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The Everchanging Landscape of Army Aviation

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2600708

The Army begins production of the second tranche of short-range reconnaissance UAS. U.S. Army photo by Matthew Ryan.

The Command Corner

Transformation: The Leadership Factor

The Enduring Transformation of Army Aviation

Transformation is not a new concept for the U.S. Army; it's a historical constant. From the Civil War's balloons to World War I's airplanes, and from horse cavalry to the mechanized and air cavalry of Vietnam, adaptation has been central to the Army's success. Post-Vietnam, a partnership with industry yielded the "Big Five" systems—the AH-64 Apache, UH-60 Black Hawk, M-1 Abrams Tank, Bradley Fighting Vehicle, and Patriot Missile System—which cemented our technological dominance for a generation. These platforms proved decisive in conflicts like Desert Shield/Desert Storm, with aviation units playing a critical role in maneuver operations in Iraq and Afghanistan. This evolution continues today through the Army's Continuous Transformation, which drives advancements in manned, unmanned aircraft systems (UAS), robotics, human-machine interfaces, and artificial intelligence.

Leading Soldiers Through Transformation

A consistent factor in every era of transformation is the human response to change. Resistance to change is a natural human reaction, stemming from psychological and sociological factors. The Army has a history of overcoming these barriers—the fear of the unknown, loss of control, uncertainty, and attachment to the status quo. Despite these challenges, the key to the Army's success has always been leadership.

Leaders are responsible for acclimating their Soldiers to change. This is accomplished by ensuring Soldiers understand the "why" behind the transformation and its necessity for the Army's mission. By connecting the changes to improved mission performance, leaders can answer the crucial "What's in it for me?" question. The simple answer is an enhanced capability to fight and win current and future conflicts.

Encouraging candid feedback is another vital leadership role in the transformation rule-book. If a new system or process is ineffective or could be improved, that information is critical. Soldiers are often the first to identify when something is not working, and leaders must be receptive to their input and act on it. This feedback is especially important but even more so in our Transformation in Contact (TiC) formations.

The TiC Strategy and New Capabilities

The Army utilizes TiC formations to inform and accelerate its modernization efforts. Transformation in Contact shortens the acquisition process by getting equipment into the hands of Soldiers for early experimentation and evaluation.

This formation-based assessment, viewed through the lens of DOTMLPF-P (Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities—Policy), provides a more holistic view of a capability's potential.

Army Aviation has numerous TiC opportunities. Formations like the 101st Airborne Division (Air Assault), 10th Mountain Division, 4th Infantry Division, and 25th Infantry Division are all executing TiC to some degree, prototyping organizational changes and integrating emerging technologies but frankly, TiC is a mindset, not a specific unit. A significant focus is the aggressive integration of UAS and the application of lessons learned to refine tactics.

In parallel, the Aviation Center of Excellence is transforming its institutional training to meet future needs. This includes the new 15X military occupational specialty (MOS) for a Tactical UAS Specialist, who will be the subject matter expert for Group 1-3 UAS at the brigade level and below.

Managing Divestment and Force Structure

Some may view the divestment of systems like the AH-64D and division cavalry squadrons with concern. Understandable. However, leaders must explain that these divestments are critical for modernization. They pave the way for more capable, lethal, and survivable platforms, such as the accelerated fielding of the manned MV-75.

It is important to clarify that the reductions associated with the force structure divestments impact authorizations, or spaces, not necessarily personnel, as many of these authorizations were already vacant. The reduction of 6,500 authorizations affects approximately 300 officers in total (104 junior officers [LTs/CPTs] and 209 untracked warrant officers [WO1s/CW2s] in Year Groups 20–25) and 1,300 enlisted personnel.

Here is how Army Aviation managed these personnel reductions. First for the officers, an Aviation Talent Panel (AvTP) was created to retain top talent while offering voluntary transition paths for other valued personnel, such as re-branching or inter-service transfers. The AvTP is not an elimination board. However, involuntary actions may be necessary in Fiscal Year (FY)27, if voluntary options are insufficient. Second, our analysis shows that an AvTP for the 1,300 enlisted personnel will not be necessary. The reduction will largely be managed through adjusted promotion rates and MOS reclassification within the 15-series field.

