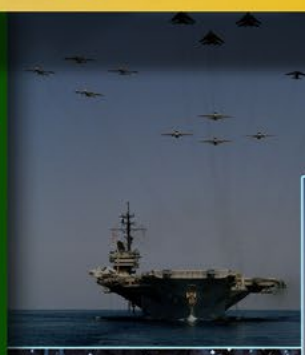
UNITED STATES ARMY AVIATION

Aviation DIGEST

UNITED STATES ARMY
July - September, 2017

Volume 5 / Issue 3



Multi-Domain Battle Operations

UNITED STATES ARMY
Aviation Digest
July-September 2017
The Professional Bulletin of the Army Aviation Branch, Headquarters, Department of the Army, PB 1-17-3

Commanding General, USAACE
MG William K. Gayler

DOTD
Director: COL Joseph S. Degliuomini
https://www.us.army.mil/suite/page/usaace-dotd

Doctrine Division
Division Chief: LTC Kenneth E. Smith
https://www.us.army.mil/suite/page/389908

The Doctrine Division, Directorate of Training and Doctrine (DOTD), U.S. Army Aviation Center of Excellence (USAACE), Fort Rucker, AL 36362 produces the *Aviation Digest* quarterly for the professional exchange of information related to all issues pertaining to Army Aviation. The articles presented here contain the opinion and experiences of the authors and should not be construed as approved Army policy or doctrine.

Aviation Digest is approved for public release. Distribution is unlimited. This publication is available through electronic media only by accessing the Army Knowledge Online (AKO) website and is intended for the use of command levels C, D, and E for the Active Army, the Army National Guard, and the U.S. Army Reserve.

This and all previous issues of *Aviation Digest* are available on the DOTD AKO web site at https://www.us.army.mil/suite/page/usaace-dotd.

Submit articles or direct comments pertaining to the Aviation Digest to: usarmy.rucker.avncoe.mbx.aviation-digest@mail.mil.

ABOUT THE COVER

Images depicting elements of Multi-Domain Battle Operations

The Command Corner

In this issue of Aviation Digest, we discuss Multi-Domain Battle as the guiding concept which shapes Army Aviation operations as we refine how we fight and how we will modernize to dominate on the future battlefield. The ability to synchronize operations and effects across land, air, sea, space, and cyberspace will enable us to maintain our competitive advantage against peer and near-peer adversaries.

Our Army has constantly sought better ways to present multiple dilemmas to our potential foes. From air land battle, to full spectrum operations, to the current operating concept of unified land operations, the Army continually advances doctrine to address the ever-changing strategic environment. This current doctrinal evolution best postures the Army to win in sustained land operations as part of a combined or joint force against increasingly capable opponents in complex environments. Over the past two decades, we have honed our skills in low intensity, semi-permissive environments against low-tech enemies. All the while, our potential adversaries studied our capabilities and evolved their own to exploit our vulnerabilities. To fight and win in increasingly complex environments, we must be able to successfully operate across multiple domains against increasingly lethal and capable competitors.

While our adversaries have improved their capabilities, we too are adapting, gleaning lessons from recent and ongoing conflicts while sharing lessons learned from our combat training centers and from multinational training exercises from the Pacific to Europe. One recent example involved both the 10th and 12th Combat Aviation Brigades executing partnered operations across Europe during U.S. Army Europe's Saber Guardian 2017. In fact, the largest aspect of this exercise consisted of 23 nations involving more than 40,000 allied and partner Soldiers over 18 events. This exercise was the equivalent of eight full-scale Joint Multinational Readiness Center rotations and saw the synchronization and execution of air-ground operations spanning multiple domains. We must continue to harness our collective experience and intellect as we develop and execute rigorous, multi-echelon training in decisive action training environments across multiple domains to deter and defeat a variety of emerging threats.

The Aviation Enterprise has also emphasized Multi-Domain Battle through various parallel efforts. Standardizing mission essential tasks, doctrine updates, and ongoing fleet modernization efforts are just a few examples of how the branch remains postured to execute the Army Operating Concept. Additionally, we remain focused on inculcating these concepts and doctrine through professional military education and through the conduct of the Aviation Training Strategy.

In this issue, you will find several articles that discuss Multi-Domain Battle. MAJ Nathan Jennings' article, "The Reconnaissance & Security Strike Group," discusses conceptual Army force design efforts to address challenges inherent in the concept, while MAJ Chris Zotter's "Shark Week" article discusses one view on future force development. These articles highlight the complexities of Multi-Domain Battle and provide valuable dialogue and viewpoints on how to fight and win across multiple domains in the future strategic environment. Your viewpoints and input will continue to inform how we organize, equip, and train. Thanks to the entire Aviation Digest staff for making this publication relevant and one of the Army's premier professional bulletins.

Above the Best!

William K. Gayler
Major General, USA
Commanding

Table of Contents

By Order of the Secretary of the Army:
Official:

GERALD B. OKEEFE
Administrative Assistant to the Secretary of the Army
1715604

MARK A. MILLEY
General, United States Army
Chief of Staff

Managing Editor
Bruce Miller

Art Director
Henry Williford

Contact
usarmy.rucker.avncoe.mbx.aviation-digest@mail.mil

Comments & Discussion

Comment on or discuss any article in the Aviation Digest. Please forward all Letters to the Editor, to the Aviation Digest mailbox at: usarmy.rucker.avncoe.mbx.aviation-digest@mail.mil.

Author's Guidelines

Articles prepared for the Aviation Digest should relate directly to Army Aviation or reflect a subject that can be directly related to the aviation profession. Submit the article to the Aviation Digest mailbox at usarmy.rucker.avncoe.mbx.aviation-digest@mail.mil in an MS Word document not exceeding 3500 words. Please indicate whether the article has been submitted to other Army professional publications. The author should include a brief biography. Military authors should include years of military service, current assignment, significant previous assignments, deployments, and aircraft qualifications.

Aviation Digest staff will make necessary grammar, syntax, and style corrections to text to meet publication standards and redesign visual materials for clarity as necessary. These changes may be coordinated with the authors to ensure the content remains accurate and reflects the authors' original thoughts and intent.

Visual materials such as photographs, pictures, charts, graphs, or drawings supporting the article should be included as separate enclosures. All visual materials should be high resolution images (preferably set at a resolution of 300dpi) saved in TIFF or JPEG format. Do not send any FOUO or classified images.

Non-military authors will need to submit authorization for the Aviation Digest to print their material. This can simply be an email indicating that the Aviation Digest has been given permission to print the submitted article. A separate comment by the author indicating that there is no copyright restriction on the use of visual material and a separate statement authorizing use of this material by the author is also required.

The Aviation Digest will publish once a quarter with distribution on or about the 15th of February, May, August, and November of each year. In order to receive information for publication and allow appropriate time for editing and layout, the deadline for submission of articles is the 1st of December, March, June, and September.

THE RECONNAISSANCE & SECURITY STRIKE GROUP:

A MULTI-DOMAIN BATTLE ENABLER

By MAJ Nathan A. Jennings

Reprinted with permission from
Armor Spring 2017, page 39

When the U.S. Army reorganized its final armored cavalry regiment (ACR) in 2011, it divested its institutional capability to enable corps maneuver with forceful reconnaissance and security (R&S) at the operational level of war.

Designed as relatively independent brigade-sized formations that included tanks, mechanized scouts, self-propelled artillery, and organic aviation, storied units like the 2nd, 3rd, 11th and 14th ACRs became iconic symbols of U.S. military power across the plains of Europe, jungles of Indochina, and the deserts of Mesopotamia.[1] Throughout the Cold War and the 1990s, the unique commands employed advanced combined-arms integration to, as stated by BG John Kolasheski, the Army's 50th Chief of Armor, "fight and win decisively across the full spectrum of conflict as part of the joint force."[2]

Arguments for the recreation of ACRs typically center on their outsized impact during major combat operations. However, in addition to enabling corps-level attacks across theater depth during multi-domain battle, more expansive arguments can demonstrate how modernized versions of the regiments – perhaps reconceptualized as more dynamic R&S strike groups (RSSG) – could empower joint efforts across the simultaneous phases of shape, deter, seize initiative, dominate, stabilize, and enable civilian authority.[3] Combined-arms teams with cross-domain capability could provide enhanced flexibility in diverse operations ranging from military engagement to limited contingency response; defeating adversaries by fighting for information and providing freedom of maneuver will remain critical.

Versatile RSSGs would be suited to "penetrate denied areas for the rest of the joint force" while having the agility to "operate in all domains simultaneously,"[4] said GEN Mark Milley, 39th Chief of Staff of the Army. As the vanguard of American landpower, they would supplement armored brigade combat team (BCT) rotations through Europe and East Asia while providing a permanent forward presence to achieve enduring partnership as a primary regionally aligned force (RAF). Second, the concept would augment the Army's excursion initiative to temporarily task-organize BCTs to serve as dedicated R&S elements. A modernized cavalry force optimized to fight for information and allow freedom of maneuver would achieve deeper expertise as the "eyes and ears" of joint-forces commands.

Cross-domain Capabilities

Modernized RSSGs would combine traditional strengths with emerging technologies. Improving on the ACR, its core would comprise three armored cavalry squadrons designed to fight dispersed under group control or individually detach to support divisions. Each RSSG would control three cavalry troops with mechanized scouts, tanks, unmanned

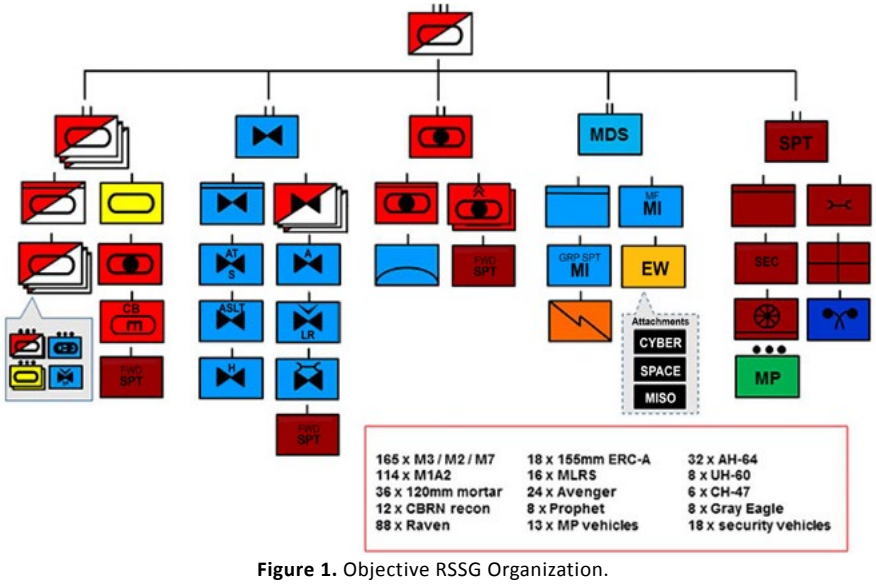


Figure 1. Objective RSSG Organization.

aerial surveillance and mortars to allow "hunter-killer" reconnaissance, a tank company to provide overmatch, engineers for mobility, and self-propelled cannon in direct support.[5] As described by LTG H.R. McMaster, COL Mark Elfendahl, and LTC Chris McKinney in their Foreign Affairs article (May-June 2013 edition, https://www.foreignaffairs.com/articles/north-america/2013-04-03/why-us-army-needs-armor), "Why the U.S. Army Needs Armor," they would have the combat power to "fight their way through long-range weapons fire and gain physical contact with hard-to-find opponents" while striking enemies "from unexpected directions with multiple forms of firepower."

While armored squadrons would employ maximum mobile protected firepower to fight forward and dispersed, the RSSG's true value in joint operations would stem from emergent cross-domain capabilities. Beginning with indirect fires, it could include a multi-faceted artillery battalion with direct control of two long-range rocket batteries and an air-defense company while coordinating self-propelled cannon fires in support of each squadron during dispersed maneuver. This seamless integration of complementary fires assets – exceeding the capabilities of the ACRs – would allow massed or distributed fires in support of scouts who are reconnoitering at extended distances. When integrated with corps and joint fires, the group would operate semi-independently while allowing supported commands to economize resources.[6]

The inclusion of an organic aviation squadron would represent a second area where the RSSG would emulate and surpass ACR capabilities. The formation would first employ three Apache troops to reconnoiter in support of ground scouts and armor. It could also include an attack company to increase lethality, an air-assault company to allow modest insertion capacity, and a lift company to facilitate responsive logistical or personal movement. Finally, to extend operational reach, the squadron would control, on behalf of the group commander, Gray Eagles with missiles and long-range sensors.[7] These capabilities, with integrated air traffic services support, would enable the command to, as mandated in the Army Operating Concept, "dictate the terms of operations" and "seize, retain, and exploit the initiative."[8]

The inclusion of a multi-domain squadron with intelligence, signals and electro-magnetic capabilities would expand capacity to dynamically "shape the deep fight," while synchronized direct, indirect, aerial, and joint fires would prove critical in dominating enemy disruption zones. This would include a company to enable human and signals-intelligence collection and analysis at group and squadron levels, a company to train and allocate intelligence-support teams to cavalry troops and tank companies, and a company to facilitate integrated electronic warfare. These capabilities – in addition to network operations to enable dispersed mission command and attached cyber, space, and informational capabilities – would enable expanded cross-domain fire and maneuver.

The entire RSSG, as a high-tempo combined-arms team, would include a sustainment squadron tailored to facilitate extended lines of communication for seven to 10 days. By fielding a distribution company to conduct forward resupply, a field-maintenance company to ensure equipment readiness, a medical company to provide Role II-plus care, a chemical company to execute reconnaissance and decontamination, and forward-support companies for supported squadrons, the command would provide multifunctional logistics across the group's area of operations while enabling more than 300 kilometers of operational reach by forward air, ground, cyber, and electronic scouts. With an organic security company and internal aerial surveillance, the squadron could secure convoys while "pushing" logistics to dispersed formations.

This array of capabilities would consequently allow RSSGs to enable corps or joint commands to dislocate complex defenses through high tempo and forceful information collection and counter-reconnaissance. The integration of diverse enablers – including cyber, electronic, indirect, and aerial fires – would reflect a 21st Century approach to conducting aggressive zone, area and forcible reconnaissance or contested screen, guard and covering assignments. The ability to detach squadrons to support modest joint task forces in disparate theaters would likewise mitigate the capabilities gap left by the demise of division cavalry in 2004.[9] With cross-domain optimization, the group would offer an agile formation to bridge air and land component efforts across theater depth during unified land operations.[10]

Joint Expeditionary Operations

The potential operational impact of RSSGs can be assessed according to potential contributions during joint efforts across the doctrinal phases of theater engagement. Moving beyond appreciation of the ACR's outsized, but relatively narrow, impact in large-scale offensives as experienced in the Persian Gulf, an expansive conception of how modernized air-ground teams could support multi-domain battle across broader ranges of operations is more applicable. In this context, forward positioned RSSGs would enable the U.S. Army, as described by GEN David Perkins, the 15th commander of the U.S. Army Training and Doctrine Command (TRADOC), to "combine sufficient cross-domain fires" to "enable decentralized ground maneuver and the creation of durable domain windows for the joint force."[11]

The first phase of joint expeditionary operations, according to joint doctrine, focuses on continuously shaping the enduring security environment by "influencing adversaries' and allies' perception" and "providing U.S. forces with peacetime and contingency access."[12] RSSGs, with cross-domain capabilities, would serve as ideal forward elements to conduct these enduring activities due to unique pairing of traditional strengths with emerging technologies. As a ground formation permanently assigned to combatant commands – as opposed to BCTs that continuously rotate and unavoidably disrupt continuity of partnership – they would routinely cooperate with a variety of theater elements while supporting allies according to RAF assignment.

The RSSG's potential for shaping evolving theater environments finds ready precedent. As an example, 14th ACR provided theater R&S capability along West Germany's borders throughout much of the Cold War. For more than 23 years, as the U.S. military defended

Europe against potential Soviet aggression, it covered the U.S. Army's V Corps and the Third German Corps with an evolving armament of aerial and armored platforms at famed places like the Fulda Gap.[13] While American joint forces have now embraced an expeditionary approach with fewer formations stationed abroad, the same model of employing forward RSSGs to execute security-cooperation activities would allow commands to shape favorable conditions with an air-ground team resourced to conduct dispersed operations.

The second phase of joint expeditionary operations is designed to "deter an adversary from undesirable actions because of friendly capabilities and the will to use them."[14] While armored BCTs own premier ability to threaten military response, RSSGs would offer a similarly intimidating mechanized profile with enhanced integration of enablers. Posturing the groups to serve as lead elements for forward joint commands would imply willingness to defend politically or operationally important terrain while providing a covering force for follow-on divisions during coalition mobilization. The return of memorable cavalry lineages to the forefront of American power projection, if publicized as a demonstration of national resolve, would also signal concrete intent to support allied nations against belligerent regimes.

This strategic deterrence is exemplified by the current rotations of armored BCTs in Europe, the Middle East, and East Asia. Operation Atlantic Resolve, for example, has evolved to include the positioning of mechanized task forces in former Eastern Bloc states to deter Russian aggression. As argued by McKinney, Elfendahl, and McMaster, such formations "are well suited to seizing terrain and exercising control over populations and resources" and "are critical both to deterring aggression and to winning conflicts when deterrence fails." However, rather than rotating BCTs or relying on temporary R&S brigades, forward strike groups would be uniquely suited – by structure, training, and specialization – to permanently conduct this mission in concert with infantry and Stryker units already on the continent.

RSSGs would prove irreplaceable when joint forces seize initiative at the onset of major combat operations as they enable shaping and deterring efforts. As the lead ground element for corps or theater armies, they would fulfill combatant commands' requirements to "gain access to theater infrastructure and expand friendly freedom of action" by "creating and exploiting temporary windows of advantage," Perkins wrote. The group's lethality and survivability would prove critical in penetrating and dislocating challenging area denial networks, and their expertise in facilitating a complex array of cross-domain fires would bridge air and land component efforts. Whether attacking or defending, the RSSGs would contribute to "setting the conditions for decisive operations" in the next phase.[15]

The success of 2nd ACR in Operation Desert Storm in 1991 provides a historical example of a large air-ground team enabling higher echelons to seize initiative during forced entry. When the U.S. Army's VII Corps enveloped the Iraqi Army's western defenses in a sweeping attack, the regiment rapidly advanced, destroyed two brigades of the Tawakalna Division and opened the way for follow-on divisions to annihilate the Iraqi Republican Guard. The robust cavalry formation – serving in its doctrinal role to shape advantageous conditions across its parent command's "deep fight" – combined the superior target-acquisition capabilities of M1 Abrams tanks and M3 Cavalry Fighting Vehicles with self-propelled artillery fires to validate the ACR concept.[16]

The most decisive phase of joint expeditionary efforts usually occurs when ground forces dominate their opponents through multi-domain fire and maneuver. This synchronized action requires aggressive scouts to fight through adversary "recon-strike" networks to dislocate networked architecture and blind opposing commands. As described in Joint Publication (JP) 3-0, Joint Operations, operational success during offensive maneuvers "depends on overmatching enemy capabilities at the critical time and place" on the battlefield.[17] RSSGs, as the most mobile of all brigade-sized ground formations, would excel at fixing enemy forces, passing friendly divisions through to attack and guarding the flanks of corps and armies during multi-domain battle. This ability would stem from its unique ability to fight with minimal support for extended durations.

The American mechanized-cavalry groups (MCG) of World War II illustrate how dedicated R&S elements can enable a corps during large-scale maneuver. The 3rd MCG, antecedent of 3rd Cavalry Regiment, supported the XX Corps of LTG George Patton's Third Army with a variety of jeeps, armored cars, and light tanks during its advance through France, Belgium, and Germany during World War II. By fighting for information, protecting flanks and occasionally attacking, the Brave Rifles enabled their higher command to seize positions of advantage against Nazi adversaries.[18] According to XX Corps campaign history, the group, "by a series of dashes, lightning changes of direction and sometimes plain, ordinary bluffing ran the gauntlet of enemy strongpoints."[19] Though lacking the lethality of later ACRs, the MCGs that fought across Europe demonstrated a potential value of RSSGs.

Once major combat operations are complete, U.S. military forces, according to typical joint-phasing sequence, seek to "establish a safe and secure environment" while restoring "political, economic and infrastructure stability."[20] While stabilization efforts in war-torn theaters sometimes favor infantry formations for dismounted patrolling in urban, jungle, or mountainous areas, RSSGs could provide unique economy-of-force options to joint commands. RSSGs could secure extended international or ethnic borders, patrol large rural territories, or conduct rapid attacks against enemy strongpoints with heavily mined defenses using their tailored combination of mobility, firepower, and protection. They would also prove ideal for partnering with dispersed allied units or mitigating critical coalition capability gaps.

The 11th ACR's service in Indochina from 1966 to 1972 provides an example of how RSSGs could enable joint task forces during distributed security efforts. Predominantly equipped with M-113 Armored Cavalry Assault Vehicles and M-48 Patton medium tanks, the Blackhorse Regiment provided

the U.S. Military Assistance Command-Vietnam three highly mobile squadrons that specialized in dispersed patrolling, route security, and shock assaults. In addition to possessing a "better means of gathering intelligence," GEN Donn Starry later assessed that the unit "had a higher density of automatic weapons, possessed long-range radios, and had more aircraft than a mechanized brigade."[21] The 11th ACR would mirror this success three decades later against a similarly challenging guerrilla opponent in Iraq.

The final phase of expeditionary campaigning centers on empowering civilian authorities so American forces can return to shaping security conditions in normalized operational environments. Similar to their amplifying value in stability operations, versatile RSSGs would own the potential to provide economized, yet impactful, capacity for joint and allied commands to control large areas and safeguard transitioning regions. The combined-arms teams would excel at dispersed security-force partnership and border-security operations given their inherent operational reach and advanced sensory integration. These tasks, reflective of historical cavalry missions, would enable, as usually expected during latter stages of expeditionary campaigns, "the civil authority to regain its ability to govern."[22]

The U.S. Army's employment of constabulary regiments from 1946 to 1950 in West Germany illustrates how armored teams have previously assisted in post-war transition. The Stars and Stripes newspaper explained in 1945 how "highly mobile mechanized security force units, which may prove more efficient for occupation duty than infantry-type troops, will be organized in occupied Germany." It then noted that "using armored cars, tanks, jeeps, motorcycles, and other vehicles outfitted with full radio and signal equipment, units will patrol areas and maintain contact with local counter-intelligence corps detachments, military government, German civilian police, and occupational-troop commanders."[23] By 1948, as tensions increased with the Soviet Union, the 2nd, 6th and 14th Constabularies reorganized as ACRs (Light) to begin their long service along the Iron Curtain.[24]

Enabling Multi-Domain Battle

The Army's Chief of Staff recently warned that "right now the level of uncertainty, the velocity of instability and potential for significant inter-state conflict is higher than it is has been since the end of the Cold War in 1989-91."[25] Even as American forces shape and deter adversaries, seize initiative and dominate, and stabilize and transition troubled regions, RSSGs could provide a versatile cornerstone for the Army's forward presence. This concept would augment BCT rotations in Europe and East Asia while improving corps and division information-collection and counter-reconnaissance capabilities. In case of an offensive campaign in the Middle East, a group or individual squadrons could deploy to lead forced entry as the 2nd and 3rd ACRs did during Operation Desert Storm.

Creating regionally aligned RSSGs as the vanguard of American expeditionary operations, while certainly costly, would ultimately facilitate the Army's ability to conduct dynamic multi-domain battle. As argued by the National Commission on the Future of the Army, which suggested increasing heavy-brigade quantities and

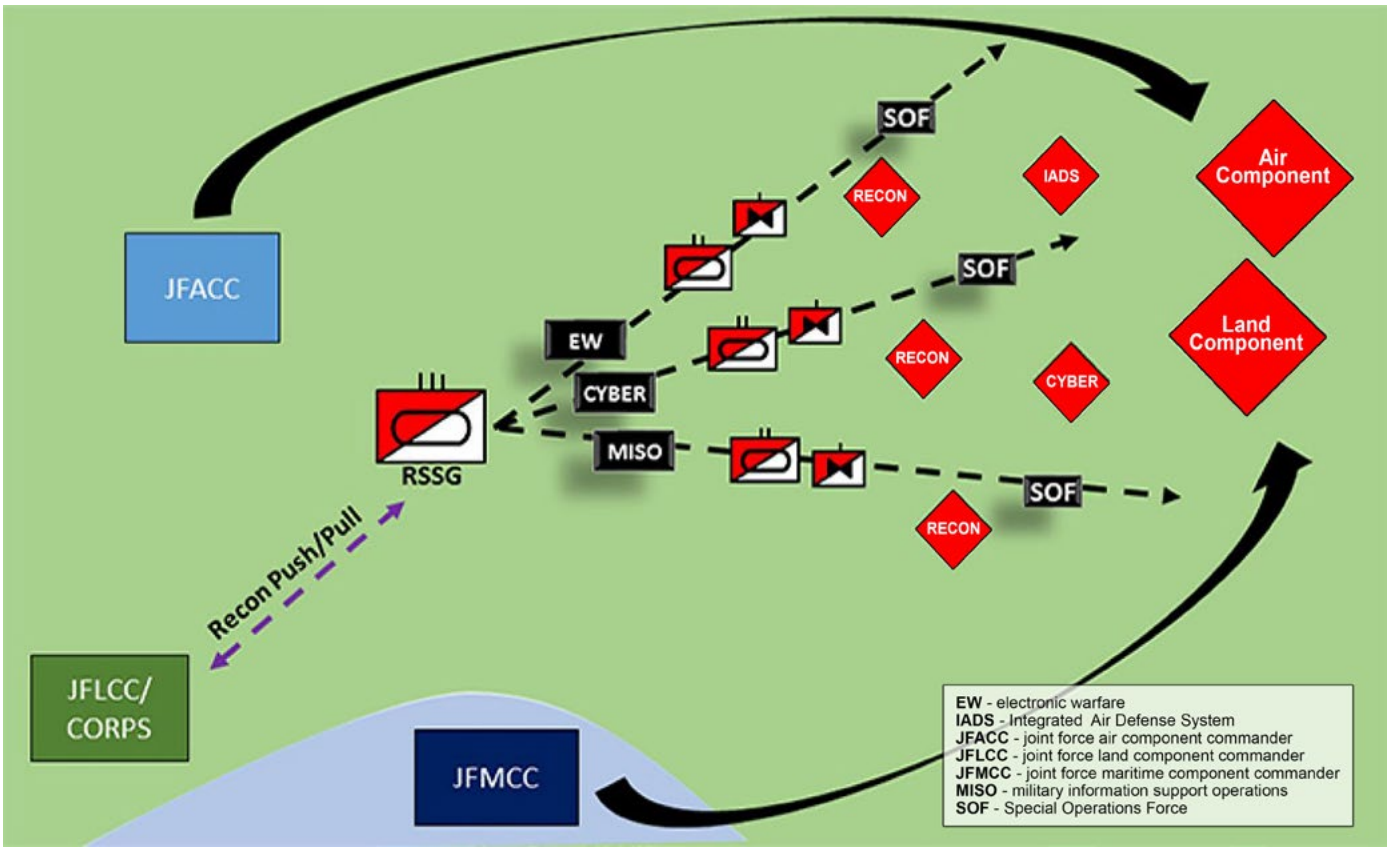


Figure 2. RSSG IN MULTI-DOMAIN BATTLE.

