and broke through to units in trouble, proving the value of light armored forces in keeping road networks open. However, using cavalry divisions for this purpose full-time would relegate them to a secondary role and diminish their prestige. Convoy escort units would be better placed under the Quartermaster Corps to simplify chain of command and avoid creating the impression that cavalry now exists to babysit other units.

Furthermore, armored cavalry in cordon operations would likely remain a regimental-level task and not justify a division-sized force. As with armored divisions on the open plains, in difficult terrain any gaps bigger than what a regiment can handle should instead be plugged with light-infantry divisions. Cavalry is capable of dismounted action, but using it as an equally capable substitute for infantry divisions will ultimately make it more interchangeable with infantry and eventually justify converting all cavalry divisions into mechanized or light infantry.

Limits of strategic rapid response

A more recent proposed use for cavalry divisions is as a strategic asset that can be rapidly deployed around the globe. This proposal revolves around embracing the full capabilities of the Stryker, as cavalry divisions mounted in Bradleys or helicopters would be less useful as a strategic rapid-response force due to fuel requirements. The idea is to offer a middle ground between airborne divisions, which are the most deployable, and infantry/armor divisions, which are less deployable. This is a task which would merit the use of a division or more, but it would lack institutional longevity since it ultimately rests on an equipment-centric division of labor.

The entire proposal would fall apart if the United States chose to instead mount its airborne divisions in Strykers, mimicking how the Russian airborne troops ride in *boyevaya mashina desantas* (BMDs); Strykers are airdroppable, and a modern airborne division would become capable of landing with or without them. This would make them cavalry's equal as a light-mechanized rapid-response force but with vastly superior strategic mobility. In the end, it would justify converting cavalry divisions into more airborne divisions to gain the dual-purpose benefits and make the peacetime Army more cost-effective. Simply put, modern cavalry divisions have no viable equipment-based roles that can't be filled by infantry, armored or airborne divisions.

Cavalry's best option

With so many arguments against cavalry divisions' usefulness vis-à-vis cavalry regiments and non-cavalry divisions, it may seem as though there are no places left on a modern battlefield for cavalry divisions to be uniquely relevant. However, there is one more role available that the American military traditionally struggles to fill: terrain specialization.

Cavalry regiments, infantry divisions, armored divisions and airborne divisions can beat out cavalry divisions in generalist roles. However, this generalist nature makes it next to impossible for any of them to retain terrain specialization in peacetime. Every time the Army attempts to raise jungle, Arctic and/or desert-specialized infantry or armored divisions in peacetime, these initiatives rarely last more than a few years. Priorities and budgets change, and the wider culture worries about veering too far toward overspecialization and "preparing for the wrong war." If cavalry divisions stepped in to fill the gap, they would resolve the seeming contradictory needs between adaptability and specialization overnight.

The first advantage of terrain-specialized cavalry divisions is that it would not rob them of their ability to carry out any of the previously mentioned missions. Cavalry divisions could still carry out deep reconnaissance and cordon tactics in extreme terrain/climates and could still be a strategic response force. In all three cases they'd be better prepared and acclimated for the extreme terrain than general-purpose infantry, armored or airborne divisions. The cavalry's expertise would furthermore assist in bringing these general-purpose divisions up to speed once the latter arrive in-theater, should generalist divisions be needed. Strategically, if America faces multiple crises simultaneously in both mild and difficult terrain/climates, then the general-purpose forces can more readily deploy to the mild climates while the cavalry tackles the harsh climates without being forced to make compromises, improvise *ad hoc* solutions or reinvent the doctrinal wheel.

The second advantage of terrain-specialized cavalry is that it is not an equipment-dependent niche, despite appearances. Instead of coming up with a single cavalry table of organization and equipment (TOE) that must be shoehorned into radically different extreme terrains/climates, cavalry divisions would be free to custom-tailor TOEs for each specific extreme terrain/climate without losing their distinction from infantry, armor or airborne divisions. It doesn't matter if jungle cavalry uses light armored ground vehicles or not, or whether desert cavalry uses helicopters or tanks, etc.,

equipment for difficult terrain comes and goes, but the cavalry divisions remain. Cavalry divisions would wear special jungle/desert/Arctic uniforms that stand apart from standard woodland camouflage as their standard, everyday uniform, their vehicles would look different, and these visible distinctions from general-purpose troops can consequently enable the cavalry to retain an *espirit de corps* that is not purely historical and contributes to readiness.

As a bonus, terrain specialization would not be a break with American cavalry's heritage. Unlike Old World cavalry, American cavalry spent most of its horseback years in the Wild West rather than in chivalric contests. While cavalry in the American Civil War did fight like European cavalry of the day, for decades afterward it fought in underdeveloped, trackless wilderness as expeditionary forces with no continuous supply lines.

This culture of embracing difficult terrain continued into the 20th Century. When motorization began in 1940, many horse cavalrymen opposed the idea, not because they opposed new ideas, but because they wished to retain their cross-country mobility and not become road-bound and fuel-dependent.

The arrival of the helicopter in Vietnam was also initially seen as a cavalryman's tool; even though infantry and airborne troops used them frequently, their choppers were essentially transport battalions. The infantry/airborne did not see them as any different from five-ton trucks and armored personnel carriers. They were much less a central part of the unit's identity.

In contrast, 1st Cavalry Division was truly a modern cavalry force with exclusive organic lift capacity that allowed it to overcome Indochina's formidable terrain with a dual-purpose mindset of aerial and dismounted action, something that would have been familiar to its 19th Century predecessors. Terrain specialization would keep this unique cavalry heritage alive, and as long as America must fight in jungles, deserts and Arctic terrain, cavalry divisions will remain relevant no matter what technological/equipment changes occur.

Tripling cavalry divisions

At the moment, America has one unspecialized cavalry division, has trained 25th Infantry Division in jungle warfare, and 11th Airborne (at the time of this writing) is slated to become an Arctic force. The simplest route (to be minimally disruptive in a physical sense) would be to convert 1st Cavalry Division into a desert-specialized force, then convert 25th Infantry and 11th Airborne into cavalry divisions.

However, there are many good reasons to keep 11th Airborne Division, as well as reinstating 101st Airborne as an airborne division.[2] Three or more Stryker-mounted airborne divisions paired with three terrain-specialized cavalry divisions would be a formidable strategic quick-reaction force in peacetime. In this latter scenario, 1st Cavalry Division would become a jungle-warfare division due to its heritage in the Philippines and Vietnam, while 2nd Cavalry Division would be a desert cavalry division, and 3rd Cavalry Division would be the Arctic division. Although 2nd and 3rd Cavalry Divisions never saw action, 2nd Cavalry Division was assigned to patrol the Mexican border after Pearl Harbor and was intended for the North African Campaign.

Today this could be accomplished with a swap of banners: 25th Infantry would become 1st Cavalry and the existing 1st Cavalry would become 2nd Cavalry. The 3rd Cavalry division would need to be built from scratch if neither 11th Airborne nor 10th Mountain Divisions are touched.

Closing thoughts

This article has been written in very broad terms, and there are doubtless details that have been skimmed over. But the principles remain. The overall goal of making each division permanently relevant is a long-term solution to readiness concerns.

Cavalry, both in its regimental and divisional forms, can play two very distinct and necessary roles in the age of drones and precision munitions without treading on anyone's toes, and it can round out the Army's toolbox. Most of America's enemies have the luxury of specializing their entire armies to fight in one or two particular terrains/climates and believe that this is a permanent advantage over American troops. Cavalry divisions embracing terrain specialization would rob our enemies of a significant X-factor advantage and be a natural, rather than arbitrary, division of labor that stands up to peacetime scrutiny.

Michael McCabe is as a draftsman/designer at Newport News Shipbuilding in the Hampton Roads area of Virginia. He has been published on ***Small Wars Journal*** *under the pen name Michael Gladius, and some of his essays have been reposted on* ***RealClearDefense****. He holds a bachelor's of arts degree in biochemistry-molecular biology from Carroll College.*

Notes

[1] Sniper platoons and LRS teams are more passive compared to armored or air cavalry.

[2] Generalist air-assault needs would be best filled by the National Guard, and the proposed cavalry divisions would likely also possess this capability.

Acronym Quick-Scan

ACR – armored cavalry regiment
BMD – *boyevaya mashina desanta* (Russian combat vehicle of the Airborne)
LRS – long-range surveillance
TOE – table of organization and equipment

On-the-Move Network to Increase Armored Formation Survivability, Lethality

by MAJ Alexander Barron, MAJ Bryan DiPalermo, MAJ James Luke Napper, MAJ JayPatrick Griffith and MAJ Todd M. Klinzing-Donaldson

To be successful in a future multi-domain operational fight against a near-peer adversary, U.S. armored formations will require robust, resilient network connectivity, and they'll need it on the move. A recent Army pilot assessment of new and emerging commercial on-the-move network capabilities demonstrated how modernized commercial command and control (C2) capabilities could enable mobility, increase survivability and ensure lethality at the decisive point across all warfighting functions.

The Army's armored-formation on-the-move (OTM) network pilot – supported by Spartan Brigade, 2nd Armored Brigade Combat Team (ABCT), 3rd Infantry Division – was conducted at Fort Stewart, GA, in January and February 2022. The pilot was not a formal operational test or acquisition down-select but an opportunity for the Army to inform operational and technical concepts, requirements, technological maturity and affordability supporting the service's network modernization Capability Set 25 design goals.