Additionally, Army Aviation will absorb some excess personnel by manning combat aviation brigades (CABs) at 100% or greater. This will consolidate tracked talent at or above 90% to fill experience shortages in COMPO 1, addressing readiness, safety, and training shortfalls. In FY26, CABs will be manned at 125% and the 15-series career management field at 103–105% in FY27.

Conclusion

It is imperative to embrace change by understanding the long-term value and importance of transformation. This mindset is key to overcoming resistance to change. I am fond of a saying by the former Chief of Staff of the Army, GEN (Retired) Eric K. Shinseki, who stated, "If you don't like change, you'll like irrelevance even less." Our Army has transformed many times throughout its 250-year history. Army Aviation leaders—officers, WOs, and noncommissioned officers—must guide our transformation effort, as Army Aviation is too critical to the joint and combined arms teams to become irrelevant, and we won't!

Above the Best!
Fly Army!

Clair A. Gill
Major General, USA
Commanding

U.S. Army AH-64 Apache attack helicopters conduct a flyover in Clarksville, Tennessee. U.S. Army photo by SSG Vincent Levelev.

Aviation DIGEST

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Please submit articles via MS Word document format. Articles should not exceed 1,500 words. Include a brief biography (50 word maximum) with your article. We invite military authors to include years of military service, significant previous assignments, and aircraft qualifications in their biographies.

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Visual materials such as photographs, drawings, charts, or graphs supporting the article should be included as separate enclosures. Please include credits with all photographs. All visual materials should be high-resolution images (preferably set at a resolution of 300 ppi) saved in TIFF or JPEG format. For Official Use Only or Classified images will be rejected.

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Spring 2026 (published on or around 15 May 2026). Accepting articles now through 01 April 2026.

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Authors are asked to observe posted deadlines to ensure the *Aviation Digest* staff has adequate time to receive, edit, and layout materials for publication.

Notices to Air Missions (NOTAMs)

Director, Aviation Transformation Integration Directorate (COL Sean C. Keefe):

Team,

Greetings! The past year has been one of significant change across our Army, and I want to explain what these changes mean for the U.S. Army Aviation Center of Excellence (AVCOE) and our branch at large.

Last year, the Chief of Staff of the Army, General Randy George, guided by the Department of the Army and Department of War, launched the Army Transformation Initiative. This monumental effort led to the merger of U.S. Army Training and Doctrine Command and U.S. Army Futures Command into a single, unified command: the U.S. Army Transformation and Training Command. This strategic consolidation was designed to streamline modernization and ensure our Army remains the world's premier land fighting force.

This top-level merger prompted similar restructuring at branch centers of excellence across the force. Here at AVCOE, it led to the creation of the Aviation Transformation Integration Directorate, or AVTID. Our mission is to lead the integration of Army Aviation transformation by developing and implementing comprehensive solutions across Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy (DOTMLPF-P). In short, AVTID was purpose-built to improve the synchronization of our modernization efforts and more effectively integrate lessons learned from the field, ensuring the branch remains ready and responsive.

To achieve this, AVTID is organized into three subordinate directorates, each with a distinct and vital role:

1. Directorate of Training and Doctrine (DOTD): DOTD is our engine for intellectual and tactical readiness. It is responsible for providing training, education, and doctrine that enables Army Aviation to fight and win. They develop our field manuals and techniques, manage academic and operational training, and ensure our leaders and Soldiers have the foundational knowledge to succeed on current and future battlefields.

2. Office of Personnel and Force Development (OPFD): OPFD focuses on our people and our formations. This office develops our branch's organizational requirements, assesses our force structure, and identifies capability gaps. Critically, OPFD also serves as the branch personnel developer, managing the career paths and life cycles for our talented Officers, Warrant Officers, and Enlisted Soldiers.