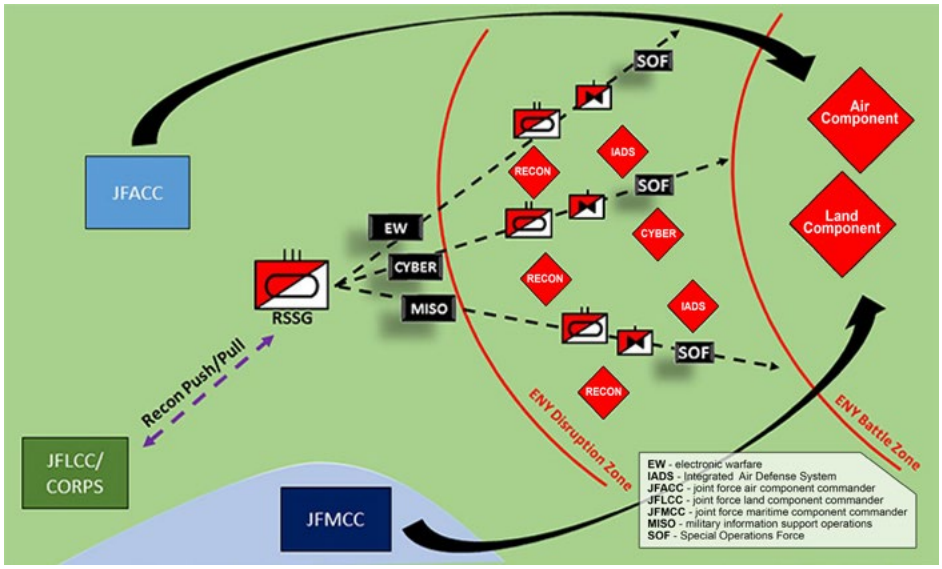


Figure 2. RSSG IN MULTI-DOMAIN BATTLE.

forward-stationing them to attain higher readiness, "the value of armored forces for conducting major combat operations adds to their value for deterring aggression."[26] Deploying robust air-ground teams with specialized reach, lethality, and survivability to contested landscapes would achieve these propositions while demonstrating resolve to defend allies and deter enemies. If ACRs seemingly outlived their utility in 2011, their reinvention as modernized RSSGs could hold the key to their reawakening.

[1] James Sawicki, *Cavalry Regiments of the U.S. Army*, Dumfries, VA: Wyvern Publications, 1985.
[2] BG John Kolasheski, foreword, *The United States Army Armor 2017-2018 Training and Leader Development Strategy*, March 2017.
[3] JP 3-0, *Joint Operations*, August 2011; see Robert Cameron, *To Fight or Not to Fight? Organizational and Doctrinal Trends in Mounted Maneuver Reconnaissance from the Interwar Years to Operation Iraqi Freedom*, Fort Leavenworth, KS: Combat Studies Institute, 2010, for the 1990s origins of the cavalry-strike-force concept.
[4] GEN Mark Milley, quoted in "Army $40B Short on Modernization vs. Russia, China: CSA Milley," *Breaking Defense*, Oct. 3, 2016.
[5] Field Manual (FM) 17-95, *Cavalry Operations*, December 1996.
[6] FM 3-98, *Reconnaissance and Security Operations*, July 2015.
[7] FM 3-04.126, *Attack Reconnaissance Helicopter Operations*, February 2007.
[8] TRADOC Pamphlet 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World*, October 2014.
[9] William Nance, "Lost Sabers: Why We Need Operational Cavalry and How to Get It Back," *ARMOR*, October-December 2014.
[10] Kyle Trottier, "The Cavalry Squadron of 2025," *ARMOR*, January-March 2015.
[11] GEN David Perkins, "Multi-Domain Battle: Joint Combined Arms Concept for the 21st Century," *ARMY*, Nov. 14, 2016.
[12] JP 3-0.
[13] Sawicki.
[14] JP 3-0.
[15] Ibid; Perkins.
[16] MG Robert H. Scales, *Certain Victory: The U.S. Army in the Gulf War*, Office of the U.S. Army Chief of Staff, Washington, DC, 1993.
[17] JP 3-0.
[18] Harry Yeide, *Steeds of Steel: A History of American Mechanized Cavalry in World War II*, Minneapolis: Zenith Press, 2008.
[19] *XX Corps personnel, The XX Corps*, Osaka, Japan: Mainichi Publishing Co., 1945.
[20] JP 3-0.
[21] GEN Donn Starry, *Mounted Combat in Vietnam*, Department of the Army, Washington, DC, 1989.
[22] JP 3-0.
[23] *Stars and Stripes*, Nov. 13, 1945.
[24] Sawicki.
[25] Sydney J. Freedberg Jr., "Gen. Milley to SASC: World Getting Worse, Army Getting Smaller," *Breaking Defense*, July 21, 2015.
[26] *National Commission on the Future of the Army*, Jan. 28, 2016.

MAJ Nathan Jennings is a student in the School of Advanced Military Studies, Fort Leavenworth, KS. His previous positions include assistant professor of history at the U.S. Military Academy; headquarters-troop commander and cavalry-troop commander, 1st Cavalry Division; security-force platoon leader, 1st Infantry Division; and 19D cavalry scout in 2nd ACR (Light) with Operation Iraqi Freedom tours in Baghdad and Kirkuk, Iraq. MAJ Jennings holds a bachelor's of arts degree in history from Northwestern State University of Louisiana and a master's of arts degree in history from the University of Texas at Austin. His military schooling includes the Maneuver Officer Basic Course, Maneuver Officer Advanced Course, Cavalry Leader's Course and Air Assault and Airborne schools. He won 1st place in the U.S. Army Armor School's 2015 Starry Writing Competition, and he is the author of *Riding for the Lone Star: Frontier Cavalry and the Texas Way of War, 1822-1865*.

Acronym Reference

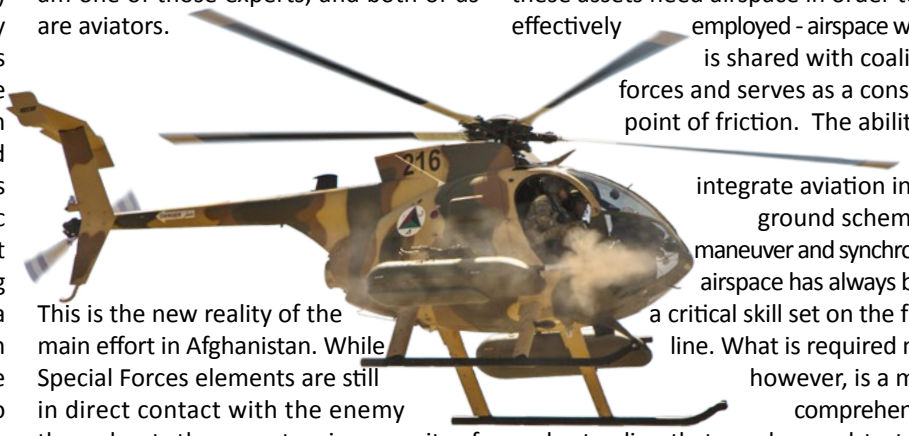
ACR – armored cavalry regiment
BCT – brigade combat team
FM – field manual
JP – joint publication
MCG – mechanized-cavalry group
R&S – reconnaissance and security
RAF – regionally aligned force
RSSG – reconnaissance and security strike group
TRADOC – (U.S. Army) Training and Doctrine Command

An Ever Expanding Role.
Aviators as Maneuver Experts on the New Front Line of Advising

By CPT Kyle R. Hopkins

It's a beautiful Afghanistan night. The gazebo in which we sit with our Afghan counterparts is surrounded by a picturesque rose garden ironically trimmed with the spent casings of D-30 artillery shells. Blending into the scenery are both the steely-eyed guardian angels of the 101st Rakkasans and a heavily armed Afghan National Army (ANA) protective detail. Both groups are wary of the threats posed from insider attacks and the Taliban lurking just outside the walls. Ever on guard, we keep a stern watch on everything and everyone around us, including each other. Six kilometers to the north, explosions and automatic weapon fire can be heard from the front line where the ANA have been clashing with the Taliban for months over Sha Mansur Hill. The hill is a piece of key terrain in the heart of Tarin Kowt city, which the local leadership understands is pivotal to success or failure in Uruzgan province.

We are here because the Taliban are close to overrunning the provincial capital and achieving their first step towards a major strategic objective: isolate Kandahar city, the old Taliban seat of power, from the rest of the country. To help ensure the successful defense of Tarin Kowt, an expeditionary advising package is sent to the area consisting of a six-man advising team, a large security element, and a forward arming and refueling point to provide AH-64s the station time to operate in the area. The advising team includes experts in a wide set of functions including police integration, logistics, explosive ordinance disposal, fires, intelligence, and combined arms maneuver. Tonight, inside the gazebo, two of our maneuver experts sit with the Commander, 205th ANA "Hero" Corps discussing and advising on his bold new plan for the seizure of Sha Mansur Hill. I am one of those experts, and both of us are aviators.



This is the new reality of the main effort in Afghanistan. While Special Forces elements are still in direct contact with the enemy throughout the country in pursuit of their anti-terrorism mission, all of the coalition's conventional forces are dedicated to the train, advise, and assist commands. Observation posts overlooking Taliban-controlled valleys have been replaced by a new front line made up of offices of various ANA staff and commanders. "Shana ma shana," (shoulder by shoulder), with our Afghan partners, we work to assist a young and struggling fighting force to prevail against a highly trained and well-resourced enemy.

Facing a large number of challenges including shortages of food, ammunition, fuel, training for their Soldiers, and corruption that runs all the way to the top, make it difficult for the ANA forces to gain ground. Their primary advantage over the enemy comes in the form of combat enablers such as D-30 artillery, local light attack helicopters, and close air support from Kabul. However, all of these assets need airspace in order to be effectively employed - airspace which is shared with coalition forces and serves as a constant point of friction. The ability to integrate aviation into a ground scheme of maneuver and synchronize airspace has always been a critical skill set on the front line. What is required now, however, is a more comprehensive understanding that can be used to teach these concepts or adapt them on the fly. The Afghans need new ideas and systems that work for their culture and for a staff that, until recently, has never had access to air power. Synchronizing the ANA's rudimentary airspace control methods with our own highly complex systems is now integral to our nation's mission in Afghanistan, and is essential for ensuring success on the battlefield.

Back in the gazebo, we are joined by four Afghan MD-530 light attack helicopter pilots. Trained in the United States, the Afghan Air Force has only been

employing air power on the battlefield for about a year and a half, but with growing effectiveness. The Afghan commanders love them because of the timely and accurate support they can provide, but also the detailed intelligence they bring back with them. The Taliban are constantly repositioning, and the ANA have had little success in denying them freedom of movement throughout the area of operations. The MD-530s are invaluable to the ANA ground commander because they are both his only reliable asset for neutralizing a dug-in enemy position, as well as his most reliable source for an accurate picture of the current threat disposition on the front line.

After discussing the current shape of the battlefield with the pilots and making some minor adjustments to the ground scheme of maneuver with the corps commander based on their information, we use the opportunity to discuss conducting combined missions with the AH-64s. This technique has recently been used to great effect in Helmand province. It allows the AH-64s to utilize their sensor arrays to identify potential targets which the MD-530s can assess and potentially engage in a timelier manner due to different rules of engagement. The Afghan pilots are provided with a copy of the grid reference guide we have been using for the objective area, and we explain how to use it to communicate specific building locations quickly and accurately between aircrews. Both groups exchange frequencies and agree to give it a try the next day when AH-64s will provide support to ANA maneuver.

On the way back for the night, I run into Sherzai (an Afghan nickname that roughly translates to heritage or heart of the lion), the ANA 4th Brigade Aviation Liaison Officer (ALO). This isn't a real job in the Afghan Army and he was appointed to the position not because of any formal training or subject matter knowledge, but because he is hard working, intelligent, and loves to fight the Taliban. Because 4th Brigade has been under constant threat, the 205th Corps has pushed nearly all of their available air assets to Tarin Kowt since they started receiving air support last year. When we discovered what Sherzai was doing to integrate and control air power in the area, we gave him the title and started working with him directly to improve synchronization. Tonight he tells me about four targets he submitted for bombing the next day and we spend a little time setting priorities using the grid reference guide.

Back at the U.S. compound, a small portion of the ANA base we have sealed off with concertina wire and Hesco barriers, we discuss priorities for air targeting to support the Afghan scheme of maneuver the next day with the Combined Joint Operations Center. The Afghan human intelligence sources inform us that the enemy has started employing spotters who specifically look out for coalition aircraft. They watch us closely and know that we will not attack unless we see them commit a hostile act, so they have stopped attacking and will even put on female garb when they see our aircraft to prevent us from engaging. We request that the intelligence, surveilance and reconnaissance platforms turn their position and anti-collision lights off in an attempt to mask their presence and increase their chance to observe a hostile act against which we can retaliate.

Once we agree on priorities for the next day's mission, I contact the Apache platoon leader to discuss the potential employment of manned-unmanned teaming and how it could be effective against the current enemy TTPs. Everyone is in agreement that our current methodology is not producing results, so we coordinate options to allow other sensors to identify targets for hand-off to the AH-64s. Together with the joint terminal attack controller, we discuss what conducting a combined flight operation with the ANA MD-530 crews would look like and agree upon a plan that will effectively deconflict mission assets.

As the AH-64s prepare to launch for the mission, I confirm with the local ANA support battalion commander that he is not to shoot his artillery without first obtaining clearance through either me or our command post (CP) as we have rehearsed. He agrees, eager to allow the Apaches to engage the enemy, and we review the battle drill one more time.

I check in with the ANA staff to determine whether there have been any reports from the fight. They show me a set of grids reported for their front line that don't make any sense. The operations officer acknowledges that they have a problem with most troops, and even many officers, not knowing how to read a map properly; all the maps they use are in English, which adds to the difficulty. Regardless, we manage to piece together an idea of what progress has been made based on the reports, and the ANA ALO and I leave to speak with the brigade planners.

On the way, the Afghans approach me and report that they are frustrated with the AH-64s. They have troops in contact and have received reports of the enemy firing positions. They passed the information to our CP, but the Apaches are not engaging. The Afghans want to fire their D-30 artillery at the targets, but our CP isn't giving them the clearance to fire because the Apaches are still on station. The joint terminal attack controler (JTAC) is not comfortable with clearing the ANA to fire, even if the Apaches

are clear of the gun target line. This is a conversation I have had many times and we eventually agree that if the AH-64s cannot prosecute the targets, they are to move to a different objective area in order to allow an asset that can deliver effects to the battlefield the chance to do so. The problem is not solved, but the immediate fire has been put out.

I move into the 4th Brigade Headquarters to discuss an upcoming operation to reopen a ground line of communication to a neighboring district that has been cut off for nearly two years. The planners have identified the Morcha Pass as a critical point in the operation as the route becomes canalized between two mountains for several miles. The insurgents have control of the high ground in this area and occupy dug-in battle positions and cave networks, making them nearly impossible to destroy with artillery or air power. We discuss the potential for an air assault using the 3rd Special Operations Kandak, the elite U.S. trained commandos of the Afghan defense forces, to secure the key terrain and permit a route clearance team to clear through the pass.

Pouring over the map, we discuss the merits of the plan and also the challenges that are involved with planning an air assault. Because commandos are involved, the brigade planners often assume they can do anything. I walk them through some basic questions regarding their plan for an air assault. Have they done any terrain analysis to determine if there are any suitable landing zones available for the helicopters in the area? What will the timing of the assault be, and how will it be supported? How will they determine if the area is clear of threat just prior to landing? Do they have any options should the plan go wrong and an aircraft goes down? Can the forces be resupplied in that highly restrictive terrain? Can all of the commandos be inserted in a single lift; and, if not, what additional risk is assumed by having to do multiple turns? The Afghan planners are ready for some of my questions, but also taken off guard by many. Several times I hear a response I have become very accustomed to: "That's someone else's job to figure that out." Calmly I explain that it needs to be their problem, and together we work through the questions.

Later, I walk outside to call the CP and run into Sherzai. Two A-29 Super Tucanos have arrived on station near a base currently surrounded and cut off by insurgent forces and successfully dropped a 500 pound and 250 pound bomb on two targets. I ask him how much ammunition they have left. Sherzai contacts an Afghan terminal air controller (ATAC), recently trained by Sherzai to function in a similar manner to a JTAC, to allow dynamic and accurate targeting of aerial assets. Since most ATACs have not yet seen combat, everyone is interested to see how they perform in the field. We confirm that the aircraft still have two 250lb bombs and multiple rockets remaining, and the ATAC directs them to an observed enemy fighting position threatening the base. We listen anxiously as the pilots engage the targets and eventually confirm their destruction.

The advising mission is often frustrating and slow to show tangible results on the battlefield, but we also understand that if America and the Coalition Forces ever want to see an end to their deployments to Afghanistan, we have to do everything we can to empower the Afghans to fight their own fight. Victory for the ANA is always slow in coming and is often fleeting, but four days later we stand in that same gazebo next to the tattered and bullet hole-ridden Taliban flag that has flown over Sha Mansur Hill for the last year. A brave young Afghan company commander climbed a 200ft tower under threat of sniper fire to remove it and raise the Afghan flag in its place, announcing to everyone in Tarin Kowt that the ANA were in control and that the Taliban were on the run. It's an important moment and a proud day as it marks their first major victory in some time, but we all know the war is far from over.

In Army Aviation, we have long had the motto that everything we do is in support of the ground force commander. However, it is easy to become stove-piped into the aviation specific aspects of that support, forgetting that first and foremost, we are a maneuver element. During my tour as an advisor, I have helped the Afghans plan a wide variety of operations ranging from their yearly corps campaign plan to a company level assault. Upon learning that I am an aviator, I am never asked why we don't have an infantryman as an advisor. To them, an Aviation officer is equally qualified to determine the best method of attack or the points of vulnerability. The Afghans see us the way we need to see ourselves, as professional Army officers who are experts in maneuver and the application of ground warfare. Understanding the trade of ground maneuver is critical to our success in providing the best support possible and integrating all of our aviation capabilities seamlessly into the fight. As the battlefield continues to evolve, so does our role in it. Every Aviation officer must remember that he needs to, first and foremost, be an expert in maneuver, and to treat the study of that craft with just as much emphasis as their aircraft's chapters five and nine.

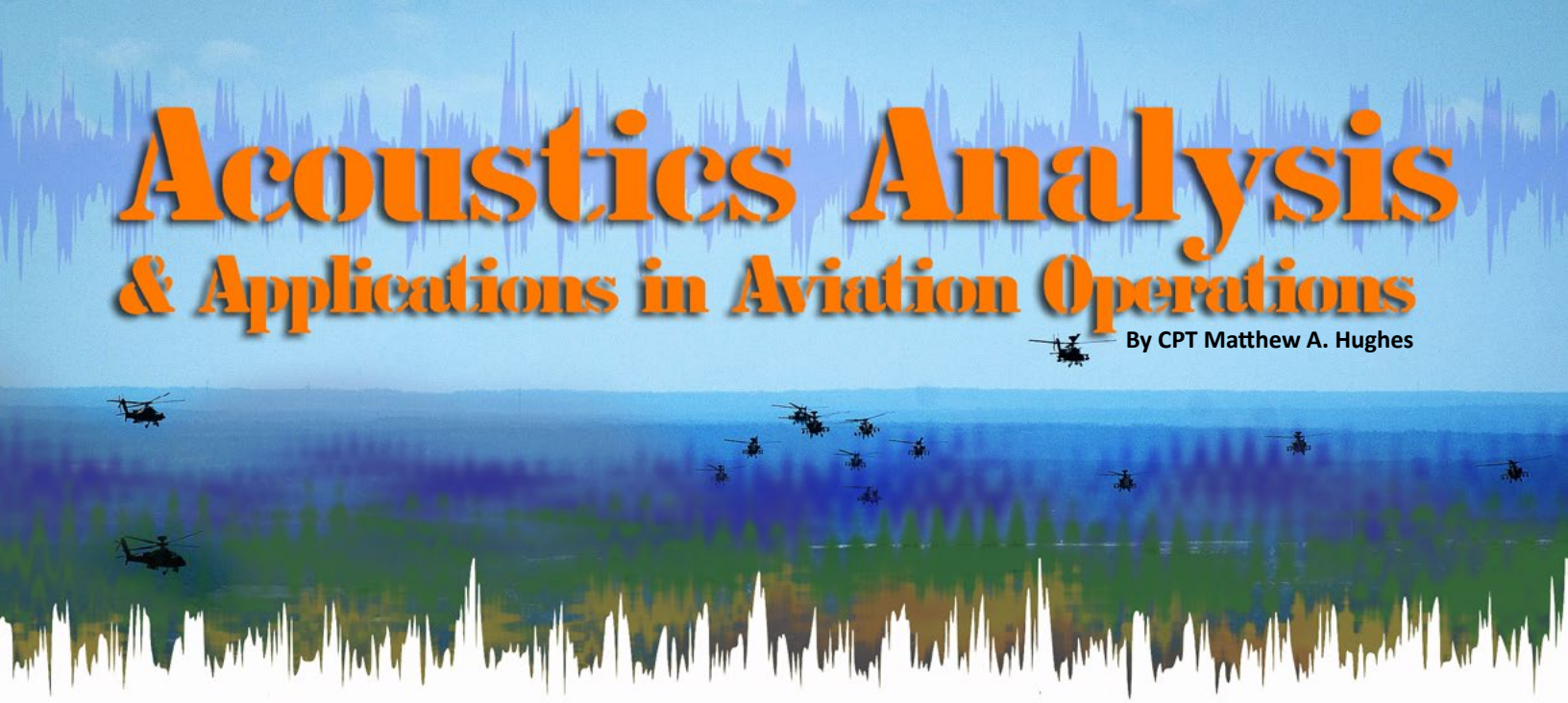
CPT Kyle R. Hopkins is currently serving as Assistant Brigade Aviation Officer, 3rd Brigade Combat Team, 101st Airborne (AASLT) Division and the Operations and Plans Advisor for the Train, Advise, and Assist Command-South to the Afghan National Army 205th Corps. CPT Hopkins has deployed four times, twice as an enlisted RQ-7B Shadow Tactical Unmanned Aircraft System operator during Operation Iraqi Freedom, once during Operation Enduring Freedom as an UH-60M platoon leader, and his current tour as an Afghan advisor. He is a UH-60M aviator with eleven years' service.

Acronym Reference

ALO - Aviation Liaison Officer	**CP** - command post
ANA - Afghan National Army	**TTP** - tactic, technique, and procedure
ATAC - Afghan terminal air controller	**JTAC** - joint terminal attack controler

Acoustics Analysis & Applications in Aviation Operations

By CPT Matthew A. Hughes



"Be extremely subtle, even to the point of formlessness. Be extremely mysterious, even to the point of soundlessness. Thereby you can be the director of the opponent's fate."

- Sun Tzu, *The Art of War*

On January 29, 2017, U.S. Special Operations Forces (SOF) led a raid targeting a house in the Al-Qaeda camp near Ghabat Yakla, Yemen to capture information about future terror attacks. President Trump deemed the operation successful due to valuable captured information, but some senior military officials disagreed, with one remarking "almost everything went wrong," alluding to one Navy SEAL, 14 Al-Qaeda fighters and, allegedly, women and children who perished in the raid.[1] Sources agree that somehow, Al-Qaeda forces were tipped off. Most media outlets cited nearby residents who claimed to have heard drones buzzing nearby prior to the raid.

While the theory that drone operators flew within the acoustic threshold of the objective remains a plausible allegation, accounts from residents hearing buzzing drones reveal a common flaw in military operations. The impacts of noise significantly contribute to success or failure in tactical scenarios, yet pilots, analysts, and commanders generally lack a comprehensive understanding of sound properties. There are a series of unresolved gaps in understanding and applying sound in tactical warfare, but revisions in doctrine and training, emerging technology, and future research efforts can help units overcome these issues.

