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Readiness in Army Aviation

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Task Force Saber conducts a multi-ship UH-60 Black Hawk flight over the Luzon Strait, Philippines. U.S. Army photo by SGT Olivia Cowart.

The Command Corner



Working to Address Army Aviation Readiness

Organizations are always working to achieve a degree of balance between current and future operations. Current operations are unyielding, and future ops are forever a challenge of preparation and planning. The Army, and by extension the Aviation Branch, is no different than any other organization and must find balance between meeting the needs of today while preparing for an uncertain future. There has been more than enough discussion regarding the future, and it is time to remember that we must never lose sight of the needs of today, specifically the effort to stay ready to fight tonight. Former SecDef, Donald Rumsfeld, famously stated, "You fight the Army you have, not the one you want."

Readiness certainly isn't just an aviation issue and area of focus, but it's an Army challenge too. During the recent annual McAleese Defense Programs Conference, Army Undersecretary Michael Obadal said, "To say we're satisfied with our readiness rates, I think would be disingenuous. We have real problems with our major weapons systems, both aircraft and ground, and we have to address those things, and we're doing so through a number of different ways."[1] The attention can, of course, be related to continued actions being taken by our military across the globe. Operational tempo has been increasing with actions in Venezuela and Iran, and Army Aviation has been playing a significant role. My question to all of you echoes the sentiment of our Undersecretary, specifically as it relates to training and maintenance: Are we satisfied with our readiness rates?

In many ways, readiness and achieving Army standards is a way to measure organizational efficiency and effectiveness. When we meet or exceed that standard, it becomes easy to say that we are winning. However, as Hall of Fame Basketball Coach Pat Summitt once said,

*"Winning is not the point. **Wanting to win is the point**. Not giving up is the point. Never letting up is the point. Never being satisfied with what you've done is the point."*

If the past year has shown us anything, change is happening with respect to our future as a branch and Army, and it rightly must occur. From acquisition of major airframes, like the MV-75 Cheyenne, to a variety of launched effects, Army Aviation is in a state of continuous transformation. However, if the past year has demonstrated anything else to us, it is that Army Aviation is in high demand, and that will not soon change. That means we cannot always hyperfocus on the flux of aviation but must consider if we are satisfied with today's preparedness.

[1]Welch, C. (2026, March 17). *Army is not satisfied with readiness rates, says service's undersecretary.* Breaking Defense. https://breakingdefense.com/2026/03/army-is-not-satisfied-with-readiness-rates-says-services-undersecretary/

Admittedly, maintaining readiness in the face of today's operational demands while balancing the need to evolve as a branch is challenging but not impossible. When we draw back to the core characteristics of our Aviation Warfighter Culture, we see hints of things intended to pave our way to success, including being technically and tactically focused. Let's all commit to doing everything possible on the ground to prepare for success in the air. Training within our branch must be effective, maximizing opportunities to do more; showing up unprepared to train is unacceptable. There's truth to the adage, "the more you sweat in peace, the less you bleed in war." A good way to frame the situation: We must be prepared to extract 5 hours of experience for every 1 hour of flight time (planning, rehearsing, execution, after-action reports).

Training time is sacred and requires forethought. Training plans and objectives are critical to establishing meaningful outcomes. But training plans aren't a topic just for platoon leaders and company commanders. Rather, they are critical for individual crews trying to get the most out of their training.

Maximize EVERY opportunity. For instance, units can increase proficiency and even unit cohesion with the introduction of simple changes in business rules, such as eliminating single ship continuation training flights. Imagine the benefit of insisting on multi-ship for every training flight, as this is a more demanding mode of flight, and there's accountability in teams (just like a gym partner!). To successfully conduct a multi-ship flight, a plan must be generated, discussed, revised, and executed. This increases the demand signal for aircraft and drives maintenance, ultimately impacting how maintenance is managed within the unit. Purposeful planning for training events, and increasing complexity of flights, will give way to the reality that the days of unstructured single ship flights are simply in the past. We must intentionally train, with intensity and purpose.

Commanders, your job is perhaps the hardest of all when considering the challenge of improving aviation readiness. The problems that drive readiness levels across Army Aviation are multi-factored, complex, and compounding. It is up to every commander to define the specifics of their unique challenges. My recommendation is that you begin to develop operational metrics: Strive to understand how long a progression takes in your company and why, consider how your current training leads to changes in your readiness, and capture variables impacting maintenance and maintenance management practices. Analyze the situation to best define the problem, and then attack the problem to the best of your ability, but never be satisfied with what you have done, because ***wanting to win is the point***. Keep building combat power and be ready to fight tonight!

Above the Best!
Fly Army!

Clair A. Gill
Major General, USA
Commanding



Combined Resolve 26-07: Forging Readiness in Grafenwoehr, Germany. U.S. Army photo by SSG Troy Wharton.



Army Soldiers kneel at a safe distance as a CH-47 Chinook hovers during an air assault sling load operation at Fort Carson, Colorado. U.S. Army photo by SPC Jonathan Reyes.

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C T S S B

Critical Task Site Selection Board

Name	Abr.	Last Board	Next Board	Location
Avionics Mechanic	15N	Jun 2025	29-23 FEB 2029	Ft. Eustis
Apache Pilot	AH-64	Jan 2025	9-11 Mar 2027	Ft. Rucker/MS Teams
MQ1 UAS Operator	15C	Jun 2021	7-11 Feb 2028	Ft. Rucker/MS Teams
Aviation Maintenance Tech WOBC	151A WOBC	May 2021	3-7 Aug 2027	Ft. Eustis
Blackhawk Pilot/NRCM	UH-60	Mar 2025	13-15 Apr 2027	Ft. Rucker/MS Teams
Aircraft Structural Repairer	15G	May 2025	20-24 Mar 2028	Ft. Eustis
UH-60 Helicopter Repairer	15T	Jul 2025	15-19 May 2028	Ft. Eustis
15 Series Common Aviation Maintenance	15 CAM	Jul 2022	16-18 Mar 2027	Ft. Rucker/MS Teams
Fixed Wing Pilot	FW Pilot	Jul 2020	1-3 Feb 2028	Ft. Rucker/MS Teams
Maintenance Test Pilot *(all airframes)*	MTP/FCP	Sep 2021	10-12 Mar 2026/14 16 Mar 28	Ft. Rucker/MS Teams
Lakota Pilot/NRCM	UH72	Oct 2021	14-16 Apr 2026/17-19 Apr 29	Ft. Rucker/MS Teams
Aviation Maintenance Tech WOAC	151A WOAC	May 2023	2-5 Nov 2027	Ft. Eustis
RQ7 UAS Repairer	15E	Aug 2022	17-21 Aug 2026	Ft. Rucker/MS Teams
CH-47 Helicopter Repairer	15U	Jun 2022	14-18 Sep 2026	Ft. Eustis
Aircraft Powertrain Repairer	15D	Feb 2024	8-12 Feb 2027	Ft. Eustis
Warrant Officer Intermed Course WOIC	151A	Mar 2022	15-19 Mar 2027	Ft. Eustis
Aircraft Pneudraulics Repairer	15H	May 2024	3-7 May 2027	Ft. Eustis
Air Traffic and Airspace Mngement Tech	150A	May 2024	10-14 May 2027	Ft. Rucker/MS Teams
Warrant Officer Senior Course WOSC	151A	Jun 2022	19-23 Jul 2027	Ft. Eustis
Aircraft Powerplant Repairer	15B	Jul 2024	20-24 Sep 2027	Ft. Eustis
Aviation Maintenance Officer	AMOC	Nov 2023	15-19 Nov 2027	Ft. Rucker/MS Teams

FY26– FY29



To realize MOS training modernization goals, we need our Aviation Soldiers, Senior Enlisted Advisors, and Leaders in the Field to respond to Aviation Critical Task Site Selection Board (CTSSB) Surveys distributed by DOTD, to help determine what Soldier MOS tasks should stay in training and what should go. Our leaders must also enable the CTSSB process by ensuring that their most talented and proficient Soldiers will participate in these boards when called, this is your opportunity to affect change in Army Aviation.

To contact and for more information, email: usarmy.novosel.avncoe.mbx.dotd-training-division@army.mil

U.S. ARMY



Joint Company "Blavens" VIP movement during Combined Resolve 26-07 at Hohenfels Training Area, Germany. U.S. Army photo by SPC Phillip Nojunas and Pexels.com.

THE DIGITAL LEARNING AVIATOR: MODERNIZING KNOWLEDGE MANAGEMENT FOR PEAK ARMY AVIATION READINESS

By LTC Andrew M. Bartlett

Introduction: A Crisis in a PDF Viewer

Imagine serving as the commander of the Army's premier aviation training battalion, only to discover almost a month after the fact and through second-hand channels, that the foundational doctrine dictating how we fly our aircraft, (Training Circular [TC] 3-04.4, *Fundamentals of Flight*, 2022) had been updated and renumbered as TC 3-04.1-4 (Department of the Army, 2026). If the Enterprise's training nucleus is caught off guard by critical doctrinal shifts, how can we expect the line aviator to stay current?

The journey to becoming a U.S. Army Aviation tracked aviator is a capstone of a pilot's career, yet the preparation for it often resembles an archival research project more than a modern learning experience. For many, preparation involves navigating a labyrinth of outdated study guides, disparate digital portals, and dense doctrinal publications, none of which fully captured the practical wisdom needed to master the craft. This frustrating, inefficient process is not an isolated incident; it is a symptom of a systemic crisis in how Army Aviation manages its most critical resource—knowledge.

Our current model for training and knowledge sustainment is outdated, failing not only to meet the needs of a modern, digital-native force but also to incorporate contemporary research on effective learning. Information is siloed in formats that are difficult to access and digest, forcing aviators to expend precious time on low-level information gathering rather than high-level learning. More concerning, when a seasoned pilot retires or rotates to a new assignment, decades of invaluable, hard-won expertise often departs with them, creating a perpetual brain drain and readiness gap (DeLong, 2004).



Illustration courtesy of Pixabay.com.

A fundamental modernization of Army Aviation's knowledge management is critical. To ensure peak readiness, we must develop a centralized, mobile-first digital platform to capture institutional knowledge, make it effortlessly accessible, and use proven learning science to ensure it is retained. This investment will create a smarter, more lethal aviation force by empowering individual aviators to achieve and sustain mastery, thereby freeing unit leadership to focus on the complexities of tactical collective mission execution.

The Fractured State of Knowledge: Three Core Deficiencies

The current system is undermined by three interconnected failures that increase cognitive load and inhibit effective learning.

Information Silos and the Burden of Access

The first deficiency is the sheer annoyance of accessing a single, authoritative body of information. Critical knowledge is spread across doctrinal manuals, flight school handouts, locally produced study guides, and multiple online platforms. This fractured landscape requires individuals to be highly proactive researchers, a task for which they have limited time and resources. This reality is governed by the Zipf Principle of Least Effort, in which individuals default to the most accessible, rather than the most accurate information (Zipf, 1949). An aviator is therefore more likely to use a convenient, outdated, study guide from a colleague than cross-reference manuals on a government portal. This creates a significant risk of knowledge gaps and the use of incorrect information.

The Evaporation of "Tribal Knowledge"

The second, and perhaps most critical, deficiency is the systemic loss of tacit knowledge. Much of the practical artistry of flying is not explicitly codified in doctrine. The foundational concept of tacit knowledge posits that "we can know more than we can tell" (Polanyi, 2009). Consider, for example, the aerodynamic braking in a CH-47 Chinook. While the maneuver is described, the nuanced aerodynamic principles are interpreted and taught by an experienced instructor pilot (IP) based on feel and observation. This is a classic example of tacit knowledge—the "how" vs. the "what." Unless a student meticulously transcribes this wisdom, it remains locked in the instructor's mind and is lost upon their departure. The corporate world recognizes this *silver tsunami* of retiring experts as a major strategic threat and has invested heavily in knowledge management systems to capture this expertise before it is lost (DeLong, 2004). Army Aviation must treat the constant rotation of its most experienced aviators with the same strategic urgency.



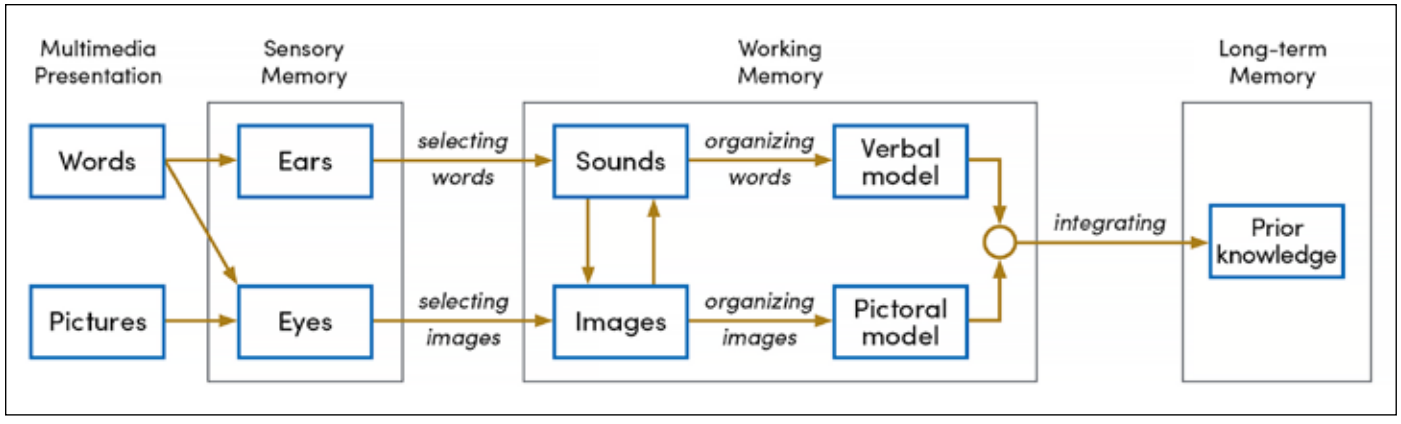
LTC Currie (right), outgoing Commander of the 1st Battalion, 101st Aviation Regiment, 101st Combat Aviation Brigade, 101st Airborne Division (Air Assault), conducts his final flight as the Battalion Commander on Saber Army Airfield, Fort Campbell, Tennessee. U.S. Army photo by SSG Vincent Levelev.

The Fallacy of "Fire and Forget" Training: The Leaky Bucket

Finally, the current model for knowledge sustainment is fundamentally flawed because it fails to account for the basic mechanics of human memory. Think of an aviator's knowledge as a bucket being filled with sand. During flight school and initial training, sand is poured in, filling the bucket to the brim. However, the bottom of this bucket is riddled with holes. These holes represent the natural, scientifically documented process of forgetting.

This model aligns perfectly with the principles outlined in the Army's own reference doctrine via the Aviation Instructor's Handbook. All information first passes through a sensory register (part of the brain receiving input from the 5 senses) before moving to short-term memory, which is finite and temporary. It can only hold a small amount of information for a short period before it is lost. For knowledge to be retained, it must be coded and consolidated into long-term memory (LTM) (Federal Aviation Administration, 2020). The holes in the bucket represent the information that never makes it to LTM or that fades from LTM due to lack of use. This is not a failure of motivation but a simple cognitive reality as described by the Forgetting Curve, which shows that learners can forget most new information within days if it is not actively reinforced (Ebbinghaus, 1885/1913).

The problem is that the current system teaches aviators how to fill the bucket but does not equip them with the proper tools to keep it full. We expect them to patch the holes and replenish the sand on their own. Assuming motivation is equal across the force, some avia-

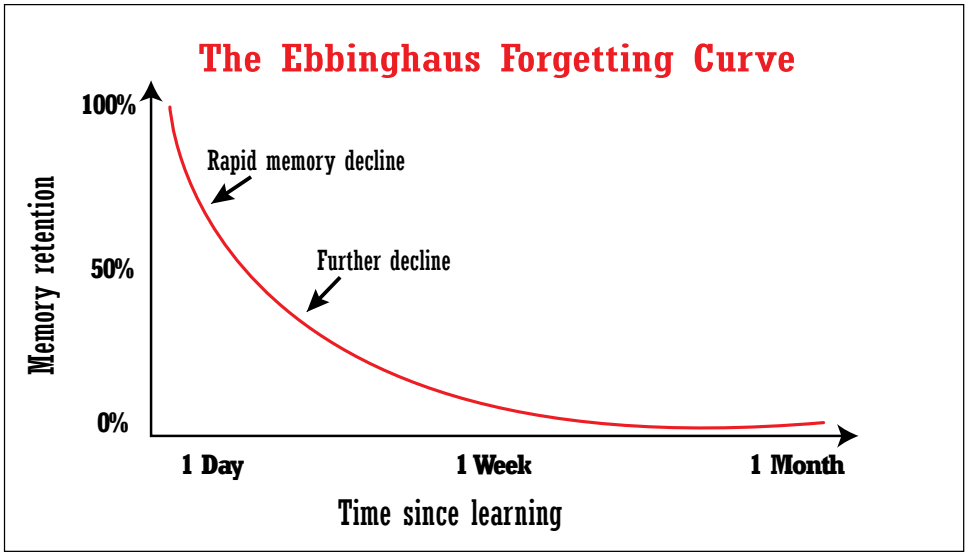


Cognitive Theory of Multimedia Learning (Mayer, 2025).



Artificial intelligence illustration courtesy of Pixabay.com.

tors, through life experience, may have developed an effective *shovel* for this task, while many others are left with a *kitchen fork*. The effort expended may be the same, but the effectiveness is vastly different. This is compounded by the ease-of-processing heuristic, a cognitive bias where using the *fork* (e.g., passively re-reading familiar material) feels productive but adds very little sand back to the bucket (Koriat & Bjork, 2006). The result is a perishable knowledge base—a perpetually half-empty bucket—validated only by a lagging annual evaluation that does little to ensure daily readiness. The evidence of this systemic failure is clear and quantifiable: Experienced pilots often struggle on the entrance exams for graduate-level courses.



The Hermann Ebbinghaus Forgetting Curve is courtesy of elearningindustry.com.

The Solution: A Digital Ecosystem for Continuous Readiness

To remedy these deficiencies, I propose a holistic digital platform that serves as a high-efficiency *shovel* for every aviator. It is designed around the user experience and grounded in learning science.

A Unified and Engaging Platform

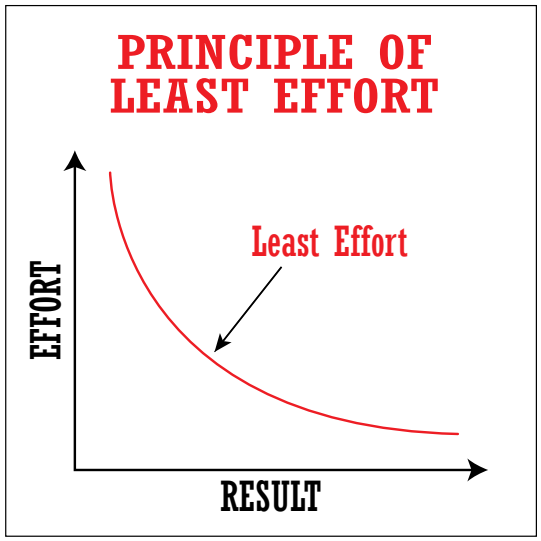
The core of the solution is a single, intuitive application for web and mobile devices. The major doctrinal areas—Aerodynamics, Advanced Aircraft, Tactical Employment—are the distinct areas within the app. The individual lessons within each topic are the engaging, focused experiences designed for learning. This user-centric design lowers the barrier to entry and transforms study from a chore into an act of exploration.

Capturing the Craft: From Sourcing to Tangible Content

To solve the problem of evaporating IP knowledge, the platform will be built around microlearning modules. This does not require creating knowledge from a vacuum; the foundational content and expertise already exist. The content will be derived from established doctrine, existing academic material, and the subject matter experts at the Aviation Center of Excellence (AVCOE). The development team will fuse this expertise with talent in application development and artificial intelligence, leveraging that artificial intelligence as a force multiplier to accelerate content creation. The ultimate goal is to translate dry source material into the tangible, engaging formats of short videos and interactive diagrams, in line with the Multimedia Learning Theory, which highlights that students learn more deeply from words and pictures than from words alone (Mayer, 1997). This process makes the tacit tangible and the dense digestible, creating permanent, scalable institutional assets that supplement the work of IPs.

Engineering Engagement and Sustained Mastery

The most transformative element of this ecosystem is its approach to sustainment. To combat the Forgetting Curve, the platform will employ a spaced repetition system. This algorithm intelligently quizzes users on material at increasing intervals (Wozniak, 1999). This process is scientifically proven to interrupt the forgetting process and move information from short-term to long-term memory. To drive continuous engagement, the system will incorporate elements of gamifica-



The Principle of Least Effort was first observed by Pareto Vilfredo and further developed by George Zipf (Mayer, 2025).

tion, using game-design elements in a non-game context to motivate users (Deterding et al., 2011). Aviators would earn points for completing modules and unlock badges for mastering topics. This can generate a continuing education module, as employed by many other professions, replacing the once-a-year annual general studies exam into a year-round knowledge sustainment model.