3. Transformation and Lessons Learned Manager (TLLM): TLLM is our direct link to the operational force. This directorate drives continuous transformation by representing Soldiers in the field within the broader DOTMLPF-P framework. They are responsible for warfighter representation, integrating feedback, and analyzing lessons learned to ensure our solutions are practical, effective, and relevant.

Together, these directorates will enable a ready and responsive U.S. Army Aviation force. This new structure is designed to break down information silos and drive change through integrated solutions. I am confident that by unifying these critical functions under AVTID, we will be better postured to anticipate challenges, embrace change, and provide the nation with the world-class Aviation force it deserves.

Above the Best!

Training Division (Training Division Chief: Mr. Bo Thurman):

The Directorate of Training and Doctrine's Academics Division drove significant modernization and innovation for Army Aviation training in 2025. While navigating major organizational changes, including the new Army Transformation and Training Command and Transformation Integration Directorate structures, our team focused on delivering impactful results that directly enhance the readiness and proficiency of our Aviation Soldiers.

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
ALSE Technician	ALSE	Oct 2022	22-26 Jun 2026	Ft. Rucker/MS Teams
Fixed Wing Pilot	FW Pilot	Jul 2020	1-3 Feb 28	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
RQ7 UAS Operator	15W	Jun 2021	16-20 Mar 2026	Ft. Rucker/MS Teams
Lakota Pilot/NRCM	UH72	Oct 2021	14-16 Apr 2026/17-19 Apr 29	Ft. Rucker/MS Teams
MQ1 UAS Repairer	15M	May 2023	13-17 Apr 2026	Ft. Rucker/MS Teams
AH-64 Attack Helicopter Repairer	15R	Mar 2023	4-8 May 2026	Ft. Eustis
Aviation Operations Specialist	AOS	Jul 2022	8-12 Jun 2026	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

Key Accomplishments

• **Accreditation with Distinction**: Achieved an exceptional score of over 96% in Army Enterprise Accreditation Standards 3 and 4 for training development. Key recognitions included our use of artificial intelligence (AI), the creation of a Data Literacy 101 course, and innovative 3D training graphics.

• **Digital Department of the Army Form 2028**: Revolutionized the feedback process with a digital Product Change Request form. This allows our team to receive suggestions from aviation subject matter experts and post updates to the Central Army Registry almost immediately, ensuring our force trains with the most current information.

• **Pioneering AI Integration**: Continued to lead in streamlining training development with AI. Notably, the System Training Integration Branch used CamoGPT to produce a full Initial System Training Plan in weeks, a process that traditionally takes nearly a year.

• **Unmanned Aircraft Systems (UAS) Training Transformation**: Led the charge in transforming UAS training by supporting the new 15X military occupational specialty (MOS), developing a training strategy with the mobile advanced readiness training concept, and creating a "Train-the-Trainer" program.

The Way Ahead

As we move further into 2026, we will continue to adapt and leverage technology to meet the Army's evolving demands. Our team's dedication ensures that Army Aviation remains the most lethal and capable aviation force in the world.

Major Program Developments

Program	Update
15F/N Merger Pilot	Developed and executed a pilot program to identify efficiencies in combining these two maintenance MOSs.
Future Long-Range Assault Aircraft	Developed comprehensive training plans for future MV-75 aviators and maintainers. Congratulations to **CW3 Baker** and **CW5 McKnight** on becoming the first Army Aviation Center of Excellence pilots to complete V-22 familiarization.
Aviation Tactics Instructor Course Refinement & Maintenance Examiner (M/E) Pilot	Partnered with the 110th AB to implement a pilot M/E program, ensuring aviators continue to hone their craft.
Aircrew Coordination Training (ACT) Program	Continued to refine the ACT program, setting a new "gold" standard for future Aviation Captain's Career Courses.

Army Aviation and Transforming With a Vision

A UAS operator participates in the first U.S. Army Europe and Africa Best Drone Warfighter Competition, Grafenwoehr, Germany, 2025. U.S. Army photo by SSG Dylan Bailey.