Gaps in Analysis and Operations

Challenges relating to acoustics in planning and execution of missions include the following:

- Limited understanding within military units about how sound propagates
- Neglecting the role of sound in Army tactics and doctrine
- Lack of pre-mission planning and analysis considering the acoustic properties of helicopters and unmanned aircraft systems (UAS)
- Platform sound emissions are not integrated into flight simulators as a variable
- Insufficient funding and a low priority for research hinders progress

Discussion Points and Recommendations

Properties of Aircraft Sound Emissions and Wave Propagation

Children often learn basic principles of visual concealment, hiding among foliage where obstacles block line of sight, or in shadows, where obstacles obstruct or hinder the travel of light. Sound is slightly more complicated, presenting challenges when trying to gauge sound signature thresholds, or how far and how strongly sound waves spread throughout an area. A Soldier can guess how far away an enemy would need to stand to hear him stepping through leaves in a forest, but gauging sound thresholds becomes increasingly more difficult when studying larger objects, such as a helicopter or UAS.

Different models of helicopters and UAS have distinct sound signatures based on rotors, blade slap, bearing, speed, and altitude. While such sound properties remain relatively predictable under controlled conditions, sound wave propagation varies depending on environmental factors, including terrain, temperature, humidity, wind speed and direction, altitude, and ambient noise. Sound waves are subject to refraction, diffraction, and interference as they travel, and can lose speed, change direction, or become absorbed. For instance, if a helicopter flies into heavy winds during ingress to an objective, the wind will muffle helicopter noise reaching the objective, granting greater acoustic concealment. Similarly, aviation units can capitalize on wind factors in deception operations. Incorporating basic sound wave properties into doctrine and increasing the knowledge base on how sound travels can enhance mission planning and help analysts identify threats and opportunities based on noise.

Although knowledge of how sound travels can improve planning efforts, mission analysis remains heavily based in assumptions, as a pilot or Aviation Mission Survivability Officer (AMSO) has difficulty modeling sound propagation for reliable estimates. This challenge becomes problematic when planners must determine adequate standoff from an objective to avoid "burning the landing zone," or alerting enemy of nearby aviation platforms by flying close enough for them to hear those platforms. This inability to visually portray a sound signature also perpetuates fallacies of assuming enemies will not hear a helicopter or UAS because they will not be able to see that platform due to vegetation or surrounding terrain. Sound is more complicated than depicting visual lines of sight, requiring a more comprehensive understanding of sound wave propagation and the application of modeling software to produce reliable analysis for mission planning.

Dearth of Doctrine

The role and significance of sound in Army doctrine remains vague and inadequate. Army publications often cite the Eight Forms of Contact, in which "contact" refers to "any situation that requires an active or passive response to a threat or potential threat."[2] Contact can thus occur while in the offense or defense, and can involve surveillance, hostile actions, or other events. Field Manual (FM) 3-21.10, *The Infantry Rifle Company*, contains the most comprehensive description of the Eight Forms of Contact, listing them as follows:

- Visual (friendly elements may or may not be observed by the enemy)
- Physical or direct fire with an enemy force
- Indirect fire
- With obstacles of enemy or unknown origin
- With enemy or unknown aircraft
- Involving CBRN conditions
- Involving electronic warfare tactics
- With non-hostile elements such as civilians[3]

While this list encompasses hostile and non-hostile actions and spans air, land, sea, space, and cyberspace domains, the criteria for contact fails to adequately account for sound. This list should include sound as a ninth form of contact, due to the relevancy of audible contact and the intrinsic nature of sound as one of the human senses.

Army publications addressing tactics include little mention of sound or the role of acoustics in operations. For instance, the only occurrence of sound and related terms in FM 3-04, *Aviation*, discusses passive detection methods employed by enemies, which might use acoustic detectors to identify and locate aircraft.[4] Army publications, especially those involving aviation operations, should address the role of sound in potential mission sets. Important considerations include laager sites and reconnaissance passes maintaining adequate standoff from an objective to avoid acoustic detection, how flight altitude influences a helicopter's acoustic signature, and how varieties of terrain influence sound propagation. Field Manual 3-04.111, *Aviation Brigades*, states that "standoff is key to aviation survival," addressing vulnerabilities in urban environments and challenges in avoiding visual detection, yet fails to describe the role of sound emissions in detection of friendly aviation platforms.[5] Doctrine should set forth environmental considerations for sound, such as wind speed and direction, to tailor or adjust flight paths as weather conditions present opportunities. Publications should also emphasize how to leverage sound in deception tactics, such as false insertions. These manuals should address different types of sound emissions, including sounds outside of human perception which enemy detection systems may be able to identify. Ultimately, aviation publications should incorporate sound by describing how terrain and weather conditions influence noise, identifying risks and vulnerabilities associated with a platform's sound emissions, and addressing ways to harness audible noise in deception operations.

Sound has played a critical role in tactical warfare throughout history. Physicist Charles D. Ross, after investigating the role of sound in American Civil War battles, reflected, "An experienced officer could follow the course of a battle to some extent merely by listening

to the sounds."[6] Despite modern marvels involved in surveillance and reconnaissance, much of the information collection taking place at the tactical level relies on the basic senses of a trained Soldier. At the Army's three main combat training centers, for instance, weather, maintenance, or conditions imposed by the training staff forces units to leverage organic assets to the fullest extent and manage information collection without external support. Inevitably, scouts play pivotal roles in maintaining contact with the opposing force, which usually involves reporting and analysis based on visual or observation or audible detection. Doctrine should reflect this reliance on sound for friendly and enemy information collection, addressing how to exploit opportunities and avoid threats presented by the propagation of sound waves.

Acoustics in Mission Analysis

A Soldier may be able to identify optimal observer post locations by looking at a standard topographic map based on contour lines, vegetation, and line of sight principles; but, determining optimal routes or areas based on sound requires technical applications. Fortunately, budding technology offers a solution for determining reliable sound thresholds for military equipment based on platform sound emissions and sensor properties. Researchers at the Cold Regions Research and Engineering Laboratory (CRREL) in Hanover, New Hampshire have developed a modeling application called Environmental Awareness for Sensor and Emitter Employment (EASEE).

EASEE is a software application that models line of sight, acoustics, seismic properties, and more by displaying a colored threshold for sound wave propagation of various platforms, including noise from helicopters and UAS. Precision of models largely depends on the resolution of elevation data, yielding more reliable sound models with Light Detection and Ranging (2m resolution) than Digital Terrain Elevation Data (30m resolution). This application greatly enhances mission analysis as pilots, planners, and analysts can determine optimal locations and routes to reduce audibility of friendly assets and employ sensors monitoring enemy activity. In essence, one can plot a flight path or fixed point, set parameters for weather and platforms, and model a helicopter or UAS sound bubble to determine where an enemy force can hear that platform. These features enable units to capitalize on surprise and mitigate the likelihood of providing early warning to the enemy due to sound.

As a government owned/government operated research software suite, EASEE is accessible to members of the Department of Defense. The EASEE beta version does not need network connectivity, making the software ideal for field training exercises in austere conditions. The CRREL is currently developing a version for use on the non-secure and Secure Internet Protocol Routers, which will require network connectivity, but simplify analysis by removing the user requirement to provide elevation data files. Users may upload EASEE products as Georeferenced Tagged Image File Format files to ArcGIS (a geographic information system) and other geospatial programs. The software is still in research and development phases, enabling users to provide feedback to the CRREL to incorporate new features.

Under the tutelage of CRREL, the 3-227 Assault Helicopter Battalion (AHB) S-2

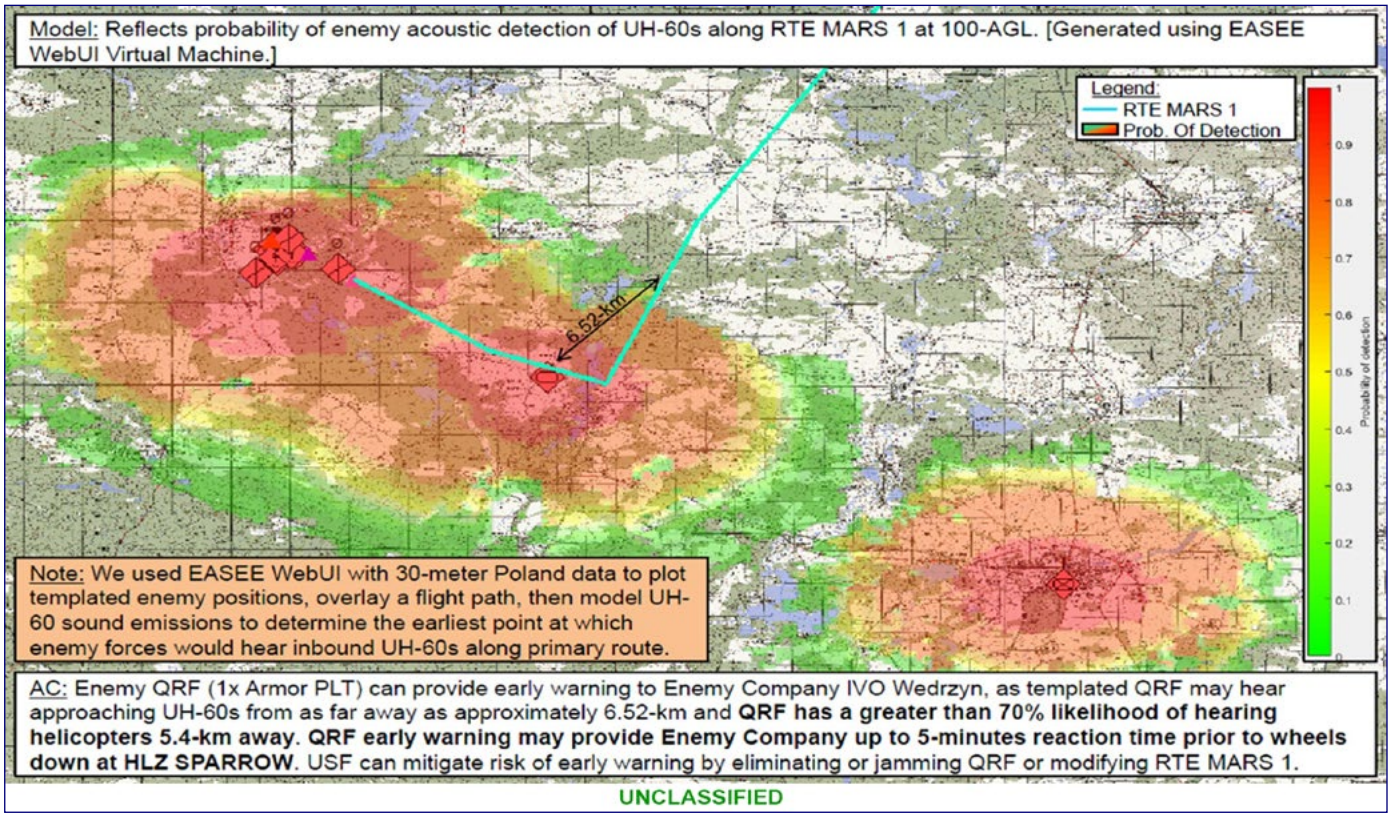


Figure 1: 3-227 AHB S-2 displays an EASEE model of enemy forces' acoustic detection thresholds for an inbound UH-60L formation.

personnel became proficient in the EASEE software. The S-2 leveraged EASEE during two training rotations at the Joint Multinational Training Center (JMRC) in Hohenfels, Germany; one multinational operation in Poland; and several field training exercises in the United States. Originally designed for counterinsurgency operations, the 3-227 AHB pioneered the application of EASEE for decisive action operations against a near-peer threat. Analysts built situational templates for acoustics, enhancing planning for raids and air assaults and validating attack-by-fire positions. During mission analysis for an air assault with the Bulgarian SOF, the S-2 determined that the route of flight mitigated visual detection of approaching helicopters, but enemies in the targeted compound would be able to hear these helicopters from a significant distance. Analysts utilized EASEE to model UH-60 sound emissions and recommended a new route providing optimal acoustic and visual concealment. The S-2 cell later fielded a new version of EASEE during a 32-ship air assault in Wedrzyn, Poland, attracting the attention of the Deputy Commander of U.S. Army Europe for enhancing situational awareness and reducing risk for aviation operations.

The fastest and most cost-effective way to incorporate acoustics into planning is for each aviation unit to harness emerging technology by acquiring and utilizing EASEE software. In each aviation unit, the S-2 and the AMSO should understand EASEE capabilities and establish templates for acoustics products imbedded in each mission analysis brief. These leaders should incorporate acoustics and an EASEE capabilities brief into aviator academics to increase understanding of sound waves and their role in tactics and determine how to best employ this new capability in mission analysis for future mission sets.

Figure 2: Dr. Don Albert of the CRREL calibrates acoustic measuring equipment during experiments with the AH-64E Block III at Landing Strip 12 of Fort Hood, TX (Photo by Mike Ekegren, CRREL).

Incorporating Acoustics into Helicopter and UAS Simulators

For decades, programmers have accounted for noise in video games, causing an enemy Soldier to react if a player approaches too quickly or walks on wooden planks instead of soil. Although the sound wave propagation in video games may not be grounded in actual physics, the noise caused by a friendly's action spurs some reaction by the enemy to enhance the game's realistic qualities and the player's experience. This noise aspect has yet to be incorporated into flight simulators utilized by the Army, specifically the Aviation Combined Arms Tactical Trainer (AVCATT) for helicopters and the Universal Mission Simulator (UMS) for Gray Eagle and Shadow UAS.

The best approach to incorporate reliable sound properties for helicopters and UAS into flight simulators is to transfer CRREL's sound baselines for each platform to the simulators. As the helicopter moves, the program would generate a hidden sound threshold bubble around the helicopter, continually changing depending on the weather conditions, surrounding terrain, and the platform's bearing, speed, and altitude. Similar to the cause-and-effect nature within video games for friendly sounds eliciting enemy reactions, flight simulators should enhance training by incorporating sound in hostile scenarios. This bubble can cause a reaction from enemy forces once the enemy element falls within a certain sound threshold of the platform's sound bubble (i.e., move to wood line for cover/concealment, fire at source of noise, or move into the open to acquire visual contact). Flight simulators can thus improve a pilot's

awareness of noise emissions through realistic responses by the enemy.

Research and Funding

Units may directly contribute to acoustics research and budding analysis applications by networking with scientists and proposing or participating in research projects. In November 2016, 3-227th AHB hosted an experiment on aviation platforms organic to the 1st Air Cavalry Brigade and invited five CRREL researchers to Fort Hood, TX. The S-2 and researchers set up an array of microphones on a landing strip to collect sound emissions of the UH-60M Blackhawk and AH-64E Block III Apache Longbow (Guardian). These tests yielded reliable baselines for sound emissions of each platform under varying conditions, including terrain, weather, and platform bearing, speed, and altitude.

A high operational tempo and continual dialogue with pilots facilitated a steady stream of feedback to CRREL researchers, contributing to improvements in the application and additional research ideas. One topic for future acoustics testing involves changes in CH-47 sound emissions with varying cargo weights. Inspired by feedback from CH-47 pilots in the 12th Combat Aviation Brigade during a training rotation at the JMRC, the 3-227th AHB S-2 designed an experiment to measure CH-47 sound emissions properties at varying cargo weights for more reliable modeling. Current modeling does not account for the wide variance in weight, which can greatly influence the CH-47 acoustic profile. An additional topic for future testing involves sound wave propagation over water. The CRREL does not currently have reliable data on helicopter sound properties over water, but there are certainly applications for the Coast Guard, non-combatant evacuation, or early entry operations. Finally, government entities should sync data and efforts to fill research gaps. For instance, the CRREL lacks data for sound propagation over large bodies of water, but the Naval Research Laboratory's Atmospheric Acoustic Propagation application may contain data filling this void and data for additional airframes utilized by the Navy and Marine Corps.

Although units have identified gaps in research and analysis, funding remains a key challenge in collecting and processing data. One work-around is to incorporate testing into approved and funded training, especially at combat training centers. An approach to steer research efforts toward acoustics is to submit challenges and innovative solutions to the Rapid Equipping Force (REF) via the REF Portal at http://www.ref.army.mil/. Increased dialogue on acoustics research can highlight current shortfalls and influence funding levels to solve identified problems. While funding issues associated with the AVCATT's legacy status hinder new features in helicopter flight simulators, expressing interest in acoustics modeling within the UMS may further efforts to enable UAS pilots to train in more realistic conditions, growing accustomed to their platform's sound signature thresholds during flight in simulators.

Conclusion

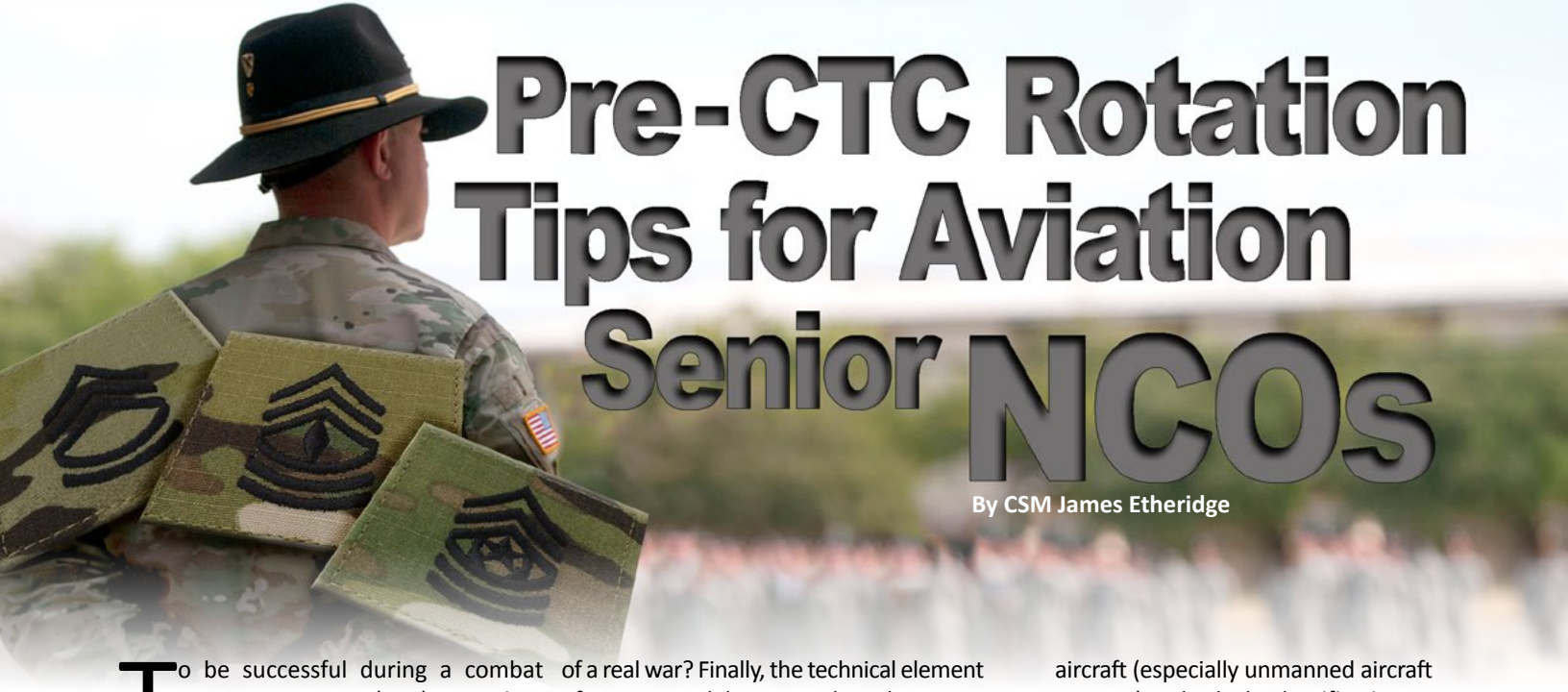
Army doctrine, practices, and historical and recent operations highlight a lack of understanding and application of acoustics in tactical warfare. Emerging technology offers new ways to incorporate acoustic analysis into mission planning and training. Additional funding, unit participation, advocacy, and research efforts can further the exploration and application of acoustics in military operations. Commanders, aviators, and staff should gain a comprehensive understanding of acoustics and capitalize on emerging technology offering methods to visualize and leverage acoustics in tactical operations. Such efforts will grant leaders enhanced situational awareness and enable them to exploit or avoid actions resulting from sound wave propagation.

[1] William M. Arkin, Ken Dilanian and Robert Windrem, "Inside the Navy SEAL Raid in Yemen Targeting al Qaeda" (NBC News, 3 FEB 2017), available at http://www.nbcnews.com/news/us-news/what-went-wrong-inside-yemen-seal-raid-n716216 (accessed 18 MAY 2017).
[2] FM 3-21.10 *The Infantry Rifle Company* (HQ DA, Washington DC, 27 JUL 06), Pg 4-10.
[3] Ibid. Pg 4-10, Para 4-45.
[4] FM 3-04 *Army Aviation* (HQ DA, Washington DC, 29 JUL 2015), Pg 1-10, Para 1-56.
[5] FM 3-04.111 *Aviation Brigades* (HQ DA, Washington DC, 7 DEC 2007), Pg 3-13, Para 3-68.
[6] Charles D. Ross, "Sight, Sound, and Tactics in the American Civil War," in *Hearing History: A Reader*, ed. Mark M. Smith (Athens, GA: The University of Georgia Press, 2004), 270.

CPT Matthew A. Hughes is an All-source and Signals Intelligence Officer currently assigned to the Defense Language Institute at Monterey, CA. He previously served as the S-2 of 3-227th Assault Helicopter Battalion for 27 months. CPT Hughes holds a Master of Arts in Intelligence Studies from American Military University, where he received the Graduate President's Award for his contributions to the intelligence field. He commissioned in 2011 through the United States Military Academy, where he earned a Bachelor of Science, majoring in Arabic/Spanish and minoring in Terrorism Studies.

Acronym Reference

AHB - assault helicopter battalion
AMSO - aviation mission survivability officer
AVCATT - Aviation Combined Arms Tactical Trainer
CRREL - Cold Regions Research and Engineering Laboratory
EASEE - Environmental Awareness for Sensor and Emitter Employment
JMRC - Joint Multinational Readiness Center
REF - Rapid Equipping Force
SOF - Special Operations Forces
UAS - unmanned aircraft system
UMS - Universal Mission Simulator



Pre-CTC Rotation Tips for Aviation Senior NCOs

By CSM James Etheridge

To be successful during a combat training center (CTC) rotation, leaders at all levels must prepare themselves and their Soldiers prior to deployment. Each CTC has its own challenges. One of the primary goals at the Joint Multinational Readiness Center (JMRC) at Hohenfels, Germany is for Soldiers at all levels to understand the difficulty and importance of building interoperability while training with multinational partners.

The relationship with multinational partners can be viewed from three perspectives: human, procedural and technical. The human element deals with language, terminology, and cultural differences and can be the most challenging when developing a common visualization to achieve battlefield success. The procedural element focuses on doctrine, procedures, and training. Understanding our allied partner's tactics, techniques, and procedures is key to building a strong relationship. Something as simple as understanding North Atlantic Treaty Organization (NATO) vehicle markings can prevent a fratricide incident during a rotation. As another example, everyone knows the Multiple Integrated Laser Engagement System (MILES) rules the battlefield at a CTC. While no one "dies" when engaged with MILES, a "fratricide" incident during a rotation can rapidly erode trust with multinational partners. After all, if engaged during the relatively benign conditions during a CTC rotation, what is going to happen during the mass confusion of a real war? Finally, the technical element of interoperability can be the most frustrating during a rotation. Differences between U.S. and NATO hardware and communications equipment can make it challenging for commanders as they exercise mission command.

So how can senior non-commisioned officers (NCOs) prepare their Soldiers, while at home station, to set the unit up for success during a CTC rotation? Senior enlisted leaders can focus on:

- Understanding the commander's training objectives and how those objectives nest with collective and individual training,
- Exercising the unit's mission command systems,
- Developing confidence and a winning attitude in their Soldiers,
- Conducting extensive friendly and enemy aircraft (especially unmanned aircraft systems) and vehicle identification, and lastly,
- Ensuring that every Soldier is proficient with the equipment they are expected to operate.

Training Objectives and Collective Tasks

Senior enlisted leaders must be intimately familiar with their unit's mission essential task list (METL) and the commander's CTC rotation training objectives. They should also be familiar with where to find the supporting collective tasks and training and evaluation outline (T&EO) reports which detail the task, conditions, and standards for each task. As part of a part of a multifunctional aviation task force, the commander's training objectives will likely be made up of a combination of tasks from the type of units making up the task force. Units

can use their Combined Arms Training Strategy (CATS) to assist in creating a unit training plan. Each CATS contains task sets (TS) comprised of collective tasks that support the unit's mission, functions, capabilities, and METLs. All of this information and more can be found

at https://atn.army.mil. For example, a first sergeant in either an assault or an attack/recon helicopter company WILL perform convoy operations and occupy a tactical assembly area. In the unit's CATS, one could use TS 01-TS-2304 Conduct Convoy Operations and Occupy a Tactical Assembly Area to guide the training of these tasks. This TS contains more than 25 supporting collective tasks. Also, each collective task has a T&EO that the CTC observer coach/trainers use to evaluate a unit's proficiency. Using these T&EOs and training to the defined standards during home station training will contribute to the unit's success during a CTC rotation.