During the pilot, Soldiers evaluated innovative commercial network technology from more than 20 industry partners integrated onto the unit's available surrogate armored command vehicles. Intended platforms for future network integration include the Armored Multi-Purpose Vehicle and Joint Light Tactical Vehicle. Three battalions received three unique commercial-network communications equipment sets with varying satellite communication and line-of-sight (LoS) capabilities. Soldiers provided their feedback on how well each equipment set delivered mobile, simple, flexible and resilient C2.

Pilot intent, capabilities

Lessons-learned from previous combat training center (CTC) experiences drove the brigade's goals and desired outcomes for the armored-formation OTM network assessment. For example, during the brigade's most recent CTC rotation at the Joint Multinational Readiness Center (JMRC) in Hohenfels, Germany, in September 2020, the unit experienced long delays while trying to establish Upper Tactical Internet. In one instance, command-post relocation caused a loss in operational tempo when a battalion needed to establish Upper Tactical Internet to enable communication.

With these things in mind, the brigade commander's intent was to meet Army pilot objectives by answering the following questions:

- Will these systems increase the survivability of the warfighter on the ground while enhancing lethality?
- Can these systems increase the accuracy of the common operating picture to inform the commander's decisions to allocate resources?
- Are these systems simple to use and reliable?
- Do they enhance the unit's primary, alternate, contingency and emergency (PACE) plans for increased network resiliency?

The unit executed the pilot during three weeks, with each week dedicated to a different battalion and equipment set. The pilot's commercial OTM network prototype systems provided several enhanced network capabilities across the battalion-specific equipment sets, along with several satellite communications (SATCOM) antenna prototypes at the brigade command post. These included SATCOM integrated onto individual vehicles that required a "flip of a switch" to operate, as well as brigade and battalion LoS mesh networks.

The battalion LoS mesh enabled redundant SATCOM. If one vehicle's SATCOM was degraded or inoperable, it could use another vehicle's feed within the LoS mesh. For contrast, one battalion operated solely with vehicle-level SATCOM connectivity and had no internal mesh network. The brigade LoS

Figure 1. Soldiers assigned to the Can-Do Battalion, 3rd Battalion, 15th Infantry Regiment, 2nd ABCT, 3rd Infantry Division, test, assess and provide feedback on one of the three commercial OTM network equipment sets during the U.S. Army's three-week armored-formation OTM network pilot at Fort Stewart, GA, Feb. 2, 2022. The Army will use Soldier feedback and the data collected to inform the Army's Capability Set 25 network design and market research to determine currently available and maturing industry solutions for potential armored formation network integration. *(U.S. Army photo by CPT Detrick Moore)*

mesh provided Upper Tactical Internet connectivity via LoS to the battalions using a tethered drone that could reach up to 200 feet, a vehicle-mounted quick erecting antenna mast or a non-vehicle mounted 15-meter mast.

Movement and maneuver

The commercial OTM network capabilities in this assessment were critical to the movement and maneuver warfighting functions. Network connectivity is a fundamental condition check with the brigade before initiating decisive action.

Currently a battalion command post must come to a halt and wait while establishing Upper Tactical Internet communications, and it's limited to Lower Tactical Internet only. The equipment assessed during the OTM network pilot enabled continuous Upper Tactical Internet connectivity at the battalion level with two of the three equipment sets, and it reduced connection time at-the-quick-halt for the last battalion down to five minutes.

Retaining near-constant Upper Tactical Internet significantly reduces a battalion commander's need to stop to set conditions for an operation. Armored formations must retain mobility to balance dispersion and survivability with the ability to mass at the decisive point.

Command and control

C2 is essential in support of all warfighting functions. A key focus of OTM network connectivity in support of the Army's network modernization Capability Set 25 design is to develop a network architecture that is transport-agnostic with multiple digital data-transportation pathways where the transmission path is unknown to the user. Currently, armored formations at brigade and below rely on a singular SATCOM transport method with their at-the-halt satellite-transportation terminals. Unfortunately this singular transmission pathway is not conducive to network resiliency.

To help solve this challenge, during the pilot, each equipment set provided different transport configurations using SATCOM or digital LoS mesh at the brigade and battalion levels. For a network to be genuinely transport-agnostic and simple for the user to operate, it must provide automatic failover. Automatic failover requires zero user interaction when one method of transport fails, compared to switchover, which requires the user to manually select the next method of transport. The pilot demonstrated the network's ability to seamlessly provide failover, thus simplifying the user experience and allowing users to focus solely on their warfighting-function tasks. This auto-PACE capability facilitated the success seen across all warfighting functions.

Figure 2. Soldiers assigned to the Can-Do Battalion, 3rd Battalion, 15th Infantry Regiment, 2nd ABCT, 3rd Infantry Division, set up a satellite terminal to test and assess one of the three commercial OTM network equipment sets during the U.S. Army's three-week armored-formation OTM network pilot at Fort Stewart, GA, Feb. 2, 2022. *(U.S. Army photo by CPT Detrick Moore)*

Intelligence

The 2nd ABCT, 3rd Infantry Division, evaluated how the OTM network capabilities affected the unit's ability to maintain a current common intelligence picture (CIP) and if the CIP could feed the brigade common operating picture. Maintaining a CIP is typically challenging for units due to the requirement to have connectivity to the Upper Tactical Internet. When battalions are not established on the tactical network, they often do not receive up-to-date higher echelon enemy composition and disposition reports. Battalions are also less likely to provide a holistic picture of the enemy to the brigade command post, leading to decision-making based on stale information.

Unlike the brigade's previous JMRC rotation, where information sharing was a constant challenge, the commercial OTM network prototype capabilities helped solve this problem by providing flexible and resilient digital connectivity at the battalion level. Upper Tactical Internet is required to access the collective shared-intel database such as Distributed Common Ground System-Army Capability Drop 1. The OTM equipment sets enabled near-continuous intelligence data sharing across the brigade using these intelligence warfighting systems. The OTM network systems also improved intelligence reporting timeliness, which increased the effectiveness of the fires enterprise.

Fires

An accurate and timely intelligence picture enables effective brigade-level fires support that shapes the brigade's close-fight and ultimately provides brigade and battalion commanders more decision space. The commercial OTM network capabilities in this assessment facilitated improvements in providing lethal shaping fires. The fires warfighting function realized similar benefits as the intel warfighting function by placing an Advanced Field Artillery Data System in the battalion fires-support-element vehicle. This allowed the fires enterprise to process more fire missions from the battalions, using digital Upper Tactical Internet capabilities instead of slower Lower Tactical Internet methods like very-high-frequency or high-frequency radios. Processing fires on the Upper Tactical Internet is typically up to 10 minutes faster than processing on the Lower Tactical Internet.

Due to the prototype OTM network's digital data-transport design, multiple data pathways supported digital fires processing. Multiple data pathways further reduce Lower Tactical Internet reliance by creating a robust, flexible and resilient network for fires-mission processing. The OTM network pilot's mobile, flexible and resilient capabilities facilitated the brigade's ability to provide timely and lethal shaping fires, which are critical to the survivability of the unit's movement and maneuver elements.

Conclusion

Each equipment set displayed strengths and weaknesses. However, there were common capabilities that enabled authentic OTM network communications for the pilot armored unit.

The commercial OTM network prototypes provided commander's options to improve survivability and lethality without sacrificing C2 of the current operational fight. Commanders could establish command posts according to operational tempo instead of by location. This allowed them to disperse their command posts to increase survivability from indirect fires.

Units could process faster fire missions from sensor-to-shooter through reliable access to Upper Tactical Internet and maintain a more accurate COP across the formation. The OTM network capability could also provide Upper Tactical Internet for reconnaissance operations at combat-trains command posts and sustainment operations at field-trains command posts to increase C2 of sustainment operations, thus improving the timeliness and accuracy of logistics operations.

Figure 3. 1LT Holly Gerber-George, Hound Battalion, 3rd Battalion, 67th Armor Regiment, 2nd ABCT, 3rd Infantry Division, supervises her Soldiers and vehicles as they start movement to begin the Army's armored-formation OTM network pilot Jan. 24, 2022. *(U.S. Army photo)*

The OTM network prototype capabilities have the potential to change battlefield network architecture, C2 and the way the Army fights in future multidomain operations. Network mobility and continual resilient connectivity will be key enablers in future near-peer fights.

MAJ Alex Barron is the top operations officer (S-3) for 2nd ABCT, 3rd Infantry Division, Fort Stewart, GA. His previous assignments include operations officer, 6th Squadron, 8th Cavalry Regiment, 2nd ABCT, 3rd Infantry Division; chief of operations for the Train, Advise and Assist Command – South, Kandahar Airfield, Afghanistan (under Operation Resolute Support); and small-group leader at the Maneuver Captain's Career Course (MCCC), Fort Benning, GA. He commanded companies in 3rd ABCT, 3rd Infantry Division, and 316th Cavalry Brigade. He also served as a platoon leader and staff officer in 3rd Armored Cavalry Regiment. MAJ Barron's military education includes Command and General Staff College, Joint Firepower Course, Ranger School, MCCC, Armor Officer Basic Course and Air-Assault School. MAJ Barron holds a master's degree in business administration from Kansas State University and a bachelor's of science degree in Spanish and Arabic from the U.S. Military Academy. His awards include the Bronze Star Medal and the Meritorious Service Medal with three oak-leaf clusters.