A Living Ecosystem: The Continuous Feedback Loop

For the platform to succeed, it must be a living ecosystem that evolves with the needs of the force. A multi-faceted, continuous feedback loop is essential. First, the platform will solicit institutional feedback from Directorate of Evaluations and Standardization and the observer controller/trainer teams at the combat training centers, whose insights will prioritize content that addresses documented, real-world knowledge gaps. Second, the system will employ internal analytics to understand user behavior, providing a powerful visualization of what information is being actively studied and what is being ignored. For future implementation, specialized commander and standardization pilot dashboards can display crew usage and progress. This allows leaders to move from anecdotal assessments to data-driven management of their unit's academic readiness, identifying personnel who need support and tailoring training to address specific weak areas revealed by the data.

How will This Program be Sustained to Ensure Long-Term Success?

Sustaining this digital ecosystem is critical—its survival cannot rely on the localized efforts of a few motivated individuals subject to Permanent Change of Station. To ensure long-term continuity and Enterprise-wide adoption, the program requires a formalized management and resourcing structure. While the 1st Battalion, 223D Aviation Regiment, in coordination with the Directorate of Training and Doctrine, AVCOE Knowledge Management, and the Combined Arms Center–Chief Data and Artificial Intelligence Officer (CAC-CDAO), has successfully spearheaded the initial application build, operational command teams and line pilots cannot sustain Enterprise software indefinitely. The next logical step is an institutional handover. Responsibility for the platform's maintenance and content evolution must transition to a dedicated cadre operating as a modern, digital extension of the U.S. Army Aviation Technical Library. Furthermore, resourcing a product of this caliber requires innovative funding models. Leveraging grant opportunities or strategic partnerships with professional military organizations, such as the Army Aviation Association of America and the Association of the U.S. Army, offers a viable pathway to secure the necessary development capital without immediately straining localized operational budgets.

Conclusion: Investing in Knowledge is Investing in Readiness

The U.S. Army Aviation Branch can continue to rely on a 20th-century model of knowledge management and accept the inherent inefficiencies and risks, or we can embrace the proven tools of the 21st century. The development of a unified digital learning ecosystem is not a luxury; it is a strategic opportunity. By capturing the invaluable wisdom of our experts and delivering it through a system engineered to create and sustain mastery, we can build a more intelligent, proficient, and lethal aviation force.

Biography:

LTC Andy Bartlett is the battalion commander for the 1st Battalion, 223D Aviation Regiment.

Leaders or organizations interested in collaborating on the digital learning ecosystem discussed in this article can reach the project team at the following MSTeams Link: General | Lifelong Learning App Development

The author used artificial intelligence to assist in drafting and reviewing their article. The content was fully reviewed, edited, and fact-checked by the Army Aviation Digest, which retains full editorial control.

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Becoming an Assault Helicopter Company:

Army Structure Lessons Learned



Air assault training at Fort Carson, Colorado. U.S. Army photo by SSG Tyler Ewing.

By CPT Ian A. Greer, CPT Anthony L. Giachin, CPT Austin M. Jones, CPT Deanna R. Ogrinc, and 1LT Mason K. Kleinheksel

In his 2024 paper regarding continuous transformation, GEN James Rainey outlined shortcomings in the Army acquisition process and proposed an incremental approach that fielded new capabilities in a phased process known as the Transformation in Contact (TiC). He described a capability as "the ability to do something on the battlefield," which, he states, "requires having the people organized, trained, and equipped to do it" (Rainey, 2024, p. 2). Although TiC has been ongoing in the Army over the past several years, its implementation has recently begun to impact the combat aviation brigades (CABs)—the cornerstone formation of Army rotary-wing aviation. The 101st Airborne Division's CAB tackled the most demanding of aviation's transformation requirements, activating and deactivating entire battalions and transforming its companies to—in some cases—unrecognizable extents. One such transformed company is the former command aviation company (CAC), which the TiC restructures into a larger assault company with modernized aircraft. This article outlines key friction points; lessons learned; and best practices related to training, equipping, and manning that Company Alpha, 6th Battalion, 101 Aviation Regiment (A/6-101), General Support Aviation Battalion, experienced through its transformation to A/6-101 Assault Helicopter Battalion (AHB-M).

Key Friction Points and Lessons Learned Training

During the transformation, the company faced five acute and confounding training shortcomings that it overcame in various ways. The modified table of organization and equipment (MTOE) grew from about 35 personnel to more than 50, which the brigade filled from the air ambulance company. This simplified personnel movements but consolidated the aviators with generally less experience performing air assaults to one company. Due to the stark differences in mission sets between an air ambulance company and an assault company, the supplemented aviators did not have recency—or the qualification in some cases—for many mission tasks common to light divisions, such as external load training. Conversely, the organic A/6-101 aviators who were qualified and current on external load operations, had minimal experience in the UH-60M. Due to these unavoidable aviator shortfalls, the company faced risk when completing complex air assault tasks commonplace in the 101st Airborne Division.

To best mitigate the lack of experience in mission set and airframe across the formation, the company executed a very deliberate train-up and careful crew selection for difficult missions. A/6-101 continues to hone its proficiency in airframe and mission set to develop into the most adept and experienced assault company possible.

Transition to the UH-60M served as a minor hurdle for rated and nonrated crewmembers (NRCMs) as the company received its first aircraft. For the rated crewmembers, the 3-year-old build seven software upgrade meant that only those who were recent in the UH-60M or recent graduates from flight school could continue flying only after a proficiency flight evaluation. The remainder required academics and a simulator period to qualify them on the software. Although qualifications took only 3 days, aviators continue to develop high proficiency and expertise in the novel UH-60M systems. Unlike the rated crewmembers, who received initial qualifications in the UH-60M in flight school, the NRCMs with tenure in the company were unqualified in the UH-60M. This necessitated a heavy workload for the company enlisted standardization personnel early in the

fielding. While only lasting 1 week, the NRCM qualifications required special attention and dedicated support in a company with only two aircraft during the period of receipt.

The UH-60M also brought complications for the company's secure communications (COMSEC) program. While the underlying fundamentals of COMSEC were the same, the process of loading an aircraft and building a simple key loader was new for the aviators who had never performed this task on a UH-60M. The company was building its COMSEC program while it was also learning individual deficiencies of its new aircraft. This made troubleshooting difficult, as the pilots queried whether the load, procedure, or radio was the issue for taking fills. Special command emphasis on COMSEC loading and learning individual faults of each aircraft built a program commensurate with the other untransformed programs in approximately 4 weeks.

The company found it was objectively in a state of reduced readiness due to changes in the training and evaluation matrix for the Air Assault, Air Movement, and Command and Control (C2) operations. Previously, the company had a maximum of eight aircraft and aircrews, needing only six to assess readiness as *Trained* (T). Under an MTOE of 12 aircraft and aircrews, however, the company requires nine aircraft and aircrews to assess as T, while six aircrews would degrade readiness to *Untrained* (U). At the time of the re-task organization, the company had exactly six aircrews, meaning due only to changes in the evaluation criteria, readiness had fallen from the highest to the lowest possible rating. This messaging is important to note during quarterly training briefs and similar training updates to higher headquarters, outlining an increased requirement for manning and equipping the former CAC in the transformation's early stages. Under the new Army Structure (ARSTRUC), all UH-60 companies within the CAB transform into assault companies, and accordingly the Headquarters, Department of the Army, directs them to hold only the expeditionary deployment, air assault, and air movement mission-essential tasks (METs).



U.S. Army Soldiers conduct fast rope insertion/extraction system qualifications. U.S. Army photo by SPC Phillip Nojunas.

The C2 MET drops from this list; however, experience from the 101st Airborne Division indicates an appetite still exists for utilizing the UH-60M as a C2 platform. The transition from UH-60L to UH-60M, which former C2 companies across the Army flew, requires careful expectation management for leaders who desire this service. Anecdotal evidence in the 101st suggests many senior pilots in a transforming CAC have not flown a UH-60M to an appreciable extent since flight school. The new cockpit changed the way its pilots managed the mission, which the company overcame in conjunction with its emphasis on COMSEC, since communications made up the bulk of the C2 workload. The company also retained this MET on its assessments to provoke candid conversation about its ability to perform this mission during its transformation window. With the ongoing demand likely across the force, A/6-101 recommends this C2 remain an evaluated MET to ensure adequate training and proficiency across the company, allowing leaders to *inspect what they expect* during training meetings and readiness briefs.

Equipment Friction Points and Lessons Learned

The ARSTRUC's nature throughout Army Aviation reduced the number of UH-60s authorized in heavy divisions and increased the number in lighter divisions. With transfer directives redistributing these helicopters accordingly, the company discovered that most of the helicopters received required modifications to enable some of the mission sets of lighter divisions—specifically rappels and fast rope insertions. Upon receipt, the UH-60s did not have the rings required for rappel operations or the fast rope insertion/extraction system (FRIES). Fast rope insertion/extraction systems were especially slow-going to install, as the UH-60 community was short on retaining bolts, and the systems left in the rear during the deployment required corrosion control inspections from an already undermanned quality control section. Moreover, a shortage of UH-60 weight-and-balance certified quality control representatives in the brigade delayed production of a Department of Defense Form 365-4, *Weight and Balance Clearance Form F* (Department of the Air Force, 2023), for FRIES configuration. Other brigades undergoing transformation efforts should anticipate similar setbacks, especially if undertaking such efforts after a deployment.

With the demand of a C2 platform still existing under the new ARSTRUC, the company faced equipment limitations that would enable MET execution. The internal communication system (ICS) is fundamentally different between the UH-60L and UH-60M. While the company retained 12-point ICSs during the restructure, those systems are not compatible with the UH-60M, which limits the number of internal headsets. There is a special install to create the capability for 11 headsets in the

UH-60M, but it would require additional maintenance hours and money to implement, both of which are in short supply. The 15E C2 system, which enables multiple sources of over-the-horizon (OTH) communication and situational awareness, is also not compatible with the UH-60M. The company experimented with air demonstration kits during recent collective training exercises; however, they use aircraft satellite antennas for their OTH voice capabilities. In turn, this limits the supported unit to one satellite communication frequency at a time. If C2 remains a MET for the company, it recommends additional dedicated assets, including implementing 12-point ICSs and aftermarket systems analogous to the 15E, allowing effective required mission set execution.

The final equipment shortcoming is not from the increase of equipment required to meet mission under the company's new structure but a delay in the timeline for turning in ancillary equipment associated with the UH-60L. The UH-60L's rapid transfer outside of A/6-101's formation divested the helicopters, but the directives required removal of most militarized equipment. Moreover, the company retained its 15E C2 system, which is not forward compatible with the UH-60M. The problem set preventing turn-in differed before and after the ARSTRUC. Before the ARSTRUC, this equipment fell on the company's TOE, meaning that it required special directives to turn-in. Transfer directives for the divestiture focused on the UH-60L and not its associated equipment, leaving some of the militarized equipment on the company's property book with no codified way to turn it in.

After the MTOE changed to its ARSTRUC configuration and the company received enough aircraft and associated equipment to render the surplus militarized equipment as excess, the process for turning in excess equipment lagged behind the speed of the transformation. The deactivation of the air cavalry squadron became the main effort for equipment divestiture, and the company retained its legacy equipment. Presently, the company is exploring several options to divest its excess, including Class IX turn-ins through technical supply and supply support activities turn-ins for excess equipment no longer on the MTOE.

Personnel Friction Points and Lessons Learned

In addition to the equipment MTOE shortages induced by the ARSTRUC changes, the company also experienced personnel shortages, limiting its capabilities during the transition. There is no company-assigned 92Y supply clerk position, as a junior WO fills the additional duty of company supply officer. The massive transfer of aircraft and associated equipment undertaken to align with Army directives requires an immense amount of logistical manpower to adequately ensure the proper accountability and supply discipline of all equipment. This is a large onus to place on the shoulders of an aviator with no formal supply discipline training.



A U.S. Army Soldier receives hands-on training to use a simple key loader during a training course. U.S. Army photo by SPC Yon Henderson.

The addition of a 92Y to the MTOE would massively improve the effectiveness of the commander's supply discipline program, especially with the large number of transfers the company experienced both turning in the UH-60L and bringing in the UH-60M. The expertise provided by the 92Y would not only assist in advising the commander of proper practices and procedures but help ensure the company is financially protected from potential clerical errors difficult for an untrained Soldier to identify.

While the brigade and battalion were able to compensate for rated crewmembers through transferring the surplus aviators from the air ambulance company to the transforming CAC, they could not compensate with NRCMs accordingly. The aviation-wide shortage of 15T UH-60 helicopter repairers hit all companies in the CAB similarly, and such transfers were not possible—chronically reducing readiness. The training and evaluation outline for the air movement, air assault, and C2 operations all require combat crews for their readiness assessments, which in turn require a pilot-in-command, pilot, and two NRCMs. The change to the company's MTOE increased required nonrated personnel by eight individuals, and the organization found itself with only 12. The lack of aircraft during the months following the redeployment and the requirement to conduct initial UH-60M qualifications limited nonrated standardization personnel's ability to rapidly train any new crewmembers. This became the limiting factor for readiness as the company accrued its sixth aircraft.

Best Practices

Annexes in the XVIII Airborne Corps aircraft transfer directives authorize direct liaison authority (DIRLAUTH) between subordinate elements, though they do not specify at which level DIRLAUTH should occur.[1] With ongoing transformation efforts taking a significant amount of bandwidth and occurring in conjunction with ongoing unit operations—as is the intent with the TiC—waiting on battalion, brigade, division, and corps staffs to produce orders would cause significant delays to the transformation. Much of the coordination initiated at the company level, with commanders providing bottom-up feedback to drive a rapid transfer plan. Such action is a best practice and in keeping with the principles of mission command.

Even after commanders at all levels agree upon equipment for transfer, continuing to drive the transfers at lower echelons yields the best results. The first aircraft transfer at two separate divisions proved the most difficult, in part, because the first transfer awaited a proposed sourc-

[1]This document changes frequently and is only available through organizational distribution. Please contact CPT Ian A. Greer at ian.a.greer.mil@army.mil for further information.



U.S. Army UH-60M Black Hawks stand by at Fort Bliss, Texas. U.S. Army photo by SPC David Poleski.

ing decision (PSD).[2] This document outlined specific aircraft and their supporting equipment to be transferred, but the level of detail listed on the document allowed for minimal deviations. Due to systemic disconnects between technical supply and property book signatories, the appropriate serial number on some Class IX items did not appear on the PSD, which required additional coordination to change. Proposed sourcing decisions need approval before a transfer may occur, meaning that on two separate occasions, paperwork stalled the transfer process. Involved parties overcame this in subsequent transfers by foregoing PSDs, using the transfer directive as supporting documentation for the transfer, and completing a Department of the Army Form 3161, *Request for Issue or Turn-In*, (lateral transfer) (Department of the Army, 2023). This allowed companies, battalions, and brigades to overcome discrepancies at their level rather than relying on echelons through the U.S. Army Forces Command level to approve changes.

Sending an advanced echelon composed of a quality control representative, a maintenance test pilot, an additional pilot, and an officer proved a best practice for planned transfers of more than one aircraft. This enabled the receiving unit to identify critical shortfalls in maintenance or property that would take extended periods of time to rectify before additional crews arrived. Regardless of transfer aircraft status, elements utilizing temporary duty to receive aircraft will reduce expenses in the long run through performing inspections, test flights, and inventories on all identified aircraft. This practice ensures conditions are set for subsequent travel, affords the losing unit time to rectify deficiencies, and minimizes travel expenses associated with trip extensions.

Conclusion

Despite the many challenges that come with the implementation of ARSTRUC, A/6-101 remains ready and prepared to execute all assigned missions. The transition demands a deliberate, unhurried training plan to build competence and proficiency. Safe execution of all tasks remains the company's top priority beyond the transition into an assault company. The massive transfer of equipment also provides the company an opportunity to revamp the commander's supply discipline program, ensuring strict attention to detail and positive accountability of all equipment. The difficulties associated with the new ARSTRUC can be applied more broadly to far more companies and units than CACs. While CACs are undergoing a complete mission and equipment overhaul to develop into an assault company, many air cavalry and heavy assault companies are experiencing similar equipment and MTOE-related shortfalls. It is critical that the company levels are diligent in their supply discipline, deliberate in their manning, and predictive in their training to bridge readiness gaps.

Biographies:

CPT Ian Greer, U.S. Army, is the commander of A/6-101 AHB-M "Warlords." CPT Greer graduated from the United States Military Academy in 2018 with a bachelor's degree in physics. His operational assignments include a platoon leader and an Assistant Operations Officer in 2916th Aviation Battalion at Fort Irwin, California; the 96th Aviation Support Battalion Operations Officer, Fort Campbell, Kentucky; and Headquarters and Headquarters Company 5-101, "Havoc," at Fort Campbell. CPT Greer holds qualifications in the UH-60M, UH-60V, UH-60L, and LUH-72.

CPT Anthony Giachin, U.S. Army, is a former platoon leader in A/6-101 AHB-M "Warlords." CPT Giachin graduated from the United States Military Academy in 2021 with a bachelor's degree in mechanical engineering. He then earned a master's degree in biotechnology from the University of Cambridge. His operational assignments include an Assistant Operations Officer and platoon leader in 6-101 Aviation Regiment at Fort Campbell, Kentucky, where he currently serves as the Battalion S4. CPT Giachin holds qualifications in the UH-60M, UH-60V, UH-60L, and LUH-72.

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[2]Proposed sourcing decisions are G-Army actions that formally propose where organizational equipment will go.

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ARMY AVIATION IN JOINT WARFIGHTING CONCEPT 3.0: THE DECISIVE CONVERGENCE ARM IN CONTESTED WAR

A U.S. Army Black Hawk prepares to land at Marine Corps Training Area Bellows, Hawaii. U.S. Marine Corps photo by Cpl. Anabelle Reed-O'Brien.

By LTC Keith R. Benoit

At 0417 local time, a dispersed U.S. Army task force operating along a contested littoral lost satellite communications. Joint cyber effects had just disrupted an adversary's coastal air defense network, creating a narrow window of opportunity. With GPS degraded and higher headquarters unreachable, an Army Aviation battalion launched a low-signature air assault to reposition a long-range fires battery. Within hours, the battery delivered precision fires that disrupted adversary maneuver across the theater.

This scenario reflects the operational reality envisioned in Joint Warfighting Concept (JWC) 3.0. Conflict begins globally integrated and contested from the outset rather than after a period of mobilization. Success depends on rapid convergence and immediate exploitation of fleeting opportunity across domains (Chairman of the Joint Chiefs of Staff [CJCS], 2023). In this environment, Army Aviation is not a supporting capability but the Joint Force's exploitation arm.

Aviation at the Center of Convergence

Joint Warfighting Concept 3.0 emphasizes globally integrated operations, distributed forces, and multidomain convergence. These operations create temporary windows of superiority against peer adversaries. Those windows are narrow, contested, and perishable. They demand speed, mobility, and decisive exploitation before the adversary can adapt (CJCS, 2023).

No land capability compresses time and space like Army Aviation. When joint fires degrade enemy air defenses, aviation moves maneuver forces forward at operational speed. When cyber effects disrupt command networks, aviation strikes exposes formations and repositions critical assets. When dispersed units require reinforcement, aviation bridges operational gaps that ground mobility cannot close quickly enough.

Field Manual 3-04 defines Army Aviation as a maneuver capability that creates and exploits relative advantages within multidomain operations (Department of the Army, 2025, p. ix). Under JWC 3.0, that role is central rather than supporting. Convergence without exploitation produces disruption but not decision. Army Aviation converts disruption into operational advantage and sustained momentum.

Decision Advantage Requires Mobility

Joint Warfighting Concept 3.0 places decision advantage at the core of victory in peer conflict. The Joint Force must sense, decide, and act faster than the adversary. This requirement persists even under degraded communications and contested space environments (CJCS, 2023). Operational tempo becomes decisive when adversaries attempt to paralyze networks.

Army Aviation strengthens decision advantage through persistent sensing and rapid maneuver. Rotary-wing reconnaissance and manned–unmanned teaming extend observation into denied terrain where other sensors are con-



A U.S. Army Soldier prepares to deploy equipment from a CH-47 during a joint helicopter exercise with U.S. Marines. U.S. Navy photo by Mass Communication Specialist 1st Class Omar Rubi.

strained. Aviation formations operate decentralized by design, reinforcing mission command under degraded conditions. When connectivity falters, physical mobility preserves initiative and operational coherence.

Contested networks present operational challenges but not disqualifying vulnerabilities. Aviation's culture of decentralized leadership enhances resilience in degraded environments. Crews train to operate amid uncertainty and dynamic threat conditions that mirror the assumptions of JWC 3.0. This adaptability strengthens decision resilience across the Joint Force and reinforces cross-domain integration.

Distributed Operations Demand Vertical Maneuver

Joint Warfighting Concept 3.0 assumes distributed forces enhance survivability by complicating enemy targeting (CJCS, 2023). Distribution reduces vulnerability but increases the risk of operational isolation. Forces separated by terrain, water, or long distances require rapid reinforcement to maintain combat power. Vertical maneuver mitigates that risk and preserves tempo.

In the Indo-Pacific, archipelagic terrain demands rapid movement across dispersed islands and littorals. In Europe, operational depth requires repositioning under the threat of long-range fires and dense integrated air defenses. Aviation enables air assault, reinforcement, casualty evacuation, and displacement of long-range fires systems across both theaters. Without aviation, distributed formations lose flexibility and responsiveness under pressure.

Army Aviation transforms distribution into agility rather than fragmentation. It sustains tempo across dispersed formations and contested theaters. Its ability to reposition combat power preserves operational coherence and reinforces convergence. Distributed operations are viable because aviation connects and synchronizes the force.