Mission Command Systems

The principles of mission command are written about and discussed extensively, but rarely is the mission command system itself discussed. As stated in *Army Doctrine Publication 6-0, Mission Command*, "At every echelon of command, each commander establishes a mission command system — the arrangement of personnel, networks, information systems, processes and procedures, and facilities and equipment that enable commanders to conduct operations." An infantryman's primary weapon system is the M-4. A Soldier that works in a command post (CP) and uses the Command Post of the Future (CPOF) needs to treat CPOF as if it is his primary weapon system - he needs to fire expert with it. A radio operator not only needs to know how to talk on the radio but how to fill it and how to troubleshoot it. Too many Soldiers rely on the limited resources of the S-6 to troubleshoot, fill, and operate their mission command systems. The S-3 senior NCO should conduct multiple communication exercises prior to a CTC rotation. Set up the CP and have the commander approve the layout. After all, the CP configuration has to work for the commander so he can make accurate and timely decisions during the course of a battle. Have established battle drills that Soldiers, battle captains, and anyone else can articulate perform. Set up the CP and exercise mission command systems prior to the CTC rotation.

Build a Winning Attitude

Too often Soldiers come to a CTC rotation and are just there to grind it out. They don't have a winning attitude. Every opposing force (OPFOR) Soldier from PV1 to LTC wants to win the fight. So how is the OPFOR unit, less than a quarter of the size of the friendly forces that deploy to a CTC, able to win? Just like an enemy in a real world scenario, the OPFOR has the advantage during a CTC rotation. They are more familiar with the terrain, they most likely know from where the attack will come, and they've seen each event play out multiple times. The MAIN reason they win the majority of the time is that each Soldier in the OPFOR wants to win more than the rotational unit Soldier. When U.S Forces deploy to a real world scenario, they understand the gravity of the situation and always want to win. It is this same attitude that must be instilled in Soldiers prior to deploying. Building a winning attitude prior to departing for a CTC rotation starts with senior enlisted leaders at home station. If every Soldier in the unit doesn't come to the rotation with a winning attitude, the training value is diminished. Coming to a CTC is about training and making the unit better, and that starts with a winning attitude.

Enemy and Friendly Unit Identification

Something very simple and very easy can set Soldiers apart on the battlefield; train them on vehicle, weapons, and aircraft identification. Soldiers fighting at JMRC are hesitant to shoot at OPFOR because they cannot identify the enemy due to the heavy multinational flavor. We also

see that Soldiers engage allied partners because they believe they are the enemy. As stated earlier, a fratricide incident, even at a CTC where MILES engagement simulate "kills," can erode trust with our allied partners. Leaders can get ahead of the game by building a vehicle/weapons identification book and drilling Soldiers on identification of both enemy and friendly forces. A source for enemy vehicle and equipment identification is the Worldwide Equipment Guide (WEG). The WEG can also be found on the Army Training Network. There are three volumes of the WEG; Ground Systems, Air and Air Defense Systems, and Naval Systems. By developing enemy/friendly equipment identification classes prior to a rotation, Soldiers will be more reliable on the battlefield. This will lead Soldiers to exercise tactical initiative which will lead to a more aggressive Soldier that won't hesitate on the battlefield. This initiative also feeds that winning attitude discussed earlier.

Equipment Training

A multifunctional aviation task force has over 100 different pieces of equipment that can vary from an AH-64 to a high mobility multipurpose wheeled vehicle. A Soldier's ability to operate each piece of assigned equipment is essential for the unit's overall success. If the S-2 section has an OE-254 antenna, the Soldiers in that section need to know how to configure it and make it operational. Soldiers need to be licensed on all vehicles in their sections and platoons, and they need to be trained and licensed to drive at night using night vision goggles. They should also know how to operate all of the different types of weapons in their platoon. Too often, Soldiers come to JMRC and cannot operate the M249 they are pulling guard duty with. Most importantly, maintainers must not only be experts with their weapon systems, but must also be able to perform maintenance on them in the field. A disciplined Soldier that is a master of his toolbox and follows the technical manual will give the unit an advantage during a CTC rotation.

While this discussion is focused primarily on the CTC fight, each of the preparations discussed are directly applicable to the events playing out daily all over the world. Units need to be ahead of the game going into a CTC rotation. Senior NCOs must prepare their Soldiers to perform in every aspect of their jobs, which will give them the confidence they need at the CTC and, in turn, improve their readiness for a real fight.

"Train to Win"

CSM James Etheridge is currently serving as the Senior Enlisted Aviation Trainer at the Joint Multinational Training Center (JMRC), Hohenfels, Germany. Previous assignments include Command Sergeant Major, 1/228th Aviation Regiment; Operations Sergeant Major, 128th Aviation Training Brigade; and Operations Sergeant Major, 160th Special Operations Aviation Regiment. CSM Etheridge is a graduate of the Joint Special Operations Forces Senior Enlisted Academy and has Bachelor of Science Degree in Homeland Security from Austin Peay State University.

Acronym Reference

CATS - Combined Arms Training Strategy
CP - command post
CPOF - Command Post of the Future
CTC - combat training center
JMRC - Joint Multinational Readiness Center
METL - mission essential task list
MILES- Multiple Integrated Laser Engagement System
NATO - North Atlantic Treaty Organization
NCO - non-commissioned officer
OPFOR - opposing force
T&EO - training and evaluation outline
TS - task set
WEG - Worldwide Equipment Guide

Opposition Forces VS. Rotational Training Unit SUAS at the Joint Multinational Readiness Center

By LTC Matthew T. Archambault,
CPT Franklin G. Peachey,
CPT Sean D. Hayball, and
WO1 Drew D. Lincoln

The rapid expansion of commercially available small unmanned aircraft systems (SUAS) enables many countries to easily collect information in support of offensive and defensive operations. Small unmanned aircraft system employment is significant to modern operations due to its ability to provide collection for reconnaissance, target acquisition, and battle damage assessments. At the Joint Multinational Readiness Center (JMRC), the 1-4th Infantry (IN) Battalion (BN) (Warriors) opposition force (OPFOR) replicates real-world threat tactics, techniques, and procedures (TTPs) to engage and challenge rotational training units (RTUs). The Warriors' utilization of SUAS is crucial to their success and provides lessons for the larger Army in terms of practical considerations as well as tactical employment.

This paper is a broad assessment focusing on the SUAS threat posed to RTUs. It briefly compares the relative combat power of the Warrior BN to RTUs and discusses the factors causing a lack of SUAS utilization by RTUs. The paper also describes best practices and preferred SUAS employment techniques from the perspective of 1-4th IN BN and, finally, offers recommendations for future RTUs to effectively employ SUAS as part of the combined arms effort.

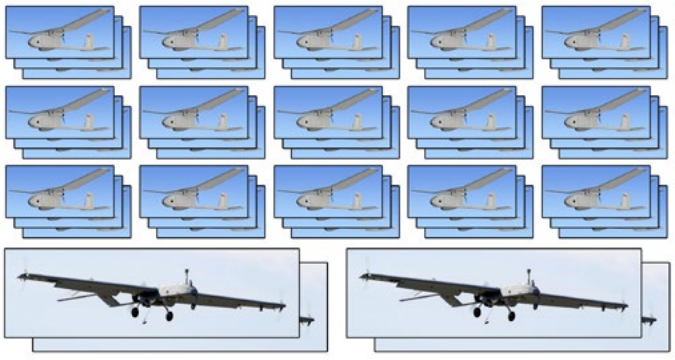
Threat

Over the last three decades, technological advancements have revolutionized the modern battlefield. Commanders are able to gather more information about a battlefield today than at any point in history. One of the most important links in this transformation is the proliferation of SUAS in increasing quantities and capabilities. These assets are capable of providing a real-time stream of information which assists the commander's decisionmaking process and the accurate targeting of enemy assets. Despite this significant impact, JMRC RTUs lack an appreciation for the lethality tied to information collected from SUAS.

A clear example of this lack of appreciation is repeatedly observed at JMRC where units often ignore SUAS completely or assume that a 1-4th IN BN Raven is friendly.[1] Incoming units receive briefings on the presence of enemy SUAS; however, the activity is routinely not reported or countered. Units allow their battle positions, seams, attack positions, and scheme of maneuver to be reconnoitered. This unimpeded collection assists the OPFOR answer priority information requirements to exploit the RTU's vulnerabilities.

The 1-4th IN BN's SUAS assets effectively acquire and pass-on time sensitive targeting information, which queues the targeting cell, generally resulting in RTU losses. This largely unanswered reconnaissance and fires on RTU positions enables the OPFOR to effectively neutralize an RTU course of action, both offensively and defensively. When all aspects of these collection opportunities are combined, a smaller unit is capable of rapidly neutralizing or defeating a much larger force. A real-world example occurred in Eastern Ukraine where SUAS reconnaissance and target acquisition ability, combined with mass fires, resulted in the destruction of two Ukrainian mechanized battalions in a matter of minutes by rebel forces (Fire Strike at Zelenopilly).[2]

Figure 1



2:1 Advantage in Relative UAS Combat Power

When the RTU does use their SUAS assets, poor RTU password protection or operations security (OPSEC) procedures enables open viewing of their SUAS feed and allows the OPFOR to better assess the current RTU common operating picture of its elements. The JMRC has observed this OPSEC vulnerability across much of the RTU digital infrastructure. Despite the various threats outlined above, RTUs

have the capacity to disproportionately exploit these same capabilities based on their superior relative combat power to the JMRC's 1-4th IN BN.

Relative Combat Power and Results

Rotational units have at least a two-to-one advantage in SUAS collection capacity compared to the JMRC's OPFOR. In an infantry brigade combat team (IBCT), this collection capacity typically consists of 15 RQ-11B Digital Data Link (Raven) systems, each composed of three Raven aircraft. A typical allocation is: three per reconnaissance squadron, four per maneuver battalion, two per artillery battalion, one per support battalion, and one system in the special troops battalion. An IBCT also has four Shadow RQ-7BV2 UAS in a tactical unmanned aerial vehicle platoon.[3] In total, this gives an IBCT 49 airframes for employment across its area of operations.

In comparison, the 1-4th IN BN currently has three Raven systems, three Rapidly Deployable Aerial Surveillance Systems (RDASS), and one Puma system which gives the unit a total of 13 airframes to employ in its role as the JMRC OPFOR. To more accurately replicate a near-peer capability, the 1-4th IN BN also employs a virtual UAS capable of two flights a day. Despite their advantage in SUAS capacity, RTUs are routinely out matched by 1-4th in the employment of their systems.

Based on the reporting of SUAS use in ongoing conflicts, the JMRC's OPFOR has made a deliberate effort to accurately replicate an active SUAS environment. During the 14 training days of Exercise 16-04, the 1-4th IN BN flew 69 hours of SUAS coverage compared to two SUAS hours flown by the RTU. (See the Saber Junction 2016 graphical UAS rollup in Figure 2.) During the 13 training days of Exercise 16-06, the 1-4th IN BN had aerial collection assets on station in the battle and disruption zones even longer flying over 100 hours compared to the RTU's four hours. (See Swift Response 2016 graphical UAS rollup in Figure 3.)

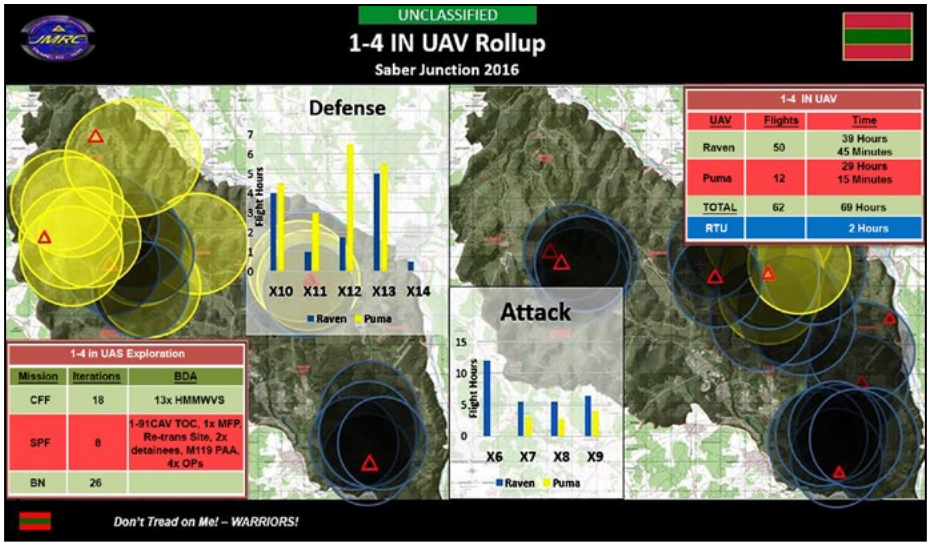


Figure 2

As a result of the JMRC OPFOR's extensive use of SUAS assets, which provided a disproportionate advantage in information collection, the 1-4th IN BN's combat power was significantly enhanced. The 69 hours or more of uncontested SUAS coverage during Saber Junction 2016 enabled unfettered target acquisition, accurate identification of emplaced RTU obstacles, and exploitation of the RTU's coordination seams. This resulted in sustained and accurate fires, bypassing emplaced obstacles, and massing forces at decisive points. As the capability to employ SUAS expands within JMRC's OPFOR, the battalion's combat power will grow.

SUAS Employment Limitations

One of the critical limiting factors to SUAS employment is the RTU's mindset toward SUAS. Almost all SUAS employment experience stems from a largely permissive counter-insurgency battlespace. Many training units ineffectively transition their planning and training for operations in a competitive SUAS environment. Effective development and execution of vital tactical integration techniques and well-trained counter SUAS procedures is

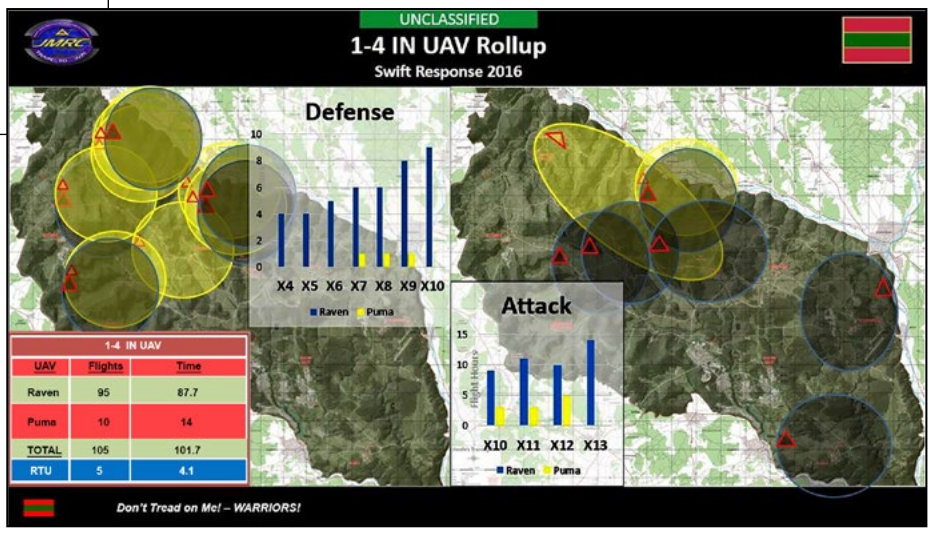


Figure 3

lacking. The result is ineffective or non-existent communication within the RTU about friendly or enemy SUAS operations.[4]

A lack of prioritization of SUAS employment during an RTU's training cycle at home-station results in untrained operators and undeveloped operating procedures. The effective employment of an RTU's SUAS capabilities must begin and be maintained at the unit's home-station. Command-level emphasis, and command-level emphasis only, will ensure certification and training currency of SUAS operators; otherwise SUAS will not reach its true capability as a force-multiplier for a unit's operations. Command-level emphasis ought to result in a standard operating procedure which establishes the roles and responsibilities for master trainers, operators, and the chain of command through battalion and brigade.

An additional limitation to SUAS employment occurs during the process of deconflicting airspace and when synchronizing restricted operating zones (ROZs). Again, these are processes and procedures that must be coordinated and practiced in order to gain proficiency. A final limiting factor is risk aversion. Many RTUs maintain their SUAS capabilities securely in their battle zone, limiting their range and collection potential. In comparison, the 1-4th IN BN accepts tactical risk by placing some of its SUAS operators forward with scout elements in the disruption zone, or deeper, to fully employ their capabilities. They consider the risks associated with losing contact with a friendly element and the payoff of reconnoitering and targeting enemy positions to significantly outweigh the risks faced by forward SUAS teams. To stay competitive, RTUs must adapt tactics that support the targeting and survivability of the brigade as a whole.

Best Practices & Preferred methods of the Warrior Battalion

As discussed earlier, the 1-4th IN has three primary SUAS platforms; each system is used based on its respective capabilities. The rapid launch and return of a Raven provides a company commander with quick target identification and the flexibility to rapidly maneuver Raven control station sites. The Puma system has a longer range and flight time allowing for deeper operational views and support to fires as enemy elements enter the 1-4th IN BN's kill zones. Both systems have an infrared camera and laser target designation capabilities. Depending on environmental factors such as wind, temperature, and humidity, the SUAS operators prefer to use Ravens in the offense and the Puma system in the defense; although, pairing the systems to queue their capabilities has provided significant advantages if a Raven is engaged. The newly implemented RDASS, which replicates a non-conventional UAS capability, has a high definition camera, but limited range and target support capabilities.

The OPFOR UAS operators prefer to use this system in a reconnaissance capacity while in towns or along tree lines in order to fully exploit its capabilities and minimize risks associated with detection.

In order to use these platforms, the Warrior Battalion's UAS Master Trainer maintains standards by monitoring currency and proficiency tasks and coordinates Class IX support for 32 SUAS operators and 13 airframes. The master trainer plays a crucial role in planning and employing the battalion's SUAS capabilities. In conjunction with the reconnaissance company commander and intelligence section, he develops an SUAS scheme of maneuver and named area of interest overlay/observation plan. Simultaneously, he coordinates with the installation tower chief to operate multiple SUAS systems while deconflicting live aircraft and fires throughout the training area. While all of these tasks are important, the master trainer's most important role is instructing and certifying operators.

The master trainer is the only Soldier in the 1-4th IN BN authorized to instruct and certify new operators and ensure all Puma, Raven, and RDASS operators are current with their airframe. Each company must maintain a total of six Puma/Raven operators and five RDASS operators requiring the master trainer to conduct a 10 day SUAS Initial Qualification Course to replenish each company between rotations as Soldiers leave the unit. Once Soldiers have completed this course, they participate in additional training that may take as many as 60 days to progress from mission preparation to mission qualified where the SUAS newest operators will eventually fly unassisted. After these formal training gates are completed, the experienced operators practice additional TTPs identified during previous rotations. When not participating in a unit rotation, the master trainer designates evaluation days where operators are tested on basic knowledge skills and emergency procedures.

Prior to a rotation, the master trainer consolidates certified personnel into a SUAS squad sized element that include the Puma, Raven, and RDASS systems. The squad is further divided into two-man SUAS assault teams who operate a specific airframe. These teams may be in uniform or dressed as civilians to penetrate deep into enemy territory. Most importantly, these teams are either accompanied by a forward observer or personally capable of coordinating fire support and dramatically shortening the sensor to shooter timeline.

Before each mission, the master trainer and his team conduct rehearsals, layouts, and final reconnaissance planning for their initial collection areas. Once the rotation begins, the master trainer takes the new operators into the fight so they can receive on the job training. Here the operators construct a ROZ, plan routes, and review rules of engagement with the

oversight of the master trainer. Once the plan is developed, they brief the master trainer and are subsequently mentored throughout the rotation. In addition, the master trainer also conducts a linkup with each team throughout the rotation to conduct a rolling after action review (AAR) and to ensure they are maximizing their SUAS capabilities.

Once a team is in position, the senior team member places the team for optimum security and over-watch. Each SUAS operator can fly in different types of environments and terrain. They launch, drive, and recover while mobile; work from roof tops in cities and camouflage themselves to blend in with terrain; or operate in the tops of trees while working beyond the forward line of protection. At every location, the SUAS teams conduct a short reconnaissance and fortify their positions to give them time to evade if discovered.

At the end of every rotation, the master trainer conducts a 100% inventory to annotate SUAS shortages and damages. He coordinates replacement parts and shipping with Redstone Arsenal and the Movement Branch Control Team and ensures the components are delivered to the appropriate company. Additionally, the master trainer builds an in-depth AAR SUAS tracker detailing every flight, location, and battle damage assessment reported during the rotation. This report is submitted to the battalion commander for the final RTU AAR. The following week, the master trainer resumes the coordination of flights to qualify and progress operators.

Recommendation Roll-up

The brigade combat team must embrace and prepare for the SUAS fight through aggressive training, planning, and employment of UAS assets. Below is a concise list of recommendations for RTUs to implement.

- Change the mindset. Understand that any future conflict will be conducted in an intensely competitive UAS environment.
- Implement and train counter-UAS drills, including the consistent employment of cover, concealment, camouflage, deception, and reporting.
- Ensure OPSEC is closely adhered to and information technology systems are secure and protected.
- Commanders must emphasize and prioritize the certification and currency of SUAS operators.
- Master trainers are not limited by the unit table of organization and equipment. Train at least two per brigade and two per battalion. Empower them to lead and coordinate their element.
- Commanders must enforce the development and implementation of SUAS standard operating procedures.
- The synchronization of UAS, fires, and maneuver elements must be incorporated and practiced at home-station training events.
- Leaders must aggressively employ SUAS and exploit the collected information.

Conclusion

The JMRC OPFOR Warrior Battalion's mission is to provide the toughest, most realistic threat to train U.S. and multinational partners. During mission execution, the Warriors are constantly learning and refining their skills in the critical areas of a maneuver battlefield while gathering and sharing lessons valuable to the U.S. Army and our partner nations. The deficiencies noted here are not unique to one unit. Following the lessons learned gleaned from multiple rotations at the JMRC will allow units to leverage the SUAS to support maneuver, as well as provide some helpful TTPs for maximizing their effectiveness.

[1] Remoy, Eric LTC. "Summary of Current Counter-Unmanned Aerial Systems Efforts." 18 February 2016.
[2] Karber, Phillip A. Dr. "Lessons Learned from the Russo-Ukrainian War, Personal Observations." 6 July 2015.
[3] Scott R. Masson, Unmanned Aerial Vehicle use in Army Brigade Combat Teams: Increasing Effectiveness across the Spectrum of Conflict. December 2006.
[4] Remoy, Eric, LTC

LTC Matthew T. Archambault is currently serving as Commander, 1-4 Infantry Battalion. His deployments include Iraq and Afghanistan where he has served a rifle company commander, maneuver planner, battalion and brigade S-3. LTC Archambault holds a Bachelor of Arts in Political Science from the United States Military Academy in Political Science and a Master of Arts in Theater Operations from the School of Advanced Military Studies.

CPT Franklin G. Peachey is currently serving as Intelligence Planner, Joint Multinational Readiness Center at Hohenfels, Germany. His previous assignments include S-2, 1-4 Infantry Battalion; scout platoon leader; and company commander at the National Security Agency. CPT Peachey holds a Bachelor of Science in Secondary Education from Millersville University and a Master of Arts in Diplomacy from Norwich University.

CPT Sean D. Hayball is the Grizzly Team (reconnaissance and security team) Intelligence Observer Coach / Trainer, Joint Multinational Readiness Center, Hohenfels. He has deployed twice to Afghanistan, where he served as a signals intelligence platoon leader and as a Security Force Assistance Advisor Team member. CPT Hayball holds a Bachelor of Arts in International Studies from the University of St. Thomas, Houston, TX.

WO1 Drew D. Lincoln is the Master Small Unmanned Aircraft System Trainer, 1-4 Infantry Battalion. His deployments include two tours to Afghanistan where he served as a scout team leader, personal security detachment team 1, fire team leader, and squad leader. WO1 Lincoln holds a Bachelor of Arts Degree in Unmanned Systems Applications from Embry-Riddle Aeronautical University and an Associate of Arts Degree in Criminal Justice.

Acronym Reference

AAR - after action review	**OPSEC** - operations security
BN - battalion	**RDASS** - Rapidly Deployable Aerial Surveillance Systems
IBCT - infantry brigade combat team	**ROZ** - restricted operating zones
IN - infantry	**RTU** - rotational training unit
JMRC - Joint Multinational Readiness Center	**SUAS** - small unmanned aircraft systems
OPFOR - opposition force	**TTP** - tactics, techniques, and procedures

Multiple Launch Rocket System Aerial Resupply

Proof of Concept

By MAJ Aris J. Comeaux and
MAJ Aaron L. Kearney

The 210th Field Artillery Brigade (FAB), also known as 2nd Infantry Division's "Warrior Thunder," stands as the ground component commander's answer to North Korean provocation against the Republic of Korea. However, the complex terrain and restricted avenues of approach across the Korean peninsula present unique logistical challenges in the timely resupply of ammunition to the brigade's batteries – and especially the heavy and bulky Multiple Launch Rocket System (MLRS) launch pod containers (LPC). Thankfully, the 2nd Combat Aviation Brigade (CAB) serves as a key enabler to overcoming these challenges.

While CH-47 external load operations appear to be the norm in bulk resupply operations, the LPC's zero drop tolerance, led both the 210th FAB and 2nd CAB to evaluate CH-47 internal load options. Neither unit was able to determine whether internal load operations involving LPCs had ever been performed. The MLRS' Army techniques publication (ATP) devotes six pages to configuring the LPC for external load configuration; however, there is only a very brief discussion of internal load operations. The information is presented in the ATP as a "concept" and its primary focus is on describing equipment requirements and identifying loading considerations. Thus, we developed most of the internal loading procedures for this combined training exercise.