MAJ Bryan DiPalermo is the executive officer of 2nd ABCT, 3rd Infantry Division. His previous assignments include executive officer, 3rd Battalion, 67th Armor Regiment, 2nd ABCT, 3rd Infantry Division; assistant operations officer, 3rd Infantry Division; planner, Operational Test Command Future Operations, Fort Hood, TX; commander, Headquarters and Headquarters Troop (Brigade), 3rd ABCT, 1st Cavalry Division, Fort Hood; commander, Company D, 6th Squadron, 9th Cavalry Regiment, 3rd ABCT; assistant operations officer, 504th Battlefield Surveillance Brigade, III Corps, Fort Hood; assistant operations officer, 6th Squadron, 8th Cavalry Regiment, 4th Infantry Brigade Combat Team (IBCT), Fort Stewart; company executive officer, Company B, 6-8 Cavalry, 4th IBCT; and platoon leader, Cavalry Squadron Reconnaissance Troop, Company B, 6-8 Cavalry, 4th IBCT. MAJ DiPalermo's military schools include resident Command and General Staff College (CGSC), Cavalry Leader's Course, MCCC, Army Reconnaissance Course and Armor Basic Officer Leader's Course. He has a master's of science degree in military studies from American Public University and a bachelor's of science degree in interdisciplinary studies from Arizona State University-Tempe. MAJ DiPalermo's

Figure 4. Soldiers assigned to the Hound Battalion, 3rd Battalion, 67th Armor Regiment, 2nd ABCT, 3rd Infantry Division, speak to Army senior leaders during a distinguished-visitors day about their unit's experimental equipment set for the U.S. Army's three-week armored-formation OTM network pilot at Fort Stewart, GA, Feb. 9, 2022. The Army will use Soldier feedback and the data collected to inform the Army's Capability Set 25 network design and market research to determine currently available and maturing industry solutions for potential armored formation network integration. *(U.S. Army photo by SGT Trenton Lowery)*

awards include the Bronze Star Medal and the Meritorious Service Medal with oak-leaf cluster.

MAJ James Napper is the top intelligence and security officer (S-2) for 2nd ABCT, 3rd Infantry Division. His previous assignments include division G-2X, 3rd Infantry Division; small-group leader, Captain's Career Course, 304th Military Intelligence Battalion, Fort Huachuca, AZ; brigade assistant S-2, 1st Brigade Combat Team (BCT), 101st Airborne Division (Air Assault), Fort Campbell, KY; and battalion S-2, 2nd Battalion, 327th Infantry Regiment, 1st BCT, 101st Airborne Division; and commander, Aerial Reaction Force Detachment, 5th Squadron, 7th Cavalry Regiment, 1st BCT, 3rd Infantry Division. MAJ Napper's military schools include the Infantry Basic Officer Leader Course, Army Reconnaissance Course, Military Intelligence Captain's Career Course and command and resident CGSC. He has a bachelor's of arts degree in political science from Auburn University, a master's of arts degree in international relations from Webster University and a master's of arts degree in operational studies from CGSC. MAJ Napper's awards include the Bronze Star Medal with oak-leaf cluster and the Meritorious Service Medal with oak-leaf cluster.

MAJ JayPatrick Griffith is the top fires-support officer (S-3) for 1st Battalion, 9th Field Artillery Regiment, 2nd ABCT, 3rd Infantry Division. His previous assignments include fire-support officer, 2nd ABCT, 3rd Infantry Division; assistant S-3 officer, 2nd Battalion, 12th Artillery Regiment, Fort Carson, CO; and commander, Headquarters and Headquarters Company, 1st Battalion, 38th Infantry Regiment, 1st Stryker Brigade Combat Team, 4th Infantry Division, Fort Carson. MAJ Griffith's military schools include Field Artillery Basic Officer Leader's Course, Joint Fires Observer Course, Joint Firepower Course, Paladin Leader's Course, Bradley Leader's Course and the Australian Defence Force Command and Staff College. He has a bachelor's of arts degree in liberal studies from Iowa State University and a master's of arts degree in policy and strategic studies from Australian National University.

MAJ Todd Klinzing-Donaldson is the top network and communications officer (S-6) for 2nd ABCT, 3rd Infantry Division. His previous assignments include operations officer, 4th Battalion/Capabilities Integration Group, Fort Belvoir, VA; commander, Headquarters and Headquarters Company, 67th Expeditionary Signal Battalion, Fort Gordon, GA; commander, Company C, 67th Expeditionary Battalion; and battalion S-6, 3rd Battalion, 321st Field Artillery Regiment, Fort Bragg, NC. MAJ Klinzing-Donaldson's military schools include the Infantry Officer Basic Course, Ranger School, Airborne School, Battalion/Brigade S-6 Officer's Course, Signal Captain's Career Course and resident CGSC. He has a bachelor's degree in business administration from Messiah University and a master's of arts degree in information-technology management from Webster University. MAJ Klinzing-Donaldson's awards include the Bronze Star and Meritorious Service medals. He is a former infantry officer who deployed for Operations Spartan Shield, New Dawn and Unified Response (a humanitarian-relief mission).

Acronym Quick-Scan

ABCT – armored brigade combat team
BCT – brigade combat team
C2 – command and control
CGSC – Command and General Staff College
CIP – common intelligence picture
CTC – combat training center
IBCT – infantry brigade combat team
JMRC – Joint Multinational Readiness Center
LoS – line-of-sight
MCCC – Maneuver Captain's Career Course
OTM – on-the-move
PACE – primary, alternate, contingency and emergency
SATCOM – satellite communications

Drones: Over the Hill and Far Away

by Donald Wilkins

The recent Russian-Ukrainian "special military action" showcases relatively unsophisticated, unmanned aerial vehicles (UAVs), or drones, in a number of military missions. Drones, foreign- and Ukrainian-built, support the defenders by performing reconnaissance and attack missions. Images of Russian small vehicles, air vehicles and armored vehicles destroyed by the comparatively quiet drones proliferate on the Internet.

The amount of video coverage of the special military action is plentiful and, probably in many instances, misleading if not outright faked. Oddly the videos very rarely reflect any successful Russian operations. The Ukrainians are utterly dominating the information war. Equally strange, the Russians do not seem to employ drones or effective anti-drone defenses. Although the Russians have claimed destruction of a few UAVs, their defenses have not been enough to deter reconnaissance or strike missions by the Ukrainians.

In fairness, some attacks have been described as missile-based, while the same attack, in other reports, are described as drone-based. What is clear is that the Ukrainians have used a variety of drones, some commercial, others military, still others are home-brewed machines cobbled together by technically savvy civilians using spare parts.

UAV support crucial

The absence of UAV support fits with the apparent blundering of Russian combat operations. Perhaps when the special military action is over, Russian reporting will be unfettered and the bleak picture of Russian ineptitude will be balanced by other descriptions. Regardless of apparent Russian mistakes, the need to integrate drones into the U.S. armory was abundantly apparent even before the current collision between Russia and Ukraine.

U.S. military forces could integrate drones onto armored vehicles with the UAVs riding on the decks of tanks and armored personnel carriers; the drone control stations could be placed internal to the armor. Appropriately armed, provisioned with sensors and guided by autonomous navigation systems, the UAVs provide over-the-hill reconnaissance and attack capabilities, together with defense against hostile drones.

To prompt discussion on the employment of drones, the following scenario is provided. Five M1A1s are assigned to clear enemy forces that may be occupying a narrow pass through a series of low hills. Each tank carries an electrically driven quadcopter on its aft deck. The maximum speed of a quadcopter is 60 mph, enabling the drone to spring ahead of the carrier vehicle (tank). Its range is about 10 miles, although this limitation is more a function of communications line-of-sight rather than energy storage. After a sprint to its operational area, the drone can loiter over the target area for two hours before returning to its tank carrier to be recharged.

The quadcopter's composition minimizes metal and thus radar reflections, while the hull has limited ability to match the color of the sky. The vehicle's cooling system points skyward, making tracking by thermal sensors very difficult. Aerodynamic design, based on techniques derived from birds of prey, reduces the quadcopter's acoustic footprint. It's not stealthy in the sense of the F-35 Lightening II, but it's quiet and chameleon-like enough to evade tactical sensors.

Within five miles of the objective, the quadcopters lift from their tanks and speed ahead of the armored column. The first drone carries long range, high-resolution sensors; two carry a pair of anti-armor grenades fitted with tail fins; and the rest of the drones carry light automatic weapons. Airborne, the drones autonomously form a communications network while flying to the designated area. Signal compression reduces demands on bandwidth and vehicle power. Video and other sensor data are transmitted to the tanks, where the controller monitors the drone, supplying input as needed.

The controller in the tank does not "fly" the UAV in the sense of using a joystick to control drone trajectory. The controller simply selects a spot on a computer screen depicting the surrounding terrain; the UAV possesses enough processing power and sensors to autonomously fly to the desired location. In general, the drones will follow or "swarm" with the designated leader. However, various elements of the flight can be tasked to individual missions if the vehicle is released to its controller.