Survivability Is a Modernization Driver

Peer adversaries field layered integrated air defenses, long-range precision fires, and persistent surveillance systems. These capabilities challenge aviation operations but do not render them obsolete. Army Aviation has historically adapted to evolving air defense threats across multiple conflicts. Modernization continues that tradition of adaptation in the face of peer competition.

Recent Army analysis emphasizes survivability in multidomain conflict as foundational to aviation's evolution (Leinen & Cox, 2025). Reduced signatures and improved defensive systems increase resilience against advanced threats. Integration with joint suppression of enemy air defenses strengthens survivability further. Survivability is therefore a modernization driver rather than a structural limitation.

Aviation does not avoid contested airspace; it adapts to operate within it. Modern tactics, technologies, and integration efforts expand operational options available to commanders. Survivability improvements increase confidence in aviation maneuver during high-end conflict. Modernization strengthens initiative across domains rather than constraining it.

Future Vertical Lift: Expanding the Advantage

Army Aviation's relevance under JWC 3.0 is accelerating through Future

Vertical Lift modernization efforts. The Future Long-Range Assault Aircraft increases speed and operational reach beyond legacy systems. Greater range reduces reliance on vulnerable intermediate staging bases and enhances unpredictability. Enhanced maneuver depth directly supports globally integrated operations and convergence.

Future Vertical Lift platforms incorporate advanced sensors and improved self-protection systems. Reduced signatures enhance survivability in contested environments. Digital interoperability enables faster integration into joint networks and shared targeting architectures. Aviation becomes both a maneuver capability and an information contributor within the joint sensing grid.

Joint Warfighting Concept 3.0 acknowledges the likelihood of protracted conflict and high attrition rates (CJCS, 2023). Modernized platforms improve maintainability and life cycle sustainability under sustained operations. Open systems architecture supports regeneration, adaptability, and integration with future capabilities. Future Vertical Lift ensures aviation remains decisive beyond the opening phase of conflict and throughout prolonged campaigns.

Army Aviation has historically adapted to evolving air defense threats across multiple conflicts. Modernization continues that tradition of adaptation in the face of peer competition.



Army designates MV-75 as mission design series for Future Long-Range Assault Aircraft. Photo by Matthew Ryan.

Critics argue that Army Aviation is increasingly vulnerable in peer conflict due to dense integrated air defense systems, long-range precision fires, and persistent surveillance. They contend that rotary-wing platforms present detectable signatures and impose significant sustainment burdens in contested environments. Some analysts suggest that unmanned systems and long-range fires may reduce the need for manned vertical maneuver altogether (DeVine & Sayler, 2022). These concerns merit consideration but overlook aviation's demonstrated adaptability, joint integration, and modernization trajectory.

Conclusion: The Joint Force's Exploitation Arm

Joint Warfighting Concept 3.0 demands global integration and rapid convergence across theaters (CJCS, 2023). It assumes contested environments, degraded networks, and sustained adversary pressure. It anticipates protracted conflict and distributed operations that strain traditional command structures. Army Aviation meets each of these requirements through mobility, integration, and modernization.

It translates convergence into maneuver at operational speed and sustains decision advantage through mobility and sensing. It enables distributed operations across theaters, while reinforcing joint tempo. It modernizes deliberately to enhance survivability, interoperability, and endurance. In high-end war, speed of exploitation determines victory, and Army Aviation delivers that speed.

Biography:

LTC Keith Benoit is an Army Aviation officer currently assigned as a student at the National War College, Washington, DC. LTC Benoit has served in numerous conventional and special operations units and has commanded at all levels, most recently as the 6th Squadron, 6th Cavalry, Fort Drum, New York. He is a senior Army aviator who is qualified in the OH-58D and AH-64D/E and will assume leadership of the Directorate of Training and Doctrine this summer.

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Observations, Insights, and Lessons Learned:

Rotary-Wing Attack Aviation at the Corps in Large-Scale Combat Operations

By CPT Austin R. Adams

Introduction

While Army attack aviation has historically operated under division headquarters, recent experiences in warfighter exercises (WFXs), command post exercises (CPXs), and combat training centers (CTCs) have revealed several critical shortfalls at the division level. Division staff are frequently overwhelmed and lack the planning horizon, workforce, and access to joint enablers needed to integrate attack aviation operations. Large-scale combat operations (LSCO) pose a unique challenge to attack aviation, presenting threats from integrated air defense systems; enemy intelligence, surveillance, and reconnaissance (ISR); and numerous radar and navigation jamming capabilities. These near-peer threats elevate risk, requiring mitigation through extensive planning, fires synchronization, and joint enabler integration. While serving on the 12th Combat Aviation Brigade (CAB) staff during four V Corps exercises, the 12th CAB staff developed a corps-centric aviation planning model. The 12th CAB deliberately integrated attack aviation into the V Corps targeting process, receiving the full attention of the corps staff to leverage joint enablers, fires, ISR, and space effects that produced survivable and successful results. I advocate for adopting attack aviation as a corps-level asset by updating doctrine, organization, and professional education. Specifically, formal codification of the Aviation Coordinator (AVCOORD) role, an operational control (OPCON) relationship from attack battalion (AB) to corps, and maneuver branch-specific aviation integration education.

Attack Aviation in LSCO

On the modern battlefield, Army rotary-wing aviation faces increasingly sophisticated threats from near-peer adversaries, including integrated air defense systems, electronic warfare (EW), and proliferated unmanned ISR at lower echelons. These conditions make LSCO particularly challenging for attack aviation and render deep operations inherently high risk. In the current model, the division is the primary warfighting element, planner, and employer of the CAB's attack aviation (Department of the Army, 2021, p. 1-17). However, lessons learned from V Corps and the 12th CAB through several WFXs, including Winter Strike 23, Austere Challenge 24, and Avenger Triad 24, suggest that attack aviation should be a corps asset. Aligning attack aviation at the corps level enhances deep-strike planning through the corps targeting cycle by leveraging a larger, more capable staff to synchronize operations and airspace across multiple divisions, while also providing better access to joint enablers.

Observation: Division Capability Shortfalls

Recent CTC rotations and WFXs have revealed critical division-level gaps in aviation deep operations planning, target development, airspace coordination, and enabler synchronization. Many division staff struggle to integrate aviation into the targeting cycle and often view attack aviation as another enabler for ground maneuver forces, an additional effect like indirect fires to 'layer on.' While the AH-64 can perform this role, its range, survivability, and weapons make it more effective when employed as a maneuver asset to shape operations and destroy high-payoff targets. Newly fielded capabilities in the AH-64E Version 6, such as the Spike non-line-of-sight missile, along with upgrades to the fire control radar, modernized radar frequency interferometer, and modernized



The 12th CAB maintains and operates Army Aviation assets in Germany. U.S. Army photo by SGT Terrell Mason.

target acquisition and designation system, extend its range and capabilities. The AH-64's increased standoff capability extends the division and corps' area of influence, while also increasing survivability by minimizing time spent in the enemy's weapons engagement zone. Retaining the AH-64 in close operations limits its capabilities, increases the risk of fratricide, and reduces its survivability.



Polish Maj. Gen. Maciej Jabłoński, deputy commanding general for interoperability, V Corps, reviews the AH-64E Apache with key personnel from 12th CAB, at Katterbach Army Airfield, Germany.

Large-scale combat operations will strain division staff, many of whom already struggle to maintain a 96-hour planning cycle. For AB planners, the cycle is compressed further, limiting their ability to request, integrate, and synchronize higher-echelon enablers, especially when divisions miss deadlines aligned with the corps' air tasking order (ATO) cycle. Divisions often lack the staff expertise and access to joint capabilities, such as suppression of enemy air defenses (SEAD), long-range fires, space effects, and EW needed to reduce risk to aviation operations. Without a dedicated deep operations planning cell (DOPC) or robust integration with joint enablers, divisions must source effects from a limited pool, placing Apache crews in high-risk environments with minimal mitigation.

The corps remains the most appropriate echelon for synchronizing deep operations across fires, ISR, and aviation. When the corps manages attack aviation operations, the staff synchronizes its pool of enablers, who cover all the corps' aviation attacks. This allows divisions to secure their portion of enablers to support division missions during overlapping timeframes. This necessitates close coordination between CAB and corps planners early in the targeting cycle, something the 12th CAB has attempted to strengthen in recent years by creating the AVCOORD position.

Insights: The V Corps–12th CAB Model

The 12th CAB operates under a unique command structure, reporting directly to V Corps rather than to a division. This relationship proved beneficial in LSCO training events such as Austere Challenge 24 and Avenger Triad 24. In those exercises, the 12th CAB was integrated into the corps G-32 aviation cell and targeting cycle and helped develop the corps-level AVCOORD role. Similar to the fire support coordinator, the AVCOORD coordinates with division CABs and corps staff and advocates for joint enablers for aviation missions. The AVCOORD serves as aviation's voice in the corps targeting cycle, recommending how and when to employ rotary-wing assets to support corps priorities and advising on changes to command relationships between corps and division CABs ahead of major operations. While divisions can continue to integrate aviation as required, the corps observed the greatest operational gains when a division CAB was elevated to a corps asset and tasked to shape deep operations.

The corps' targeting cycle, supported by the DOPC, joint air-ground integration centers, and the AVCOORD, provides the time and staff depth needed for effective planning. Corps targeting boards (target working group and target decision board), incorporating CAB representatives enable aviation units to shape their maneuver plan around selected targets. Corps fires elements can prioritize SEAD missions, synchronize with ISR assets, and provide ATO and airspace control order inputs to align key enablers early in the process (Department of the Army, 2021, p. 4-26 to 4-27). Aviation inputs in the targeting cycle can influence target nominations, particularly air defense threats to be destroyed ahead of aviation deep attacks.

Unlike at the division level, corps planning provides CABs with sufficient lead time to complete the full military decision-making process (MDMP) and produce a detailed aviation mission approval brief, vetted by the corps G-32, AVCOORD, and relevant brigade and corps staff sections before corps commander approval. This process aligns air and ground maneuver, fires, and joint effects while prioritizing survivability. During execution, the corps and CAB current operations staff direct the conditions check, monitor operations, and respond rapidly to threats, providing the adaptive command and control needed to protect aviation assets in real time (12th CAB Staff, 2025). The depth of staff and resources available at the corps level exceeds that of a division executing a similar operation, enhancing survivability and the probability of mission success.

In developing the corps-CAB attack aviation planning model, the 12th CAB and 1-3 AB staff joined V Corps' CPX Avenger Triad 24 at Grafenwöhr Joint Multinational Simulation Center, Germany. The 1-3 AB brought a flight company to serve as a company-level planning and response cell, with its pilots serving as simulation 'pucksters.' During the exercise, the CAB staff coordinated directly with V Corps, while producing mission orders for the AB. The 1-3 AB conducted its own MDMP and issued orders to its flight company response cell, which then performed its own troop-leading procedures and executed the simulated mission. This tested the planning process from corps to company, stressing all systems and processes and confirming the model's functionality. These missions proved more successful than similar division missions, due (in part) to the advanced resources and staff efforts applied.

Lessons Learned: Aligning Attack Aviation to Corps

To implement the 12th CAB and V Corps model within current LSCO planning operations, adjustments to doctrine, organization, leadership, and education are required.



The 12th CAB conducts a man-portable air-defense systems threat lane at Hohenfels Training Area, Germany. U.S. Army photo by CPT Gabrielle Hildebrand.

Doctrinal Change: Codifying the AVCOORD

First, doctrine must formally codify AVCOORD's role, thereby giving aviation a 'seat at the table' in the corps targeting process. The AVCOORD should be a key stakeholder among the corps' collective aviation assets, with a 15-series background and, ideally, intimate familiarity with attack aviation operations. In the 12th CAB's example, the brigade commander, an experienced AH-64 pilot, fulfilled this role, providing crucial attack aviation insight and capabilities into the corps' targeting priorities. The AVCOORD should maintain a collaborative working relationship among all corps aviation assets and deconflict, recommend, and elevate operational requirements. However, the AVCOORD must carry the authority of a CAB commander and be a subject-matter expert to maintain a compelling voice at the corps planning level. Therefore, officers appointed to the AVCOORD role must be designated by the corps staff or commander and foster a close working relationship with the corps G-32.

Organizational Change: OPCON Relationship

A closer command relationship between ABs and the corps should be established. The simplest solution would be to establish an OPCON relationship between the AB and the corps. Sustainment, maintenance, and administrative functions remain at the CAB level, while attack aviation missions are assigned based on corps priorities. While this would deprive the division staff of direct control of its attack aviation, the AVCOORD can liaise between the division and corps, recommending changes in command relationships when it is appropriate to assign attack aviation to support specific division missions. This relationship's objective is to ensure that attack aviation is used deliberately only for specific, high-priority attack missions with sufficient support and enablers. Having halved the number of AH-64s in the CAB from 48 to 24 as part of the Army Transformation Initiative, the corps can only provide attack aviation to the division when operationally necessary, and the division has mitigated risk to acceptable levels (Feickert, 2025).

Leadership and Education: Creating Future AVCOORDs

Army education should better prepare corps-, division-, and brigade-level staff to integrate deliberate attack aviation operations, particularly by clarifying the AVCOORD role and the planning requirements for LSCO. The Maneuver Captain's Career Course could introduce foundational deep-attack concepts, while intermediate-level education should reinforce aviation's role as a corps asset within the targeting process. Aviation-specific training paths for AVCOORDs, modeled on programs such as the Joint Firepower Course, would help professionalize the role and create depth across formations. Together, these steps would improve staff integration and ensure attack aviation is deliberately considered and resourced at higher echelons.

Conclusion

Attack aviation remains relevant in LSCO, but its survivability depends on a higher level of coordination, planning, and enabler integration than current division-centric models can provide. Division staff often lack the time, personnel, and access to joint capabilities required to effectively synchronize deep operations. Corps headquarters, with larger staffs, deliberate planning processes, and established joint connectivity, represent the lowest echelon capable of employing attack rotary-wing aviation in a manner that balances lethality and survivability. The Army should therefore formally align attack aviation under corps control during LSCO to maximize its effectiveness while preserving combat power. The experience of the 12th CAB and V Corps demonstrates a viable model for employing attack aviation in the deep fight, one that deliberately mitigates risk while preserving its operational relevance on the modern battlefield.

Biography:

CPT Austin Adams currently serves as an AS3 in the 10th CAB, having served previously as a platoon leader, battalion and brigade AS3, and liaison officer to V Corps during his 4 years in the 12th CAB in Germany. He is an Aviation Captain's Career Course, Joint Firepower Course, and Air Cavalry Leader's Course graduate and is an AH-64 D/E rated aviator and pilot-in-command.

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Reconfigurable Virtual Collective Training: The Future of Collective Rotary-Wing Combat Simulation Training



An Army Trooper trains on the Reconfigurable Virtual Collective Trainer (RVCT) system at Camp Ripley Training Center, Minnesota. U.S. Army photo by Mr. Anthony Housey.

By CPT Chance E. Kremer

In light of an ever evolving and increasingly adverse aerial operational environment, Army Aviation is not adequately preparing itself to overcome the numerous challenges it will encounter while supporting future large-scale combat operations (LSCO). During the Vietnam War, the Army Air Cavalry, still in its infancy, suffered tremendous casualties, losing over 5,600 of approximately 12,000 helicopters deployed (46%) and over 4,800 killed in action of the 40,000 crewmembers who served (12%) (Roush, 2018). While Army Aviation has learned many lessons from Vietnam and subsequent conflicts such as Desert Storm and the Global War on Terror (GWOT), the battlefield has continued to become increasingly complex. Whereas Vietnam pilots were primarily concerned with small arms and direct fire anti-air guns, and GWOT pilots were vulnerable to rocket-propelled grenades, LSCO promises an even more hostile environment filled with radar, infrared, and laser-guided threats.

Moreover, with the GWOT generally considered past, true combat deployments are nearly nonexistent. In an ironic twist, the closer the U.S. gets to LSCO, the fewer experienced combat pilots it has remaining. Given the inherent challenges and risks of conducting effective real-world combat training, electronic simulation appears to be the best option. Enter the Reconfigurable Virtual Collective Trainer (RVCT). The RVCT is the latest in the U.S. Army Synthetic Training Environment and mixed-reality technology portfolio (Thompson, 2022), succeeding the Aviation Combined Arms Tactical Trainer. If Army Aviation wants to avoid the steep learning curve it experienced in Vietnam and be prepared for LSCO, it should embrace the RVCT to simulate combat scenarios, increase flight lead and air mission commander (AMC) experience, train in diverse environments, and mitigate risk.

Simulate Combat Scenarios

As any combat vet will tell you, there is a drastic difference between conducting a combat flight and conducting a normal training flight. Even with superior planning and resources, live flight training cannot safely and realistically simulate the threats conditions required to master Aircrew Training Manual 2900-Series tasks. Though it cannot replicate true combat, the RVCT can simulate anything from Vietnam-era small arms to modern Integrated Air Defense Systems. These threats will trigger aircraft survivability equipment, forcing pilots to react to the incoming projectiles. Taken further, pilots can execute missions against active enemy air defense assets, forcing them to plan for or react to the threat appropriately or suffer the consequences. Ultimately, the RVCT allows pilots to fail and learn from their mistakes without the dangers associated with real combat.

Increase Flight Lead and AMC Experience

Pilots will not conduct LSCO missions alone. All missions will be conducted multi-ship and will require flight leads and AMCs. This is where the RVCT separates itself from other simulation capabilities. While Army simulators like the Black Hawk Aircrew Trainer can simulate enemy air defenses, all training must be done single ship. Furthermore, due to maintenance limitations and logistical constraints, it can be difficult to conduct valuable real-world multi-ship, combat-oriented training.

The RVCT solves this problem by "[allowing] squads to battalions to execute collective, combined arms combat maneuver training in a mixed reality environment" (Magnuson, 2025). This includes supporting numerous crews flying multiple aircraft. It can be programmed from simple infiltrations to complex air assaults supporting crawl, walk, run training models for flight leads and AMCs. Scenarios can implement unplanned contingencies and other challenges to build pilot reactiveness and decision-making capabilities. Aircrews must be trained to execute "formation break-up procedures due to enemy threat systems as these maneuvers require aircraft to maneuver as a team to be effective and not run into each other… [and then] regroup in order to continue the mission," (Bell et al., 2015). While real-world training can be extremely dangerous, the RVCT allows pilots to make mistakes they can learn from, further preparing them for these complex multi-ship roles.

Train in Adverse Environments

Pilots are typically confined to a specific environment for flying,

regardless of their installation, even though LSCO can happen anywhere in the world. In Korea, all flights are conducted at or near sea level, with a few small mountains across the peninsula, none of which exceed 4,000 feet. Pilots rarely, if ever, find themselves power-limited. If asked to conduct a mission in a power-limited environment, many junior pilots stationed in Korea would likely struggle. The RVCT faces no such limitations. Training can be conducted in the mountains of Afghanistan, island hopping in the Pacific, in the Korean winter, or at the peak of the Iraqi summer. Pilots can challenge themselves by planning in a variety of new and unfamiliar environments to deepen their understanding of performance planning and improve their adaptability.

Temperature and altitude are not the only environmental factors to consider. With the proliferation of drones and unmanned aircraft systems (UAS) in warfare, the once clear airspace that rotary-wing assets used to operate in is becoming increasingly saturated. Already capable of "[simulating] air and ground platforms such as the Abrams tank, Bradley Fighting Vehicle, and the Black Hawk and Apache helicopters," it should not be difficult to add UAS assets to the programming (Magnuson, 2025). Utilizing the RVCT, Army Aviation can begin the "support of Manned Unmanned Teaming (MUM-T) training for both Army Aviator and UAS operator in the same exercise," (Bell et al., 2015). Similar training can also be conducted to determine how to mitigate threats from enemy drones. In the rapidly evolving modern operational environment, the RVCT is crucial to keeping pilots tactically current.

Provide Risk Mitigation

Outside of the new operational environment, arguably one of the biggest challenges facing Army Aviation today is risk aversion. After numerous tragic accidents in recent years, commanders are understandably wary of approving complex training exercises. Here again, the RVCT bridges the gap. From multi-ship survivability to mixed-model design series training, the RVCT can simulate valuable training and exercises that might normally require approval from a brigade commander or higher. Additionally, this simulated training will greatly benefit newer, inexperienced pilots who would otherwise be excluded from advanced training. Whether used as a rehearsal tool or for the actual training mission, the RVCT increases reps and experience while mitigating or eliminating risk.

The threats associated with LSCO are only becoming more sophisticated and lethal. Preparing Army Aviation for this environment requires more than incremental improvements to traditional training methods; it demands innovative approaches that replicate the complexity and danger of modern warfare without incurring unnecessary risk. The RVCT provides a powerful tool to bridge this gap by enabling realistic multi-ship training, exposing pilots to diverse operational environments, and allowing leaders to rehearse complex missions against advanced threat systems. While no simulator can fully replicate combat, the RVCT offers Army Aviation an opportunity to build experience, confidence, and tactical proficiency before the first aircraft ever launches into a contested operational environment.



A UH-60 Black Hawk pilot trains in a flight simulator at Wheeler Army Airfield, Hawaii. U.S Army photo by SGT Olivia Cowart.

Biography:

CPT Chance Kremer is a UH-60 Black Hawk pilot stationed with the 4th Combat Aviation Brigade out of Fort Carson, Colorado, and is currently deployed to the Middle East in support of Operations Inherent Resolve and Epic Fury. Prior to that, he served 3 years in South Korea with the 2D Combat Aviation Brigade, where he conducted missions across the peninsula, including to the Demilitarized Zone.