In December 2016, both units decided to evaluate the following proof of concept (POC): Is it possible to efficiently load and unload the MLRS LPCs, restricted by zero-drop tolerance, into the cargo area of a CH-47D helicopter using only the MLRS launcher loader module (LLM) / boom and hoist assembly (BHA)? This POC tests our ability to efficiently and realistically load a CH-47D using organic equipment (the CH-47D winch, conveyors, and LLM / BHA) and to extract the loaded pods in the event of restricted logistical support (e.g., lack of forklift) on the receiving end of a resupply as described in the MLRS ATP.

Tasks Identified to Accomplish the Proof of Concept

We identified three tasks toward accomplishing the goal of providing the 2nd Infantry Division's Field Artillery commanders additional MLRS LPC resupply options. These were:

Task 1:

Prove the Class V on-loading and off-loading concept found in the MLRS ATP for two and four-pod configurations using organic equipment (CH-47D onboard winch, conveyor rollers, and the MLRS LLM / BHA).

Task 2:

Validate a non-standard off-loading method using the M985 heavy expanded mobility tactical truck's (HEMTT) crane to extract pods from a CH-47D cargo ramp.

Task 3:

Innovate techniques and procedures that expedite on-loading and off-loading.

Planning

Leaders from A Battery, 6th Battalion, 37th Field Artillery Regiment and B Company, 3rd General Support Aviation Battalion, 2nd Aviation Regiment participated in three planning conferences prior to the exercise. Concurrently, the FA Soldiers rehearsed hand-and-arm signals, forklift operations, placement and securing of plywood shoring, and the loading sequence.

We used the following scenarios to focus our training. Scenario 1 supported Task 3 to identify more efficient methods of positioning the LPCs onto the conveyors using a forklift while Scenario 2 strictly followed the procedures detailed in the MLRS ATP using FA and aviation unit organic equipment.

Scenario 1

The FAB loading team positions a forklift and two prepared LPCs outside the aircraft rotor disc. An aircrew member lowers the CH-47D ramp and positions four conveyor

rollers and two ramp extensions before unwinding the CH-47D's onboard winch. When ready, an aircrew member signals the FA loading team to advance toward the aft of the aircraft with the forklift. We deemed this scenario efficient as it was accomplished quickly and conserved time and energy.

Scenario 2

The FAB loading team stages the HEMTT (with the unprepared LPCs) outside the aircraft rotor blades. The aircrew lowers the CH-47D ramp, positions eight conveyor rollers, attaches two ramp extensions, and unwinds the onboard winch. When ready, an aircrew member signals the FA loading team to advance with the HEMTT to a position perpendicular to the long axis of the aircraft but behind the last two conveyor rollers. We deemed this scenario realistic because an FA unit lacking a forklift will always have a HEMTT available for on-loading.

Off-Loading Concepts

The first off-loading procedure uses the HEMTT as a counter-winch anchor to assist in positioning the load outside the rotor disk and is initiated when an aircrew member signals the HEMTT to advance to a position aft of and perpendicular to the aircraft's long axis. Once the eight conveyor rollers are in place, aircrew members release the inboard cargo straps, connect the HEMTT's winch to the LPC and ease the load down the ramp and onto the last four conveyor rollers. Once the LPC is positioned on the conveyors, an aircrew member releases the aircraft's winch. Meanwhile, the FA off-loading team prepares the pods for upload into the HEMTT's cargo area.

The second off-loading option entails using the MLRS' LLM / BHA to extract the pods from the CH-47D ramp fixed in the horizontal position and requires two ramp extensions and two ramp stands. Once the ramp extensions and stands are in place, the aircrew winches and pushes the load as close to the end of the ramp extensions as possible. The FAB off-loading team then moves the MLRS to a point outside the rotor disk, extendes the LLM / BHA rearward to its full length, and moves the MLRS slowly toward the aircraft until the LLM / BHA is six to twelve inches from the aircraft. From that distance, the LLM / BHA cable hooks can reach the LPCs hoisting rods. Once the LLM / BHA cable is hooked to the hoisting rod and tension is increased, the cargo straps, shoring, tow bridle, and winch are released. The MLRS crew then retracts one LLM / BHA cable, pulling a single LPC to the end of the ramp. As each LPC is removed from the aircraft, extreme care is taken to minimize sway and any potential damage to the aircraft.

Risk Assessment

Operations involving the simultaneous use of heavy equipment, vehicles, aircraft, and Soldiers are inherently dangerous and there are significant risks involved. The following recommendation can reduce those risks. Ground crew should not approach the aircraft until signaled by the aircrew that they are cleared. It is recommended that loading or unloading operations do not take place with rotors turning unless the tactical situation dictates otherwise. The aircraft engines and auxiliary power unit (APU) should be shut down when possible so that all communications can be heard clearly – the aircraft turnaround time saved by conducting hot (rotors turning) loading or off-loading operations is insignificant in comparison to risks involved. The loading and off-loading of the LPC should be restricted to level surfaces. Friction between the plywood shoring and the CH-47D helicopter internal cargo handling roller system (HICHS) slows the progression of the load, thereby inducing additional stress on the winch cable. Finally, if the load is slow moving or halted on the ramp/ ramp extension area, damage to the ramp extension teeth could occur. Both of these conditions may be aggravated if loading or off-loading is conducted on uneven terrain.

While the MLRS ATP indicates that the CH-47D can carry four LPCs internally, any attempt to load four LPCs configured in stacks of two appears impossible due to height limitations of the CH-47D cargo bay opening. Any attempt to stack the LPCs once inside the aircraft would be impossible because of weight and limited space available to maneuver inside the aircraft cargo area. Additionally, as previously mentioned, stacked LPCs would significantly increase the friction between the shoring and the HICHS rollers, especially on the ramp area, and cause added stress to the winch motor. Finally, a snapped winch could lead to personnel injury or death and / or damage to aircraft components.

Training Results

During the first day of training, we alternated use of the forklift and the HEMTT. While both were used to

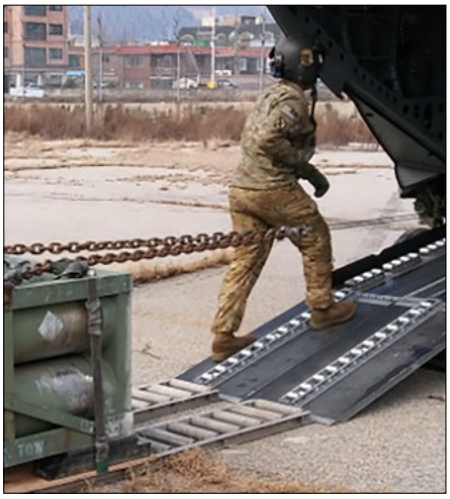
successfully place LPCs on top of the conveyor rollers prior to on-loading, using the HEMTT's crane to build the load took more time because the LPC swung like a pendulum every time it was lifted. During winching operations, the LPC shoring slipped and snagged on the ramp extension rollers several times. Also, we determined that one sheet of ¾" plywood provided insufficient shoring between the LPC and the conveyors without additional bracing. The forklift continuously proved a reliable (essential) piece of equipment; it lifted snagged loads and facilitated the repositioning of LPCs while shoring was readjusted.

Shoring snags

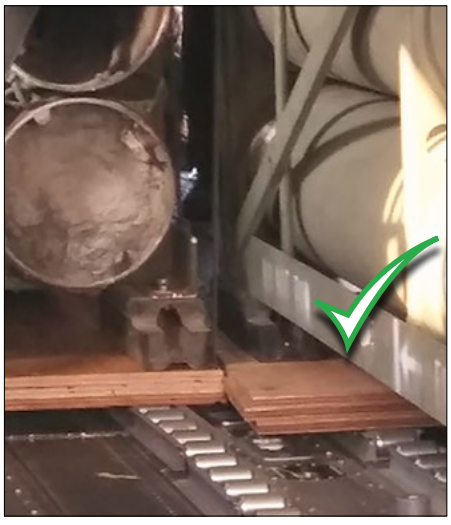
Cracking plywood

While loading single LPCs, we determined that both ramp extensions and conveyor rollers (two each) were required to minimize bending of the shoring and preventing snags. In order for two LPCs to fit inside the aircraft side-by-side, plywood shoring had to be cut perfectly to the width of the LPC. Even then, continuous manual adjustments by the loading crew were necessary to ensure a proper fit as the LPCs would slide on the plywood shoring.

Single rollers bent plywood.



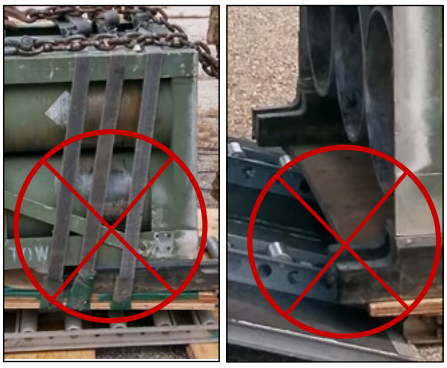
Double rollers worked best.



Proximity of LPC.

Once both LPCs were successfully loaded in the cargo hold, we discovered that the rear portion of the second LPC shoring unit snagged on a portion of the aircraft due to the ratchet straps being insufficiently tightened. Thus, we were unable to properly secure the load. To correct this, we would have to off-load the second pod, make shoring and tie-down adjustments, and re-load. We ended training day one by off-loading both LPCs. However, despite the fact that this was the first time that this loading process was attempted and despite the challenges encountered, the entire on-loading process only took forty-two minutes.

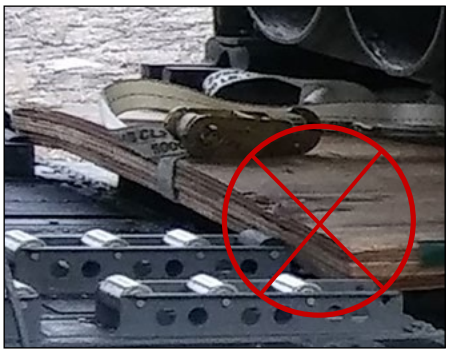
On the start of the second day of training, we used additional ratchet straps to secure the shoring to the LPCs to prevent the LPCs from slipping. Also, the cargo straps were ratcheted as tight as possible.



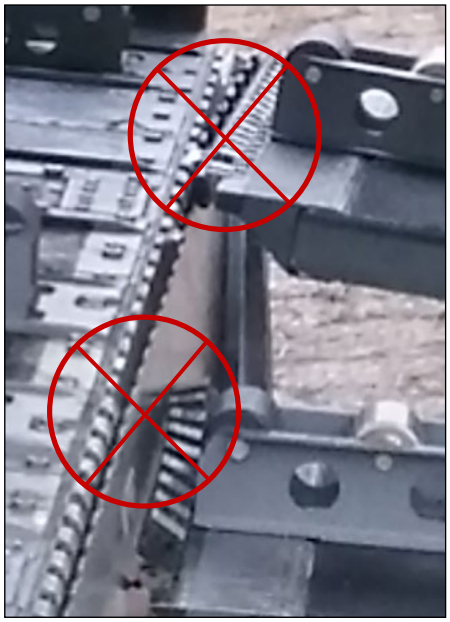
Ratchet strap and slipped shoring

Strap ratcheting

Our training objective for day two was to execute Scenario 1 and Scenario 2 for time and use the MLRS' LLM / BHA for off-loading. The first pod entered the aircraft with minimal complications. However, the second pod snagged on a roller near the cargo ramp extension hinge. The weight of the forward portion of the LPC resting on the ramp extension damaged the ramp extension teeth. At this point, both pods were now stuck inside the aircraft.



▲ Shoring snag on ramp roller

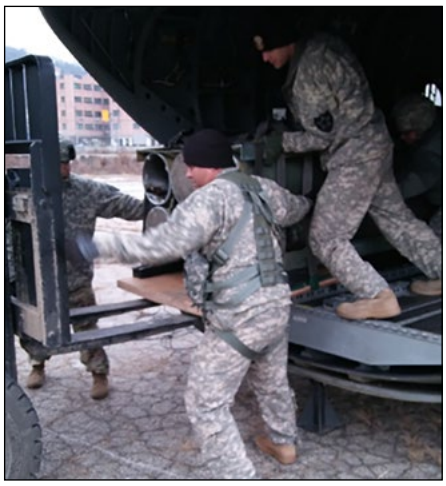


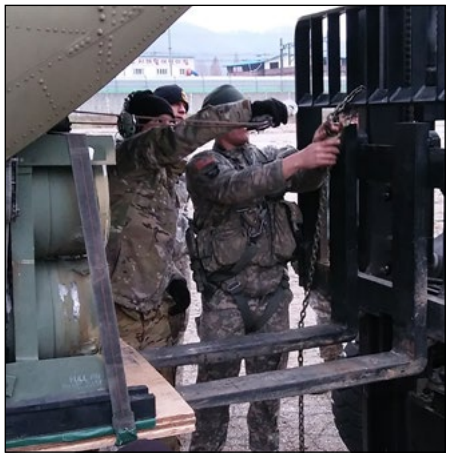
▲ Damaged ramp extension teeth ▼

To extricate the LPCs, we used the forklift to support the rear of the LPC and the MLRS LLM / BHA to pull the LPC until it was centered on the forklift tines. Once the LPC was centered on the forklift tines, we were able to move it off of the aircraft ramp.

▲ Recovery of the second PLC using the MLRS' LLM / BHA and the forklift. ▼

With the second LPC clear and the aircraft ramp in the horizontal position, we were able to recover the first pod. First, we placed the forklift tines even with the ramp and used the forklift as a counter-winch anchor to assist in pulling the end of the LPC onto the tines. After chaining the LPC to the forklift we pulled the LPC out of the aircraft until the hoisting rod was accessible. Finally, we attached the HEMTT crane's cargo hook to the LPC hoisting rod and eased the remainder of the LPC out of the aircraft.





Recovery of the first MLRS pod using the forklift, aircraft winch, and the HEMTT Crane

Conclusion and Additional Notes

Even though we did not accomplish 100% of our training objectives, this POC served as a first step in reconciling doctrine with reality. Because the MLRS Army techniques publication did not provide sufficient detail for internal loading procedures, we adapted other methods. Along the way we identified important details that will simplify this task in the future such as how to properly secure plywood shoring to the rocket pods, how to load two pods from the ground using CH-47D ramp extensions, where to position the HEMTT when operating near the aircraft, as well as other innovative uses for the MLRS and

HEMTT. We also identified several notes, cautions, and warnings to keep in mind and to use in risk assessment for future loading events. Notably, this event led to the construction of a loading dock and designs for a LPC-shoe ski to help prevent snags and damage to equipment.

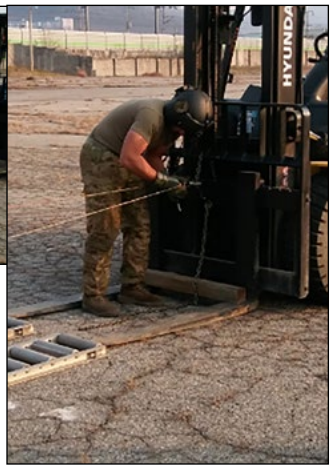
The FA Soldiers constructed a tow bridle for the LPC using the chain and pintle.

Shoring preparation was a team effort and arguably the most tedious and time-consuming task.

Using eight conveyor rollers (spread two rollers by four rollers) allowed the HEMTT crane to remain outside the rotor disk. During cold-load operations, splitting the rotors in a "Y" configuration aft of the aircraft prevented blade strikes. Although untested, using eight conveyor rollers will keep the HEMTT crane outside the rotor disk during a hot-load.

Additional plywood placed under the ramp extensions was used to open the angle between the ground and the ramp. Ensuring the conveyor rollers were above the ramp extension rollers also proved critical.

The forklift was used as a counter-winch anchor during the off-loading process.



Even when reinforced with rugged tape, the ratchet straps severed due to friction caused from being pinched between the shoring and the conveyor rollers.

MAJ Aris J. Comeaux is currently attending the Aviation Maintenance Officer Course at Fort Rucker, AL. He is projected to be the 25th DIVARTY Aviation Officer while awaiting his next KD opportunity. Prior assignments include Brigade Aviation Officer, 210th Field Artillery Brigade, Camp Casey, Korea; Calculus II Instructor, United States Military Academy, West Point, NY; Aviation Basic Officer Leadership Course II Small Group Leader / Instructor, Fort Rucker, AL; Commander, B Troop, 6-17 CAV, Fort Wainwright, AK; Squadron S4, 6-17 CAV, Fort Wainwright, AK; Platoon Leader, C Troop, 6-17 CAV, Fort Wainwright, AK/ Wheeler AAF, Hawaii. MAJ Comeaux has deployed to Iraq and is qualified in the OH-58D.

MAJ Aaron L. Kearney is currently serving as Executive Officer, 101st Combat Aviation Brigade (CAB), Fort Campbell, KY. His previous assignments include Executive Officer, 5-101st Aviation Regiment, Fort Campbell, KY; Brigade Aviation Officer, 210th Field Artillery Brigade, Camp Casey, Republic of Korea; Doctrine Branch Chief, Directorate of Training and Doctrine, United States Army Aviation Center of Excellence, Fort Rucker, AL; Company Commander, Headquarters and Headquarters Company, 3rd CAB, Hunter Army Airfield, GA; Commander, A Company, 2-3rd General Support Aviation Battalion, 3rd CAB, Hunter Army Airfield, GA; and Platoon Leader and Assistant S-3, 1st Air Cavalry Brigade, Fort Hood, TX. MAJ Kearney has deployed to Iraq and Afghanistan. He is qualified in the UH-60A/L/M.

APU - auxiliary power unit
ATP - Army techniques publication
BHA - boom and hoist assembly
CAB - combat aviation brigade
FAB - field artillery brigade
HEMTT - heavy expanded mobility tactical truck
HICHS - helicopter internal cargo handling roller system
LLM - launcher loader module
LPC - launch pod containers
MLRS - Multiple Launch Rocket System
POC - proof of concept

The Information Revolution in Warfare

By LTC Lee Ambrose

The Information Age has fundamentally changed warfare, comparable to the effects the Industrial Revolution had leading into World War I. Leaders can no longer command at the organizational level as they have in the past and be successful against a near-peer threat. The speed and availability of information, moving from national assets across the globe to tactical leaders on the battlefield, can now accelerate the decision-making process providing a decisive advantage over the enemy. The temptation in this environment of on-demand information is that an organizational leader abandons mission command principles and becomes a direct leader, thoroughly negating the advantage provided by the technology and retarding smooth operations. We must now, more than ever, inculcate in leaders of all levels the doctrine of mission command while adapting our thinking regarding planning and execution to include new domains of warfare and methods of execution.

A leader at the organizational level (a unit of such size or complexity where the leader can no longer directly influence individual elements) must ask these salient questions-

1. Am I the best person to make this decision?
2. Do I have the right information to make this decision?
3. Can I make the decision fast enough to be effective?
4. Have I used every domain to my advantage, to include cyber, space, air, electromagnetic, and ground?

Am I the Best Leader to Make this Decision?

In many cases on the modern battlefield, the organizational leader is no longer the best person to make a given decision and we are faced with what is known as an inversion of expertise. The junior leader in the field, armed with guided initiative, is usually the best decision maker in accordance with Army doctrine and mission command philosophy. So, why is it that junior officers often laugh when asked if they feel empowered by their senior leaders? This is due to legacy organizational leaders use of the technology of rapid and redundant communications to extend direct leadership throughout a larger organization; some might uncharitably say micro-manage. Instead of using the technology to their advantage, leaders, in order to extend direct leadership to larger organizations and distances, completely negate the advantage provided by the technology. These leaders place themselves in decision making situations that they were unable to be a part of in the past, assuming that their rank or position makes them best suited to make the decision - often a false assumption. If subordinate leaders are given good commanders' intent and mission orders at the start of an operation (or in training prior to execution), then the speed provided by the new technology can be used to fight the enemy in near real time, denying their maneuver space in any domain. Armed with rapid communications and situational awareness, the empowerment of junior leaders (often with the best knowledge of a given situation) through mission command and enabled by technology can make the difference in thwarting an enemy attack or enabling our own maneuver.

Do I Have theRight Info and Can I Act Fast Enough?

Simultaneous communications, such as internet relay chat, have enabled us to communicate with large groups in near real time allowing for a shared consciousness approach to knowledge management as opposed to information stove pipes. Remember how long it used to take to execute a telephonic alert roster? Now you can update an entire

unit with one Facebook post. In minutes, the President can change the course of

a nation with a tweet, or a terrorist can coordinate an attack across the globe from a cave. The speed of information matters. What if the military knew we were under a planned multi-phased terrorist attack minutes after the first airplane struck the World Trade Center on 9-11? How would we have been able to affect the enemy's plan? Unmanned aircraft systems (UAS) operations in Iraq during the surge provide a telling example of stove piping information. En route to Baghdad, a UAS operator was asked why his sensor was stowed while flying over Route Tampa. The UAV platform was passing over the worst improvised explosive device (IED) hotspot in Iraq for an hour without looking down at the road. His response was something to the effect of "the customer is in Baghdad." So not only was an opportunity lost to surveil an important route to help combat the IED threat, the video feed generated was not even shared with the multiple units in the area that could have used it. Distinctions must be made between what can be shared and what must be limited to specific operations. Once done, video feeds can be made available to all, much like mIRC* or social media, increasing the shared consciousness and mission command capacity.

Have I Used Every Domain?

One must ask why the Army doesn't focus more on cyberspace operations down to the tactical level of war now that everything we do depends in some part on cyber and satellite technology. We can no longer think of cyber as its own branch; cyber operations must be a domain in which every branch maneuvers like air and ground. It took decades to efficiently integrate Army Aviation into maneuver as the cultural norm. If we take as long to integrate cyber, we will surely lose our asymmetric advantage. For example, an Army Aviation deliberate attack against a near peer threat must include cyber-attacks on enemy radar and communication networks, combined with jamming and UAS reconnaissance before the first attack aircraft leaves the ground (if we plan on the manned platforms returning). The cyber domain has become one of the most important of any military operation, yet we almost ignore it at the tactical level. Do commanders think of social media as an offensive weapon? Has a "cyber feint" ever been used by a unit in a combat training center rotation? Does the S-6 advise planners on how to prevent Global Positioning System jamming in an operation? Are enemy radars susceptible to a virus delivered through a cyber suppression of enemy air defense plan? Can we protect friendly communications and navigation networks? These are just a few of the cyber-based questions (potentially out of hundreds) that should be considered when planning and executing an operation down to the battalion level.

No one with an understanding of Army operations pre-9-11 would argue, that since 9-11, the Army's ability to plan and execute force-on-force operations against a peer threat has decayed. While well understood, solutions remain elusive. Simply reverting to the training exercises of the past is not the answer. The Army must allow proven training techniques and scenarios from the past to more thoroughly integrate emerging technologies and techniques enabled by the information age. Simultaneously, we need to adapt our instructional methods to challenge the next generation of soldiers. The four key questions discussed help frame the integration of informational age technologies without diminishing mission command principles.

*An internet relay chat program developed for Windows.

LTC Lee Ambrose currently serves as an instructor with the Army Joint Support Team at Hurlburt Field, FL. His previous assignments include Deputy Director, Directorate of Evaluation and Standardization; S-3, 110th Aviation Brigade; Executive Officer and S-3, 1-2nd Aviation Regiment. LTC Ambrose has 18 years of Army Aviation service. He is an AH-64D pilot-in-command and served as a basic combat skills flight instructor in the OH-50A/C. He has multiple deployments to Iraq and Afghanistan.

Acronym Reference

IED - improvised explosive device
UAS - unmanned aircraft system
UAV - unmanned aerial vehicle

By MAJ Chris Zotter

Army Aviation and the teams at Shark Week have an awful lot in common. We both have a mission to go out into challenging and dangerous environmental conditions, find and report on a reconnaissance objective, and live to do it all again the next day. For Army Aviation, we have priority intelligence requirements (PIR) to answer, while Shark Week has research questions to answer. For practical matters, you can consider both reconnaissance objectives. Army Aviation has the added complexity of needing to kill that objective at times. The two areas where we both have a lot in common are research & development (R&D) for fielding the right sensor to answer our reconnaissance objectives and determining which missions should be accomplished with manned platforms vice unmanned platforms.

As the 2015 season of Shark Week ended, the research teams assessed what they accomplished, refined their reconnaissance objectives for the following year, and identified the capability gaps preventing them from meeting those objectives. How they went about resourcing those capability gaps for 2016 holds some great lessons that Army Aviation leaders should consider as we look to resource our own capability gaps going forward. Some of the reconnaissance objectives posed for 2016 were: How does the great white hunt at night? Where and how does the great white rest? Where are the great white nurseries? Modified slightly, these research questions bare a lot of similarities to our own PIR in current operations. While the Army normally operates on programs out to 7 years or more, the teams at Shark Week operate more nimbly on a one year cycle to impress their seasonal viewers with better research and better shark footage. Additionally, the teams at Shark Week developed plans to employ a mix of both manned and unmanned platforms to answer these questions, much like Army Aviation does today.

The 2016 season of Shark Week was full of excitement, but undoubtedly the most important lesson I took away was how much more effective remotely operated sensors were than manned platforms. The majority of manned missions during the 2016 season of Shark Week entailed a significantly higher risk level, they were clumsy, they required more life support, they disrupted the environment they were collecting on, they required a much bigger sustainment tail, and frankly they did not perform as well as the remotely operated systems did. On the other hand, the collection of data through sensor tagging and remotely operated surveillance systems, like the SharkCam, provided incredible information at a much lower risk level and a smaller forward logistical footprint. When an autonomous system can dive two thousand feet under water, swim in formation with a great white shark, and conduct measurements in addition to provide 360 degree field of view video today, I can only imagine what we should be able to get autonomous aerial reconnaissance systems to do. One more important point to note is that the remotely operated systems capabilities were good, but they could have been better if they didn't have to compete with the R&D and resourcing requirements for the manned platforms. All great lessons we should consider as we look to increase the lethality of Army Aviation for multi-domain battle (MDB).