Feedback from the drone – which includes sensor video, mission and vehicle status – are displayed on the visor of the helmet the controller wears. Enhanced images, merged from at least two sensors operating at two different frequencies, provide enlarged pictures of suspected targets and enable increasing awareness of the battlefield for the tanks. Weapons release requires positive authorization by the controller.

The UAVs have enough mounting points so a number of mission loads, depending on operational needs, can be incorporated onto the vehicles. In this instance, the lead drone, carrying radar and high-resolution infrared sensors, detects two small, low-flying objects circling the pass. Immediately one of the drones, equipped with an automatic weapon, surges toward the objects. A controller in one of the tanks identifies the objects as enemy drones and authorizes an attack.

The first enemy drone is easily downed. Alerted by the loss, the enemy controller sends the survivor into violent maneuvers. The attacking drone autonomously locks onto the juking enemy, matches vectors and downs its opponent.

Jamming of the drone links immediately begins but the tank-drone links skip through the frequencies. The drones rise higher to peek over the hills. Six enemy tanks are behind the hills, accompanied by dismounted

infantry, probably with anti-tank weapons. The enemy occupies the reverse side of the hills. Thermal plumes from the tanks and infantry moving into fighting positions show an aroused enemy willing to fight for the pass.

The drone controllers confirm targets and authorize the drones to attack. Two drones swoop close to the enemy armor, depositing anti-tank grenades on the lightly armored tops of the vehicles. Four of the hostile tanks erupt with explosions and fires.

The drone's laser paints the survivors. Two tanks elevate guns. Drone location, range to target are geometrically merged with the tanks' positions. Two shots are fired, and the remaining tanks are destroyed.

The fifth drone is released to autonomous attack. It drops lower, strafing the entrenched troops. Its firing does little damage, but the buzzing drone darting unscathed through hostile ground fire is a morale-breaker. Deciding discretion is the only part of valor, the enemy infantry flees.

Recall brings the UAVs back to the tank decks. The drones autonomously settle down onto the inductors that will refuel the craft. A report from one reveals an imminent motor failure. The status is included in the after-action report beamed to the rear. In response, two larger logistics UAVs arrive. One uncurls a long proboscis and begins refueling the tanks. The other drops bullets and grenades. It drops off a replacement drone while picking up the dubious drone for rear-area maintenance. When the area is secure, the tank crews will rearm the drones.

Protecting supply lines

The need for drone resupply is underlined by U.S. operations in Iraq and Afghanistan as well as Russian activities in Ukraine. Supply lines are traditional weaknesses subject to interdiction by enemy action and weather. Difficult to protect, often confined to roads, snaking through built-up areas, current logistics trains can be subject to well-prepared ambush and destruction of infrastructure such as bridges and culverts.

Aerial resupply alleviates many of those concerns. Flying supplies in UAVs can take varying routes, making ambush difficult to prepare. Manpower is conserved and can be reassigned to other missions. Small forces, such as the one described in this article, can be resupplied in the field, thereby extending operational time. Freed of traditional logistics transport, armor can operate with fewer constraints, becoming the force originally envisioned by the first theoreticians of armored warfare.

Basing drones on the decks of armored vehicles will extend the range of the drones and provide immediate air support for the vehicles, extending the column's defensive onion, which would otherwise shrink under the glare of enemy drones. Therefore, higher command could allocate more capable, and scarce, resources to more critical and better-defended objectives.

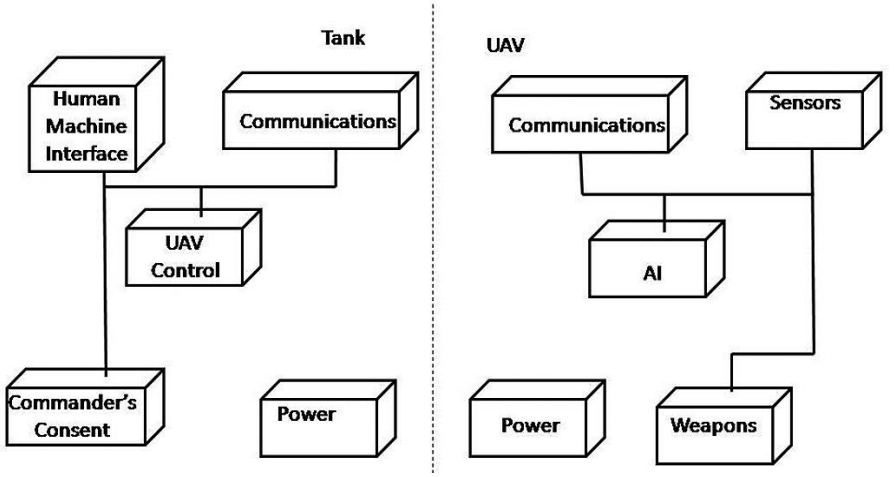


Figure 1. Way ahead for drones. *(Graphic by author)*

Way ahead

Current technology implemented in diverse applications could be quickly and inexpensively brought together to serve the warfighter. Technical risks, however, must be addressed.

First, a control structure must be implemented that guarantees safe operation of crewed and autonomous air vehicles within the same air and ground spaces. Areas of congestion such as airfields are particularly worrisome. The Federal Aviation Administration and Federal Communications Commission have started development and definition of such a control structure, but considerable work must be done to refine and deploy the necessary communications and control infrastructure.

Part of the development must take into account voice communications between air-traffic controllers and drones. Speech recognition by machines is currently inadequate for the task.

The human-machine interface between tactical operator and drone requires careful development. Optimizing the interface, increasing efficiency coordination and minimizing human workload are critical needs for the system. Cost vs. utility will determine device selection.

For example, a true three-dimensional display could be fed information from the drones. However, current designs of three-dimensional displays are expensive, and the processing capability needed to generate the images requires considerable resources. Does utility of display outweigh its cost and complexity?

Autonomous operations

Autonomous operations of the drone must be maximized without compromising safety. This will be critical to reducing operator workload because troopers have other tasks to perform in the tank beside the drones, including the demands on communications. The release of weapons from the drones must always require positive consent from the tactical operator.

The squadron commander's

responsibilities will increase with the addition of the drones. The commander must include the UAVs in mission planning and in command-and-control during operations. New techniques must evolve to ensure the commander can effectively direct the varied resources under his/her responsibility.

During experiments with mobile ground stations controlling unmanned ground vehicles, a significant issue was motion sickness induced in the operator as the vehicle he was riding in moved in a different direction than the machine he/she was trying to control. Artificial intelligence aboard the drone offers relief from this problem. Removing the need for the operator to monitor, second by second, the trajectory of a different vehicle could eliminate or at least reduce to "manageable levels" the operator's distress.

Extending range, increasing payload and optimizing the loiter time over the target area will require weight reduction and an increase in power storage for the drones. Methods to accelerate refueling must also be developed, as current approaches take too much time.

Other considerations

Basing the drone on the deck of the tank will expose the drone to high temperatures. Therefore the design of the docking station must not block the flow of waste heat from the tank engines.

Doctrine must also be revised to take full advantage of the incorporation of tactical drones into the force structure. Present dreams of drone usage border on the fantastic, ignoring issues of range, payload, cost and a host of other factors that must be compared and contrasted to produce the needed design.

Once developed for practical operation, drones will substantially enhance the armored force's capabilities. Drones riding into battle with armored forces would put the surprised expressions of the Russians mired in the current "special military operation" onto the faces of enemy forces facing U.S. armor.

Donald Wilkins, a retired electronics engineer who holds 12 patents, has extensive experience with system design, requirements decomposition and assignment, autonomous systems, human-machine interfaces and electronics design and manufacturing. During Wilkins' assignments with McDonnell Aerospace, he developed requirements for, designed, developed, manufactured and integrated the first color display for a U.S. fighter; developed requirements for, designed, developed, manufactured and integrated the first liquid crystal display for a U.S. fighter; developed requirements for, designed, developed and manufactured the avionics suite for advanced aircraft; developed requirements for, designed, developed, manufactured and integrated the first helmet-mounted display for a U.S. fighter; integrated the avionics suite for the MQ-25 program (U.S. Navy unmanned air system prototype); designed and integrated the avionics suite for a commercial cargo drone; and managed development of the neural architecture for mission planning. During his career, Wilkins' work entailed gathering requirements from U.S. Air Force, U.S. Navy and U.S. Army personnel to understand operational needs and translate those requirements into hardware and software instantiations. These designs were translated into physical implementations and, if the program was fully funded, into environmental and flight testing before going into production. Early in his career, Wilkins served as a U.S. Army Signal Corps first lieutenant with Headquarters and Headquarters Battery, 1st Battalion, 13th Field Artillery Regiment, 24thInfantry Division, Fort Stewart, GA; and as Signal Corps second lieutenant with 169th Signal Company, 36th Signal Battalion, Camp Humphreys, Republic of Korea. Wilkins has a bachelor's of science degree in electrical engineering from the University of Oklahoma and a master's of science degree in electrical engineering from the University of Missouri-Rolla.