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The opinions expressed in this paper are those of the author and do not necessarily reflect the official policy or position of the Defense Logistics Agency, the Department of the Army, or the Department of War (DoW).

Blind Requisitions: A Call to Modernize Army Aviation's Point of Order

By CW3 Ronald K. Ramdipsingh (Ram)

If you logged in to Amazon to buy something for your family vehicle and it wouldn't be delivered for more than a year, wouldn't you like to know before checking out? Well, you are given estimated delivery dates on Amazon, and if they're unreasonable, you'd look for another purchase option. Perhaps you'd purchase locally or think harder about repair options. If there is no other option, you would buy your essential items well in advance as you see delivery times shift. It's the fiscally responsible thing to do with your money.

The Global Combat Support System-Army, or G-Army, the Army's all-encompassing systems, applications, and products in the data processing-based Enterprise Resource Planning (ERP) system, does not provide Soldiers with the same level of insight. In October 2025, Army Aviation supply support activities had 17,869 backorders totaling $90 million. In early 2026, nearly one in four Class IX (repair parts and components) orders to the Defense Logistics Agency (DLA) were backordered. Most interestingly, almost 50% of these orders were for 100 of the same national stock

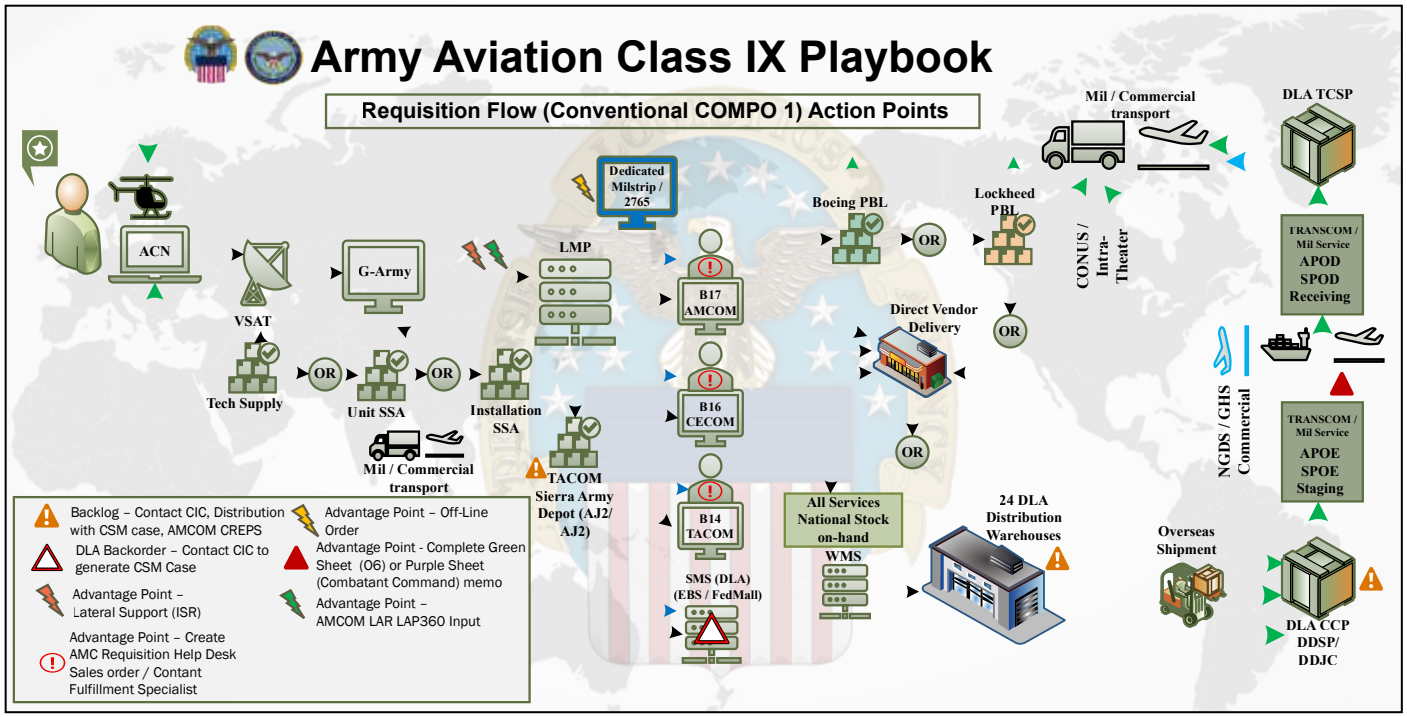

Figure 1. Army Aviation class IX playbook (Ramdipsingh, 2026a).

numbers (NSNs) repeatedly ordered and backordered.[1] It certainly doesn't help that half of all Army Aviation Class IX backorders are placed with a non-mission capable supply indicator (high-priority, non-standard required delivery date, project code, or combination of all).

So, which is correct?

- Soldiers purchase bulk, high-priority parts ***because they don't have what they need when they need it***.

- Soldiers don't have what they need when they need it ***because they purchase bulk, high-priority parts***.

This supply chain paradox has been the subject of finger-pointing for decades. At the root of supply shortages, industry leaders commonly highlight inaccurate forecasting, systematic inefficiencies with baselining aviation demands, and counterproductive supply habits at the unit level. Surely, you've heard the terms **lack of supply discipline** or **priority abuse**, along with many others pointing at the warfighter.

Now you're back on Amazon to buy an air filter for your home after finding it long overdue for replacement. You're given an option for delivery by 5 p.m., 3 days from now, or a week from now with no price difference. **What do you do?**

Imagine selecting the 5 p.m. delivery option and getting scrutinized for doing so. This is the DoW supply challenge faced by the modern warfighter (who uses Amazon's interface regularly). Wouldn't the better approach be to rapidly modernize the systems Soldiers use to place requisitions? The Class IX playbook (Figure 1) displays the flow of an aircraft repair part requisition highlighting the current supply chain complexity, dependency on various data systems, and manual action point requirements for supply managers.

Regular Army Aviation requisition flow:

1. Mechanics input a battery request against aircraft fault in Aircraft Notebook (ACN)
2. Maintenance manager validates the battery request once the ACN laptop connects to the local server. Manager submits to G-Army via secure unit satellite network
3. Unit supply clerk sees the battery request in G-Army for the aircraft and checks local inventory
4. If not on hand, unit supply clerk places an order for the battery with a few simple clicks
5. Army supply logic searches the unit's brigade-level warehouse, installation warehouse, Sierra Army Depot (AJ1/AJ2), for stock before transferring the order to materiel's managing organization (Army Aviation and Missile Command, Army Tank-Automotive & Armaments Command, Army Communications-Electronics Command, and DLA)

As much as step four sounds like Amazon.com it's far from it and disturbingly blind. There is no DLA feed into G-Army for estimated delivery date at the time of order. There's also no notification for managers to take action on requisitions for blocked stock at DLA, no flags for quantities beyond DLA's max release quantity (MRQ) or minimum order quantity, no indication of open unit backorders for the same item in high quantities, no indication of available quantity at DLA warehouses, no flags for parts that are not authorized by the unit by DLA, no item notes about the materiel from FedMall (eCommerce ordering system for the DoW, et. al.), and no indication of live constraints against contract creation for the NSN at DLA.

[1]The author gathered these data using DLA's supply management system, EBS. This information is also accessible on DLA's FEDMALL website: https://cac.piee.eb.mil/xhtml/auth/home/home.xhtml. Please contact the author with any questions.



An Army Chinook helicopter prepares for landing as part of Operation Sky Bulls at Schofield Barracks, Hawaii. U.S. Army photo by PFC Peter Bannister.

Imagine G-Army shopping cart product review ratings that show quality deficiency reports (QDRs) or supply deficiency reports (SDRs) for the materiel. Imagine being able to select alternate delivery locations based on mission needs or the ability to add exception data to specify your preferred method of shipment. Perhaps the supply clerk had all this at their fingertips in a single system and determined sourcing the battery from a local vendor would be best. If they wanted to submit a DLA demand history adjustment (DHA) to sustain national demand history, they should be able to do it in G-Army.

It's 2026. Trained supply clerks and materiel managers should be able to spend unit funds with informed data, and it should **be better** than Amazon's interface. Instead, Army Aviation operations have become increasingly dependent on an ERP accounting system that ensures financial traceability but provides limited tools to encourage fiscal responsibility. This operational dependency and limited resource visibility is not found in modern organizations that prioritize productivity and efficiency.

Soldiers should have the following (Figures 2 and 3) at their fingertips, in their single supply ordering screen inside of G-Army, not FedMall, Advana (DoW Enterprise data and analytics platform), Vantage (U.S. Army's data-driven analytics platform), etc., at the time of placing a requisition and obligating funds:

These are the missing data trends leading to large backlogs of unfilled orders, creating spirals of work across agencies to get answers, dispositions, and sometimes cancel orders without unit notification. But wait; there's more. Data applications should also apply to inventory auto-replenishments to ensure orders are grounded in **current delivery lead-time reality, not only service member demand frequency**. There's no lead-time logic for mass low-priority auto-replenishments in G-Army, commonly leading to aged inventory backorders that are constantly deprioritized by urgent manual buys for the same items. These are currently triggered at a low priority when inventory safety stock levels are reached, rather than when administrative and contract lead times drift or shipment logistics stall. Common single quality, low-priority hardware orders auto-generate inefficiently and add stress to shipping consolidation points, slowing the pipeline for urgent requirements. Army replenishment logic needs to consider total 'outbound delivery trends' or NSN lead time to adjust reorder trigger time, priority, and size.

It's time to disarm the paradoxical stance against warfighter spending habits. The technology exists. We must equip them with data and allow every supply clerk to think as materiel managers. This is not an ask to replace G-Army or discredit any effort to prioritize defense accounting. It's not an ask for artificial intelligence insights or to redisplay information in some web-based dashboard. This is a hard look in the mirror to accept that the Army's ERP has created operational dependencies in aviation that allow poor supply decisions. The question is: Can the Army accelerate modernization to achieve the capability of informed ordering and advanced resourcefulness? The warfighter is capable, and our Army is primed for positive transformation. By modernizing the point of requisition now, we begin to fix the entire system, transforming our supply chain to mitigate disruption and respond at scale.

The views and opinions expressed in this paper were developed while working alongside DLA's Class IX customer-facing resolution cell.

- **Projected delivery date** (vendor lead time + backorder volume + shipment wait times)
- **Alternative fulfillment options** (Lateral support request options/local sourcing recommendations)
- **Advanced manufacturing sources** (AMC depot manufacturing requests)
- **Backorder posture** (NSN matched unit backorder list and total DoW backorders)
- **DLA/LCMC item notes** (Alternate NSN recommendation, contracting constraints, etc.)
- **SDR/QDR submission option and ratings** (Materiel quality ratings, trends, and submissions)
- **Signal code changes and additional delivery location options** (Mission needs)
- **Exception data input** (Special instructions, i.e., priority shipping method preferences)
- **Quantity recommendation** (order fill trend/MRQ/Advice code recommendation)
- **Supply Assistance Request submission and updates** (Assistance requests for stalled orders w/ live ServiceNow responses)

Figure 2. Essential ordering data for supply clerks. (Ramdipsingh, 2026b).

- **Blocked Stock notification** (Item manager release required notices and requests to point of contacts for release)
- **DHA input options** (Manual demand input to sustain national-level demands)
- **DLA constraints to contract generation** (Service engineering approvals, DLA contract funding limits)
- **Unauthorized Stock notification** (Mil service restricted/Unit restricted notifications)
- **Demand Spike Justification statement or code** (based on national supply trends)
- **Price change trends** (time-based trend visualization with materiel price challenge options)
- **Refund notifications** (Credit return for turn-ins (returns) or cancellations)

Figure 3. Essential ordering for data managers. (Ramdipsingh, 2026c).

Biography:

CW3 Ronald Ramdipsingh (Ram) is currently assigned to the Warrant Officer Training Division, Fort Eustis, Virginia. He was previously the Aviation Readiness Officer for DLA Weapons Support in Richmond, Virginia. He has served over 18 years in Army Aviation, sourcing parts and repairing aircraft worldwide. Ram is currently earning a master's in engineering with Embry-Riddle, holds a B.S. in aeronautics, and an Associate of Applied Science degree in electromechanics. He recently completed a 1-year fellowship at Boeing's production plant in Philadelphia, Pennsylvania.

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2-159 Attack Battalion's Operation Skyfall: Apache Engagement Techniques Development for the Counter-Unmanned Aircraft System Fight



The 2-159th Attack Battalion engages an unmanned aircraft system with an AH-64E during Operation Skyfall. U.S. Army photo by Grant Hockley.

By MAJ Daniel T. Murphy and CW4 Jarrad M. Walter

March 2027—*Eastern Europe. After significant escalation on the North Atlantic Treaty Organization's (NATO) eastern flank, the 12th Combat Aviation Brigade's (CAB) 2-159 Attack Battalion (AB) deploys east to support V Corps and NATO defenses. In the V Corps' rear, CW3 Jones and WO1 Schmidt wait by their AH-64E in a Readiness Condition 3 status, pending drone alert.*

Suddenly the battalion command post radios, direct their Air Weapons Team (AWT) to launch to a predetermined sector as AN/MPQ-64 Sentinel radars detect a wave of Geran-2 Group 3 drones headed toward the division and corps rear areas. The crew launches, flying low toward the Link 16 targets passed from the Sentinels while scanning just above the horizon with their fire control radar (FCR). At first, nothing, but then the pilots see icons in their helmet mounted display (HMD); the FCR detects the Geran-2s and is cueing the crews toward them. Employing the new counter-unmanned aircraft system (C-UAS) task and proximity-fused 30-mm rounds, the AWT closes with and destroys four Geran-2 drones before they can deliver their 115-lb warheads against division and corps targets.

This scenario envisions an employment concept for the AH-64E in C-UAS operations. To prepare for such a possibility, 2-159 AB conducted Operation Skyfall from 16—20 March 2026. Building on the Apache Program Management Office (PM Apache) and 1-151 Aviation Regiment's Operation Flyswatter, Operation Skyfall sought to continue the experiment, further refining tactics, techniques, and procedures (TTPs) to share across the Apache community.

Experiment Objectives

The Gunslinger Battalion specified four objectives for Operation Skyfall: 1) Test in an operationally realistic environment to ensure transferability of lessons learned to operational units; 2) Prioritize flight activity category (FAC) I aircrew members to demonstrate line pilots' ability to conduct this mission; 3) Test a variety of engagement profiles to refine tactically relevant and rapidly communicate them to the U.S. Army Aviation Center of Excellence (AVCOE) and the Apache community; 4) Integrate with 5-4 Air Defense Artillery (ADA) Regiment (Maneuver-Short-Range Air Defense [M-SHORAD]) to develop joint TTPs and communication architectures to share the C-UAS fight.

Operating Environment

Operation Skyfall occurred at Range 301, Grafenwöhr Training Area (GTA). In addition to being 2-159 AB's usual aerial gunnery range, its rolling terrain and trees make it a match for the battalion's likely employment locations within Europe. Engagements occurred during daylight hours and with favorable weather.

The 'threat' was the Griffon Aerospace MQM-170C Outlaw, a Group 3 UAS (Department of the Army, 2025, p. 3). In comparison to the Geran-2 (or Shaheed), the Outlaw is shorter (8.75 feet vs. 11 feet) with a longer wingspan (10.8 feet vs. 8.2 feet); however, the delta wing of the Geran-2 presents a larger targetable area (Wolf, 2024; Griffon Aerospace,

2024). The Outlaw was manually controlled due to range restrictions, meaning the airspeed, attitude, altitude, and flight path were highly variable. Crews had less than 1 minute of flight time to acquire, target, line up, and engage the Outlaw on its roughly 3-km path downrange.

Although range restrictions largely dictated terrain and target factors, they also served to force the experiment in a realistic direction. Despite knowing the general location of the Outlaw prior to taking the range, crews faced significant time pressure in preparing their engagements against an erratic target in complex terrain.

Weaponry and Sights

In addition to standard 30-mm training rounds and flechette rockets, the Gunslingers requested and received Advanced Precision Kill Weapon System (APKWS) rockets for this event. Due to range limitations, Hellfire and Joint Air-to-Gound-Missiles could not be tested. Approval of air-to-air weapons danger zones proved possible through dedicated effort by the battalion master gunner (MG) and the GTA Live Fire Branch; however, early emphasis on the novelty of the engagement is key to a timely approval.

Crews attempted to acquire the Outlaws with all three sights of the AH-64E: the Target Acquisition and Designation Sight (TADS), the FCR, and the Pilot Helmet Sight (PHS).

Crew Selection

Five crews participated in Operation Skyfall. The battalion standardization pilot (SP) and MG first validated the range and then experimented with the available munitions in different engagement profiles and ranges. The remaining crews were dual pilot-in-command (PC) (including the two newest PCs in the battalion), with cockpit experience totals ranging between 1,150 and 1,550 hours. Although participation was restricted to PCs, and the battalion SP vetted crews, six of the eight crew members were FAC I aviators and, therefore, representative of line crews. Select crews completed 4 hours of training in the Longbow Collective Trainer and one live flight simulating air-to-air engagements prior to Skyfall execution.



Outlaw drone stationed for take-off at Grafenwöhr Training Area during Operation Skyfall. U.S. Army photo by SSG Jamie Robinson.

5-4 ADA Integration

The 2-159 AB was able to acquire the Outlaw drones for Operation Skyfall by coordinating with 5-4 ADA, which is co-located in U.S. Army Garrison Ansbach. After learning that 5-4 ADA is Link 16 capable, the Gunslingers added digital communications and joint aviation ADA TTPs to the experimental objectives. Able Battery, 5-4 ADA, was present at Range 301 for the experiment.

Results

Operation Skyfall provided many valuable insights for the Gunslinger Battalion and beyond. First, it largely replicated the findings of Operation Flyswatter with respect to 30-mm and flechette engagements but extended those results to a tactically realistic environment (low altitude, time-constrained, complex terrain, erratic target flightpath).



Terrain at Grafenwöhr Training Area, Range 301, during Operation Skyfall. U.S. Army photo by CPL Grant Hockley.

Second, it validated that this mission can be accomplished with the line flight crews most likely to be tasked with it. Third, it tested a variety of engagement profiles with detailed results available for dissemination. Notably, TTP iteration within Operation Skyfall led to the final day's two crews being more successful. This result demonstrates the need for broader testing and familiarization before any definitive conclusion regarding the overall suitability of the AH-64E in this role. Finally, Operation Skyfall was unsuccessful in achieving Link 16 target transfers between aviation and air defense, because Link 16 connection could not be established between the units. This pointed to a need for more frequent cooperation between the two branches if these capabilities are desired.

Sights

For target acquisition, crews tested all three sights. The most effective method was visual identification by the pilot, followed by an internal target handover to the copilot gunner. The narrower field of view of the TADS limited its utility in acquiring the Outlaw without visual cueing. The FCR struggled to identify and track the target in a top-down scan profile, likely due to ground clutter. However, when the AH-64E hovered (at or below 25 feet above ground level) and scanned upward, crews reliably received usable radar returns and HMD icons cueing them to the target. It is important to note that these results may vary at night or with terrain variance.

Weapons

Gunslinger crews successfully engaged Outlaws with both PHS and TADS using aimed, 10–20 round bursts of 30-mm training ammunition; however, flechette rockets proved ineffective. The APKWS air-to-air engagements were not attempted due to the challenge in maintaining steady laser on an erratic target. CW4 Walter, the battalion SP, wrote a white paper with specific engagement profile results to inform AVCOE and to share with interested units across the Army (Walter et al., 2026).[1]

[1] Please contact MAJ Daniel T. Murphy for further information regarding this paper at daniel.t.murphy61.mil@army.mil or CW4 Jarrad M. Walter at jarrad.m.walter.mil@army.mil



An Army AH-64E Apache helicopter engages a UAS during Operation Skyfall. U.S. Army photo by CPL Grant Hockley.

Recommendations

If Army Aviation wants to take part in the C-UAS fight for the Joint Force, several lines of effort should be pursued. First, more testing should consider the full sensor-to-shooter kill web that the Apache would operate in for the C-UAS fight. To that end, greater emphasis should be given to ADA and AH-64E Link 16 connectivity, for both bidirectional target handover capability and fratricide prevention. Second, a 'use case' for the AH-64E should be developed and communicated. Although current AH-64E systems may be less effective against Group 1 and 2 UAS, the hypothetical scenario at the beginning of this article offers a tactical real-world example for the employment of AH-64s in the Group 3 UAS fight—a fight demonstrably relevant in both Ukraine and the ongoing Iran conflict. Allies and partner nations who already employ the AH-64 in a C-UAS role (such as Israel or the United Arab Emirates) may be willing to share their lessons learned and employment concepts. Third, low-cost air-to-air weapons (such as proximity-fused 30mm) should be included in live and virtual training whenever possible. Finally, given the long lead time, beginning contracting to make Outlaws or similar target drones available for Apache gunnery should begin now using the ADA gunnery contract as an example.



An Army AH-64E Apache helicopter during air-to-air training at Operation Skyfall. U.S. Army photo by CPL Grant Hockley.