As the 2017 Army Aviation Mission Solutions Summit ended, one of the biggest headlines to make the national rounds was that armed reconnaissance is Army Aviation's biggest capability gap, and we would like to fill that gap with a light armed helicopter. While I would not argue that we have a capability gap in armed reconnaissance (being able to find what you are looking for, and kill it), I would argue about how we should fill that gap. Rather than deciding on a platform to fill a capability gap, we should focus more on what the requirement is to close that capability gap. Is it more assets reporting to the brigade combat team (BCT) commander, more timely information, better analysis of information reported, faster and better identification of enemy targets?

I would argue that Army Aviation's capability gap in armed reconnaissance is largely rooted in sensors, and not any specific platform. When you consider that we have been flying helicopters and fighting in Afghanistan for 16 years and we generally don't know where and when the enemy fires at us until post-flight, I would say we continue to have an unfilled sensor capability gap. Our sensors are what should allow us to find the enemy before they find us, yet that is not always the case and is likely the root cause of our biggest capability gap. I couldn't imagine watching Shark Week for 16 years as sharks took nips and bites of the underwater researchers without them seeing the shark first, yet that is our current state.

While the mark-1 eyeball is one of the best sensors available to a ground commander, limits of distance, light, and defilade reduce the capability of the eye to detect enemy forces. However, in some cases, the naked eye is the preferred sensor. For example, while clearing a range of civilians in the daytime, the eye and brain can quickly scan a wide area in a matter of seconds. Attempting to conduct that same task with the sensor on a Shadow unmanned aircraft system (UAS) or Apache would require several minutes due to a narrower field of view and fewer indicators in the field of view for your brain to process. However, conduct that same task at night, and the naked eye is no longer the preferred sensor due to the lack of light, so the task must be conducted using some form of sensor. Consider though, the same task being conducted at night, but now you have individuals on the range, in defilade because they don't rely on air superiority. Both the eye, and the sensor are unable to find the individuals, even if they are shooting at you as you fly past. That is the essential challenge we face today and will continue to face in the future.

As Army Aviation continues to fight in a counterinsurgency (COIN) environment today, while training and showing strength in a decisive action (DA) environment, and looking towards the future of a MDB, we must focus new capabilities on meeting our reconnaissance objectives beyond visual detection. Having an armed reconnaissance platform that can detect localized Global Positioning System spoofing, triangulate radio jamming, collect on the electronic spectrum of integrated air defense, and detect both conventional forces and irregular forces through a blend of infrared, moving target indicator, acoustic weapon signatures, visual changes, or other future developments would probably serve us well. By planning to field these capabilities in a remotely operated or autonomous system, we would allow for much greater capacity than if we looked towards fielding another light manned helicopter. Additionally, we should be considering what our capability gap could look like a few more years down the road as we begin to un-package multi-domain reconnaissance and all the potential that it will hold for a BCT commander.

When we consider the requirement for armed reconnaissance, we should also be looking at other options for providing fires and effects than to consider only the platform that is flying. You can kill a lot of systems on the battlefield armed only with a map and a radio if you have the right sensor and effects available. We should ensure that any new platform is focused onreconnaissance capability first, with the tools to reach back for the right effects (cyber, electronic warfare, fires, etc.).We might be able to meet the requirement of armed reconnaissance (finding the enemy and killing them) with a platform that has no direct fire weapon systems at all, but one that can communicate and leverage cross-domain fires as a means to kill or temporarily overwhelm an enemy force once located. When considering that every additional pound of direct fire system added to a reconnaissance platform is one less pound available for sensors or fuel for station time, we could easily tilt capacity away from finding the enemy. We usually do fairly well killing the enemy once we find them, but gaining and maintaining contact with the reconnaissance objective is usually the toughest part of any reconnaissance mission.

Some might say we have this already with the manned-unmanned teaming (MUM-T) of Apaches and Shadows, but MUM-T has not realized its full potential yet because we did not design our requirements considering both a DA and a COIN environment and instead focused mostly on the immediate demand for full motion video in a static COIN environment. Consequently, our Shadows are not as expeditionary as our aviation task forces and they often get left behind in a DA environment. The National Training Center is a perfect example of this if you think otherwise. Furthermore, to improve MUM-T, we need more

sensor cross cuing and digital target sharing for an MDB environment. Yes, it's helpful to verify target handovers from a Shadow by verifying what their video is looking at, but in a MDB environment we need to trust our sensor operators and update our common operating picture with digital target handovers to increase the speed of our decision and targeting cycles. Even better, would be more autonomous processing of threats detected in extra wide fields of view to make the sensor more capable of conducting reconnaissance.

Before looking forward, we should also look back a few years and reflect on how slow the Air Force was to recognize the future of remotely operated systems over the previous decade and a half and ask ourselves if we are being visionary enough in what capabilities we need to best support the maneuver and combatant commanders. Are we being stubborn in remaining committed to a light helicopter for armed reconnaissance? Sure, all commanders need more reconnaissance assets, but is a light helicopter the best way to close Army Aviation's greatest capability gap? Could we meet the requirement with a different alternative, maybe an offshoot of a current UAS? How many more dollars would we be able to pour into advanced sensor development and autonomous control if we didn't pursue a light helicopter at this time? We should also be careful that we stay focused on the actual requirement of armed aerial reconnaissance to close our capability gap, without letting a specific platform become the requirement. Otherwise, we may find ourselves with the platform we asked for, but the same capability gap after twenty years.

As we consider the future operational environment that Army Aviation will fight in, where we can expect to be outmanned, outgunned, outranged, and outdated across a multi-domain battle; we need to take a hard look at what will best meet our armed reconnaissance capability gaps. If we expect to be outmanned, we should be looking for ways to do more reconnaissance with less people. If we expect to be outgunned, we should be looking for ways to employ systems that are more stealthy and expendable. If we expect to be outranged, we should be considering ways to operate and employ effects deeper into enemy territory. And if we expect to be outdated, we should be considering ways that we can rapidly acquire and field new systems or upgrades to current systems, specifically more plug-and-play type sensor improvements to overcome enemy countermeasures to our current sensors.

At a congressional roundtable discussing future vertical lift (FVL) two years ago, one of the questions asked was how we are building survivability into FVL. Our congressional leaders are well aware of the risks in developing new systems and placing manned platforms in environments where we could use remotely operated systems instead. The frame of reference we go back to of light manned helicopters operating at tree top level spotting enemy forces is probably a false hope in a multi-domain battle. Sure you can put a person inside a shark cage to see what a shark is doing below the surface, but why would you when you can do the same mission for a longer period of time, and collect better results with a lower risk level with autonomous systems? We should take a lesson from Shark Week and invest our limited R&D money in improving our sensors and our autonomous and remotely operated systems to close our armed reconnaissance capability gaps. Once we find the enemy, we can employ a range of effects through MUM-T, direct and indirect fires, cyber, and electronic warfare to kill or overwhelm them. If you have time this summer, I would recommend coming down from flight level to go underwater with Shark Week for a few episodes to get a glimpse of the advances they are making and imagine how we could do the same for Army Aviation.

MAJ Chris Zotter is currently serving as Executive Officer, Task Force Tigershark, 1-229th Aviation Regiment. His previous assignments include OH-58D mechanic; Brigade Aviation Officer, 2-2 Stryker Brigade Combat Team; Joint Staff Legislative Liaison; Commander, C Company, 2-159th Aviation Regiment; and Commander, D Company, 2-159th Aviation Regiment. MAJ Zotter has 16 years' service and is currently on his 5th deployment to the Central Command Area of Operations. MAJ Zotter holds a Master's Degree in Policy Management from Georgetown University.

Acronym Reference

BCT - brigade combat team
COIN - counterinsurgency
DA - decisive action
FVL - future vertical lift
MDB - multi-domain battle
MUM-T - manned-unmanned teaming
PIR - priority intelligence requirements
R&D - research & development
UAS - unmanned aircraft systems

Army Air Traffic Control in a Decisive Action Environment

By CPT Brandon Dotson

Army tactical air traffic control (ATC) provides a vital and unique set of mission capabilities for the aviation community in support of training and warfighting operations. With the ever increasing reliance on aviation assets and unmanned aircraft systems, the ability of ATC to conduct this mission directly effects the deployment and projection of combat power. As the Army transitions to decisive operations, focusing on near-peer and hybrid threat scenarios, the safe and successful integration of tactical ATC requires a reconsideration of doctrine and training principles that haven't been applied for well over a decade. This shift in training focus, coupled with new technologies and improved ATC systems, has created an opportunity for the air traffic services community to grow in knowledge, experience, and capability while providing a safer operating environment for Army aviation operations.

It is essential that ATC Soldiers are trained and ready to deploy to austere environments with short notice, and F Company "Skymasters," 6-101st General Support Aviation Battalion, Combat Aviation Brigade (CAB), 101st Airborne Division has spearheaded this initiative with their own "Air Assault" twist. In order to validate collective unit readiness, F Company deployed the Air Traffic Navigation, Integration, and Coordination System (ATNAVICS); the Tactical Airspace Integration System (TAIS); the Tactical Terminal Control System (TTCS); and maintenance support teams to the National Training Center (NTC) Rotation 16-09 in August 2016. Through the non-standard implementation of organic capabilities, they used this training rotation to identify key areas where tactical ATC can be more effectively applied in a decisive action environment. Among the many lessons learned from this exercise, F Company demonstrated the significance of controller cross-training between ATC systems, the importance of home station controller training, and leveraging garrison ATC facilities.

The ATNAVICS radar system allows the CAB to project aviation assets during degraded weather conditions. Controllers provide vertical and lateral terminal approach guidance to an aircraft, directing it to a point in space 200 feet above the ground. This capability allows the CAB to safely recover aircraft to a field site in conditions of limited visibility and low ceilings, rather than redirecting them to an alternate landing site and disrupting future operations. While this system is typically used at improved airfields, F Company controllers developed tactics, techniques, and procedures for rapid system setup and efficient airspace integration to conduct non-traditional ATNAVICS radar approaches to unimproved helicopter landing zones. Utilizing Digital Terrain Elevation Data and the Aviation Mission Planning System, the ATNAVICS team significantly reduced setup time by two orders of magnitude to complete 23 precision radar approaches during the rotation.

When coupled with an external radar source, TAIS tracks aircraft in near real-time and provides a common operating picture of aircraft traffic, air routes, and gun target lines for both air traffic controllers and the command post. The F Company operators successfully

Figure 1 – The Air Traffic Navigation, Integration, and Coordination System (ATNAVICS) at the National Training Center.

Figure 2 – ATC controllers assigned to F/6-101ST AVN practice sling load operations with the Tactical Terminal Control System at Fort Campbell, KY.

integrated TAIS into the culminating brigade combined arms live fire exercise (CALFEX) by deconflicting fires to guide aircraft to the forward line of troops.

The TTCS is a mobile communication system mounted on a M1097 high mobility multipurpose wheeled vehicle. The system is used to provide air traffic services and a temporary control tower during expeditionary aviation operations at remote landing zones, drop zones, pick-up zones, and temporary airfields. After coordinating with Fort Irwin controlling agencies, F Company controllers directed arriving and departing helicopter and unmanned aerial vehicle traffic at multiple tactical assembly areas (TAA) from their TTCS.

The speed and efficiency of air assaulting F Company personnel and their TAIS, TTCS, and ATNAVICS was demonstrated when CAB CH-47 and pathfinder assets were used to quickly establish air traffic services at forward TAAs to rapidly mass combat power. In addition to rigging and inspecting the sling loads, the controllers and pathfinders would identify and mark suitable aircraft landing zones and parking areas well before the main element of aircraft would "jump" to a new TAA. Such markings, coupled with an ATNAVICS precision radar approach capability increased the aviation commander's flexibility in this decisive action environment. This not only increased the effectiveness of the unit's air assault maneuvers, but also provided an added layer of safety controls not normally exercised in aviation field operations.

Figure 3 – Sling load operations with the Tactical Airspace Integration System at NTC.

Before collectively implementing these ATC systems at the NTC, F Company trained extensively to gain proficiency with each system by increasing garrison training support and through a series of field exercises and mobile training events at home station. By leveraging the entire 101st CAB's training schedule, teams from the Mobile Tower System and TTCS supported multiple iterations of helicopter aerial gunnery by providing expeditionary tower operations at multiple forward arming and refueling points and TAAs. Additionally, they conducted multiple "rapid deployment" training missions and system battle drills in order to build individual team proficiency. Whenever the opportunity presented itself, ATC teams were inserted into the CAB's company and battalion level training events to take advantage of valuable training opportunities. The home station training helped to produce competent, tactical controllers that would be prepared and confident to execute expeditionary ATC operations.

Five months prior to conducting the first precision radar approaches at NTC, F Company did not have any qualified ATNAVICS Soldiers. A mobile training team from the Air Traffic Services Command (ATSCOM) conducted three weeks of instruction at Fort Campbell in order to train and rate several air traffic controllers and examiners. To prepare for the NTC rotation, the ATNAVICS section was setup at Sabre Army Airfield for over three months to allow the controllers to develop the necessary skills and proficiency. The system was flight-checked by an ATSCOM C-12 inspection aircraft to certify its use for radar approaches into Sabre Army Airfield. As their proficiency increased, F Company ATNAVICS controllers and examiners deployed to conduct hands-on equipment training with Indiana National Guard controllers. The intensive train-up, the opportunity to train another unit, and the opportunity to operate the system on Sabre Army Airfield allowed the ATNAVICS team to become extremely proficient in system setup and operation. In the five months prior to deployment to NTC, F Company controllers logged over 200 precision radar approaches.

Pre-deployment training also included practicing and refining air assault and pathfinder skills during home station training events. These skills included rigging equipment such as the TTCS, shipping containers, fuel blivets, trucks, water trailers, and generators and guiding CH-47s in for hook-up and delivery to and from different training areas under day and night conditions. Taking advantage of pathfinder coded positions, F Company sent 15 Soldiers through the Pathfinder Course at Fort Campbell to improve the Company's tactical air traffic controller's combat capability.

As they continued training and perfecting individual skills, F Company Soldiers contributed ATC support to Eagle Radio flight following and the control tower at Sabre Army Heliport. These positions provided ATC controllers a unique

Figure 4 – The Tactical Airspace Integration System (TAIS) during a combined arms live fire exercise at Fort Campbell, KY.

opportunity to earn Federal Aviation Administration (FAA) tower, radar, and airspace ratings while also supporting 24/7 aviation operations at Fort Campbell. By having over 15 Soldiers enrolled in these garrison training programs, tactical ATC personnel were able to greatly enhance proficiency and basic controlling ability when not deployed in a field environment. For example, prior to being considered for a tactical rating on the TAIS, F Company Soldiers were assigned to the Eagle Radio Airspace Information Center to learn airspace control and radar flight following procedures. With higher traffic densities, coupled with more conservative FAA training and currency requirements, trainees assigned to such facilities typically develop overall airspace control skills and a mastery of basic ATC phraseology. In turn, these abilities directly translate to increased controller competence and proficiency in their assigned tactical ATC system. By leveraging and balancing these training opportunities and partnerships with installation facilities, F Company was able to significantly improve Soldier tactical ATC competencies.

One of the most significant lessons learned from deploying tactical ATC in a decisive action environment at NTC is the overall importance of controller cross-training. Historically, tactical controllers could go most of their careers without being rated on more than one type of ATC system; with Soldiers being broadly grouped into tower, radar, or flight following categories. However, when exercising the organic capability of a tactical ATC company in an expeditionary and decisive action environment, having competent controllers qualified in different systems that speak a common language is paramount. The ability to understand each of the assigned ATC systems, how they collectively function, their physical limitations, and system requirements greatly enhances a shared safety and operational picture between ATC system operators. This interconnected network of collective ATC systems, ultimately provides greater capability, flexibility, and safety for both aviation and ground commanders - particularly in a decisive action environment.

Since its successes during the NTC 16-09 Rotation, F Company has continued to push the boundaries of ATC training. They have conducted multiple training missions with all four ATC systems working collectively in support of the 101st CAB and 101st Airborne (Air Assault) Division ground assets. In this capacity, F Company has completed three rotations at the Joint Readiness Training Center and three iterations of battalion and brigade level CALFEXs. During these CALFEX missions, controllers successfully assumed control of airspace on the Fort Campbell Training Reservation from garrison facilities in order to help facilitate ATC training in a tactical and decisive action environment. During these missions, F Company assets provided airspace deconfliction, expeditionary airfield operations, and aircraft control in order to synchronize rotary-wing aircraft, A-10 fixed-wing close air support, artillery live fire, helicopter gunnery, and unmanned aerial vehicle assets. This level and

Figure 5 – ATC controllers assigned to the Mobile Tower System perform expeditionary airfield operations at Fort Campbell, KY.

Figure 6 – The Air Traffic Navigation, Integration, and Coordination System undergoes a flight check by the Air Traffic Services Command (ATSCOM) C-12 inspection aircraft at Sabre Army Airfield, Fort Campbell, KY.

intensity of ATC training would not be possible without an unparalleled focus on home station exercises, controller cross-training, leveraging installation ATC facilities, and incorporating non-standard ATC system implementation.

Army tactical air traffic control provides an irreplaceable set of mission capabilities for the aviation and ground force commander in a decisive action environment. With increased emphasis on collective interaction between complex ATC systems and Soldier cross-training, while also simultaneously maximizing home station training opportunities, tactical ATC units can directly influence the projection of combat power. Moreover, non-standard applications of ATC systems such as the TAIS and ATNAVICS in an expeditionary setting, as demonstrated by F Company at the NTC, ultimately helps to facilitate both the safe and expedient passage and recovery of combat aviation assets. It is for these reasons that aviation leaders and units across the Army must remain incessantly focused on improving and maintaining air traffic control readiness, capability, and knowledge.

Figure 7 – The first Air Traffic Navigation, Integration, and Coordination System precision radar approach being conducted at the National Training Center by a CH-47.

CPT Brandon Dotson is currently serving Commander for F Company, 6-101st Aviation Regiment. Previous assignments include Assistant S-3 and Flight Operations Officer, 1-101st Aviation Regiment; Platoon Leader, A Company 1-101st Aviation Regiment; and Battle Captain, Combat Aviation Brigade, 101st Airborne Division. CPT Dotson deployed in support of Operation Resolute Support and Operation Freedom Sentinel. He has 7 years of service and is qualified in the AH-64D and AH-64E.

Acronym Reference

ATC - air traffic control
ATNAVICS - Air Traffic Navigation, Integration, and Coordination System
ATSCOM - Air Traffic Services Command
CAB - combat aviation brigade
CALFEX - combined arms live fire exercise
FAA - Federal Aviation Administration
NTC - National Training Center
TAIS - Tactical Airspace Integration System
TTCS - Tactical Terminal Control System
TAA - tactical assembly area

Attack Helicopter Operations in the Combined Environment

Captain Anthony S. Pelczynski
Company Commander
5th Battalion, 501st Aviation Regiment
Camp Eagle, Wonju, Korea

Captain Cho, Choon Ho
Company Operations Officer
105th Attack Helicopter Battalion
31st Aviation Group
Army Aviation Command, Republic of Korea

INTRODUCTION

Today, multinational forces quickly are becoming a normal way of conducting strategic, operational, and even tactical operations. Officers and soldiers must face the reality that they may someday be directed in battle by a commander from another country. Attack helicopters are an essential element of the combined arms team. With training, attack helicopters easily can be placed under the operational control of a commander from an allied nation. Learning about attack helicopter operations in a combined environment is important to all aviation leaders.

In Korea, interoperability between the Armed Forces of the Republic of Korea (ROK) and the U.S. Armed Forces is essential to successful military operations on the peninsula. Preparing our two great armies to fight side–by–side in the region of the world where the last vestige of the cold war still looms over the ROK is a continuing challenge.

The ROK Armed Forces are well trained and very capable. They have invested a great deal of time and money in high-tech weapons and force restructuring. This year, the ROK has assumed command of the Combined Forces Command, Korea, which includes all U.S. ground forces. The U.S. Government remains committed to being a part of the South Korean defense plan against a possible North Korean aggression well into the next century. Our two forces are strongly linked by a common cause and purpose.

To prepare for war, U.S. and ROK Forces conduct combined training at all levels. Major exercises, such as Team Spirit and Ulchi-Focus Lens, rehearse large–scale operations and tactical scenarios involving divisions and brigades. While other smaller exercises and ranges work the smaller units' capabilities. On a monthly basis, attack helicopter battalions in the ROK have the opportunity to train with ROK ground forces. Conducting attack helicopter training under the operational control of a ROK commander with ground troops presents some unique challenges.

DOCTRINE AND TACTICAL PROCEDURES

Our operational doctrine and tactical procedures are similar and compatible. The ROK has purchased most of its military hardware from the United States and, therefore, has adopted much of the doctrine and force structure to support the equipment.

As a result of our similarities, the ROK and U.S. Forces have developed a closely knit force that operates as one combined army. Still, there are some minor obstacles when combining U.S. attack helicopters in support of ROK ground forces. These obstacles can be overcome through effective training and good communications.

One obstacle is that ground commanders always do not understand how to successfully employ the attack helicopter assets assigned. This problem exists in both our armies. However,the ROK has had the AH–1 Cobra helicopter only since 1988. Many of its ground commanders have had limited training exposure to attack helicopter operations.

Also, during training, we send only a company–sized element to support a range. This is done to conserve our limited resources and maximize our training opportunities. Some commanders may view this as standard operating procedure.

This problem can be solved by conducting combined operations training as often as possible; and by teaching our capabilities and limitations at every opportunity available, whether it is during a coordination meeting or an officer professional development session. Effective communications between the ground commander and the attack helicopter commander will resolve many of the problems during the onset of war.

COMMUNICATIONS

Language remains the foremost barrier to effective communications during combined operation between ROK and U.S. Forces. An interpreter is needed to conduct joint coordination meetings. During coordination meetings, the U.S. liaison officer (LNO) is assisted by a Korean Augmentee to the U.S. Army (KATUSA).

These young enlisted soldiers are members of the Korean Army but work directly with the U.S. Army throughout their enlistment. They have a good command of the English language, but do not always possess the tactical acumen required to successfully translate the information being passed. At times, hand gestures and simple drawings are needed to communicate.

ROK planners usually will have detailed graphics of the operations plan, but these too require translation. Their graphic symbols are the same as ours;however, Hangul, the Korean language, is difficult to read unless one is fluent. The most important thing to remember is to try and understand fully the operation plan and the commander's intent by whatever means available.

The attack helicopter air battle captain (ABC) must conduct detailed planning and precise execution when supporting ROK units. He also must remain flexible enough to meet the challenges on the fluid battlefield. Understanding the commander's intent assists the ABC when the ground commander has to change the plan to meet the enemy. Communications between the ground commander and the ABC during a rapid mission change is difficult. One solution is to assign an LNO to the supported commander's operations center. The LNO, assisted by an interpreter, will be able to advise the ground commander on the best use of the attack helicopters as well as provide effective communications with the ABC. Another solution is to assign a ROK aviation officer to the attack battalion to serve as an LNO. The ROK LNO can assist during coordination meetings and handle all Korean language traffic over the radio during the missions.

Radio communications also can affect the operations. U.S. and ROK ultrahigh frequency (UHF) and very high frequency (VHF) bands are compatible. This provides excellent communications between the ABC and the supporting Air Forces during joint air attack team (JAAT) operations. However, the ground forces use only nonsecure, single channel frequency modulation (FM) radios. This is in contrast to the frequency hopping, secure single channel ground and air radio system (SINCGARS) FM radio system of the United States. The problems of nonsecure radio conversation can be minimized by detailed planning and the use of code words.

BUILDING CONFIDENCE BY COMBINED TRAINING

Each time we conduct a combined operation, both the U.S. and ROK participants benefit immensely from the experience and exposure to each other's operational procedures. Both sides remain flexible to changes. Attack helicopter ABCs must understand the Korean commander's intent to complete the mission according to the ground commander's course of action.

On the other hand, the ground commander must understand the attack helicopter's capabilities and limitations to effectively use the deadly power of the attack helicopter. As we do with our own ground forces, Army Aviation must sell itself and emphasize its abilities to become a decisive asset on the battlefield.

The opportunity to do this is during combined operations training. JAAT and air assault security missions involve close coordination between the U.S. and ROK Forces and give prime opportunity for both to learn and rehearse our wartime missions.

CONCLUSION

Combined operations between Korean and American Forces are an essential element of the defense plan for the ROK. As members of the Combined Aviation Force, the 5th Battalion, 501st Aviation Regiment (U.S.), and the 105th Attack Helicopter Battalion (ROK) have had the opportunity to conduct many joint and combined operations.

One important lesson to be learned is to remain flexible, but insistent when working with the ground commander to adhere to the doctrinal employment of his aviation forces. The lack of an habitual relationship with any one ROK unit has caused us to continuously face the same stumbling blocks during the coordination meetings and execution of the missions.

We have proven to ourselves and our Korean counterparts that U.S. and ROK Army attack helicopter units can and will continue to be a vital asset during any political conflict. Fighting side–by–side, in a combined effort we can maximize our combat power regardless of which country we support.