By MG Clair A. Gill

The operational environment is rapidly transforming. Anti-air threats, small unmanned aircraft systems (UAS), long-range fires, island-hopping, and the tyranny of distance faced in large-scale combat have created a myriad of adaptive problems to solve. The changing threat seen in combat across the globe demands that the U.S. Army transform to meet the challenges of the future operational environment. Senior Army and Aviation Branch leaders alike are certain that business as usual is no longer acceptable. And yet, we have one Army, and it must be prepared to fight tonight while concurrently preparing for the future.

The Department of War and U.S. Army recently demonstrated a sense of collective urgency surrounding the changing landscape of modern and future conflict by releasing guidance on specific transformation efforts in what has become known as the Army Transformation Initiative, or ATI, which aligned with the Army's continuous transformation. The Army Aviation Branch has embraced continuous transformation, finding this period of organizational evolution both necessary and valuable, specifically from a capability and readiness perspective.

Since the Army relies upon combined arms warfare, today and in the future, all members of the Combined Arms Team, or CAT, must ensure they find ways to best serve the needs of the greater Army. After all, we are not the Aviation Branch for the sake of simply having aviation. Instead, we are the Army's Aviation Branch and must *continuously transform* to provide ground force commanders the necessary battlefield capabilities to fight and win.

As we progress into the future, Aviation Branch capabilities will transform within our formations, as equipment like MV-75, UAS, Launched Effects (LE), and Degraded Visual Environment (DVE) technology proliferate across the force. But change requires alignment of authorities, formations, resources, and most critical of all, vision. The branch vision provides a description of how Army Aviation will evolve current capability and nascent advancements in technology and training to successfully transition from exclusively human-piloted machines to teamed, autonomous dominance from the air. As such, Army Aviation's vision is:

"*Army Aviation will continue to deploy, fight, and win, providing critical land-focused air capabilities in the conduct of combined arms operations by leveraging specific technological innovations, both manned and unmanned systems, employed by Aviation Soldiers trained and developed through a purposeful Warfighter Culture*" (Gill, 2025, p. 12).

DNA of Vision

Any good vision acknowledges the interest of key parties, such as the CAT and our Aviation Soldiers. The interest of

A U.S. Soldier from the 101st Airborne Division monitors a PDW C-100 drone in flight, outfitted with the Widowmaker munition dropper, during exercises in Germany. U.S. Army photo by SPC Adrian Greenwood.

the CAT remains the ability to deploy, fight, and win our nation's wars through the provision of critical land-focused air capabilities. The key party delivering valuable air-centric expertise is always the Aviation Soldier. Bottom line, Army Aviation expects its Soldiers to leverage specific technological innovations, both manned and unmanned, in support of victory in the land domain.

The implications are clear; the traditional focus on mostly manned aviation is beginning to give way to unmanned and even autonomous technologies, a significant departure from business as usual. As we embrace this reality and its technology, it remains critical that we temper the right balance between manned and unmanned capability. The perfect mechanism to temper this period of transformation is for the entire Aviation Branch to redouble its efforts on purposeful development of personnel through a deliberate warfighter culture that contextualizes everything we do, from initial training to professional military education. And leaders at every level will be critical during this time, shepherding our branch into a powerful future. Our vision must be consistent to purposefully guide the branch through specific efforts and initiatives, focusing on *People, Formations, Environment, Future Development*, and an *Aviation Warfighter Culture* meant to take Army Aviation into a very achievable future.

A Strategy for Future Success

People: Our Soldiers remain the cornerstone of Army Aviation. In my estimation, there is no technology under the sky that surpasses the value of an Army Aviation Soldier. While the following discussion is not exhaustive, the major initiatives presented will guide how Army Aviation prepares and executes its assigned mission. As such, the changes initiated in how we train people, specifically our initial-term aviators, both enlisted and officer, will invariably reverberate throughout every specialty and formation within the branch.