Conclusion

Determining whether a doctrinal role for the AH-64E in the C-UAS mission is technically or economically feasible requires a broader analysis. This analysis must consider threat capabilities, current and future Apache munition capabilities, and costs in comparison to other existing and planned Army C-UAS capabilities. Whatever the results of that analysis, Operation Skyfall showed that current line AH-64E crews can acquire and destroy Group 3 UAS in complex terrain with existing weapons; this capability will only increase with weaponry, sight, and training improvements tailored to the C-UAS mission.

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Aviation Tactical Assembly Area Organization in the Next War



Soldiers flying an AH-64 Apache and operating Bradley fighting vehicles join forces at the JMRC. U.S. Army photo provided by the JMRC Falcon Team.

CPT Michael B. Leinen, CPT William S. (Liam) Thies, CPT Calvin L. Smith, and MAJ Ronald J. Edwards

Introduction

Aviation units need to disperse if they want to survive and continue fighting in support of ground forces in future wars. However, as units disperse, their ability to conduct maintenance, sustainment, and command and control (C2) become more challenging. This is not a new problem for Army Aviation. In his Vietnam War Air Mobility Study, LTG John Tolson (1999) argued that a dispute between tactical commanders and logisticians caused the U.S. Army to under-resource air mobility, leading to persistent maintenance shortages. While commanders sought flexible, decentralized maintenance for maximum responsiveness, logisticians viewed this as an inefficient fragmentation of scarce resources. The Army decided centralized maintenance enabled efficiency elsewhere, creating large, fixed depots that limited tactical flexibility and the benefits of dispersion. Retired CW4 Robert Howard (1993) recounted a time his maintenance company came under attack from mortar fire, resulting in their personnel, work areas, and helicopters being heavily damaged. As a result, every available Soldier had to scramble to repair all the damage, resulting in 1 whole day of support to the ground force lost.

The U.S. will never fight the Vietnam War again; however, we faced similar problems in the War on Terror, operating out of large forward operating bases and staying in one place for too long, which made us susceptible to enemy attacks. The changing nature of warfare observed in Ukraine has shown us we must disperse to survive in a high-threat large-scale combat operations (LSCO) environment where we can expect heavy surveillance from satellites and drones hunting our formations to attack. The Ukrainian Air Force dispersed its aircraft to secondary and tertiary airfields, dispersed its maintenance and munitions, and trained its personnel to maintain their fleet in these dispersed conditions. This contributed to Russia's inability to establish air superiority at the onset of the war and through the present day (Deptula, 2024).

> ***"You'll never fight the last war again … That will inform you of what goes into the future, but it is not the future."***
>
> **– GEN Donahue, Commanding General, U.S. Army Europe and Africa (Byerly, 2026)**

This article will offer a way to conduct dispersed maintenance, sustainment, and C2 for aviation tactical assembly areas to enable us to effectively fight and win in the next war. Additionally, we will recommend Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy solutions to identified gaps for this framework.

Current doctrine regarding command post (CP) organization, as it applies to aviation units in Army Techniques Publication (ATP) 6-0.5, *Command Post Organization and Operations*, only prescribes the need for a main CP (MCP), a tactical (TAC) CP, and company CPs (Department of the Army [DA], 2017, p. 1-4). This limited framework lends itself to large, concentrated aviation assembly areas with centralized maintenance, sustainment, and C2 for ease of operations. However, as outlined in Center for Army Lessons Learned Publication

Number 26-1118 (Leinen & Cox, 2025) and observed at the Joint Multinational Readiness Center (JMRC), these large aviation footprints are easily identifiable and exploitable by our adversaries with dire consequences. The paper argues that aviation units gain survivability through dispersion; however, current aviation doctrine does not enable that dispersion by only prescribing an MCP, TAC, and company CPs. The Army already has a framework that exists for combined arms battalions requiring the utmost dispersion on the front lines. That same framework, modified to fit the unique maintenance and sustainment requirements of aviation units, while also tying into the larger Army logistical framework, offers a way to improve survivability through dispersion. The framework, depicted in the Figure, increases dispersion and decreases footprint sizes to increase survivability, while also allowing aviation units to provide continuous support to ground forces during survivability moves. This updated framework, adapted from Figure 3-3 in ATP 4-90, *Brigade Support Battalion*, (2026) can be conducted in short and long durations, based on mission requirements.

The framework in the Figure breaks down each node to fulfill a specific function for an attack or assault aviation battalion during LSCO. The framework was designed assuming that we are in a no-growth Army and that it will continue to evolve with improvements to maintenance and sustainment. A brief description by node follows and can be applied to similar aviation formations.

Company CPs: The forward/expeditionary company CPs are positioned forward to offer opportunities for engagement with supported ground forces and speed of response regarding launch criteria, while staying outside of enemy tactical artillery range. The company CP should be able to operate autonomously with elements from aviation maintenance and forward support to increase the company's endurance. Forward support assets at the company CPs will remain with those company CPs and get resupplied by distribution elements from the combat trains CP (CTCP). When tactically feasible, liaison officers from the company CP can travel to the supported brigade, battalion, or company to coordinate integration of air assets into the ground tactical plan.

MCP: The MCP is comprised of the battalion headquarters and staff to conduct mission planning and provide C2 for current operations. The battalion's downed aircraft recovery team (DART) will be positioned here to provide additional maintenance support to the forward company CPs when necessary. The TAC can push from the MCP to a company CP during operations to aid in C2. When the MCP conducts survivability moves, the TAC can operate autonomously or co-locate with the CTCP or a company CP to maintain C2.

CTCP: The CTCP, led by the battalion S4 and forward support company (FSC) commander, becomes the battalion's ground maintenance collection point to provide maintenance support for vehicles that cannot be fixed by a contact team at the vehicle's organic location. This is also the logistical and administrative hub for the battalion. This will be the Role 1 location (first level of medical care). The distribution platoon will push from the CTCP to company CPs or logistics release points for logistical resupplies, in addition to sending assets back to replenish sustainment in the division support area.

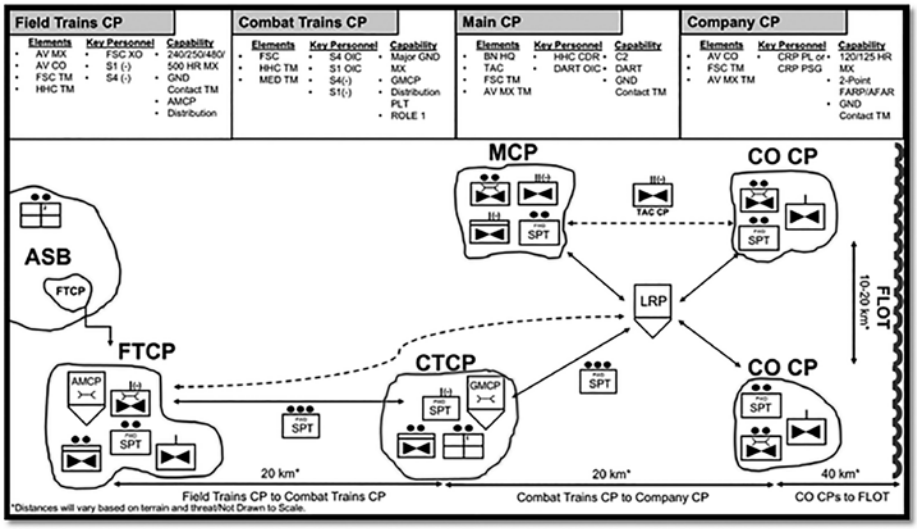

Figure. Dispersed aviation assembly area using field, combat, and company trains. Figure created by the authors.

Field Trains Command Post (FTCP): The FTCP, led by the FSC executive officer and the aviation maintenance company commander, would become the battalion's air maintenance collection point, providing major scheduled maintenance capability, as well as maintenance support for aircraft that cannot be fixed with the DART or maintenance capability at the forward CPs. The FTCP will be near the aviation support battalion (ASB) for additional maintenance support. The FTCP's goal is to communicate aviation maintenance and sustainment requirements and to push sustainment forward into the fight. The FTCP will also have a flight company organized within it to perform maintenance test flights, ferry aircraft forward to company CPs once maintenance is complete, and bring aircraft back from forward company CPs that are almost due for major maintenance. This company will also perform rear area security or join a forward company for a short duration to support a mission when necessary.

Benefits of Dispersion in Sustainment and Maintenance

Decentralized maintenance and sustainment is harder due to the level of synchronization required, and specialized individuals and tools will be spread between all nodes to conduct continuous operations. However, if one company were to be attacked, units would only lose a portion of their sustainment and maintenance capabilities as opposed to all of them, which prevents catastrophic damage to a unit's endurance. It also presents the enemy with multiple dilemmas trying to target a multitude of nodes as opposed to one location, straining their intelligence gathering resources. This also enables units to maintain the element of surprise by having organic sustainment and maintenance capability at each location to minimize the movement of assets prior to a mission, creating a form of concealment, and enabling more survivability and protection. To do this more efficiently, aviation units will have to organize themselves in this manner in garrison and during training to build the relationships and systems necessary to make decentralized maintenance and sustainment more commonplace. Training in this manner will allow them to build the necessary foundation of mutual trust and respect prior to executing in a real-world mission. Enabling flight line companies with low density military occupational specialties (MOSs) and the necessary equipment allows company commanders to better support ground force commanders.

The Way Forward

Doctrine:

• **Update** aviation and CP doctrine (ATP 6-0.5) to incorporate aviation into the combined arms battalion model for CPs.

• **Prioritize** dispersed and decentralized sustainment, maintenance, and C2 in aviation doctrine. This strategy allows for the rapid relocation of command nodes and favors maintenance over centralized hubs.

Organization:

• **Structure** aviation battalions to be self-sufficient and operate independently in the field.

• **Exercise** tactical control over all attached units (senior command in each unit).

Training:

• (Units will) **Train** and task organize within the framework while in garrison to establish the command relationships; build trust; and practice synchronizing the sustainment, maintenance, and survivability moves while supporting continuous operations.

"I'm increasingly convinced in Aviation operations working up to Corps level, that our ability to sustain operations forward (through enhanced FARPs – incorporating C2, maintenance, & sustainment) is our centre of gravity. It remains a wholly unacceptable reality that these Force Elements are the least invested in for training, equipment, and resources … collectively, we must make this cultural shift quickly to protect our relevance on the battlefield."

– (LtCol David Lambert, personal communication, February 3, 2026)

• (Units must) **Train** prolonged operations while conducting maintenance in austere conditions with limited tools and personnel up to the 125/120 hour level.

• (Distribution elements must) **Train** to operate autonomously and defend themselves in austere high-threat environments.

• **Utilize** CP exercises to practice C2 within organic aviation units and with adjacent maneuver units within the same division headquarters.

• **Integrate** portions of the ASB into home station unit training and combat training center rotations in preparation for LSCO. Army Techniques Publication 4-90 outlines how an ASB can supplement aviation units with maintenance, sustainment, and C2 capabilities that can support the framework (DA, 2026).

• (Aviation units and ground units must) **Train** Soldiers how to integrate traditional single-channel ground and airborne radio system/Joint Battle Command-Platform/aircraft radios and Blue Force Tracking with the Integrated Tactical Network (ITN). The ITN is backward compatible with systems used by aviation task forces. A solution already exists, but very few people know and understand how to unlock the interoperability between air and ground force C2 systems (Pidcock, 2025).

• (Units must) **Master** the basics to protect themselves. Although we want specialized personnel to focus on tasks within their expertise, each Soldier is needed to provide security within their respective node.

• **Cross-train** skills from low density MOSs across the formation to minimize the effects of not being able to have the full spectrum of specialized jobs at every location.

• **Add** Conduct Unit Defense (63-CO-0727) as a mission-essential task for every company within aviation battalions.

Materiel:

• **Field** aviation units' ITN systems to close the air-ground communication gap.

• **Update** aircraft C2 systems to be standardized across all platforms and ensure their compatibility with ITN.

• **Procure** commercial off-the-shelf military satellite communication systems to enable C2.

• **Procure** additional radar-scattering camouflage nets for concealment and inflatable aircraft decoys with fake tents for deception.

Leadership and Education:

• **Educate** aviation leaders throughout all professional military education courses on historical and modern lessons of dispersion for survivability.

Conclusion

The sacred trust ground forces place in aviation—to See, Strike, Move, and Ex-



Army AH-64E helicopters prepare to land during Combined Resolve 26-05 at the Joint Multinational Readiness Center's Hohenfels Training Area, Germany. U.S. Army photo by PFC Lilah Windle.

tend in direct support of their scheme of maneuver—is an enduring cornerstone of modern combined arms warfare. Our presence on the battlefield is more than a simple combat multiplier; it is a source of profound psychological strength for the Soldier on the ground. The knowledge that expertly trained aviators are overhead, ready to deliver decisive firepower, evacuate the wounded, or provide critical intelligence often provides the critical edge for ground forces to push a little harder and fight a little longer.

However, we can no longer guarantee this support if we continue to operate from large, centralized aviation assembly areas. In an era of sophisticated satellite imagery, long-range precision fires, and pervasive sensor-to-shooter links, these static, high-value locations are no longer safe havens—instead, they are conspicuous targets. Our adversaries have studied our methods and are actively developing the capabilities to neutralize our airpower on the ground before it can ever influence the battle. To ignore this reality is to cede the advantage we provide, and ultimately, break the sacred trust with the formations we are sworn to support.

The solution is clear: We must disperse. We must fundamentally re-engineer our formations to enable decentralized operations, enhancing our survivability and complicating the enemy's targeting calculus. This will require a significant cultural and doctrinal shift. It means challenging the conventional wisdom that centralizes the warfighting functions of maneuver, sustainment, and C2 for the sake of efficiency. We must now prioritize protection, understanding that true efficiency is irrelevant if our capabilities are destroyed in a single, catastrophic strike. Embracing a model of distributed sustainment, resilient C2, and agile maneuver from dispersed locations ensures that we continue to execute these functions when they are needed most. If we fail to protect ourselves by dispersing our forces, we will not get the chance to perform any other function. If we choose to cling to outdated models of force concentration, we risk a catastrophic failure—becoming our own single point of failure. The choice is stark, but the path to continued relevance and battlefield dominance is through dispersion.

Biographies:

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For more information regarding topics in this article, please visit the podcast at https://www.dvidshub.net/audio/91958/logstat-survivability-through-dispersion-new-approach-aviation

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The AH-64E is the Army's most advanced Apache variant, integrating improved sensors, connectivity, and manned-unmanned teaming capabilities that enhance battlefield awareness and extend combat reach. U.S. Army photo by 1LT Victoria Spangler.

Integrating Aviation Into the Digital Fires Architecture: AH-64E and Advanced Field Artillery Tactical Data System Interoperability

By Mr. Jack Oberle and SFC Nicholas S. Michels

Introduction

As the U.S. Army continues to modernize for multidomain operations, the ability to rapidly integrate aviation assets into the digital fires architecture is critical for achieving overmatch. This article explores the operational advantages and tactical implications of conducting a digital call for fire (DCFF) with the AH-64E Apache attack helicopter via the Advanced Field Artillery Tactical Data System (AFATDS). The AH-64E, equipped with advanced sensors and networked systems, serves as a critical node in reconnaissance and target acquisition. The AFATDS is the Army's automated command and control (C2) system for planning, coordinating, and executing fires.

By enabling direct digital communication between aircrews and fire direction centers (FDC), this capability reduces sensor-to-shooter timelines, minimizes human error, and enhances the speed and precision of joint fires. Leveraging the AH-64E's onboard sensor suite and Link 16 connectivity with the AFATDS provides a scalable solution for seamless integration of aviation platforms into battalion-, brigade-, and division-level fires planning.

Additionally, we will outline current capabilities, assess interoperability pathways, and recommend optimized employment considerations of DCFF in security operations and large-scale combat operations (LSCO).

Employment

The AH-64E, with Modernized Target Acquisition Designation Sights/Pilot Night Vision Sensors and Link 16/Blue Force Trackers (BFT), provides real-time intelligence, surveillance, and reconnaissance. Using DCFF, AH-64Es can send targeting data directly to ground-based fire support elements without relying on manual relay or voice transmission.

The AFATDS serves as the central node in the digital fires process, acting as the primary C2 system for coordinating and executing fire missions. In the context of DCFF with the AH-64E Apache, the AFATDS receives digitally transmitted fire requests from the aircraft and processes them through the established fire support architecture. It synchronizes, prioritizes, and routes these requests to the appropriate firing units, ensuring timely and accurate delivery of effects. The AFATDS enables seamless interoperability between aviation, ground maneuver elements, and artillery units, significantly reducing response times and enhancing lethality on the modern battlefield.

Network Preparation

To ensure uninterrupted communication between the AFATDS and AH-64E, multiple requests must be submitted to the Secure Internet Protocol Router (SIPR) segment of the Mission Command Support Center (MCSC) and the Regional Hub Node (RHN). It is necessary to set conditions to establish the network between the AFATDS and MCSC by:



U.S. Army AH-64E Apaches take off at the Joint Multinational Readiness Center's Hohenfels Training Area, Germany. U.S. Army photo by PFC Lilah Windle.

• Establishing a static internet protocol (IP) address on the AFATDS, ensuring IP is allotted to a local SIPR/Network Internet Protocol Router Access Point terminal pool

• Ensuring a request is submitted to the brigade S6 to add new static IP address/unit reference number (URN) to the network through the MCSC

• Obtaining the necessary network operations center (NOC) IPs and protocols for all three Blue Force Tracker Global Network (BGN) NOC sites to include data distribution service, C2 interface, and AnyCast, a method of networking where multiple users share the same IP address, and communications are routed based on protocol

• Verifying the AFATDS URN and static IP match the data product obtained from the MCSC

• Ensuring a network tunnel is established by the Global Agile Integrated Transport between the AFATDS and the MCSC BGN NOC stations

• Ensuring all IPs, ports, and protocols obtained are permissible through the local and RHN-based firewalls

AFATDS Preparation

A key enabler of the AFATDS interoperability across joint systems is its use of the Variable Message Format (VMF), a standardized digital messaging protocol used in tactical data exchanges. The VMF provides a structured, machine-readable message format that facilitates rapid, secure, and accurate communication between battlefield systems. To enable translation of a BFT 2 message from an Apache into a VMF message required by the AFATDS, the following conditions must be met:

• Ensure all AH-64Es are properly built in the master unit list and added to the communication workspace

• Verify the AFATDS time is synchronized with all other AFATDS in the kill chain and the Apaches

• Establish target block numbers in the AFATDS preferences

• Add all the AFATDS that fall in the kill chain into the unit workspace

• Set the appropriate attack analysis for the AFATDS

AH-64E Preparation

To enable the AH-64E Apache to conduct DCFF through the AFATDS, the only information required from the fires cell is the AFATDS URN. This URN enables message routing using the BFT network, leveraging the aircraft's Tactical Internet (TI) capability. The AH-64E must be operating with Software Block II, and both the messaging and CFF functions must be configured at the SECRET classification level. This classification setting is essential, as the AFATDS operates on upper TI, which is required to establish the digital connection between the system and the aircraft. Once this configuration is complete, a test message should be transmitted from the aircraft to the AFATDS using the mail page within the TI interface. Upon successful confirmation, the aircraft can initiate a standard six-element CFF in accordance with procedures outlined in Technical Manual 1-1520-263-10-3.[1]

Operational Impact

Digital CFF dramatically shortens the sensor-to-shooter timeline by moving

[1]This publication is located at: https://login.aesip.army.mil/portal/faces/home and requires a common access card to view.



AH-64E Apache helicopters arrive at Fort Bliss, Texas. U.S. Army photo by SGT Charlie Duke.

targeting data as digital messages rather than through voice relays, eliminating transcription errors and reducing radio congestion. When paired with the AH-64E's high-fidelity sensors and Link 16 connectivity, the AFATDS can process and route fire requests in seconds, synchronizing aviation, artillery, and joint assets with a degree of precision and speed that voice procedures cannot match. The result is measurably higher first-round effects, tighter collateral damage estimates, and more resilient fires networks that remain effective even in a degraded electromagnetic environment.

In both counterterrorism and LSCO, this speed and accuracy translates directly into operational overmatch. Digital CFF enables commanders to converge effects from dispersed formations, striking time-sensitive or moving targets before they displace and to mass fires across echelons without revealing command posts through voice transmissions. By synchronizing airspace and fire support channels, the AFTADS enables Apache deep attack missions, long-range artillery, and emerging precision effects in the same fire plan, thereby compressing kill chains to minutes and denying adversaries the procedures they rely on for maneuver, counter-fire, or electromagnetic attack. This capability is vital when operating in urban or densely populated areas where minimizing collateral damage and adhering to strict rules of engagement are paramount. Digital CFF enhances situational awareness and coordination between aviation and ground forces, allowing commanders to swiftly neutralize high-value targets, disrupt insurgent networks, and support special operations forces with timely, accurate fires while maintaining operational security. Additionally, using the AH-64E as an observer platform extends the operational reach of artillery beyond that of traditional ground observer limits and minimizes risk to force through reducing exposure time.

Conclusion

As adversaries employ increasingly sophisticated anti-access and area denial systems, the integration of aviation and ground-based fires through a digital, networked framework ensures that Army formations retain the ability to deliver precision effects at speed and scale beyond the forward line of own troops. The adoption and refinement of DCCF capabilities will be vital in achieving decision dominance and maintaining combat superiority during future conflicts.

Biographies:

Mr. Jack Oberle recently concluded his service in the U.S. Army following a successful tenure as a Fire Support Officer with 2-17th Air Cavalry Squadron (ACS). During his time in uniform, he deployed in support of Operation Inherent Resolve, served as a Home Station Mission Commander for 2-32D Field Artillery Regiment, and served as a Battery Executive Officer for 6-37th Field Artillery Regiment at Camp Casey, South Korea. He holds a bachelor's degree in economics from Gettysburg College and is a member of Vanderbilt's Master of Business Administration Class of 2028.