Army Aviation Requires Two Warrant Officer Tracks at the Company Level: Trainers & Maintainers

By MAJ Michael C. Shaw
and Mr. Justin M. Witty

PROLOGUE

In the April-June 2017 issue of *Aviation Digest*, we initiated a yearlong project to discuss "wicked problems", two per edition, which we identify as either an opportunity or a challenge within the Aviation Branch. The core of this endeavor is the Read, Think, Speak, and Write (RTSW) model[1], an ancient Greek construct recently adapted by Benjamin Armstrong in a series of articles titled *Charting a Course for Our Professional Writing*."[2] Our project aims to generate critical thinking and dialogue amongst the aviation branch, those serving in aviation organizations, or Soldiers of other branches. Previously, we explored the opportunity, "*An Invitation to Read, Think, Speak and Write*, and the challenge, "*Is Army Aviation Truly a Profession*." In this issue, we investigate the opportunity "Army Aviation Requires Two Warrant Officer Tracks at the Company Level: Trainers and Maintainers" and the challenge, "Overestimated Self-Perceived Command Abilities of Captains Career Course Graduates: Right or Wrong, You Be the Judge." Each piece is dynamically independent yet complexly interconnected.

Are There Other Options?

The postwar period is often a time for self-reflection and organizational improvement.[3] The United States Army Aviation Center of Excellence (USAACE) and those working in and around its organizations are committed to this expedition. To that end, we see an opportunity for organizational improvement concerning the progression model of aviation warrant officer tracks.

Familiar to all within the branch is the warrant officer development path; pilot, pilot-in-command, and then track a specialty skill such as instructor pilot (IP), maintenance test pilot (MTP), aviation safety officer (ASO) or aviation mission survivability officer (AMSO). This force management construct constitutes the Aviation Branch's developmental pathway for warrant officers; predicated by operational demands over the past 20 years.[4] However, experiences since 2001, tell us that there is a need for change.

The Aviation Branch, at its core building block (company level), **requires** only two warrant officer tracks - trainers and maintainers. Any additional positions should simply be derivations of these core tracks. Training proficient crews that obtain and retain the highest degrees of readiness and delivering sustained and reliable aircraft day in and day out is the heart of Army Aviation. Since the August 2015 swearing-in of General Mark A. Milley, the 39th Chief of Staff of the Army, many of us have heard him say, "Readiness is our number one priority… there is no other number one."[5] In that vein, we recommend that all warrant officers become either IPs or MTPs as CW2s, with only the most qualified warrant officer aviators earning AMSO or ASO identifiers after reaching the grade of CW3. Only warrant officers who have proven themselves to be excellent trainers or maintainers would qualify.

This recommendation varies little from the original intent of either of the ASO or AMSO track. These positions existed for experienced aviators within the warrant officer community who were intended to be knowledgeable advisors to the commander. The most qualified IPs and MTPs should be selected for ASO and AMSO additional skill identifiers to perform those limited task requirements at the company level. This course of action would provide an extra IP and MTP for each company. As a result, combat power and unit collective readiness would increase as more aviators were trained and aircraft availability increased.

What is the Role of the Company Aviation Mission Survivability Officer?

The AMSO track, (TACOPS prior to 2013)[6] has been searching for a clearer, more defined, and quantifiable purpose for their officers.[7] The changing of the track name to more correctly reflect the role they wish to play is just one of the more visible efforts. The AMSO track is relatively young (begun in 1993) and, until recently, possessed a poorly defined job description. As a result, there are questions

surrounding expectation and performance criteria with the AMSO's commanders and with the AMSOs themselves. With little institutional guidance and few regulatory requirements, as compared to aviators in the IP and MTP tracks, the AMSOs relied on prior experiences to guide their tasks within the unit.

The company level AMSO is presently an under-utilized, under-informed, and solitary position most often relegated to management of the Aviation Mission Planning System (AMPS). Force structure billets the AMSO track as a full-time job within the company headquarters, though many might argue that, at present, they lack full employment. Their chronic under-utilization stems from more than a decade of low tech counterinsurgency warfare with little to no air, ground, or radar threat. Tactics varied little and mission planning went the way of the Apache "deep attack."[8] However, a decisive action environment will require the AMSO to operate at a much higher level. Enemy integrated air defense systems (IADS), tactical mission planning techniques, the complexities of aircraft survivability equipment, evasive maneuvering procedures, and aircrew education will become the AMSO's entry level knowledge base. The AMSO's success will be defined by not only knowing classified ranges or how to program the AMPS, but also in knowing how the enemy will array their forces; the ability to teach pilots how to plan missions using aircraft systems and terrain; and how to best maneuver using live, virtual, and constructive training scenarios that replicate a living and thinking peer threat. Reciting ranges inside the infrared spectrum during a pilot's brief is great, though the application of that knowledge by aviators within the organization is what is necessary.

The AMSOs must perform as the tactical linkage between the commander's intent and the readiness of the organization. They are also the primary link between the unit and the battalion's intelligence section (who may or may not understand air threats or airframe complexities). In short, the AMSO's requirements are complex and vital, thus requiring the awarding of the AMSO skill identifier to the most capable IPs. Administrative documents such as *Department of the Army Pamphlet 600-3, Officer Professional Development and Career Management*, does not list tasks an AMSO should perform as a CW2. It does state that "Qualified warrant officers are assigned to company-level AMSO positions as CW3s."[9] Such a definition alone communicates the expectation concerning experience and applicable required tactical knowledge to assist and advise the commander in planning and decision making. *Training Circular 3-04.11, Commander's Aviation Training and Standardization Program*, notes that the AMSO should be designated as a unit trainer, be a simulator instructor/operator, and have advanced training in fundamentals of instruction. All skills that an IP already possesses.

Inside the USAACE, subtle changes to the concept of the AMSO Course are ongoing. To fill a capabilities gap, Fundamentals of Instruction is now part of the AMSO track curricula. This alone emphasizes the importance of training and teaching as a core function of the AMSO. Providing AMPS instruction is also receiving greater focus. However, as an individual 1000 series task within each aircraft aircrew training manual, it is not the responsibility of the AMSO to input unit mission data such as routes, frequencies, or other mission essential information into the AMPS. It is the AMSO's job to train and enable proficiency within company aviators to perform those tasks.

If structured according to this new paradigm, the AMSO's position within the table of organization and equipment would exist, as it does today, inside the company headquarters. However, the relationship and education of the AMSO position would require bringing the AMSO into the "training team" of IPs. The AMSO would be the most talented, tactically driven IP, who would assist the commander in mission design and building readiness as well as communicating and coordinating with the unit SP and IPs. This change would then permit aircrew program management to be the company SP's primary focus.

What is the Role of the Company Aviation Safety Officer?

The ASO at the company level is also underutilized and often left adrift. The ASO's primary function within the company is often focused on organizing the monthly safety brief, ensuring training compliance (i.e. checking sign in rosters), or procuring fire extinguishers. For the most part, the ASO track is not tied to the Army's number one priority - generating unit readiness. It is often perceived as creating unnecessary or distracting secondary tasks unique only to their positional needs, thus consuming readiness. The ASO's focus should be on reducing risk and monitoring safety procedures as it applies to mission planning and execution. However, there is more to it.

Over the past decade of conflict, most Army Aviation aircraft accidents

were not caused by enemy action but rather by pilot error, overconfidence, violations of rules and regulations, environmental factors, or maintenance/material failures. These statistics remain relatively constant even as deployments have reduced in frequency. Thus far, third quarter 2017, Army Aviation has a total of 20 Class A accidents - four more than the entirety of 2016 and nine more than 2015.[10] How is the ASO supposed to mitigate what appears to be poor judgment or a failure of individual proficiency either on the ground or in the air? At the company level, every Soldier in this "profession" is required to understand the technical complexities that accompany their position and thus have the ability to observe, advise, or stop any action that may be dangerous or jeopardize mission accomplishment. The slogan "Everyone is a safety officer," ingrained into our heads since joining the service, applies. So how might an ASO provide more tangible results? Having the skills of a top-notch MTP could be the key since ASOs and MTPs both share a deliberate focus on risk management surrounding aircraft maintenance and operations. Additionally, many of the maintenance failures and physical aviation risks occur with the turning of wrenches or dealing with aircraft faults as they occur in flight.

The ASO is also a "primary adviser to the command team." It is essential that the ASO has insight into daily aviation and ground operations in order to prevent accidents. The key to the maintenance and safety track combination is the requirement for an ASO to have the experience and knowledge to understand, be comfortable with, and be trusted by everyone in the unit. The ASO must have a keen eye to identify an unsafe maintenance procedure, an Occupational Safety and Health Administration (OSHA) violation, or a risky flight operation so the deficiency can be mitigated at the lowest level. Is the CW2 ASO bringing sufficient knowledge, credibility, or experience to the company to prevent the loss of combat resources? Is the CW2 ASO able to integrate risk management recommendations into troop leading procedures?[11] To address these gaps in our company level skills, a paradigm shift in our aviation culture is required. Redefining what the ASO and AMSO mean to our formations and who we select to fill those positions is one way to do that. Providing a top performing MTP with extra safety training and awareness will add skills to an already proven skill set and assist the MTP identify risks that others might bypass.

We the Workhorses

The corollary to the underutilized AMSO or ASO is the overburdened IP or MTP. With the high volume of unit personnel turnover, sustainable readiness goals, objective-T requirements, and named and unnamed operations, there is never a shortage of aviator readiness level progressions, check rides, test flights, proficiency flights, maintenance troubleshooting, and associated paperwork.

The burden induced by personnel turnover becomes the burden of the company standardization section (IPs and the SP). While many IPs love the high annual flight hours and the earned respect for being knowledgeable company workhorses, that seemingly endless workload leads to burnout, feelings of animosity towards other perceived "less busy" tracks, and complacency in getting people certified rather than generating real readiness. Qualifying the company's most proficient IP as an AMSO allows the standardization section to focus on the aircrew training program while permitting a qualified instructor to direct the unit aircrew survivability program within the commander's intent for combat readiness generation.[12] As time permitted, the IP/AMSO would also be able to supplement the standardization section's flight tasks.

Similarly a MTP/ASO would be able to supplement the maintenance and troubleshooting tasks. During Operation Iraqi Freedom and Operation Enduring Freedom, there were never enough MTPs to go around. The insatiable demand for flyable aircraft is, in part, why the number of deployed maintenance contractors have grown exponentially. Twenty-four hour a day operations with limited personnel meant the MTPs were conducting test flights most days, and in some circumstances, even while the MTP was assigned to a quick reaction force. Some units found it necessary to conduct limited night test flights to meet mission requirements. Adding another MTP to each company would make more sense than adding additional risk and increasing the number of contractors to our operations.

Often, MTPs are too busy conducting maintenance and are unable to fly operational missions. In many circumstances, the MTP is performing a last minute test flight, misses the air mission briefing, and must receive an abbreviated mission briefing from the other crew member. Many times while flying on a mission, the MTP will help the crew of another aircraft through a maintenance issue or will actually switch aircraft mid-mission to monitor a potential maintenance

deficiency in order to keep the aircraft in the fight. As training increases to meet readiness expectations, so must maintenance increase to generate the necessary aircraft hours. The ASO tasks at the company level are not taxing. An additional MTP in the unit with the ASO skill identifier would contribute significantly more to the unit aircraft readiness.

Opportunity Abounds

We acknowledge that timelines, career paths, and special skill identifiers will not be linear for every aviator. We also believe this to be a straightforward model with the aviation core skill sets, training and maintaining, forming the permanent foundation for all tracked warrant officers. The immediate benefit to tracking all warrant officers as either an IP or a MTP is building and maintaining combat power at the highest level of readiness. With the changes we have recommended, additional benefits will become apparent within the aviation company. These include:

1. Shared workloads will foster greater teamwork, common understanding, and more time for self-development.
2. There will be a clearer path to increased responsibility and better opportunity for advancement.
3. Synergy and commonality between career tracks will reduce any animosity.
4. The changes will provide a more evenly distributed responsibility model, reduce perceived positional power, and balance flight hours.
5. The IP and MTP tracks will be demistified and result to actual defragmentation of the aviation hard drive, a goal of many senior leaders.[13]

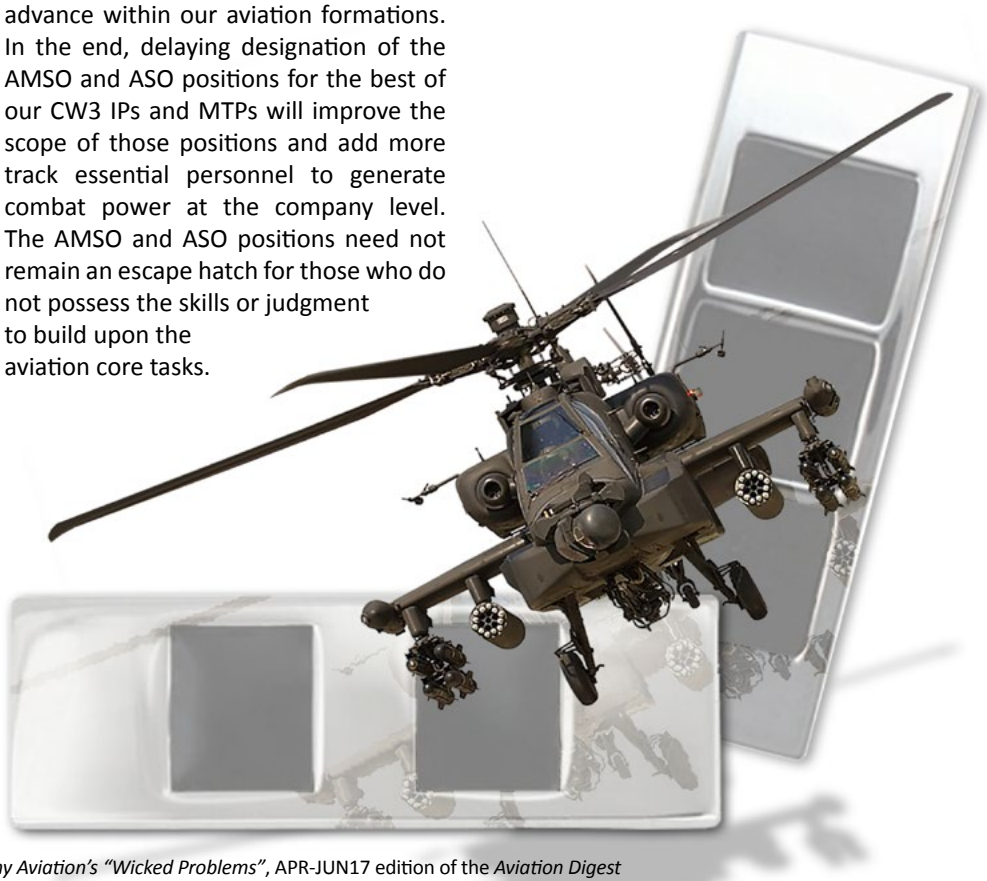
Finally, the proposed changes increase the level of trust for AMSOs and ASOs by company leadership, junior aviators, and Soldiers of the unit; thereby, enhancing the means by which they affect training and can report risk.

We cannot track warrant officers according to the "whatever the company is short of" method any longer. Both the organization and the individuals deserve more than to be placed into a career track without much preparation or expectation. There is a great desire to become a pilot-in-command, select a track, and go to the Aviation Warrant Officer Advanced Course as soon as possible because of the understandable desire to get promoted. The outcome of this pipeline is a generation of younger warrant officers holding more senior positions in which they have neither the experience nor the necessary influence to be successful. The ASO and AMSO positions are not designed to be tasked down. These positions require the highest levels of understanding and initiative. Achieving a greater standard of experience and talent within our existing formations is possible if the ASO and AMSO were additional skills for warrant officers who were already experienced as IPs and MTPs.

Even though there is value added, we would be remiss to ignore the financial costs implied in such a change. We also acknowledge that these figures are merely estimates and that a full concept plan would be required to capture the exact requirement of "faces to spaces" or training seats per year as garnered through the Structure and Manning Decision Review executed by Headquarters, Department of the Army. Since there are real differences in cost between track requirements, all calculations are derived from the most expensive IP and MTP courses. Furthermore, all estimates comprise only active component training seats. Based on an 11 combat aviation brigade model and assuming this design would begin at the company level with new CW2s looking to track, this new paradigm generates a need for one new IP and MTP in every aviation company - equating to approximately 165 additional IPs and 165 additional MTPs. We assumed that company AMSO and ASO positions are two years in duration and, that at a minimum, we need to generate a total of 83 IPs and 82 MTPs. This training increase has an annual estimate of approximately $57.8M per fiscal year in addition to current institutional training costs.[14] This plan does not take into account a potential increase to USAACE requirements such as more IPs to teach or additional aircraft to fly the increased student load. However, it is expected that such a financial cost would be recouped since many warrant officers "dual track" later in their careers, through reduced requirements for

contracted maintenance personnel, and increased aircraft and aircrew operational readiness. Additionally, the cost of this proposal would be more than justified if even one modernized aircraft avoided a Class A accident because of an improved maintenance posture or an increase in aircrew proficiency that will result with these recommendations.

A possible argument against this proposal is the concept that not all warrant officers can or should be an IP or an MTP and that we must provide a separate professional development track in order to retain those officers. The fact is that this proposal's focus is on ensuring that the basic fighting unit in Army Aviation, the company, is optimized for that task. That means increased aircrew proficiency and aircraft readiness, through more efficient training and maintaining, that will determine mission success and failure. If a warrant officer is not capable or does not desire to perform as an IP or MTP, then maybe they do not need to advance within our aviation formations. In the end, delaying designation of the AMSO and ASO positions for the best of our CW3 IPs and MTPs will improve the scope of those positions and add more track essential personnel to generate combat power at the company level. The AMSO and ASO positions need not remain an escape hatch for those who do not possess the skills or judgment to build upon the aviation core tasks.



[1] For more information about the RTSW model read *Army Aviation's "Wicked Problems"*, APR-JUN17 edition of the *Aviation Digest*

[2] Benjamin Armstrong, "Charting a Course for our Professional Writing," *The Military Writers Guild*, www.militarywritersguild.org/rtsw-charting-course-professional-writing/. Accessed 13 Feb. 2017

[3] We use the term postwar with full acknowledgment that OEF and OIR are still ongoing as well as other operations around the world. While some are still deploying the major branches, doctrine writers, and TRADOC organizations have begun to reflect and take a longer view than the next deployment.

[4] TC 3-04.9, Commander's Aviation Mission Survivability Program, 7 Aug 2015, Preface - Page V

[5] Daily, Daniel A., "Cohesive teams will thrive in ambiguity," U.S. Army, 5 Oct 2016, https://www.army.mil/article/175431/cohesive_teams_will_thrive_in_ambiguity. Accessed 20 Jun 2017

[6] TACOPS Officer Track Name Change, CW5 Mike Kelley, Aviation Digest, Jan-Mar 2013, Pg 39, http://www.rucker.army.mil/aviationdigest/images/AVN_DIG_2013_01-03.pdf

[7] The new TC 3-04.9 does a good job of listing tasks associated with the AMSO program though neither author has ever seen a robust operational AMS program as outlined in any aviation company.

[8] There are varying degrees across the mission, design, and series formations to which aviation units retained, practiced, or executed mission planning. Planning over the past decade has usually been reduced to the concept of the operations generation via PowerPoint. There are exceptions to all examples, though overall the force is witnessing planning difficulties in units from a company through brigade. Professional military education students are struggling with basic troop leading procedures and military decisionmaking process concepts and there appears little to no desire for self-development. For these reasons the authors feel confident in saying that we have lost our edge.

[9] DA PAM 600-3 Commissioned Officer Professional Development and Career Management, 2014, Pg 98

[10] U.S. Army Combat Readiness Center, U.S. Army Accident Information Aviation Information Statistics – Fiscal Year End 01 October through 30 September, Jun 2017, Pg 2

[11] DA PAM 385-90, Army Aviation Accident Prevention Program, 24 Feb 2010, Para 1-4m

[12] TC 3-04.11, Commander's Aviation Training and Standardization Program, Aug 2016, Para 2-13

[13] Defragging the Hard Drive: A change in aviation training philosophy, LTC Josh C. Sauls, *Aviation Digest*, Jan-Mar 2015, Pg 5, http://www.rucker.army.mil/aviationdigest/images/AVN_DIG_2015_01-03.pdf

[14] The most expensive IP course costs about $500,000 per student (AH-64E) and the most expensive MTP course nearly $200,000 (CH-47F). IP cost of approximately $41.3M and MTP cost of approximately $16.5M.

Major Michael C. Shaw is currently serving as the Integration Officer, Headquarters, Department of the Army G-3/5/7, Department of the Army Management Office - Aviation. Previous assignments include Executive Officer and S-3, 3-159th Attack Reconnaissance Battalion (ARB) and Commander, A Company, 4-4 ARB. MAJ Shaw is a graduate of the Army's Command and General Staff College, Fort Leavenworth and has a Ph.D. in Human Resource Education and Leader Development from Louisiana State University.

Mr. Justin Witty is a former Senior Instructor at the Aviation Warrant Officer Advanced Course at Fort Rucker, AL. His previous assignment included Commander, C Company, 3-101st Aviation Regiment, Fort Campbell, KY. Mr. Witty has deployed twice in support of Operation Enduring Freedom.

Acronym Reference

AMPS - Aviation Mission Planning System
AMSO -aviation mission survivability officer
ASO - aviation safety officer
IADS - integrated air defense systems
IP - instructor pilot
MTP - maintenance test pilot
USAACE - United States Army Aviation Center of Excellence

Overestimated, Self-Perceived Command Abilities of Aviation Captains Career Course Graduates: Right or Wrong, ... You Be the Judge

By MAJ Michael C. Shaw, Justin M. Witty, and Dr. Michael Burnett

"If you look at readiness, if you look at combat power, the most important element of that is not technology. It's not the guns, the planes, the ships. It's not the weapons. It's not the computers. It's the people, and, most importantly, it's the leaders."

– General Mark A. Milley[1]

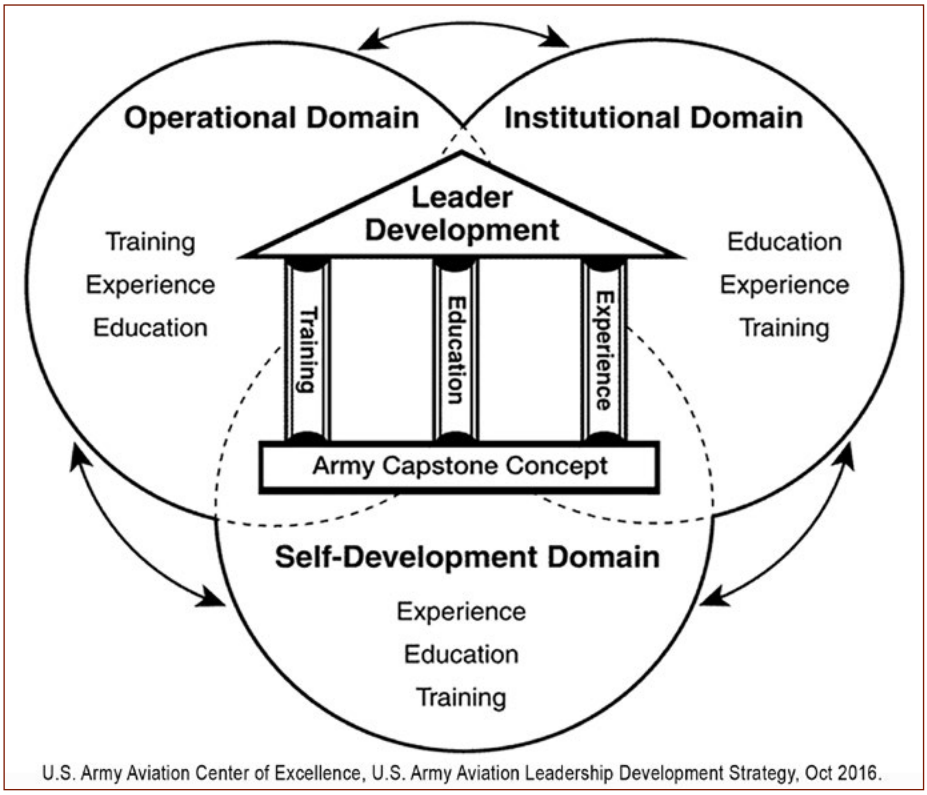
The Why

In 2011, Major Shaw began researching the self-perceived command abilities of captain career course graduates within the Operations Division (OD),[2] formerly known as Maneuver, Fires, and Effects. This research hypothesized that captains career course (CCC) graduates who had previously served in a command assignment would have a higher self-perceived ability to command, than those who had yet to command. This theory did not prove correct; since nearly all the graduates surveyed held their self-perceived abilities in very high regard. The majority of the graduates rated themselves as above average in over 80 different categories, with only 3.8% of the surveyed Aviation Captains Career Course (AVCCC) graduates rating their overall ability as moderate. Not a single officer categorized themselves as "Fair," "Poor" or "Unacceptable."[3] How is it that the preponderance of captains believe that they are prepared for and have amassed the skills necessary for a position that they have never served, and only partly observed?

Through personal experience and interviews with junior officers, it is the authors' personal belief that most officers believe that they will receive specific training for command during the CCC. However, AVCCC is not a company command training course. Rather, it is intended to broaden doctrinal understanding and heighten critical thinking. Command insights are instead garnered through opportunity engagements with senior leaders, perceptions of the small group instructors, or shared experiences from post command peers. In the case of AVCCC, such a differentiation with the program of instruction does not seem to have any bearing on the student's self-perceived abilities. They believe they are ready for the next challenge, even without specific training. So, where does this confidence or over-confidence stem?

If the CCC doesn't train officers to become company commanders, other theories may state that their confidence comes from previous deployments, platoon leader time, or even their age or gender. When looking at the collected survey data, there was no direct connection with any of the demographics or experiences that dictated why AVCCC graduates rated themselves in such a positive fashion. They were confident in their abilities regardless of their rank, age, or professional experience. Some argue that this is exactly what we want in our leaders, people who are willing to lead Soldiers and deal with the unknown, while believing in their heart that they will succeed. Others might also argue a need for aviators who are self-assured, and can lead in the heat of battle, but not be so arrogant that they ignore sound advice from subordinates. Just like an engineer's laser level, there is a faintly perceptible line we must walk between confidence and humility. Such a narrow line poses a supreme challenge to our branch, interweaving subjects that span a wide range of topics from toxic leadership to flight safety.