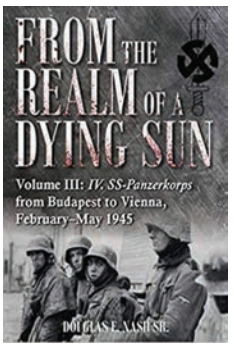
Figure 2. 11th Armored Cavalry Regiment and the Threat Systems Management Office operate a swarm of 40 drones to test the rotational unit's capabilities during the "Battle of Razish" on the National Training Center (NTC) May 8, 2019. This exercise was the first of many held at NTC located at Fort Irwin, CA. *(U.S. Army Photo by PV2 James Newsome)*

Acronym Quick-Scan

JTARV– Joint Tactical Aerial Resupply Vehicle
NTC – National Training Center
UAV – unmanned aerial vehicle

BOOK REVIEWS

From the Realm of a Dying Sun – Volume III: IV SS Panzerkorps from Budapest to Vienna, February-May 1945 by Douglas E. Nash Sr.; Havertown, PA: Casemate Publishers; 2020; 352 pages, illustrated, with appendices and endnotes; $22.95 Kindle, $32.62 hardcover.



Fighting a statis war – as the Global War on Terrorism seemed to have become – is hard enough. Now imagine fighting in a lost and hopeless war for a cause soon to be extinguished, where your efforts only result seemingly each day in staving off some type of catastrophic disaster.

In ***From the Realm of a Dying Sun – Volume III: IV SS Panzerkorps from Budapest to Vienna, February-May 1945***, the reader is treated to less the sounds of combat and the clanking of tank treads than a bone-wearying tiredness and the smell of fear and desperation that permeated every day of a fighting retreat to escape Soviet captivity. Douglas Nash Sr. notes upfront that to finish the trilogy he had to datamine other sources extensively, as records relative to IV SS Panzerkorps became scarce or were lost in the death throes of the Third Reich.

Many readers might have known little of SS Obergruppenfuhrer Herbert Gille, the IV SS Panzerkorps commander. Leadership positions in the Wehrmacht and SS had become a veritable carousel due to Hitler's attempts to find the right combination of what he estimated to be the proper National Socialist political commitment and operational combat skills. Gille obviously had met this test with his award of the Knight's Cross with oak leaves, as demonstrated by his tactical and operational savvy in the Volume I battles around Praga and Warsaw, and in Volume II, the unsuccessful efforts to relieve Fortress Budapest. Reading how he continued to navigate the political minefield of leadership in an increasingly paranoid Third Reich, always suspecting treachery, alone makes it a mindful read.

But in this the third volume, Gille and IV SS Pankerkorps are tested to almost beyond endurance in their efforts to survive in this, a lost war, while trying to still hope for some Frederick the Great *deus ex machina* deliverance at the stroke before midnight; however, Volume III shows that despite all Gille's efforts, time was running out. Moreover, as Nash notes, almost in disbelief, Gille's commanding officer, Herman Balck at 6th Army, seemed more interested in political machinations against Gille.

Nash time and time again savages Balck's poor handling of not only 6th Army but his repeated efforts to undermine Gille and to have him relieved of command. Nash never fully seems to reach a conclusion as to why their relationship was so contentious – was it personality-driven, the smoldering conflict between the Waffen SS vs. Wehrmacht, or was it more? Regardless, Nash builds a strong case that Balck's judgment served as a distraction and probably cost the lives of more soldiers due to his oft-miserly and untimely withholding of resources Gille needed.

The Lake Balaton Offensive (Operation Spring Awakening) is interesting for the insights Nash brings to this, the last major German offensive of the war. But the running gun battle from this failed offensive to the fighting retreat to Vienna is more interesting. Nash, like the reader, is stupefied that at this point in the war, no replacement tanks were sent to IV SS Panzerkorps – that only the miraculous efforts of the field-repair facilities kept them from being the shell of an armored formation. We've read too often of the Germans having to destroy tanks awaiting repair and their continual cannibalization of equipment as we watch this panzerkorps slowly begin to sink into a form of demechanization.

But the part of the book I found myself rereading was Gille's use of every tactical trick he could squeeze out to bring his unit to the north side of the Enns River and into the relative safety of captivity courtesy of the U.S. Army. Consider: how does one manage to try and scramble for safety when, on April 5, 1945, you are told the last train of ammunition for Army Group South had arrived? A fighting retreat requires ammo and, Nash relates, the Soviets had pressed Gille hard, depleting his resources.

Of particular note in the book's photographs and illustrations is one of three soldiers passing to Gille's rear, all shouldering panzerfausts. A keen eye will also see, increasingly, the faces of teen boys thrown into the maelstrom of Gotterdammerung.

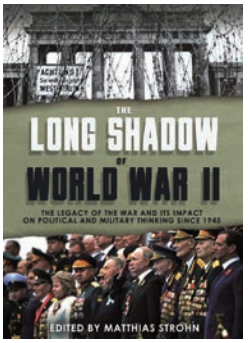
Nash also treats us to a brief recapitulation of both Gille's and Balck's postwar lives. It is for readers to draw their own conclusions from what Nash presents how you judge these two.

For anyone with the slightest interest in the Eastern Front, this concluding volume of the trilogy of IV SS Panzerkorps is simply a must-read. Nash has done yeoman's work in marshalling and datamining sources for this period of the war when records and record-keeping went into an abeyance, from the Lake Balaton Offensive to keeping the Hungarian oilfields. What we can only hope for is that Nash will drive on in his Eastern Front scholarly work and perhaps treat us to a long-overdue balanced biography and assessment of Field Marshall Walter Model.

DR. (LTC) ROBERT G. SMITH

The Long Shadow of World War II, The Legacy of the War and Its Impact on Political and Military Thinking Since 1945; edited by Matthias Strohn; Havertown, PA: Casemate Publishers; 2021; 269 pages; $65 (hard cover).

Although World War II ended nearly 80 years ago, the conflict's legacy shapes global events today. How do we best interpret the war and understand these effects and – for military



professionals – use this knowledge to our advantage?

One course of action is to move beyond a strictly American interpretation to study World War II from a greater variety of perspectives. ***The Long Shadow of World War II, The Legacy of the War and Its Impact on Political and Military Thinking Since 1945*** provides a primer to approaching the war from this angle. ***Long Shadow*** is a compilation of essays written by a wide range of academic and military experts from the major Axis and Allied nations as well as those regions caught between the two opposing sides.

Restated, this work is not a simple "coffee table book" rehash of well-known World War II history, but instead analyzes its impact on individual nations from war's end in 1945 to the present day.

Dr. Matthias Strohn opens ***Long Shadow*** with a personal reflection on how the war shaped his childhood growing up in post-war Germany. Strohn explains his perceptions as a boy and how those views change as he matured and learned how others, including non-Germans, understood the conflict. Using this as a solid foundation on the evolving nature of the war's impact, the book moves into the individual "national viewpoint" chapters analyzing the conflict in three broad categories: during the war, in the initial post-war era and in relation to current events.

The Russian chapter is particularly prescient, given the post-publication invasion of Ukraine, in its discussion on how Vladimir Putin's dictatorial regime uses the Great Patriotic War to advance his own agenda on the world stage.

Similarly, leaders will likely pay special attention to essays on United Kingdom, French, German, Dutch and Baltic States views to explore their participation in the North Atlantic Treaty Organization and European collective security.

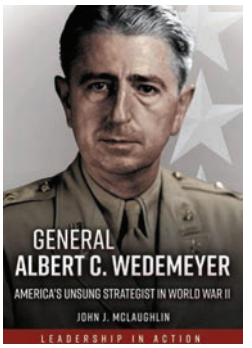
Oddly missing from the book, however, is the Japanese perspective of World War II. While Japan receives mention throughout ***Long Shadow***, the editors did not dedicate a chapter to Imperial Japan itself. This absence is unfortunate, as Japan played a major role in the Pacific and China-Burma-India theaters and remains a key U.S. ally in international-security issues with both China and Russia today. Summed up, the book feels incomplete without a Japanese perspective.

As with any compilation work, the tone and style of the writing changes between authors with each new chapter. However, the various approaches create a harmonious narrative akin to an experienced jazz band, where each musician enjoys his/her moment in the spotlight while complementing the other players. While no single book can possibly account for every facet of World War II, ***Long Shadow*** effectively offers a comprehensive analysis of the war and its continuing importance.

LTC CHRISTOPHER J. HEATHERLY

General Albert C. Wedemeyer: America's Unsung Strategist in World War II by John J. McLaughlin; Philadelphia: Casemate Publishers; 2012; 322 pages, including photographs, maps, endnotes, bibliography and index; $24.95.

When discussing which American generals made major contributions to victory in World War II, Marshall, MacArthur, Eisenhower, Bradley and Patton at once come to mind. Regrettably, historians and military professionals alike have neglected the significance of GEN Albert C. Wedemeyer.



John J. McLaughlin's biography of Wedemeyer describes his importance as a visionary strategist and principal author of the America's Victory Program. This plan was the blueprint for mobilizing the Army for World War II, designing its force structure for global warfare, and the transitioning America's industry from peacetime to wartime production.

While most of the credit for planning the Normandy invasion has been attributed to others, Wedemeyer's work was the conceptual framework for Operation Overlord.

Wedemeyer's early Army career was hardly the stuff of a future grand strategist. His struggles with the sciences and mathematics resulted in mediocre academic performance at West Point. His military career nearly ended before it began; during his first assignment at Fort Benning, GA, a court martial found him guilty of drunkenness, resulting in a six-month restriction and a reduction in pay. After receiving a civilian job offer, he submitted his resignation, which was not accepted since he had not completed the terms of his sentence. According to McLaughlin, while Wedemeyer was completing his sentence "… superior officers dissuaded him from resigning. …" In a lapse in scholarship, McLaughlin did not identify these officers.