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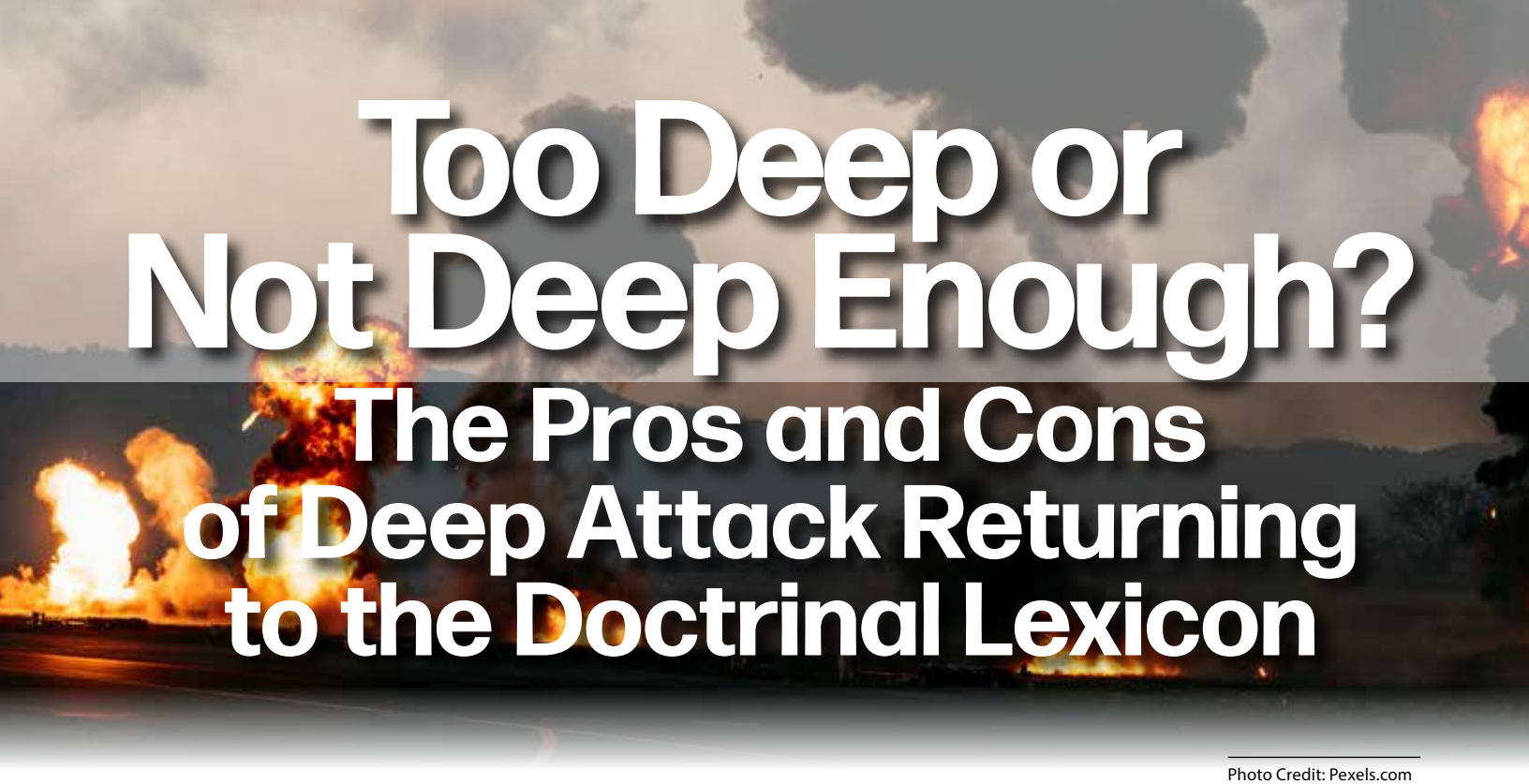

Too Deep or Not Deep Enough?

The Pros and Cons of Deep Attack Returning to the Doctrinal Lexicon

Photo Credit: Pexels.com

By LTC Jeffrey R. Hayes

Introduction

I remember exactly where I was when I saw the March 2025 publication of Field Manual (FM) 3-04, *Army Aviation*. My immediate reaction was to pen a note to a friend, then at Fort Rucker's Directorate of Training and Doctrine, and thank him for his hand in the updated FM. He and his teammates achieved the long-awaited dream of many an old Cavalry and Attack Pilot—killing the verbose and cumbersome *attack on enemy forces out of friendly contact* and replacing it with the tried-and-true *deep attack*. Although identical in meaning, the latter carries a punch that the former could never manage. Deep attack just rolls off the tongue a little sweeter. The phrase itself has a swagger about it, conjuring up images of the daring Cavalry raids of decades and centuries gone by. The gray beards of the branch never really stopped using it. We all knew what they meant. I approved of the term then as I do now.

What I had not anticipated was the confusion that would result from use of the word *deep* regarding something that may be referring to, but is not necessarily restricted to, the division or corps deep area. A clear understanding of the definitions of these missions and the circumstances under which they may be employed are critical to providing the full range of mission possibilities to the maneuver commander. It is the responsibility of Aviation Officers as the battalion and brigade level to 'teach up.'

Doctrinal Terminology Changes

The 2025 FM 3-04 defines deep attack as "**attacks conducted against enemy forces out of direct fire range of friendly forces to shape future operations**" (p. 56). The previous FM 3-04, dated April 2020, provided a nearly identical meaning for the legacy term, attacks against enemy forces out of friendly contact, stating "Army Aviation attack and reconnaissance units, maneuvering independently against an enemy force not in close contact with friendly ground maneuver forces, conducts hasty or deliberate attacks to divert, disrupt, delay, or destroy enemy capabilities before they can be brought to bear on friendly forces" (p. 3-8). For yet more context, FM 3-04.126 (2007) used the term interdiction attack with an almost identical meaning (p. 1-4). And so we observe that while the doctrinal terms have changed, the change was merely one of terminology—not of substance. The only changes of note to the definition were making it concise.

What is not mentioned in either case, nor was ever the intent as far back as my research can dig, was a restriction vis-à-vis the battlefield geometry to the division or corps deep area. Put differently, **a deep attack can legitimately take place just beyond direct-fire weapons range in the division close/brigade combat team (BCT) area of operations (AO), and when conditions demand, frequently should**. No other combat arm can facilitate preserving tempo for the maneuver commander during an offensive or defensive transitions like attack aviation.

From Counterinsurgency to Large-Scale Combat Operations

The shift from counterinsurgency (COIN) to large-scale combat operations (LSCO) has been underway for half of my own career, and the tipping point was reached when I heard a senior leader react harshly for use of the term *on order* and *be prepared to* in relation to attack aviation missions. Perhaps in his zeal to reinforce deliberate planning processes, he assumed that such terms implied COIN-centric laziness. This was then, as it can be now, an incorrect assumption. In our haste to distance ourselves from antiquated COIN tactics, techniques, and procedures, we have occasionally

thrown the baby out with the bathwater—a hesitation to use the term *on order* is merely one example. Deliberate planning for a trigger-based operation is still deliberate planning, vastly different and more thorough than what was likely imagined in that leader's mind as the old grid, frequency, callsign approach.

Perhaps we have done ourselves a disservice to return to a term, which on its face, implies a *location vice a condition*. The old FM 1-112, *Attack Helicopter Operations* (1997), avoided this by defining deep operations in the context of a far more well-understood term. It used the term *raid* synonymously and defined its divisional role as to "shape the battlefield" and "engage the enemy throughout its depth" (pp. 1-6 to 1-7). Additionally, such an attack is "directed against enemy forces that currently are not engaged but that could influence division or corps close operations within the next 24 to 72 hours" (p. 1-6). Right there in black and white we see the critical element, at least back as far as 1997, as shaping in-depth those enemy forces that could be in position to influence operations as soon as the next 24 hours, regardless of the literal unit boundaries at play.

The primary reason for differentiating between deep attack and close attack at all is not one of physical distance, as the terms seem to imply, but of the nature of coordination with the maneuver force. A close attack, formerly *attack on enemy forces in close friendly contact*, occurs amidst the chaos and extremely kinetic direct-fire space between maneuver elements, perhaps as far apart as around 5 kilometers (km) and close enough to be literally intermixed with no discernable lines. Close attacks were permissible in most COIN environments, where the friendly elements nearly always had communications and fire superiority, and the enemy was technologically limited; however, that is no longer the case. Simply trying to maintain effective situational awareness is difficult enough for the friendly maneuver commander, much less to the attack platoon conducting a fighter check-in.

The division is quite correct to align attack aviation frequently in the deep attack role, but to fully make use of the capability, there must be an understanding that the possibility exists for deep attacks into the division close/BCT AO (or the brigade deep, if you will). As long as it is out of contact with friendly forces (Department of the Army, 2025, p. 55), this is still a doctrinal and efficient use of rotary-wing combat power.

Close Attack and Deep Attack

In LSCO, both missions—close and deep attack—still require detailed integration and deliberate mission planning regardless of the actual distances in the battlefield geometry, but the nature of the integration changes from one to the other.

In a close attack, detailed integration is required with the supported ground force to rapidly gain situational awareness and prevent fratricide to augment and directly enable brigade fires and maneuver in real time. With the sheer scope and speed of the direct-fire fight in LSCO conditions, especially with the wide proliferation of small unmanned aircraft systems and air defense systems at the tactical level, mission effectiveness by manned rotary wing will be greatly limited under most circumstances, and as such, is rarely the best use of these assets. This is almost certainly what division planners are seeking to avoid by gravitating to deep attack recommendations.

In a deep attack, whether into the division or corps deep or a BCT AO, detailed integration is required at multiple echelons to synchronize passage of lines along various unit boundaries and to coordinate joint and higher echelon enablers. The enablers



11th Airborne Division conducts deep attack for Joint Pacific Multinational Readiness Center training exercise 26-02. U.S. Army photo by SSG Kylee Marshall.



Arctic Apaches Clear the Way: 11th Airborne Division conducts deep attack ahead of air assault. Photo by Correy Mathews.

are critical in opening the convergence windows upon which mission success frequently depends. Rather than assisting the ground force commander directly in the current fight, where it is difficult to maximize effectiveness, a deep attack destroys high-payoff targets, such as enemy command and control nodes, long-range fires, sustainment, etc., whose destruction will disrupt the enemy's tempo and enable conditions for BCT success in the near future (24–72 hours). A deep attack may also have immediate impacts on the close fight by providing additional dilemmas to an enemy in contact. The critical point is that such a deep attack could still conceivably be within only 10–20 km of the forward line of own troops, depending on the enemy situation, terrain, and nature of the targets. Ten–20 km might not be what any staff officer or commander intuitively consider deep, but it is deep enough, doctrinally speaking.

Inaccurate or partial understanding of aviation-specific terms increases the risk that S3/G3 operations staff will rely on planning assumptions that may not utilize AH-64 to its best effect, artificially constraining mission sets and resulting in an incomplete suite of options to the division commander. If such a thing as a brigade deep existed, this is where I offer that the attack battalion excels—distances close enough to be self-sustaining from a logistics perspective—but deep enough to maximize damage against soft targets while remaining deconflicted from the direct fire fight and increasing survivability in an ever-evolving enemy targeting cycle.

Conclusion

Truly **deep** deep attacks are the stuff of legend. From BG J.E.B. Stuart's rides around McClellan (Hartwig, 2021) and COL Benjamin Grierson's raid deep into Mississippi (Holloway, 2022), they do have their place and they can be successful, even today. However, the resources required to enable them on the modern battlefield and the costs of such an attack going badly makes them a high-risk endeavor that should only be employed if the benefit justifies it. As such, having the language to precisely articulate the actual range of options, the risks and potential rewards, is critical to aviators' ability to continue presenting division and corps commanders with immediate, realistic, achievable mission sets to enhance combined arms maneuver on the LSCO battlefield. Don't let misconceptions about doctrinal terminology constrain what attack aviation can provide. Worse still, don't be the only one in the room who doesn't speak the language fluently. Attack!

Biography:

LTC Jeff Hayes is the Commander of 1st Battalion (Attack), 25th Aviation Regiment, at Fort Wainwright, Alaska. Among his previous assignments, he has served as an OH-58D Cavalry Troop Commander, Attack Battalion S3 and Executive Officer, and as Director of the Air Cavalry Leader's Course.

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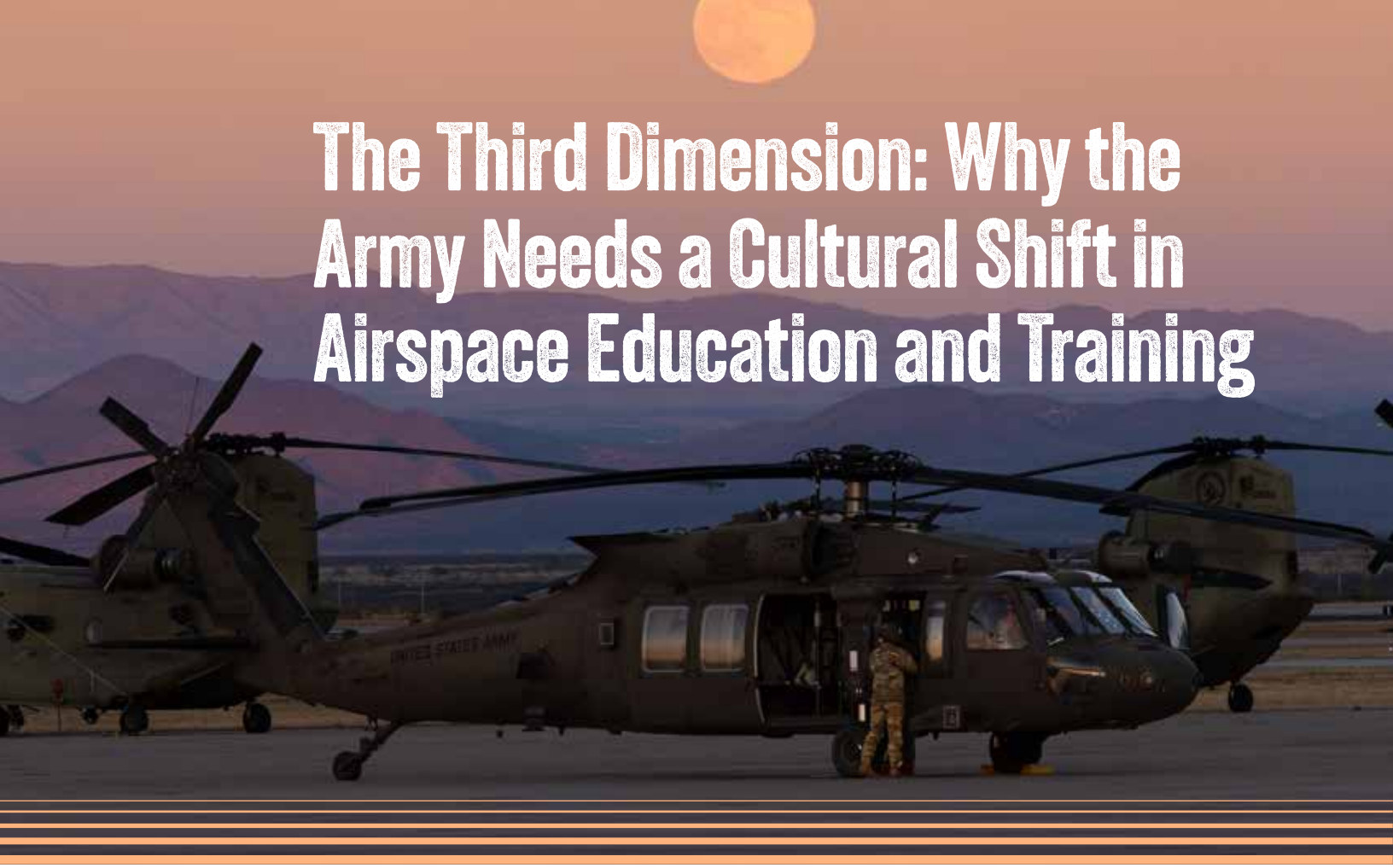
The Third Dimension: Why the Army Needs a Cultural Shift in Airspace Education and Training



An Army Black Hawk crew chief assigned to Joint Task Force-Southern Border (JTF-SB) performs after-landing-procedures at Fort Huachuca, Arizona. The JTF executes full-scale, agile, and all-domain operations. U.S. Army photo by MSG Alexander Henninger.

By CW4 Robert A Kilpatrick

Introduction

The modern battlefield is a symphony of coordinated chaos and is a complex, multi-layered environment where the fight for dominance extends far beyond the ground. In the skies, a mix of assets—drones, manned aircraft, surface-to-surface effects, and air defense systems—all compete for the same time and space in the air domain. Within this congested third dimension, the U.S. Army faces a critical and growing challenge: the effective management and integration of the air domain.

According to the 2024 Joint Publication 3-0, Appendix D, *Fundamentals of Joint All-Domain Operations*, "Currently, no single joint functional component commander or echelon of command has assigned or attached capabilities or self-contained C2 [Command and Control] to conduct joint warfighting across all domains at all times throughout their OA [Operational Area]. The terms and attributes of JADO [Joint All-Domain Operations] are based on the accelerating introduction and contributions of joint capabilities in all domains that require joint integration for joint and theater headquarters (HQs) spanning regions, theaters, and multiple combatant command (CCMD) AORs [Area of Responsibility]. Previously, joint doctrine sought to guide commanders in deconflicting operations. This deconfliction enabled components to focus Service-centric or domain-specific [emphasis added] approaches in discreet or segregated OAs [emphasis added]. In cases where the joint force enjoyed complete overmatch throughout the theater and beyond, this approach may have been acceptable [emphasis added]. However, against a capable enemy, this approach **is obsolete** [emphasis added]. In fact, this is how our enemies want the United States to fight. In the most demanding conditions, joint operations must be more than deconflicted [emphasis added] Service component actions. Joint warfighting requires joint operations with **all-domain qualities and attributes working in unison** [emphasis added] to survive and succeed" (p. D-2).

I have conducted dozens of interviews and organized professional discussion groups over the years with Observer Controller/Trainers at the National Training Center, Joint Readiness Training Center, Joint Multinational Training Center, Joint Pacific Multinational Readiness Center, the Air Force 505th Detachment 1, Army Joint Support Team contractors, and Mission Command Training Program members, as well as Air Traffic and Airspace Management Warrant Officers working at echelons from brigade through theater Army. The majority of these conversations reveal the same issues; our leaders and staffs simply are not being trained and educated

effectively to plan, integrate, manage, and control operations in the air domain through the established Army and Joint framework. Through these conversations and analysis of professional military education programs of instruction at the institutional level, coupled with the size limitations at functional courses like the Echelons Above Brigade Airspace Course, reveal a need to adapt a new plan to train and educate our leaders so they can integrate airspace users effectively and execute JADO (Joint Chiefs of Staff, 2024, para. 1.c (1)). This is not just a technical shortfall solved by material solutions but a deep-seated cultural issue demanding an immediate and fundamental shift in how the Army trains and educates its leaders.



A small-unmanned aircraft system provides a demonstration for U.S. Air Force and U.S. Army members at an undisclosed location. U.S. Air Force photo by SSgt Tylin Rust.

I believe that the solution lies in the 4 pillars outlined in this article. Through these steps, we can right the ship and get ourselves back on track, making our Army the best at integrating JADO into the air domain.

Crisis in the Third Dimension: A Deep-Seated Knowledge Gap

At this problem's core is a widespread lack of understanding among Army leaders about the joint processes governing air operations. While many are proficient in the Army's internal targeting processes, they remain unaware of how that process integrates into the joint air tasking cycle—the unified effort prioritizing airspace and delivering effects across all services. According to Joint Publication 3-52, *Joint Airspace Control*, the joint air tasking cycle is an analytical, systematic cycle that focuses joint air efforts on accomplishing operational requirements (Joint Chiefs of Staff, 2022, p. II-6).

This knowledge deficit leads to critical and dangerous misconceptions from many of our Senior Leaders. A prime example is the misunderstanding of the coordinating altitude's (CA) purpose. Many leaders incorrectly believe that a CA grants them the unilateral authority to employ assets without further coordination. In reality, a higher CA increases that organization's responsibility to deconflict a larger, more complex volume of airspace with joint assets supporting broader, higher priority strategic objectives.

This seemingly small misunderstanding highlights a much larger problem—failure to grasp the interdependent nature of the modern operational environment and how to effectively understand the impacts of requesting more airspace. Just because you desire a higher CA to achieve faster coordination of fires and effects in support of your operations doesn't mean you have the means to plan and integrate all joint users and control them.

This issue is exacerbated by a historical over-reliance on service-specific exercises (e.g., Warfighter and Red Flag exercises). These *silos of excellence* create a false sense of security and reinforce habits that are ill-suited for a true joint environment. They foster an unrealistic expectation that every request for air or land support will be met without friction or compromise. In a real conflict against a peer adversary where resources are constrained and priorities are contested, such an approach is not just obsolete—it is a recipe for failure. The joint friction arising from competing priorities and the need for deconfliction is not a bug to be eliminated, but a feature of coalition warfare that must be trained for to an acceptable standard, so we will be ready for it when the time comes.