The CCC, is designed for company grade officers to broaden their knowledge of the tactical level of war, introduce them to the operational level, enhance critical thinking, and share experiences and ideas amongst peers. As an academic program, it also serves as a regulatory milestone in an officer's development.



U.S. Army Aviation Center of Excellence, U.S. Army Aviation Leadership Development Strategy, Oct 2016.

Furthermore, institutional education is the central pillar, alongside operational assignments and self-development, for leader development. This structure is an attempt to reach an optimal equilibrium of "training, education, and experience" within all officers.[4] Just as puzzle pieces connect to unveil a hidden yet expected image, the connection of all three domains reveals an equally obscure, and yet expected, skillset of the participant.

Who are the Aviation Captains Career Course Survey Respondents?

The following information describes the participants and their background and provides potential insight as to their responses to the survey. All of the information extracted pertains to the respondent's status and life experiences prior to taking the survey.

Between 2011 and 2013, 903 student surveys were collected, examining CCC graduate opinions of their self-perceived ability to command to two separate classes from each of the OD Centers of Excellence (CoE) CCCs. Of the 903 surveys, 844 provided usable responses (93.4%). The AVCCC comprised 12.4% (105) of the total usable responses. Overall, the assumed demographic stereotype of an aviation officer held true. Of the aviation respondents the majority, 84.4%, were age 25-31. When responding to gender, 85.4% identified as male (14.6%). Of note, the AVCCC had the highest percentile of female respondents out of all surveyed OD CCCs.[5] Aviation opened its aircraft to female aviators as early as 1974,[6] leading combat arms branches in the integration of gender. Incidentally, this study reached completion before females could serve in all branches of the Army; therefore, it is possible that the ratio of women attending OD CCCs has changed.

While the AVCCC may have been leading in the gender integration category, they were lagging with regard to earned graduate degrees. The AVCCC had the lowest percentage of advanced degrees among all the branches in the study with less than 5%.[7] The cause of such small continuing education numbers is unknown. We speculate that the length of flight school, first job assignments, refinement of flight skills, and trying to become a pilot-in-command and air mission commander may not provide enough time for officers to continue their personal educational goals. Or perhaps, the academic rigor of flight school satiates a junior aviation officer's appetite for an advanced degree compared to peers in other branches. Either way, research was not performed to study any of the above conjecture, though future research could improve understanding of branch complexities.

Professional demographics such as, platoon leader assignments, months serving on a staff, etc. were not a significant surprise either. However, one point of observation did stand out. Regardless of source of commissioning, whether through the Reserve Officer's Training Corps (ROTC) or the U.S. Military Academy, self-perceived abilities were equal. Unsurprisingly, ROTC was the largest commissioning source at 56.4% compared to 32.7% coming from West Point. There was only one officer in attendance from a foreign service and no participants from sister services. Graduates were almost exclusively Active Duty (99%), and held the rank of captain, also 99%. Other branches attending the AVCCC included Armor, Air Defense Artillery, Chemical Corps, Field Artillery and Civil Affairs.[8] The Maneuver (12) and Military Police (8) Career Courses were the only two other schools with a greater variety of external branch attendees.[9]

The AVCCC responses regarding professional assignments were expected except for one point; only 15 of the AVCCC graduates identified themselves as holding a command before attending the AVCCC, a number smaller than expected by the researcher. The pace of deployments leading up to and during the data collection phase led the author to surmise that more captains would have completed branch qualifying command assignments before attending the CCC. Although the CCC is not a requirement for command, many battalion and brigade commanders see the CCC as validation of military competency when slotting individuals in command positions. This is purely subjective view with no comparative statistical support of actual performance. Of the 15 respondents who previously held a command, six commanded 13 months or longer, six commanded between 7-12 months, and three commanded less than 6 months. Due to the lack of survey specificity (researcher design error), it is unclear as

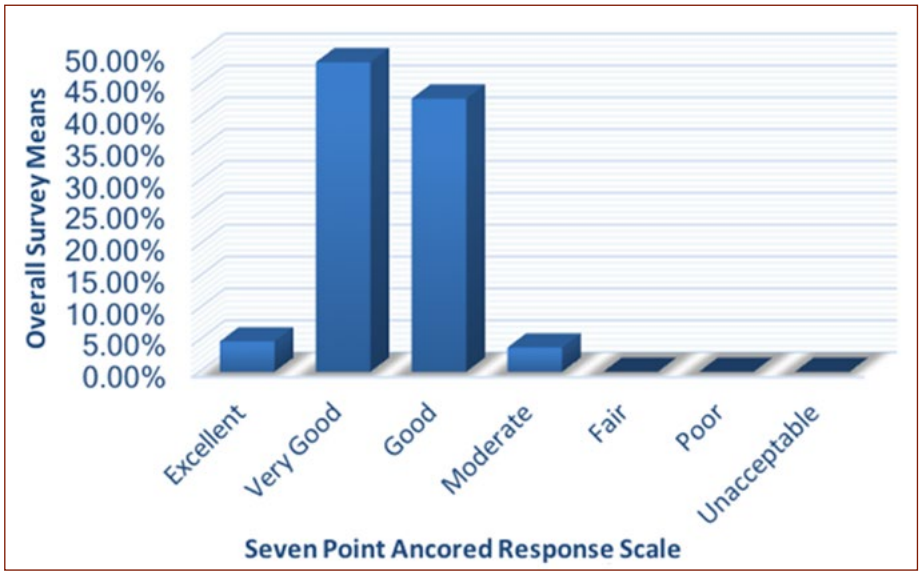
to whether those individuals completing command time prior to attending AVCCC will require second commands following the AVCCC or whether those officers will be assigned staff or broadening assignments.[10] Graduates signaled a split in platoon leader assignments with 47.1% holding one position and 42.2% holding two positions. Interestingly, 26.6% of the aviation CCC students never held a staff officer position.[11]

Survey data indicated that 6.9% of graduates never deployed. The majority of AVCCC graduates served one (44.1%) or two combat tours (43.1%) with 50.0% indicating deployment in support of Operations Iraqi Freedom and 60.8% supporting Operations Enduring Freedom.[12]

Description of CCC Graduate's Self-Perceived Ability to Function as a Successful Company Commander

This research used the Army's Leader Behavior Scale (LBS), initially designed in the Multi-Source Assessment and Feedback survey to measure the respondents' perception regarding their ability to function as a successful company commander. This older version of the LBS consists of 87 items to which participants were asked to respond on a seven point anchored scale. To aid in reporting the item scores, the researcher developed an interpretive scale that included the following values and descriptors: 1.0 to 1.5 = "Unacceptable"; 1.51 to 2.50 = "Poor"; 2.51 to 3.50 = "Fair"; 3.51 to 4.49 = "Moderate"; 4.5 to 5.49 = "Good"; 5.5 to 6.49 = "Very Good"; and 6.5 to 7.0 = "Excellent". The item that received the highest rating by the aviation cohort was "Demonstrating commitment to the Nation, U.S. Army, one's unit and Soldiers" with a mean (*M*) response of 5.93. This item was in the interpretive category of "Very Good." The item that received the lowest rating was "Creating and sharing a vision of the future" (*M*=5.12). This item was still in the interpretive category of "Good." Overall, 52 items were in the "Very Good" category, and 35 items were in the "Good" interpretive category.[13]

In the end, 4.76% of AVCCC graduates believed their command abilities to be "Excellent," 48.57% "Very Good," 42.86% "Good," and only 3.81% "Moderate." As explained by the scale below, the selection of "Moderate" indicates average skill competency. With 96.1% of the surveyed population identifying "Good" or better, what does that say about their confidence or perhaps overconfidence in their self-perceived command abilities? To what standard is each student basing "success" on? While the difference between confident and overconfident may be subjective, the data did serve to illuminate which categories they felt strongest and weakest in. The highest average (5.69) occurred in the "Lead by Example" category (Min=2.33, Max=7.00) and the lowest average (5.38) occurred in the "Develop Leaders" category (Min=2.14, Max=7.00). Both the highest and lowest average category scores still fall within the "Very Good" and "Good" parameters. What this spread of averages tells us that while some of the AVCCC graduates self-perceive their abilities as "Fair" or "Poor" in certain categories, their overall self-perception was much higher.



So What?

Collected demographic data and mean scores of survey questions do not amount to much without an interpretation of meaning; so what does this say about our AVCCC graduates? It says AVCCC graduates hold a "Very Good" self-perception of their ability to command with no statistical significance related to their either personal or professional demographics - a "why" to understand the prevailing "Very Good" categorization cannot be identified from the research conducted. Other variables, such as life experiences or educational background may possess some significance in the determination of a graduate's self-perceived command ability.

The possibility does exist that these officers maintain an elevated self-perception, not solely related to command. Such a self-perception could have begun before the graduates' oath of commissioning and federal service, or the influence of officer evaluation reports, awards, feedback from colleagues, and professional counseling. There could also be ties to resiliency, which helps people overcome past hardships or trauma and enables them to face future challenges with optimism. In either case, leaders must be self-aware. Knowing one's talents as well as shortcomings is critical. The Army's institutional domain, in this case the CCC, is an opportunity for individuals to shore up those weak points and to share strengths with peers. The Army needs captains who are confident in their abilities to lead but not so overconfident that they get in over their heads. Students should have the confidence to participate in coursework and challenge accepted norms; however, they should not disregard their instructor's experience or advice. All Soldiers demand a degree of confidence from their leaders that they can lead them to accomplish the mission. In an

Army culture that promotes toughness, and a can-do attitude, how can we expect anything less?

A professor once asked his students how many of them were prepared to escape if their building caught fire. Almost all raised their hands. He explained that statistically only 50% would be expected to survive a fire in that particular building and asked the same question a second time. Again, nearly all the class raised their hands, confident of their ability to escape. When asked why they thought they would survive, many stated they were "fast" or "smart." Only a few of the students based their confidence on the fact that they knew where the fire exits were. Many of us assume false confidences about life's challenges and neglect the requisite planning and preparation to ensure success. If the CCC student's self-perception of command abilities is overly confident, what does that say about their motivation for self-development or preparation at the career course? If they already believe they will succeed in their follow-on command, how much preparation is being done in these two key quadrants of the Army's leader development model? How truly prepared are these officers for command? How much of their study and energies are focused on taking that preverbal knee because they have "earned" it? Perhaps greater failure within our company grade officers (field grades not excluded) might lead to improved self-awareness and a truer self-perception. Perhaps we have it all wrong, and these officers are simply that good.

Self - awareness and confidence are important traits for any leader. Understanding limitations, listening to dissenting viewpoints, and building a team that shores up their own weak points will not only create a better unit but also limit flawed planning and poor execution. It is essential that confidence doesn't bleed over into arrogance, especially at this juncture so early in their careers.

[1] Michelle Tan, "Army Chief to Leaders: Winning is Everything in Combat," *Army Times*, www.armytimes.com/story/military/careers/army/2016/04/22/army-chief-leaders-winning-everything-combat/83395612/. Accessed 21 May. 2017

[2] The submitted dissertation utilizes the term CCC "completers" because all officers had completed all necessary course work but were awaiting graduation. This document will use the term "graduate" in the place of "completer."

[3] " Michael Shaw, Command Abilities of Captain Career Course Completers in Maneuver, Fires, and Effects: A Self-Perceived Assessment, http://etd.lsu.edu/docs/available/etd-08242015-161647/unrestricted/Shaw_Diss.pdf, 03AUG15.

[4] Headquarters Department of the Army, Washington DC (Army Regulation 350-1 (Army Training and Leader Development)) 19AUG14, p 67.

[5] Michael Shaw, Command Abilities of Captain Career Course Completers in Maneuver, Fires, and Effects: A Self-Perceived Assessment, http://etd.lsu.edu/docs/available/etd-08242015-161647/unrestricted/Shaw_Diss.pdf, 03AUG15 p.71

[6] Alex McVeigh, "Army Honors its First Female Helicopter Pilot" *U.S. Army* https://www.army.mil/article/18853/army-honors-its-first-female-helicopter-pilot Accessed 23 Jul 2017

[7] Michael Shaw, Command Abilities of Captain Career Course Completers in Maneuver, Fires, and Effects: A Self-Perceived Assessment, http://etd.lsu.edu/docs/available/etd-08242015-161647/unrestricted/Shaw_Diss.pdf, 03AUG15 p.71-72

[8] Even though both authors were branched aviation neither attended the AVCCC; instead graduating from the Maneuver and Military Intelligence CCCs. All aviators may compete to attend other branch/service career courses including the Maneuver CCC at Fort Benning, GA, the Engineer CCC, and the Marine Corps Expeditionary Warfare School (MEWS),. Sister branch CCCs open to Aviation Branch LT(P)s and CPTs are posted at the link below. Students of the Engineer CCC have the opportunity to participate in the MS&T Cooperative Degree Program which carries only a one year ADSO. Participation (resident) in this program will depend on Army requirements at the time those officers graduate the Engineer CCC. Please refer to branch specific CCC web pages for details. https://www.hrc.army.mil/content/AV%20LT%20Jr%20CPT%20Desk

[9] Michael Shaw, Command Abilities of Captain Career Course Completers in Maneuver, Fires, and Effects: A Self-Perceived Assessment, http://etd.lsu.edu/docs/available/etd-08242015-161647/unrestricted/Shaw_Diss.pdf, 03AUG15 p.73

[10] Ibid., p.76

[11] Ibid., p.74-76

[12] Ibid., p.77-78

[13] Ibid., p.119-124

[14] Ibid., p.162-163

Major Michael C. Shaw is currently serving as the Integration Officer, Headquarters, Department of the Army G-3/5/7, Department of the Army Management Office - Aviation. Previous assignments include Executive Officer and S-3, 3-159th Attack Reconnaissance Battalion (ARB) and Commander, A Company, 4-4 ARB. MAJ Shaw is a graduate of the Army's Command and General Staff College, Fort Leavenworth and has a Ph.D. in Human Resource Education and Leader Development from Louisiana State University.

Mr. Justin Witty is a former Senior Instructor at the Aviation Warrant Officer Advanced Course at Fort Rucker, AL. His previous assignment included Commander, C Company, 3-101st Aviation Regiment, Fort Campbell, KY. Mr. Witty has deployed twice in support of Operation Enduring Freedom.

Dr. Michael Burnett is Professor and Director of the Louisiana State University School of Human Resource Education & Workforce Development. His specialty is Research Methods and he teaches the graduate courses in research for M.S. and PhD students. He is a full member of the LSU graduate faculty. He received his PhD from Ohio State and an M.S. and B.S. from Clemson University.

Acronym Reference

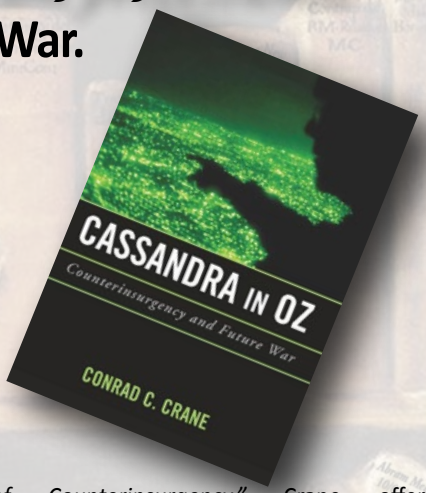
ARB - attack reconnaissance battalion	**LBS** - Leader Behavior Scale
AVCCC - Aviation Captains Career Course	***M*** - mean
CCC - captains career course	**OD** - Operations Division
CoE - Centers of Excellence	

TURNING PAGES

~ book reviews of interest to the aviation professional

Cassandra in Oz: Counterinsurgency in Future War.

By Conrad C. Crane, Published by The Naval Institute Press, Annapolis, MD, 2016. 320 pages, Available at: https://www.usni.org/store/books/transforming-war-series/cassandra-oz



A book review by MAJ Nicole E. Dean

The national defense community has its fair share of Cassandras, those unfortunate souls whose ability to accurately forecast the future goes unheeded by others. Conrad C. Crane is one. As a retired officer and former professor at the United States Military Academy, Crane has the ability to see the continuities of military interventions and wars across eras, informed by his academic passion for grand strategy, military history, and political science. His attempts to grapple with the phenomena of insurgencies and counterinsurgencies is examined in his most recently published book, *Cassandra in Oz: Counterinsurgencies and Future War.*

Crane frames the military problem and the political environment at the beginning of the Global War on Terror and provides strategic context to the revision of *FM 3-24, Insurgencies and Countering Insurgencies* in 2003. According to Crane, the absence of strategic guidance and conflicting political preferences resulted in vague policy aims for stability operations and reconstruction. This friction was coupled with an institutional gap in counterinsurgency doctrine and education for all levels of military leadership. Nevertheless, as he points out, the knowledge was not completely vacant from the ranks. Numerous Cassandras were tucked away in corners of the joint and interagency communities, waiting to share prophecies of nation building, asymmetric warfare, and insurgencies. All they needed was a medium to communicate through. To some, that medium would become the republished *FM 3-24*

Crane provides his view on the rewrite process, the coalitions that influenced the manual, and the reality of executing counterinsurgency (COIN) in Iraq and Afghanistan with the Surges. The end state of the draft evolved as it encountered friction. In this regard, Crane creates a metaphor: the need to define an end state but remain open to emerging options. In his examples of post-war stabilization, Crane cites the US Civil War as a "great illustration" of the need to balance political and civil policy aims with the greater objectives of Reconstruction, noting that those "lofty objectives… were not realized until a century after the conflict had ended." With *FM 3-24*, the Army's senior leadership took an adaptive approach as well. "He provided a few suggestions," Crane references conversations with Army Chief of Staff, General Peter Schoomaker, "[h]e told us to set the bar high but not to aim for perfection, fixing any shortcomings later." The refrain of adaptive end state is a common theme throughout Crane's text.

In *Cassandra*, Crane also details his opportunity to observe COIN theories, doctrine, and techniques in action with the Iraq Surge following the 2006 manual re-write. Crane's previously held COIN theories were reinforced by discussions with tactical military leaders living the fight from day to day in cities and districts where considerable security gains were being made. To most of the individuals he met, a commitment to the long war seemed evident and the necessities of increased manpower and money were recognized. To Crane, the need to remain adaptable and allow for setbacks and successes to balance the security situation in time was clear. In his concluding remarks about Operation Iraqi Freedom, he notes, "[t]he Surge was reducing violence and creating a window of opportunity for Iraqi politics to start settling disputes and allocating resources. That process would still take more time to get established, and some were already starting to suspect that that particular resource (time) would not be available."

Crane's final chapter, "*Final Musings: Observations on the Long War*," is the most crucial. Modelled on the previous *FM 3-24's* section on the *"Paradoxes of Counterinsurgency,"* Crane offers reflection points for tactical operations and understanding the strategic context of future wars. Discussion topics like "precision targeting is not always the answer," "mission creep is a self-inflicted wound," and "people are not terrain" are intended to shape professional dialogue on the future of war and warfare. Throughout, Crane reinforces that insurgency and counterinsurgency will remain, even as the Army transitions for future wars. Doctrine is not a complete tactical recipe for success, nor is it strategic guidance for how America should prosecute all wars. It is a start point for operations, meant to "continue the process of learning, adaptation, and anticipation that is the only real guarantee of success in future conflicts."

Cassandra in Oz is *half mea culpa*, half *j'accuse*, championing the efforts of all Cassandras to make their voices heard. Crane is also no different than some of his contemporaries in his efforts to wrestle with the theory of the phenomenon that is our American way of war. His debates with the military academia are ones that have been on-going and recur each time the military enters a period of transition, whether intentionally or not. For Army Aviation professionals, Crane's insight into the importance of debating theory, creating coalitions, drafting doctrine, and observing the execution of counterinsurgency is crucial to understanding force modernization and growth. Conrad Crane may be one of many Cassandras in the defense community's ranks, but his visions are not wrong and merit professional discussion as we continue to train and fight as an air-ground team now and in the future.

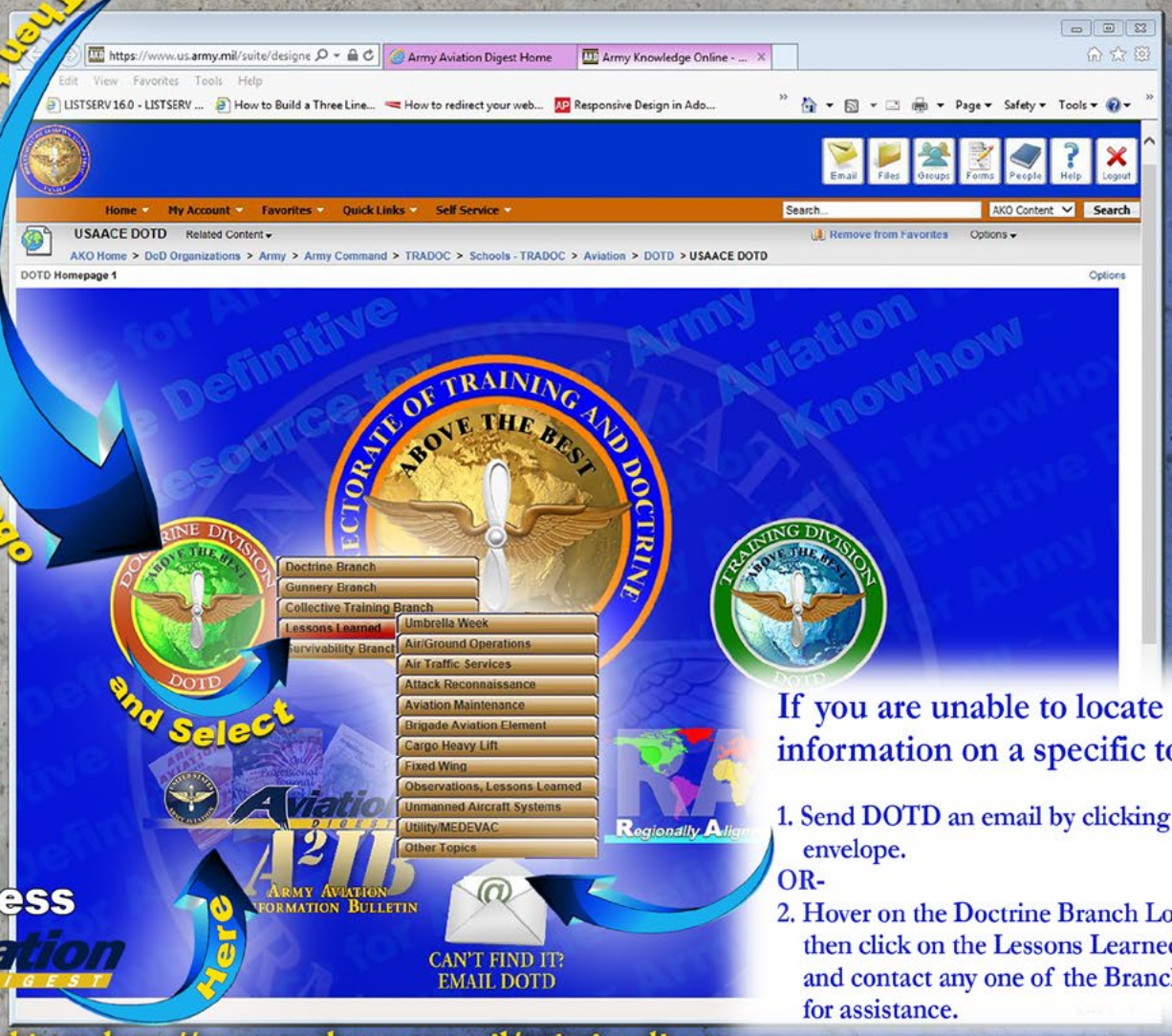
Army Aviation Lessons Learned

Working to **Prevent Repeat Errors** by Providing a Repository of **Experience, Knowledge,** and **Best Practices**

This repository holds a wealth of knowledge on lessons learned and best practices collected from the **Combat Training Centers, Post-deployment unit visits, professional military education student input,** and **Aviation Digest** articles to help your unit avoid repeating errors experienced by other units.

To access this material, log-in to AKO and go to the Directorate of Training and Doctrine's (DOTD) web site at:

Go To https://www.us.army.mil/suite/page/usaace-dotd



If you are unable to locate information on a specific topic:

1. Send DOTD an email by clicking on the envelope.

OR-

2. Hover on the Doctrine Branch Logo, then click on the Lessons Learned tab and contact any one of the Branch analysts for assistance.

Or find it at: http://www.rucker.army.mil/aviationdigest

For non-Aviation Specific Lessons Learned go to **JILLIS** (https://www.jllis.mil/apps/) or **CALL** (https://call2.army.mil/Login.aspx?ReturnUrl=%2f)

Aviation Digest
ATTN: ATZQ-TDD
Directorate of Training
and Doctrine, Bldg 4507
Fort Rucker, AL 36362

Look For The October - December, 2017 Issue:

Our Featured Focus Will Be on

Leader Development

... and More

Write for the Aviation Digest!

Following Scheduled Topics are:

January - March 2018: ***Mission Command***

April - June 2018: ***Senior Leader Forum***

July - September 2018: ***Expeditionary Mindset***

Prepare Your Articles Now on these themes or any other topic related to our profession that you would like to share with the Army Aviation Community.

The Army's Aviation Digest is mobile. Find Us Online! @
http://www.rucker.army.mil/aviationdigest/

PB 1-17-3

PIN: 201954-000