Wedemeyer's career as a strategist and diplomat is largely the result of intensive self-study and mentorship. He attributed the beginning of his self-development to his father, who kindled a lifelong passion for history. His first military mentor was his father-in-law, COL (later, LTG) Stanley Dunbar Embick. Access to Embick's large library and their discussions expanded Wedemeyer's understanding of how military history, international relations, politics and economics are inextricably linked to national strategy.

Embick's career as a strategist and a planner was the model for Wedemeyer's career. Embick had many assignments of increasing importance at the Army's War Planning Division, culminating as its director in 1936. Later in the same year, he became the Army deputy chief of staff.

Wedemeyer's other mentor and patron was GEN George C. Marshall, who was Embick's lifelong friend. Marshall was more than a mentor to Wedemeyer; he took an active role in managing Wedemeyer's career.

Although much of Wedemeyer's success was the result of self-development and mentorship, his formal military schooling was equally significant. Wedemeyer attended the Command and General Staff School at Fort Leavenworth, KS, between 1935 and 1936. Wedemeyer did not misuse his time at Leavenworth; since he did not have to contend with advanced mathematics, he finished first in the class of 77 students. His class standing and his working knowledge of German made him an ideal candidate to attend the Kreigsakademie, the German Staff College in Berlin; the lessons he gleaned from the Kreigsakademie proved instrumental in his authorship of the Victory Program.

Marshall – newly appointed as War Plans Division chief, soon to be Army Chief of Staff – after reading Wedemeyer's report, recognized that the document accurately described German equipment, tactics, strategy and plans for future conquests. In Spring 1941, Marshall directed Wedemeyer's assignment to War Plans. GEN Dwight D. Eisenhower, when he became War Plans Division director, embraced the Victory Program's plan for a cross-channel invasion of Europe.

However, Wedemeyer's plan was anathema to Winston S. Churchill and the British General Staff, who believed the best strategy to defeat Germany was by attacking the "soft underbelly of Europe" with offensive operations in Italy, Greece and the Balkans. McLaughlin suggests there is evidence that Churchill's abhorrence to a cross-channel invasion was the cause of Wedemeyer's banishment to the Southeast Asia Command as British Admiral Lord Louis Mountbatten's deputy. Although Wedemeyer was an expert in the European Theatre of Operations, he later succeeded LTG Joseph W. Stillwell as the commander of U.S. troops in China and chief of staff to Nationalist Chinese Generalissimo Chiang Kai-shek.

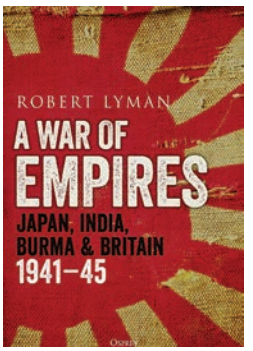
McLaughlin based this book on his doctoral dissertation; initially written for a dissertation committee, it is a ponderous read. The 27 pages of appendices, the gist of which is in the text, add little to the book. This book has some value for aspiring strategists now serving in the tactical or operational arenas; however, it is not a primer on strategic thinking.

The book's subtitle, ***America's Unsung Strategist in World War II***, is misleading. McLaughlin devotes only a third of the text to Wedemeyer's service as a strategist and less than three pages to his career prior to attending the Command and General Staff School; the rest of the book is focused on Wedemeyer's wartime and post-war service in Asia.

LTC (RETIRED) LEE F. KICHEN

A War of Empires: Japan, India, Burma and Britain, 1941-1945 by Robert Lyman; Oxford, United Kingdom: Osprey Publishing; 2021; 560 pages, $35 (hard cover).

A War of Empires is a long retelling of



the largely ignored fight for control of the China-Burma-India (CBI) Theater during World War II. At nearly 600 pages long, this is a book requiring dedicated time to read and fully understand as the CBI campaign took place in some of the most difficult terrain in an unfamiliar corner of the war. Author Robert Lyman is a masterful researcher and storyteller adept at bringing history to life.

At its core, ***A War of Empires*** is a story about the importance – indeed the primacy – of logistics in any military operation but particularly in large-scale ground conflicts. Initially both Britain and Japan alike paid little heed to logistics in planning or battle, resulting in much loss for little gain.

Most egregiously, Britain's parsimonious peacetime military resourcing left Burma and neighboring India wide open to Imperial Japanese aggression. The critical difference in determining victory in Burma, however, was in how the United Kingdom brought in new leaders, especially GEN William Slim, who fully appreciated the vital role their quartermasters played in warfare.

Japan's leadership and doctrine, by comparison, continued to place little value on logistics, relying far too much upon the warrior code of *bushido* to carry the offense.

The second major lesson is the need for senior military leaders to understand that politics play an unavoidable role at the strategic and operational levels of war. Lyman's discussion on GEN Joseph Stillwell's performance as chief of staff to Nationalist Chinese politician Chiang Kai-Shek aptly proves this key point. To be certain, Stillwell accurately assessed Chiang Kai-shek's leadership challenges and personal greed. He also recognized that the winning strategy for the CBI Theater would require both Nationalist and Communist forces to fight the Japanese rather than hoard American-provided resources for the inevitable civil war in China.

That said, Stillwell suffered from a gross inability to articulate his concerns to his Allied superiors, nor did he understand the political dimension of global warfare, leading ultimately to his recall back to the United States before his untimely death in 1946.

A third point gleaned from ***A War of Empires*** is the fool's errand of employing cheap or quick panaceas in crisis vice solid military planning and operations. The creation of MG Orde Wingate's Chindits clearly demonstrates the danger of grasping for so-called "silver bullet" solutions to solve complex strategic-level problems. Slim wrote after the war about the manpower and resource cost of special forces compared to their contribution to overall military success beyond the tactical level.

This forlorn approach to problem-solving remains a thorn in the side of the U.S. Army today, as evidenced by the number of quickly developed and just-as-quickly-discarded efforts throughout the Global War on Terrorism.

Chapter 11, titled "Rethinking Training," should be required reading for officers and noncommissioned officers alike. Here Slim offers his thoughts and advice on preparing an army for

war that remains relevant in 21st-Century military operations. Slim developed in-depth training plans focused on skills required for the battlefield vice the parade field, and demanded that all Soldiers, regardless of functional specialty, be prepared for the exigencies of combat and responsible for aggressive offensive action. He expected collaborative training for all ranks, doing away with the notion that officers observed training from afar. Slim also expected tactical instruction be provided in easily understood classes or printed materials distributed across the force to all ranks.

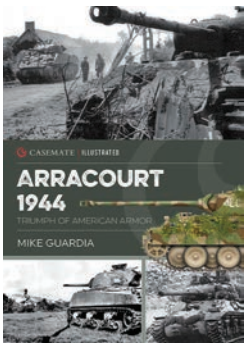
Prospective readers will find that ***A War of Empires*** is a must-buy, must-read, must-share book that will find a welcome place in their home library. Like all military classics, readers will find they return repeatedly to ***A War of Empires*** to study the profession of arms.

LTC CHRISTOPHER J. HEATHERLY

Arracourt 1944: Triumph of American Armor by Mike Guardia; Oxford, United Kingdom: Casemate Publishers; 2022; 127 pages, including maps, photographs, index; $24.95.

The Casemate Illustrated series on major World War II battles continues with Mike Guardia's in-depth analysis of the largest tank battle fought in the European Theater of Operations at Arracourt, France, in 1944. This battle should be of particular interest to maneuver commanders studying the impact of weather, logistics and tactics on armored operations.

The book follows the format of previous Casemate studies. A timeline chart displays the organization and employment of 4th Armored Division, which carried the battle for the Americans. The 4th Armored Division was the first of the "light" armored divisions. The previous three armored divisions were organized with two armored regiments and one infantry regiment. The 4th, along with all subsequent armored divisions, contained three battalions each of armor, infantry and artillery.



Each armored battalion contained three tank companies of medium Sherman tanks and one company of light Stuart tanks, and each battalion came under the control of one of three combat commands. They were designated as Combat Command A, Combat Command B and Combat Command-Reserve (CCR). CCR was the reserve command. Units could be shifted among these commands as dictated by the tactical situation. A tank-destroyer battalion often was attached to a division.

The equipment of each side is explained in detail, augmented by many photographs. Guardia discusses the pros and cons of the Stuart light and medium Sherman tank, along with various other American vehicles. Besides the tanks, the most prominent American vehicle was the M18 Hellcat tank destroyer. The same analysis is applied to the German vehicles. Their mainstays were the Panzer Mark IV and the Panther tank. They were also supported by assault guns, anti-aircraft vehicles and tank destroyers.

The author describes the fast movement of American forces as they pushed the Germans to the Moselle River. The Lorraine campaign then ensued, managed by LTG George S. Patton's Third Army. The 4th Armored Division spearheaded the drive through the major French city of Nancy and across the Moselle River, the last physical barrier before reaching the German frontier.

Given the German heavy losses in personnel and equipment during their retreat across France, they reorganized remaining assets. For the Battle of Arracourt, they employed panzer brigades, which contained "two [p]anzer battalions: one battalion of Panzer IV tanks and one battalion of Panther tanks. The organization also contained a reconnaissance company, two battalions of infantry, an engineer company and an assault-gun company."