Beyond the Silver Bullet: Why Technology Isn't the Only Answer

In the search for solutions, many are quick to point to technology, such as artificial intelligence and machine learning, as a cure-all. However, I would argue that technology alone cannot solve a problem rooted in education, process, and culture. The Army already possesses many of the technological tools required for effective airspace management; however, leaders are not adequately trained to employ them within a complex, joint framework. Pouring resources into new systems without addressing the foundational knowledge gap is like giving a master craftsman a new tool without teaching them how to use it. The focus must be on the man behind the machine.

Forging a New Culture: A Roadmap for Educational Reform

The path forward lies in a comprehensive and sustained educational overhaul. This is not about adding a single block of instruction but about weaving the principles of Joint Air Operations into the very fabric of an Army leader's career.

Pillar 1: Integrating Joint Air Operations Into Professional Military Education

From the earliest stages of an officer's career to the highest levels of senior service colleges, Joint Air Operations and Airspace Control must be a consistent and recurring theme. This ensures that an understanding of the third dimension is not an afterthought but a core competency.

Pillar 2: Executive-Level Remediation

To address the immediate needs of current senior leaders, the Army should implement executive-level courses focused on the authorities, responsibilities, and C2 linkages inherent in airspace management. These intensive sessions would bridge the current knowledge gap and equip senior



An Apache Guardian sits on the tarmac in preparation for Misty Dawn, a large-scale combat operations joint readiness exercise. U.S. Army National Guard photo by Edwin L. Wriston.

commanders to lead effectively in a JADO environment.

Pillar 3: The Crucible of Joint Training

Training must evolve to include the joint friction that is a hallmark of real-world operations. Exercises should be designed to force difficult conversations, negotiations, and compromises between service components. This means moving away from scripted scenarios and creating dynamic environments where Army, Air Force, Navy, and Marine assets must genuinely compete for and coordinate resources.

Pillar 4: The Unit Airspace Plan (UAP) as a Cornerstone

The UAP is not a mere administrative document; it is as critical as the ground scheme of maneuver. Leaders must be trained to develop and implement a UAP that effectively synchronizes fires, intelligence, and maneuver with the precise timing and tempo required to achieve victory. It is the practical application of airspace knowledge, translating theory into battlefield effects.

Conclusion: A call to Action for Army Leadership

The successful integration of the air domain is not a problem that can be solved by a new piece of technology or a single training event. It requires a profound cultural shift, a top-down emphasis from Army leadership that mastering the third dimension is not optional, but essential for survival and dominance on the future battlefield. By prioritizing a comprehensive and realistic educational framework for Joint Air Operations and Airspace Control, the Army can empower its leaders to be not just participants but true integrators in the joint fight. This educational renewal is the most critical step toward achieving the convergence of effects necessary to win in the complex and contested operational environments of tomorrow.

Biography:

CW4 (p) Robert "Austin" Kilpatrick has 26 years of experience in Army Aviation. He has held positions at every Army Echelon conducting Air Traffic Control and Airspace Management. He was also an instructor at the Army Joint Support Teams Echelons Above Brigade Airspace Course. He recently led the Air Defense Airspace Management/Brigade Aviation Element Redesign Operational Planning team while working for the Airspace Control Proponent Office, resulting in 150A's Air Traffic and Airspace Management Technicians being assigned to brigade combat teams across the Army. He is currently the Airspace subject matter expert assigned to the Aviation Center, working in the Transformation Lessons Learned Manager's Office. He is selected to become the first active duty 150A CW5 in the Army.

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A secondary aerial system provides real-time observation at the Advanced Drone Course at Fort Carson, Colorado. U.S. Army photo by SGT Christian Dela Cruz.

Mission Command for Drone Forces: A Framework for the 15X and 150U to Enable Drone Dominance

By MAJ Nickolas D. Lupo

Introduction

Rapid advancements in artificial intelligence (AI) and robotics have fundamentally altered the character of warfare, necessitating an immediate transition from the 1:1 operator to remote vehicle model to a sophisticated one-to-many (1:N) human-machine teaming architecture (Monas, Belford, Nettrour, 2026).[1] This shift requires training and developing Soldiers to employ AI-enabled heterogeneous drone forces to achieve a scale and decision speed far exceeding the limits of unaugmented human cognition. These heterogeneous drone forces are networked swarms with remote and autonomous land, air, and littoral vehicles tailored to mission, enemy, terrain, troops, time, and civilian considerations. The Soldiers controlling these drone forces will synchronize low-cost, attritable mass with exquisite command and control (C2); intelligence, surveillance, and reconnaissance (ISR); and strike platforms to achieve decisive advantage in speed, tempo, and precision lethality. In this article, we'll discuss how achieving a fully integrated AI drone force requires a revision of current unmanned systems' military occupational specialties (MOSs) and the adoption of new skill sets and employment methods vital to autonomous warfare.

Accounting for Autonomy in Existing MOSs

The 15X enlisted Tactical Unmanned Aircraft Systems (TUAS) Specialist and the 150U UAS Operations Technician Warrant Officer are the ideal Soldiers to enable the 1:N advantage and achieve drone dominance. This technological leap requires agility in training and adapting the mission command structure for the 15X and 150U, defining core competencies such as the management of large-scale AI models, edge computing nodes, and autonomous multidomain navigation relevant to all formations. While technology dictates the tempo of the modern battlefield, the nature of war remains an immutable human endeavor—a clash of wills that demands ethical oversight and strategic judgment. Consequently, developing 15X and 150U Soldiers is not merely a technical requirement but a moral imperative, ensuring that as we reach drone dominance through 1:N mission command, the kill chain remains firmly and ethically anchored to the human intent of the American Soldier. By bridging the Army's current *transforming in contact* efforts with immediate concept-driven development, this framework provides a forward-thinking, industry-informed approach to drone acquisition, innovation, and institutional training designed to enable the United States to realize enduring drone dominance (Rainey, 2024).[2]

As autonomy matures and acceptable

Role	Focus	Responsibilities
15X (Enlisted)	Tactical AI Supervision Technical Specialists	Manages local **edge AI nodes**; executes tactical (aerial reconnaissance, security, etc.) missions with 8-10 uncrewed vehicles (UVs); performs real-time **target confirmation** from AI-detected metadata; maintains hardware/software health of the drone squad; manages airframe specifics, payloads, launch/recovery, and immediate mission profile adjustments
150U (Warrant Officer)	Tactical Operational AI integrator/ Planner	Orchestrates the **AI lifecycle** across the operational environment; synchronizes 35-50 UVs; manages the **data pipeline** and model updates; deconflicts AI-driven maneuvers with the broader combined arms scheme.

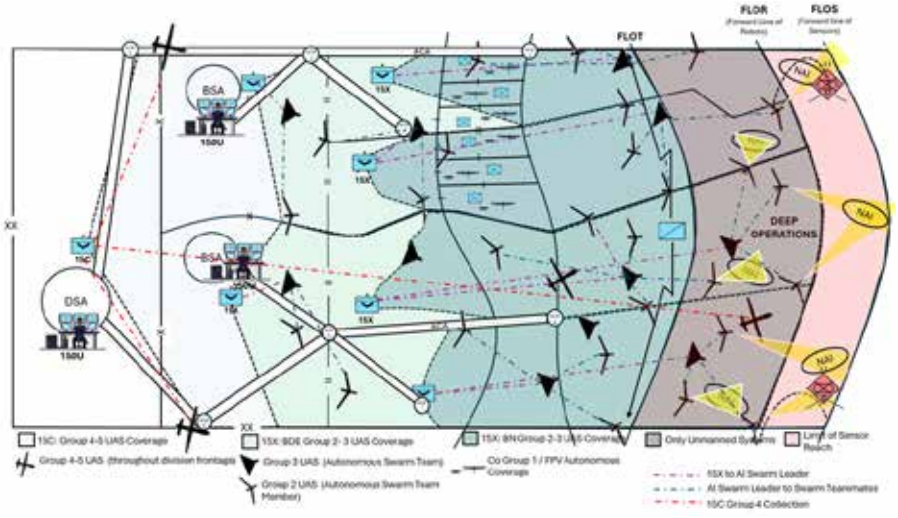

Figure. Proposed employment of 150U and 15X within a division's frontage (Lupo, 2026).

[1]Monas, K., Belford, J., and Nettrour, G. conducted a capability maturity assessment of industrial, academic, and technological capacity during their fellowship at Carnegie Mellon to operationalize a purpose-built autonomous drone force.

[2]GEN Rainey's article discusses the Human-Machine Integrated Formations initiative, which seeks to deliver integrated formations with robotic systems alongside humans, with the goal of always having robots, not Soldiers, make first contact with the enemy. This concept extends the area of influence beyond the forward line of troops, adding a forward line of robots and forward line of sensors to an area of operations.



An Army multi-functional reconnaissance company performs a drone swarm demonstration on Schofield Barracks, Hawaii. U.S. Army photo by PFC Peter Bannister.

attrition models expand, operation of Group 1, Purpose-Built Attritable System, First-Person View, and Short-Range Reconnaissance platforms become increasingly MOS agnostic (Figure). These systems will soon be employed by maneuver forces with minimal aviation-centric expertise. Consequently, the concepts described to achieve drone dominance focus on aviation core competencies specific to the 150U and 15X that are essential to managing autonomous swarms composed of Groups 2–5 systems (Figure), where integration, orchestration, and combined arms synchronization remain critical.

AI Advancements in Industry: Underpinning the Evolution

The AI architecture and C2 framework underpinning this transformation is not theoretical—it is evident in current technologies now emerging in industry. Platforms such as Anduril Industries' Lattice exemplify this evolution, functioning as AI-powered operating systems for warfare rather than simple autopilots (Anduril Industries, 2023).[3]

I propose that the critical components of any AI architecture adopted by the conventional Army must include:

Open AI architectures enabling the ingestion and fusing of data from distributed sensors—cameras, radars, and signals intelligence collectors on UAS, ground towers, and other assets—into a coherent operational picture presented through "a single pane of glass" (Anduril, 2023).

AI algorithms autonomously filtering noise and highlighting relevant decision points, reducing cognitive overload.

Automated tasking handling flight control, collision avoidance, search patterns, and sensor management, allowing the human interaction to transition from remote pilot to tactical supervisor.

Mission autonomy enabling operators to issue high-level intent—such as surveilling a sector or tracking vehicles—while the AI decomposes tasks and distributes them across available systems.

Natural-language interaction enabling operators to task swarms through unified interfaces, lowering barriers to employment, and modify AI behaviors for specific areas of responsibility.

Continuous data labeling and feedback loops ensuring that models adapt to evolving battlefield conditions.

Decentralized mesh networking supporting lost-link autonomy, allowing drones to share data and collaborate even when disconnected from centralized command.

Edge computing and decentralized command permitting operations in communications-denied environments, ensuring autonomous squads continue missions without link.

Automated reporting generating and distributing ISR summaries and battle damage assessments, reducing analyst workload and accelerating decision cycles.

Looking ahead, these architectures enable autonomous combined arms execution, empowering intelligent swarm-

[3] "Anduril Industries Inc., Costa Mesa, California, was awarded a firm-fixed-price contract with a cumulative total of $20,000,000,000 to consolidate current and future commercial solutions—including the proprietary, open-architecture, AI-enabled Lattice suite, integrated hardware, data, computer infrastructure, and technical support services—into a unified, mission-ready capability supporting the Army's evolving operational and business needs" (U.S. Department of War, 2026).



At Camp Beauregard, Louisiana, Soldiers prepare to launch a Ghost-X drone during a training exercise. U.S. Army photo by Zach Montanaro, PEO Soldier Public Affairs.

ing to support manned-unmanned (loyal wingman concepts), suppress air defenses, conduct multi-angle reconnaissance, act as decoys, or other limitless applications. This AI backbone transforms collections of drones into cohesive combat formations and makes the proposed 15X/150U roles not only viable, but essential.

Proposed 150U Evolution

The modern operational environment is an increasingly complex, multidomain environment where the effective integration of UV capabilities is paramount to achieving decision dominance. Within this ecosystem, the 150U UAS Operations Technician Warrant Officer must emerge as the critical operational-level integrator. Their core function should be to weave the capabilities of a diverse fleet of 35 to 50 UVs into the broader combined arms scheme of maneuver, transcending the traditional boundaries of aviation to support the commander's intent at echelon. Success in this role requires a mastery of several interconnected competencies, including multi-echelon mission planning, AI lifecycle management, electromagnetic spectrum (EMS) dominance, and the masterful synchronization of assets across the battlefield.

At the heart of the 150U's responsibilities must be the ability to conduct sophisticated, multi-echelon mission planning. This requires a deep understanding of the commander's intent one echelon above while planning for and with subordinate units two levels down. The 150U should not merely task assets—they must orchestrate a symphony of combined arms effects. This forward-looking approach necessitates the development of robust and detailed contingency plans for likely scenarios such as dynamic retasking, lost-link events, or the compromise of C2 nodes, ensuring operational continuity in a degraded environment.

Furthermore, the 150U must be a key enabler of AI-driven warfare. In this capacity, they are charged with managing the complete AI lifecycle. This includes deploying and updating computer vision models and ensuring onboard target libraries remain current to maximize effectiveness of AI-powered ISR. The 150U must orchestrate the strategic placement of edge computing infrastructure to guarantee low-latency inference for real-time decision making. A crucial aspect of this role is synchronizing AI-generated ISR data into the common operational picture and establishing rigorous protocols to mitigate the risks of AI hallucination and error propagation, thereby maintaining the integrity of the command's situational awareness.

Dominance of the EMS is another core responsibility that will be critical to 150U operations. The 150U must deconflict a dense network of UAS control links and data relays to prevent fratricide and ensure reliable communication. Their planning will incorporate integration of sophisticated electronic warfare (EW) payloads and development of counter-EW strategies to defeat enemy jamming and spoofing attempts. This planning must also account for operations within a Denied, Disrupted, Intermittent, and Limited environment, mitigating the potential impacts of Position, Navigation, and Timing denial, GPS jamming, adverse space weather, and satellite communications degradation into every mission design.

Finally, the 150U will synchronize both lethal and non-lethal effects with unparalleled precision. This includes planning for the suppression of enemy air defenses/destruction of enemy air defenses by orchestrating deceptive drone waves, sacrificial platforms, and loitering munitions to create safe corridors for manned aviation. Effective asset and payload allocation demands knowledge of the fleet's capabilities, matching the right airframes to ISR, kinetic attack, or electronic support missions. This is underpinned by meticulous logistics and sustainment planning to ensure that batteries, munitions, maintenance personnel, and forward launch and recovery points are positioned to support the desired operational tempo. Above all, the 150U will serve as the master synchronizer, deconflicting UAS flight paths with manned aviation, artillery trajectories, and ground maneuver forces. Through direct coordination with airspace authorities and fire support elements, the 150U will ensure all assets can operate cohesively and safely to achieve the mission's objectives.

Proposed 15X Evolution

While the 150U Warrant Officer orchestrates the operational-level symphony of uncrewed systems, the 15X UAS Specialist must become the virtuoso on the ground, translating grand strategy into tactical reality. As the hands-on supervisor of a dedicated drone squad, the 15X will be the expert responsible for immediate mission execution, adaptation, and direct support to ground forces. Their role should be defined by a unique fusion of technical acumen and tactical

cunning, encompassing a set of critical competencies that include edge node operations, vigilant computer vision oversight, micro-terrain management, and the dynamic execution of mission tasks while their systems are in direct contact with the enemy.

A primary competency for the 15X will be the direct management of tactical edge computing nodes. This involves not only operating the onboard processing units and dock-level edge nodes but also a crucial data refinement role. The 15X is responsible for cleaning and denoising raw sensor data, ensuring that the information fed into AI algorithms for analysis is of the highest quality. This technical stewardship is foundational to the success of all subsequent AI-driven functions, from target recognition to ISR processing. This oversight extends to the critical task of supervising the AI's automatic target recognition capabilities. When AI flags a potential target with high confidence, it will be the 15X who performs the final positive identification and confirmation, serving as the essential human in the loop. This seamless integration of human oversight and machine speed dramatically reduces the sensor-to-shooter timeline from minutes to mere seconds.

Furthermore, the 15X must demonstrate tactical mastery through meticulous micro-terrain and environmental management. While the 150U will designate broad operational areas, the 15X must navigate the specific complexities of the immediate operational environment. This involves planning intricate flight paths that leverage features like buildings, hills, and foliage for cover and concealment from enemy observation. They must constantly adjust for immediate and localized weather phenomena, such as sudden wind gusts or dust clouds, which can severely impact the performance and stability of smaller UAS platforms. This granular level of control ensures survivability and mission effectiveness at the forward edge of the battle area by means of autonomous behavior modification.

The 15X must also become the master of immediate tactical deconfliction within their assigned sector. Managing the real-time separation and tasking of a squad of 8–10 UVs requires intense focus, spatial awareness, and an aviation mindset. Complemented by their expert management of the squad's specific payloads and sensors, the 15X actively adjusts sensor settings, approves the operation of laser designators, ensures positive target handover, and executes tactical EW effects in accordance with the broader operational plan.

Finally, the 15X will be defined by their ability to execute dynamic, real-time operations. They are the direct link between the UAS squad and the ground force commander. When a new threat emerges, it is the 15X who dynamically retasks a drone (or team) from its pre-planned route to investigate, provide overwatch, or secure a flank. They are singularly responsible for positively identifying targets and communicating battle damage assessments directly to ground elements. This includes supervising the physical launch, recovery, pre-flight checks, and in-mission sustainment of their UVs, such as hot-swapping batteries to maintain continuous coverage. When faced with enemy action, such as jamming or equipment failure, the 15X will ensure the pre-planned contingencies are executed appropriately, whether that means the UV team switches to alternate frequencies or replaces a damaged airframe into the swarm. Through these actions, the 15X will ensure that the power of uncrewed systems is brought to bear with precision and immediacy at the decisive point.

Conclusion

The changing character of war demands a definitive shift from the traditional 1:1 operator to drone model to a scalable 1:N drone mission command architecture to achieve decisive advantage on the modern battlefield. By implementing this framework,15X and 150U Soldiers must evolve to serve as the primary architects of a heterogeneous drone force, which could span land, air, and littoral domains. Under this structure, the 15X will serve as the tactical leader, orchestrating 8-10 autonomous vehicles, while the 150U fulfills responsibilities as the operational planner, synchronizing assets across the area of operations. Designating Group 1 and short-range 1:1 platforms as MOS-agnostic allows 15X and 150U Soldiers to focus on the high-end integration of large-scale AI models and edge computing nodes. Agile and rapid adaptive training will be imperative to the success of 15X and 150U Soldiers fully leveraging the capabilities of AI-enabled drone forces. Throughout this shift, the American Soldier will remain the ethical anchor, providing the necessary human intent and professional judgment required to employ lethal autonomous swarms. Integrating this concept-driven framework into current *transforming in contact* efforts ensures a deliberate and rapid path to achieve drone dominance.

Biography:

MAJ Nickolas Lupo serves as the Executive Officer for the 2-13th Aviation Regiment, overseeing the development and implementation of UAS Programs of Instruction, including the 15X (TUAS Specialist) course. A dual-qualified fixed- and rotary-wing aviator, his experience spans ISR and armed aerial scout operations. He has led UAS acquisition and innovation initiatives across the Army and represented the Aviation Branch at national UAS and defense technology summits. His independent research focuses on integrating human-machine interfaces to enable unified combined arms operations from a single point of mission command.

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Army Receives Autonomous Black Hawk



This autonomous UH-60 Black Hawk helicopter is part of Project Convergence at Fort Irwin, California. U.S. Army photo by SPC Zion Thomas.

By Mr. Michael L. Osmon, Mr. David (Dave) R. Arterburn, and Mr. Carl R. Ott

Introduction

On March 19, 2026, Sikorsky returned the U.S. Army's H-60Mx Black Hawk® with autonomy enhancements (Capability Program Executive Aviation, 2026). The Army will use this Optionally Piloted Vehicle (OPV) research aircraft to conduct its own development, integration, test, operational experimentation, and evaluation of the Sikorsky MATRIX™ platform-agnostic Autonomy Mission Manager (AMM) and associated architecture developed and demonstrated under the Defense Advanced Research Projects Agency (DARPA) Aircrew Labor In-cockpit Automation System (ALIAS) program. The H-60Mx OPV aircraft flight testing will run concurrent with the Utility Helicopter Project Office's (UHPO) efforts to 'productionize' and qualify the MATRIX fly-by-wire (FBW) system in the Strategic Autonomy Flight Enabler (SAFE) program and will advance the understanding and potential use of autonomous behaviors and capabilities across all Army rotorcraft.

A combined Army and Sikorsky flight test team completed post-modification acceptance test procedures and initial flight tests for this one-of-a-kind H-60Mx aircraft. Then, Army pilots ferried it from Sikorsky's Bridgeport, Connecticut, facility to Fort Eustis, Virginia. Experimental Test Pilots and Flight Test Engineers with the Aviation and Missile Center's (AvMC) Technology Development Directorate, Aviation Technology, Systems Integration & Demonstration (TDD-A/SID), will conduct a series of government flight tests and demonstrations of MATRIX AMM mission functions with a variety of integrated sensors and software capability (such as dynamic route planning) to inform further development prior to the completion of the SAFE qualification.

The UHPO sponsors this work as part of its H-60 modernization efforts to enhance warfighter effectiveness in multidomain environments and supports the cost-effective maturation of platform-agnostic autonomy elements for enterprise application on current and future platforms.