While materiel assets were hastily organized, the lack of trained personnel to man the equipment was readily apparent. Reallocating former members of the German air force and navy caused a lack of "internal coherence." As Guardia points out, two of the brigade commanders became "acquainted with their subordinate commanders only in the railroad unloading area."

Three of these makeshift panzer brigades were involved in the Battle of Arracourt. By way of contrast, 4th Armored Divisions' three tank battalions were functioning like a well-oiled machine. Relying on mission-oriented orders, the combat commands and attached battalions successfully engaged German armored units in a series of engagements leading up to the pivotal battle at Arracourt.

While Guardia clearly presents the battle's essential details, the book lacks maps of the actual battle area. Consulting a map of France, one can envision 4th Armored Division's salient extending west from the Moselle. The German attempt to envelope 4th Armored Division fails for a host of reasons that the author addresses. One, fuel shortages adversely effected movement for both sides. Also, the weather turned to rain and fog, mitigating the use of close-air support by the Americans, but also causing German units to become disoriented.

While the Sherman tank had disadvantages, its superior maneuverability and speed offset the Panther tank's battlefield superiority. As the author notes, the Panther had a slower turret rotation compared to the Sherman. The dismal weather negated the Panther's superior long-range target-acquisition ability. The 76mm armed M18 Hellcat, enhanced by its speed, greatly assisted the success of the 37th and 8th Tank Battalions.

Above all, the Americans attacked whenever the opportunity arose, while the Germans were slow to mass their forces. The battle ended with an American victory that further deprived the Germans of men and materiel.

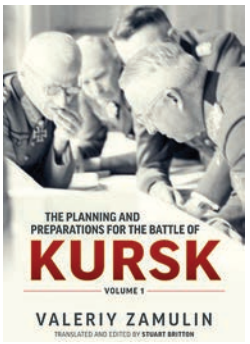
While an interesting study, the book would benefit from better editing and detailed maps. For example, as stated in the text, the Sherman was not a replacement for the M3 Stuart – rather,

it was replacement for the M3 Lee/Grant tank. Despite these shortfalls, this is an interesting study of small-unit leadership that emphasizes the importance of tank-crew training, the value of a reliable logistics system and effects of weather on battlefield activities.

COL (RETIRED) D.J. JUDGE

The Planning and Preparations for the Battle of Kursk: Vol. 1 by Valeriy Zamulin, translated by Stuart Britton; United Kingdom: Helion and Company; 2021; 566 pages; $45.63 paperback.

The first volume of Valeriy Zamulin's



The Planning and Preparations for the Battle of Kursk masterfully adds new life and energy into a largely oversaturated and stale historiography of World War II. World War II historiography has been dominated by macro-history narratives of the war and its actors from the Allied perspective. Due to the sensitivity that comes from assessing the war from the Axis point of view, there is a significant deficiency to the other half of the story. Zamulin stands out in existing historiographical assessments in that he assessed both the German and Soviet sides equally in the lead-up to the Battle of Kursk from a logistical, political and strategic perspective.

Volume 1 of ***Kursk*** is not for the novice historian. It throws the reader right into the situation facing Germany after the Battle of Stalingrad. Zamulin explains early on that regardless of Kursk's outcome, the war was permanently on the way to defeat for Germany. Deficiencies existed at all levels of the German army and *Oberkommando der Wehrmacht*, or OKW. Ultimately, the German army of 1943 was like that of the German army of 1944 during the Battle of the Bulge. Even if a tactical victory occurred and a breakout followed, there was simply not enough men, materiel and strategic excellence to capitalize on localized gains and to win the war. After Stalingrad the war was lost for Germany, and Kursk was ultimately an exercise in futility.

Almost entirely based on digitized primary-source documents, charts, graphs and letters between members of the respective high commands, Zamulin's first volume on Kursk is a sophisticated read. The use of these sources provides the much-needed context into the thinking of two military goliaths. Zamulin further excels in that he challenged the popular narrative of German tactical and strategic ingenuity. He highlighted the immense confusion and highly politicized nature of the OKW structure and the inter-branch conflicts over resources. Zamulin argues that these senseless rivalries – combined with a disjointed command structure and no cross-branch communication – is part of the reason why Germany was destined to lose. This work examines the inner workings of this broken apparatus.

The second part of the book shifts to the Soviet side of the Kursk preparations. The Soviets were fully aware that the Germans were planning a major offensive to regain lost ground after Stalingrad. Before piecing together where the offensive would take place, the Soviets also had to undergo their own massive set of reforms and rearmament.

Zamulin sets the stage for this in the first part but dedicates more to the issue in Part 2. Zamulin discusses primary source documentation between members of the Red Army and Central Committee, along with providing numbers and charts that detail the stats of the Red Army as the day of battle drew closer. He follows the same format as in the first part; this is an effective method for the reader to track the narrative in these comparative historical studies. The only criticism I can levy against this work is the absence of chapters and the somewhat hard-to-follow timeline. This is a stylistic critique at best, but one that I think, if remedied, could allow for a larger audience to comprehend the story and accompanying argument.

Zamulin's ***Planning and Preparations for the Battle of Kursk Vol. 1*** is an excellent and detailed assessment of how two military juggernauts looked to the future and made plans for a showdown at Kursk. Zamulin definitively states early on that Operation. Citadel was never going to be a German victory. This stands in contrast to previous narratives in that the Battle of Kursk could have gone either way. Zamulin defends his position by examining the decision-making process, logistics obstacles, composition and disposition, and moral and political situation in both Germany and Russia on the eve of Kursk. Zamulin wisely chose to not examine the battle itself, as many have done before. Rather, he focused on the many months of preparation leading up to the battle from both the German and Soviet side. ***Kursk*** is a must-read for those interested in the behind-the-scenes movements of massive armies.

1LT IAN A. MELENDEZ

The Foreign Policy of the Third Reich 1933-1939 by Thomas X. Ferenczi; United Kingdom: Fonthill Media; 2021; 359 pages; $52 (hard cover).

Readers looking to expand their knowledge of Nazi Germany's international-relations strategy in the increasingly dark days before World War II need look no further than ***The Foreign Policy of the Third Reich 1933-1939***. Where most history books primarily focus on the military aspects of the conflict, this work instead explores Adolf Hitler's aggressive use of diplomacy, information and economic levers to further German national interests.

Author Thomas Ferenczi is an expert on World War II as well as Canadian criminal and employment law. He approaches the subject as a trial lawyer would a case by presenting well-documented evidence of Germany's first tentative steps against its neighbors for territorial gain and its progressive hostility in both word and deed. While this is an

effective way of proving a thesis, it also makes for a rather dry read. Ferenczi's writing style is a heavy serving of lengthy quotes from documented history, combined with his summary analysis of the provided information.

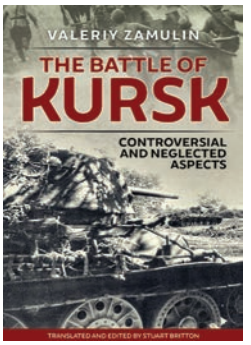
As the book progresses from chapter to chapter, it is quite easy to trace the inevitable endstate – namely a second world war resulting from the Reich's foreign policy. Hitler declared his intent to obtain *Lebensraum* through conquest in ***Mein Kampf*** and then used a combination of diplomatic threats and military action to achieve that aim bit by bit until he invaded Poland in 1939. Ferenczi walks the reader through this discourse using the words, speeches, diplomatic cables and private notes of the major figures in the storyline.

Readers will find that the Reich's foreign policy eerily parallels modern Russia's dealings with its European neighbors. This is particularly evident in Vladimir Putin's frequent employment of manufactured crisis and blatant propaganda as rationale for the so-called liberation or protection of ethnic Russian minorities living outside Russia proper. There are corresponding echoes of Western diplomatic efforts by Henry Kissinger (playing the unenviable role of Neville Chamberlain) claiming appeasement to Russia as a winning strategy in Ukraine. One hopes the 2022 revival of this story has a different, and far happier, ending than the tragedy experienced in the 1930s.

The latter third of ***Foreign Policy*** comprises more than 70 pages of additional material in the postscript appendices and a moderate number of black-and-white photographs of the primary actors covered in the book. The appendices make a ready reference of the historical international agreements and the German Military High Command's strategic-level guidance – signed by Hitler himself – for the invasions of Austria, Czechoslovakia and Poland. While ***Foreign Policy*** never grips the reader's attention as a true military classic, it does serve as a recommended venue for professional study on how diplomacy ultimately shapes warfare.

LTC CHRISTOPHER J. HEATHERLY

The Battle of Kursk: Controversial and Neglected Aspects by Valeriy Zamulin, translated by Stuart Britton; Warwick, United Kingdom: Helion and Company; revised and reprinted in paperback, 2022; 404 pages; $49.95.



The ongoing Russo-Ukrainian War makes the Battle of Kursk, as the largest armored clash in history, relevant as an example of land combat on the Eurasian Plain, encompassing some of the same territory now in dispute. American readers of this book – itself a compilation of revised and updated articles on various aspects of Kursk – will benefit from a deeper understanding of the Russian way of war in all its aspects: the maintenance of social cohesion despite extraordinary casualty levels; how information and orders flow through the command structure; the decision-making process involved in choosing tactical and strategic goals; and Russia's willingness to expend men and materiel to achieve them.

Valeriy Zamulin's decades-long research has focused on what Russians call "The Great Patriotic War" and specifically on the Battle of Kursk. Since the opening of Soviet archives following the end of the Cold War, revisionist historians like Zamulin have been working to correct errors and misrepresentations infesting the historical record of events connected with combat on the Eastern Front. Some of these are errors of ignorance concerning what actually happened, while others arose from Soviet propaganda needs connected with successful prosecution of the war effort.

Zamulin is blunt in assessing the state of much of what passed for scholarship during the Soviet era, when censorship and fear limited expression of viewpoints that might endanger the reputation or safety of their authors – a condition that continues to plague public discussion of the past, Kursk included. He states, "Thus, even though the possibility to raise history, including the Battle of Kursk, to a qualitatively new level has expanded, the academic study of the Second World War ... was neglected and farmed out to dilettantes, ideological weathervanes and commercial interests." The unwillingness to question source material and to test it for accuracy and realism led to oft-repeated myths, such as the one about hundreds of tanks battling it out in a field encompassing only a few kilometers, continued to be taken as fact, when analysis of the terrain and tactics then in use reveal how unrealistic such reports are.

A secrecy culture obscured, for several decades, many of the failures and difficulties that went hand-in-hand with the well-documented heroism displayed by individuals and units at every stage of the battle. Suicide was a significant problem, as was fratricide. Staff operations were often incompetently managed, and coordination between adjacent and supported units was often lacking. "If you fail to take it [the objective], I will shoot you" typifies accounts of the orders, often given only verbally, for coordination between infantry units and their armored support.

As with wars the world over, there also arose in the USSR arguments about who gets the credit or blame for how events turned out. Generals whose names are as familiar to Russians as Grant, Eisenhower and MacArthur are to Americans were the creators or subjects of a heavily censored cottage industry of memoirs that often confused as much as they clarified the story of what actually happened at Kursk, and why. Zamulin offers us his take on these writings, after decades of analysis and fact-checking, as to how the 50-day struggle around Kursk developed through its denouement. His efforts are especially welcome, as there is far more memoir literature from German commanders available in English than there is from their opposites.

One beneficiary of Zamulin's research is GEN Nikolai Vatutin, criticized by a fellow front commander for leaving

relatively thin defenses across a likely avenue of approach, later attacked by five German army corps. Vatutin's strategy was vindicated by events, as he let a deep German penetration occur to trap the spearhead by placing strong forces on each of its flanks. His use of tactical deception, though at great cost to the troops who bore the brunt of the German penetration, was as brilliantly successful as it was ruthless in expending the lives of his soldiers.

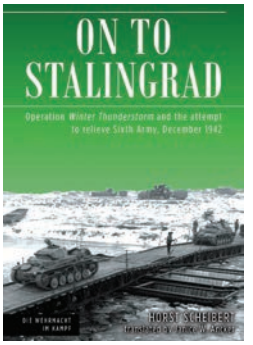
Despite all the now-revealed missteps, the sometimes-wanton expenditure of human lives and failures of planning, coordination and execution, Russian arms triumphed at Kursk against a determined and well-led foe. The lesson that readers of Zamulin's work will learn is that Russia wins, when she wins, in spite of herself. Gaining greater knowledge of Russian strengths and weaknesses in fraught times such as these is ample reward for the effort invested in often dense, technical prose translated from its original language but with much of the idiom of its native expression still intact to preserve the spirit of the author and his world.

SFC (RETIRED) LLOYD A. CONWAY

On to Stalingrad: Operation Winter Thunderstorm and the Attempt to Relieve Sixth Army, December 1942 (Die Wehrmacht im Kampf) by Horst Scheibert, translated by Janice W. Ancker; Havertown, PA: Casemate Publishers; 2022; 144 pages; $20.49 Kindle, $24.07 hardcover.

The trouble with many *ex post facto* memoirs or remembrances is they often tend to be of the variety "I was there" and did "important stuff." Or they seem overly detailed in terms of tactical actions accompanied by embellished remembrances of conversations. Or the micro-learning moments are so generic as to be of little real value for the tactically minded and student of history. For the historian and more serious reader, most of these books are thinly supported by unit or higher-headquarters logs, then the book is filled in by secondary sources of generic relevance.

But ***On to Stalingrad*** by Horst Scheibert is a refreshing example of when a book of this variety is done right. The book is a fresh, riveting and compelling read that left me surprised, as it became a page-turner.



Operation Winter Thunderstorm and the attempts to relieve the encircled Sixth Army at Stalingrad in December 1942 has conjectured many what-ifs. (The what-ifs of this effort by Field Marshal Erich von Manstein to relieve the Sixth Army has produced almost as much scholarly output as the what-ifs about those fateful days at Gettysburg.) Here was a moment – one of those imponderable moments where more than the fate of the Wehrmacht's Sixth Army hung in the balance – but perhaps the possibility of any type of victory that still might be achieved by German arms. Many will know the broad outlines of the relief effort, but the fresh perspective offered here by Scheibert, who was then an armor company commander in Sixth Panzer Division, will give you greater insights into the herculean effort this relief effort was for the Germans.

Scheibert – who built an enviable war record and was awarded both classes of the Iron Cross and the German Cross in Gold – also had Cold War service in the Bundeswehr, which no doubt helped him to critically focus on this academic effort. He notes in the book's foreword that seven out of eight tank-company commanders in his regiment were lost in the Operation Winterstorm failed relief effort. It is unimaginable that today's combined-arms team would suffer such losses.

Scheibert states up front that his goal is to provide a more factual account based primarily on the records of his division, Sixth Panzer Division. Because his work is documentary-based, supplemented by the author's and others' recollections, Scheibert endeavors to provide us with a tactical feel for this battle. Scheibert not only meets his goal of giving us a feel for the battle, less colored than many accounts of the Eastern Front – such as those of Paul Carrell – but gives us a useful primer in the field of military science.

Sixth Panzer was moved from soft billets in the region of Brittany, France, in November 1942 to the Eastern Front over a period of 450 hours. The author tells us this deployment prompted a bit of transport rage, as their movement conditions lacked rudimentary sanitary standards and were in freezing railcars. At this time the Soviet encirclement operation was well underway, leading to the shock of the unit detraining under artillery fire, a meeting engagement of sorts and an unexpected welcome to the Eastern Front. Surprisingly, Scheibert speaks highly of the bravery of the Romanians, who in many German accounts get blamed for the disaster on the Volga.

The author's use of 11th Panzer Regiment's war diary, contrasted with captured Russian orders and reports from units in the relief effort, paints a good picture. Scheibert shows more respect for the Russian fighting man and their equipment vs. many books that make the Soviet fighting man cartoonish.

No question, the most interesting account in the book is when the Germans stumble upon a Russian supply column conveyed by camels. Scheibert talks to the fact that the steppes offered little in the way of cover and concealment or wood for fires, meaning many firefights like in Winter 1941 centered upon the seizure of villages – except that here vs. 1941 the Soviets were better equipped, better led and more resolute.

Add in the fact that this effort was launched by only two divisions whose tanks' cross-country mobility was often restricted due to their treads not being able to get a bite into the ground to move, as well as the need to cross many bodies of water and ravines, and you have an operation meant for speed that was severely compromised from the start.

The most telling criticism of Scheibert's is that of senior leadership being out of touch with the reality on the condition of the frontline. Painfully slow radio communications only

increased the difficulties of those trying to break through and take the necessary tactical risks toward greater rewards, only to find the bit and reins were pulled tight by those with a sluggish understanding of the moment.

On to Stalingrad is an easy book to pass by in the bookstore because it is so thin. Thin yes in terms of width, but rich and detailed like very few of its kind are, with a crisp writing style and critical eye for the events of the battlefield that almost makes you feel as if you were there with Sixth Panzer. ***On to Stalingrad*** is a book so compelling that it simply should not be overlooked for your personal and professional enjoyment.

There is a series of maps at the front of the book that help somewhat in tracing the relief effort. However, Casemate Publishers should have provided a translated key and rotated those maps to make them larger. Small things, but it would have enhanced the ease of following the battle. The dust-jacket cover is simply outstanding, as you see a pontoon bridge built by combat engineers with the undergunned PK II tank crossing a river choked with ice.

DR. (LTC) ROBERT G. SMITH

Acronym Quick-Scan

CBI – China-Burma-India (theater)
CCR – Combat Command-Reserve
OKW – *Oberkommando der Wehrmacht*

112TH CAVALRY REGIMENT

The shield is yellow (gold) for Cavalry. The horse rampant issuing out of sinister base point is symbolic of the impatience of the regiment to be away on its business. The crest is that of the Texas Army National Guard. The distinctive unit insignia was originally approved for 112th Cavalry Regiment of the Texas National Guard March 9, 1928. It was amended to add the motto April 24, 1928. It was redesignated for 112th Armored Cavalry Regiment, Texas National Guard, June 21, 1950. The insignia was redesignated for 112th Armor Regiment, Texas National Guard, July 25, 1960. It was amended to include the Texas National Guard crest June 1, 1961. It was redesignated for 112th Cavalry Regiment with the description updated effective Sept. 1, 2008.

ARMOR
Building 4, Room 141A
1 Karker Street
Fort Benning, GA
31905

Headquarters, Department of the Army
Approved for public release, distribution is unlimited

PB 17-22-3
PIN 212877-000