Background

The DARPA ALIAS project was started in early 2014 to design, develop, and demonstrate a configurable automation architecture and toolset that enable the operation of multiple types of existing crewed aircraft with either reduced aircrew or no aircrew (uncrewed full automation) (S. Green, personal communication, 08 May 2026). Sikorsky Aircraft, a Lockheed Martin company, became the prime contractor for the ALIAS program, using its MATRIX full authority FBW technology and AMM as the foundational architecture on the S-70™ OPV demonstrated during the ALIAS program. One key aspect of this capability is a Software Development Kit (SDK) that allows the use of third-party software with the MATRIX AMM architecture.

Showing military utility across multiple mission sets, the ALIAS program entered its transition phase in 2024, having successfully integrated and demonstrated the MATRIX AMM on 16 different fixed- and rotary-wing platforms (10 in flight, six in simulation) over 10 years (this has now grown to more than 21 platforms, and MATRIX autonomy algorithms are being used in the DARPA EVADE [Early VTOL Aircraft Demonstration] program) (S. Green, personal communication, 08 May 2026). Given the UHPO's assessment of its potential, the Capability Program Executive Aviation (formerly, the Program Executive Office for Aviation) completed a Technology Transition Agreement with DARPA in 2024 to share ALIAS data rights and enable the Army to further develop and evaluate the MATRIX AMM for Army applications, including military qualification of the technology for potential integration and deployment across Future Vertical Lift air vehicles and the enduring fleet within the Army Aviation portfolio.

Previous Army Work

Initially, the UHPO funded the integration of only the MATRIX FBW



The U.S. Army takes a major leap into the future of aviation with delivery of its first autonomous-ready Black Hawk. Photo courtesy of Sikorsky, a Lockheed Martin company.

kit (without autonomy) on the Army H-60Mx aircraft at Fort Eustis, Virginia, beginning in 2019. The first 90-flight-hour test program (completed in 2023) confirmed that the FBW flight control laws could achieve better stability and maneuverability than currently fielded aircraft in reduced cueing environments (i.e., simulated degraded visual environments) with confidence and precision. These operations demonstrated the FBW system in a mission-relevant environment and yielded important information about reducing scheduled and unscheduled maintenance that should lower sustainment cost and improve readiness, setting the stage for future fleet modernization. The H-60Mx FBW aircraft continued to conduct testing and demonstrations into 2025, successfully accruing more than 140 total flight hours.[1]

New Modification

Given the MATRIX FBW success, UHPO funded integrating the complete ALIAS OPV kit, consisting of the MATRIX AMM with the ALIAS SDK onto the H-60Mx aircraft, to further assess software and hardware solutions capable of facing the challenges of an enterprise autonomy kit in an optionally piloted fielded configuration.

The Sikorsky Innovations group performed the ALIAS OPV kit system integration/installation at their Bridgeport, Connecticut, facility in cooperation with TDD-A and with administrative support from DARPA. The work included completing Sikorsky's engineering drawings, building-up of system components and assemblies, formal software testing, and airworthiness substantiation documentation, plus scheduling aircraft maintenance performed during the modifications.

Approximately 150 flight hours of testing and demonstrations are planned for 2026, including maturation of Army ground control station capabilities to allow offboard control of the aircraft; integration of mission systems (including external stores for launched effects), with a variety of perception sensors to enable sensor-guided autonomy; flight envelope expansion; beyond-line-of-sight datalink; and off-site experimentation and demonstrations with Soldiers.

SAFE Path to Qualification

The ALIAS OPV kit will provide a critical technology pathway for the early adoption of autonomy elements that a variety of platform and user communities can readily adapt to existing aircraft to improve performance, reduce training, and control aircraft via streamlined digital cockpits or by an external operator/pilot using tablet devices.

The risk reduction efforts using the H-60Mx with ALIAS OPV kit will cut the development and acquisition timelines required to field an optionally piloted and autonomous capability for the UH-60M. The SAFE design is a production version of the MATRIX FBW kit that will be fully qualified for the UH-60M and provides the fundamental digital backbone and interfaces required to rapidly integrate the OPV kit once it is matured. With the support of the AvMC Systems Readiness Directorate, the UHPO is collecting the airworthiness requirements at this early

[1]These flight hour data are based on first-hand knowledge of the authors with Army flight records from the project team.



The U.S. Army officially received a groundbreaking H-60Mx Black Hawk helicopter, extensively modified to fly with or without a pilot at the controls. Photo courtesy of the U.S. Army.

stage to inform the qualification path. The SAFE configuration design and qualification effort with Sikorsky is part of the UHPO modernization effort to integrate emerging capabilities into the existing Black Hawk fleet. This collaborative work addresses remaining challenges to achieving a robust, qualified autonomous OPV capability, including full digital control of all aircraft systems, operations in complex airspace, an enabling secure network, and human factors considerations, which are key aspects of the SAFE program.

Another key stakeholder (and collaboration partner) in the ALIAS autonomy technology is the state of Texas, which is sponsoring a "multi-year autonomy testbed effort through the Texas A&M University System's Bush Combat Development Complex" (Capability Program Executive Aviation, 2026). This effort will use modified UH-60Ls to determine the value of autonomous aircraft to wildland firefighting and associated state missions. The tactics, techniques, and procedures of core autonomously performed mission tasks align with the Army Utility/Assault missions that include contested logistics and agile sustainment.

Conclusion

Army Aviation continues to build on decades of research in automation/autonomy to optimize performance and reduce human error as aircrews manage greater complexity of onboard and offboard systems. Increased automation and autonomy on Army rotorcraft will enhance mission effectiveness to increase the lethality and survivability of Soldiers while providing flexibility to operational commanders. Autonomy will improve the combat mission performance of novice, busy, fatigued, and/or injured pilots, and this H-60Mx OPV effort is key to realizing this capability through a cohesive autonomy suite combining perception, control, mission systems, and user interfaces to enable optionally crewed operations.

Biographies:

Mr. Michael Osmon served the Army for 25 years as an officer, aviator, and engineering educator. He holds a master's degree in aerospace engineering and attended the U.S. Naval Test Pilot School. Primary aircraft included OH-58D/F, UH-72A, UH-60L/M, C-12, and Cessna T206H. He now provides technical support to Capability Program Executive Aviation.

Mr. Dave Arterburn is a retired Master Army Aviator with over 28 years in Army Aviation. He holds master's degrees in both aerospace engineering and systems engineering and attended the U.S. Naval Test Pilot School. He has over 2,100 flight hours in 52 different types of fixed- and rotary-wing aircraft and is published in dozens of professional publications.

Mr. Carl Ott is an Experimental Test Pilot in the U.S. Army Combat Capabilities Development Command Aviation and Missile Center, Technology Development Directorate at Fort Eustis, Virginia. Mr. Ott's areas of expertise are in advanced flight controls, autonomy, and aircraft handling qualities.

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Area for Forward Arming and Refueling Operations: A Solution to Large-Scale Combat Operation Challenges

A Soldier waves off an AH-64 Apache helicopter during Area Forward Arming and Refueling (AFAR) training on Fort Drum, New York. U.S. Army photo by SPC Sam Shomento.

By 1LT Isabella C. Erickson

INTRODUCTION

Among the ever-changing large-scale combat operations (LSCO) environment, counterinsurgency operations are becoming outdated as the Army improves itself to face larger, stronger enemies. Aviation forward support companies especially face challenges as they change their response to aviation tactics and ground tactics. Because of LSCO changes, forward arming and refueling points (FARPs) become less suitable as logistics elements approach the forward line of own troops (FLOT). A FARP could become an operational nightmare, resulting in increased casualties and damaged equipment essentially crippling logistics support and allowing enemies to predict helicopter movements. While developing responses to LSCO, a somewhat novel operation has surfaced.

In this article, I will discuss challenges arising from FARPs, area for forward arming and refueling (AFAR) operations as a solution to these challenges, recommend safety considerations for ground units, and finally, recommend best practices for AFAR operations. The AFAR is a viable solution to protect forces and extend supply chains beyond the current FARP capabilities; however, units must incorporate further safety and operational considerations for the AFAR to be truly effective.

TYPES OF FARPS AND THEIR CHALLENGES

Fueling operations for helicopters typically consist of three subcategories. The first is cold refuel, where helicopters are stationary and all electronics are turned off. The second is hot refuel, where a helicopter's blades are spinning and ready for takeoff (usually, this only happens with a FARP). The third is warm refuel, where the helicopter's auxiliary power unit (APU) is on, but the blades are not spinning (Department of the Army [DA], 2018, pp. 2-9; 2-12).

There are many types of FARPs, including the:

- **typical FARP**, located at a predetermined location consisting of either the Heavy Expanded Mobility Tactical Truck (HEMMTT) Tanker Refueling System (HTARS) or Advanced Aviation Forward Area Refueling System (AAFARS) hoses, which increase pressure and create faster pumping speeds so helicopters can land and take off in less than 10 minutes, and the primary purpose is refueling (DA, 2018, p. 2-6).

- **silent FARPs**, which are stood up, exist when there are multiple FARPs set up and ready to issue fuel, but only one is identi-



Example of an AFAR course of action development at the Fort McCoy's Young Air Assault Strip (YAAS), Wisconsin. Graphic created by the author.

fied to actively issue fuel until activated. This is likely used as a protective measure and to respond quickly to changing operations on the front line (DA 2018, p. 2-1).

•A **jump FARP** is when a FARP is deactivated, dismantled, and moved from one location to another, usually when there is a specific mission and a lack of multiple logistics assets assigned (DA, 2018, p. 2-1).

•A **rolling FARP** occurs when aviation assets are accompanying a convoy, and a rapid refuel point is established alongside the convoy but does not necessarily require hot fuel (DA, 2018, p. 2-2).

All four FARP versions create logistical challenges, particularly because of the additional vehicles required to transport equipment, the amount of personnel required, the time required to take down and set up, safety precautions required, and hoses susceptible to damage (DA, 2018, pp. 2-10 to 2-19; 3-7).

During LSCO, these increase visibility of logistics elements, which could result in higher rates of enemy attacks, especially considering increased enemy capabilities. Further, while facing near-peer threats, the battlefield will develop faster than the current FARP operations can keep up, resulting in aviation units exceeding supply chain capabilities. When units may be spread over miles of terrain, especially aviation elements, a forward operating base with the ability to protect a FARP becomes less feasible and reduces flexibility (DA, 2025, pp. 1; 102–103). The AFAR reduces time, equipment, and maneuverability issues.

WHAT IS AN AFAR?

"Army Techniques Publication (ATP) 3-04.17, 'Techniques for Forward Arming and Refueling Points,' (2018) and ATP 3-04.1, 'Aviation Tactical Employment,' (2020) lack specific techniques or procedures for conducting AFAR operations" (Mcquinn et al., 2025); therefore, this article seeks to clarify specific planning and safety considerations as temporary guidelines or personal recommendations.

An AFAR resembles warm refuel, and like a FARP it is a temporary site used to increase survivability, deployed as far forward and as widely dispersed as feasible to provide fuel and ammunition necessary for sustainment of aviation maneuver units in combat (DA, 2018, pp. 1-1; 2-9; 2-12). A silent FARP, jump FARP, or rolling FARP can be used simultaneously with an AFAR if the required personnel and equipment are available.

A typical AFAR would usually consist of logistics elements or higher headquarters choosing a landing zone (LZ), with the logistics element conducting reconnaissance, pre-combat checks/pre-combat inspections, and movement to the location. The logistics element will conduct both concealing and marking activities as necessary near the LZ. As helicopters fly in, logistics will make itself known through radio or visual signals. Upon landing, logistics will wait for an all-clear from the crew chief and then approach the helicopters in a predetermined path to avoid collisions. Ideally, security elements would conduct security around the LZ and maintain communications during this time. If ammunition or other classes of supply are required, those logistics elements would move in after the fuelers to resupply while fuel is being pumped. When fueling is complete, the logistics element will immediately depart from the LZ back to its original position. When all vehicles are safely away from the LZ, the helicopters will start and takeoff. The standard time from touch down to takeoff is 30 minutes with fuel alone (this is taken from a scenario involving two HEMTTs, one Chinook, and two Black Hawks). Set up is completed in less than 30 minutes and takes about the same amount of time as a refuel on the move.

An AFAR is most suitable when aviation exceeds the ground unit's capabilities to jump a FARP, during a lack of suitable terrain, or a need for greater maneuverability. Although helicopters must stay longer at that point, logistics can spend less time setting up and taking down the HTARS or AAFARS. An AFAR also gives the ability to jump



An AFAR staging at YAAS airfield. Incoming helicopters can be seen above antenna. Photo provided by the author.



The AFAR at YAAS airfield, Fort McCoy, Wisconsin. Photo provided by the author.

to the next fueling location with less equipment to haul (DA, 2018, pp. 2-7 to 2-10). This results in logistics spending less time in the open as high priority targets and makes it less likely that enemy forces can predict helicopter movement.

Additionally, it allows more maneuverability for helicopter LZs, so the LZ can change at the last minute, if needed (DA, 2018, pp. 2-7 to 2-10). Like a FARP, the AFAR could theoretically increase logistic capabilities by delivering ammunition and food resupply for the helicopter crew or by using the helicopters to transport classes of supply when it would take too long to transport over ground (e.g., emergency medical equipment) (DA, 2018, pp. 2-24 to 2-25). The APU being 'on' reduces start-up time for the helicopters and takeoff, compared to a cold refuel. When planning at a company level or higher, the AFAR gives commanders a greater ability to conduct course of action development within the military decision-making process.

PROPOSED RISK ASSESSMENT FACTORS

Safety is a preeminent concern with AFAR operations, beginning with training. Units attempting AFAR operations should use crawl-walk-run phases when training, especially if attempting night operations. Units should ensure associated training tasks are built into their training programs and that safety considerations are built into their standard operating procedures (SOPs). Units may still use a modified FARP checklist to ensure safety and carefully coordinate with any flight control or control towers.

The current doctrine, ATP 3-04.17, does not account for certain risks that logistics elements should account for during FARP—or particularly—AFAR operations. I recommend including the following considerations in a deliberate risk assessment:

- ***Fire/Explosion Hazard***

Verify pumps, vehicles, and storage tanks are bonded and grounded. Place fire extinguishers and other firefighting equipment within easy reach but safe from fire, preferably between the helicopter and the HEMTT. There should be no smoking, handling of matches, or cigarette lighter usage while handling fuel. Phones and flashlights are not allowed near HOT fuel or the FARP. Use only explosion-proof lights and flashlights. Immediately clean and report spills. Cotton cloths, and NOT nylon, will be worn when handling petroleum products. Ensure the LZ is free from excessive dry vegetation.

- ***Environmental Spills/Leaks/Vapors***

Use drip pans, catch basins, or absorbent materials. Fill carefully to avoid overflow. Have spill kits ready and available, and report all incidents immediately. One Service member should be at the deadman switch. Enforce use of personal protective equipment (PPE), including the Army Aircrew Combat Uniform Operational Camouflage Pattern, goggles, flight helmets, and fueler gloves. Inspect working areas to ensure work/storage areas are well-ventilated and prevent prolonged exposure to vapors.

- ***Vehicle/Aircraft Movement***

Keep unnecessary vehicles and aircraft out of operational areas. Use radio communications to clear runways. Ensure Soldiers get the required amount of rest before operating a vehicle. Wear correct PPE and corrective lenses in vehicles. Do not approach moving helicopter blades from the rear or stand close to the APU, and mark LZs. Communicate with other units and post security at high-traffic areas or potential entrances. Any personnel climbing onto vehicles should be wearing a helmet. Conduct safety briefs, and establish communications prior to the mission. Ensure all vehicles and aircraft are guided with standard hand and arm signals.

- ***Weather and Environmental Conditions***

There are typical risks such as heat and cold injury, as well as severe weather, slips, trips, and falls. Ensure wind and rain are within acceptable ranges for flying. Do not dispense fuel during lightning storms. Improve the LZ or train operating vehicles in adverse terrain.

Identify Soldiers' abilities, qualifications, and training during the planning stage. Present a safety brief before any

movement, and wear correct uniforms and PPE during operations. Units should incorporate any safety procedures into their training programs and regularly review unit SOPs. Leaders should use a modified FARP checklist to safety certify the AFAR. Each unit's SOP should determine if a safety certification is needed. Paying attention to each issue will drastically increase safety for the novel AFAR operation.

PROPOSED AFAR CONSIDERATIONS

Leaders should use troop leading procedures when planning the AFAR; however, completing specific tasks and paying special attention will optimize the operation.

- ***Planning/Reconnaissance***

Logistics should evaluate concealment options—on a map and on ground—so ground vehicles may avoid enemy detection (DA, 2018, pp. 2-28; 3-3). Identify staging areas for helicopters as needed but only for non-tactical environments. Landing areas should be relatively flat with no protruding trees or objects, and long, dry grass or brush will not cause fire hazards (DA, 2018, pp. 3-2; 3-8). Reconnaissance should also identify ability to use grounding rods, ingress and egress routes, a route reconnaissance to ensure HEMTTs can make the trip, and risk of brown out (DA, 2018, p. 2-8). Additionally, leaders should ensure the timeline includes Aqua-Glo and filter testing (DA, 2018, p. 3-11; F-1) during the operation, which may need to be part of a larger logistics company scheme. Include preparing safety checklists, deliberate risk assessments, trip tickets, convoy clearance requests, and hazardous materials clearances as needed.

- ***Equipment***

Leaders should verify adequate grounding rods, the correct type of certified fire extinguishers, infrared (IR) chem-lights, and equipment to create inverted Y or chem-lights for directing aircraft traffic (DA, 2018, p. 2-31; G-1). Infrared chem-lights can be placed in clear water bottles for increased visibility at night. All Soldiers on an AFAR must have proper PPE in risk assessment factors, and leaders must ensure proper funding is allocated to acquire the equipment. When issuing the Operations Order, leaders may find it useful to issue a Concept of Operations or other visual aids. Wind direction, helicopter types, and their fuel ports allow for more flexibility because the HEMTTs may maneuver around the landed helicopters—based on a scenario involving one Chinook and two Black Hawks landing together and moving in the same direction based on windage—but best practice is to create multiple courses of action ensuring those involved are aware. To be effective, an AFAR should, at minimum, have two HEMTTs and one Joint Light Tactical Vehicle or High Mobility Multipurpose Wheeled Vehicle to provide security and radio support.

- ***Execution***

Follow all convoy procedures during execution, such as preventive maintenance checks and services and internal radio checks. Heavy Expanded Mobility Tactical Trucks should set up in cover and concealment (DA, 2018, p. 2-28). While not specified in doctrine, multiple HEMMTTs do not need to be located next to each other, especially when cover and concealment are scarce or when there are multiple aircraft variants. Logistics should conduct a radio check with their higher headquarters and tower, but like a FARP, the AFARS may be operated in complete radio silence (DA, 2018, p. 1-3). When logistics arrive, they should designate the LZ by the inverted Y, chem-lights, or grid coordinates since the maneuverability does not need a precise landing location if not required. Any site improvement (e.g., clearing tall grass) should be made as able or necessary (DA, 2018, p. 2-18). Concealed vehicles reveal themselves only if needed to notify helicopters of their presence. When non-tactical, it is the safest practice that after landing and rotor blades have stopped spinning, the crew chiefs, logistics, and any tower or flight control coordinate before any movement (DA, 2018, p. 1-3). The best practice, anecdotally recommended by pilots, is while approaching the aircraft, stay 50 feet away until the crew chief signals they are prepared to receive fuel. While maneuvering, avoid the APU, the tail, and the cockpit. Ground HEMTTs first, and place a fire extinguisher between the vehicle and helicopter (DA, 2018, p. 2-18). During this time, any other classes of supply may be delivered. Once complete, all vehicles should move away from the helicopters, preferably in a predetermined pattern to avoid accidents. They should radio or signal when at a safe distance, so the helicopters may restart their blades. Depending on METT-TC (mission, enemy, terrain, troops, time available, and civilian considerations), best practice may be to conceal vehicles until helicopters have safely left or to follow the rolling FARP security measures (DA, 2018, p. 3-4). Ground troops should report to higher when the mission is complete and continue to the next mission or other follow-on actions.

CONCLUSION

Because of LSCO's nature, the FARP does not provide the needed flexibility logistics and aviation units need when facing enemies with greater capabilities. This exposes logistics elements and shifts the FLOT farther than typical supply chains can manage. Despite reduced speed of fueling, AFAR operations provide a unique solution to maneuverability, protection, personnel, and equipment issues via its ability to quickly deploy and redeploy with less equipment and personnel. An AFAR is still a fledgling operation, but it is a viable solution to the FARP's challenges. By adding the proposed safety considerations and operational planning considerations to their SOPs, units can and will increase their proficiency and efficiency in the operation.

Biography:

1LT Isabella Erickson commissioned from University of Minnesota Twin City's ROTC program in 2022. She served as temporary platoon leader for the 834th Aviation Support Battalion, Minnesota Army National Guard (MNARNG), for fuel/water platoon and platoon leader for Company Echo, 2-147th Assault Helicopter Battalion, MNARNG, for the fuel and maintenance platoons. She is the current Executive Officer at the 134th Brigade Support Battalion, MNARNG, for Alpha Company.

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A U.S. Army Soldier instructs 10th Mountain Soldiers aboard a CH-47 Chinook helicopter during a hot/cold loading exercise at the Sodankyla Airfield in Finland. U.S. Army photo by SSG Ian Valley.

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