Whether through training or more formalized professional military education, the Aviation Branch seeks to provide "tailored developmental experiences to all our warfighters" (Gill, 2025, p. 12). All of our education efforts seek to achieve increased tactical competence across every formation, thereby better equipping Army Aviation for the realities of current and future combat. The aircrews in the aircraft comprise a very visible arm of the Aviation Branch, and every military occupational specialty (MOS), from Air Traffic Control, Flight Operations Specialist, to our newest high-speed UAS experts, the 15Xs, pours itself into the success of our fight.

The recent advent of the 15X Tactical UAS Specialist was born out of the divestment of the Shadow. Two MOSs, the 15W operator and 15E maintainer, were merged into a single MOS to exist as a technically proficient Soldier who can repair, modify, and operate Group 1 through 3 UASs. These new UAS specialists were first born out of a Mobile Advance Readiness Team proof of concept that was assembled and deployed to the 25th Infantry Division in August 2025. The Aviation Center of Excellence began the 15X Advanced Individual Training

course in January 2026 at Fort Huachuca, Arizona, while simultaneously running a train-the-trainer program to begin MOS conversion for the over 2,100 UAS Soldiers currently in units across the Army. These Soldiers will be closer to the front lines than in years past and at the leading edge of the changing character of modern warfare.

Army Aviation is also pursuing deliberate change in the education and training of initial-term rated aviators through a program called Flight School Next. The push to revise our initial flight training is based upon an assessment of the current and future operational environment, rigorous studies into our training models, and other metrics. Flight School Next aims to deliver a more robust initial education and flight training experience, substantially increasing course flight time, all while emphasizing fundamental pilotage skills. The focus is on returning our students to a simpler initial training aircraft to master basic flying skills before progressing to more advanced aircraft system management.

The other critical people-centric program undergoing transformation is the course responsible for training our Instructor Pilots, or IPs. The new IP course at Fort Rucker is referred to as the Aviation Tactics Instructor Course, or ATIC. The ATIC is oriented toward the development of platoon-level IPs who will be capable of training more tactically focused aviators. The course aims to create leaders and trainers who are proficient in developing their platoons to better operate as a part of a joint force and CAT (Gill, 2025). This is accomplished by changing the primary focus of future IPs from traffic patterns (still important) to more tactics-oriented training. Our future IPs must be capable of providing individual and collective training.

Formations: The ATI is more than an effort to transform the Army's equipment; it is also an effort to prioritize organizational modernization. If our Army is to be the most lethal in the world, then our organizations must be agile, trained, and most important of all, ready for the unique challenges of the future fight. As a vital member of the CAT, the Aviation Branch was identified to make necessary sacrifices to ensure future readiness. Some have lamented our ongoing aircraft divestment, including the RQ-7, AH-64D, and UH-60L. However, removing older equipment allows for eventual efficiencies to be realized in logistics and production lines, benefiting both the Army and industry, while simultaneously focusing investing in increasingly lethal systems more relevant for the next generation.

The Flight School Next pilot program begins at Fort Rucker, Alabama, 2025. U.S. Army photo by Dr. Leslie Herlick.

Transformation is difficult; however, stagnation is far worse and that is especially true when lives are on the line. Because of transformation, Army Aviation will become more lethal and agile by leveraging the growing technology and capability of unmanned aircraft and LE. The challenging part of transformation is that we only have one Army, and we must balance current and future needs with other activities simultaneously. I fully recognize this burden we have put on our commanders in the field, but I am very confident in their ability to manage and lead through this period.

Army Aviation's continuous transformation and optimization of organiza-

A UAS flies overhead at the UAS summit, Fort Rucker, Alabama, 2025. The summit allows participants to showcase various UAS platforms and paves the way for future innovations. U.S. Army photo by Dr. Leslie Herlick.

tional footprints are occurring through deliberate, risk-informed Force Design Updates. The intent is to harvest the very best of our talent and enduring fleet, while tailoring our force structure to better support multidomain operations. Purposeful planning and implementation of these updates are meant to allow the Army to remain ready to fight tonight, while preparing organizations to employ future concepts and capabilities, such as MV-75 and a variety of other autonomous systems/behaviors. Transformation today is the only way for our Army and Aviation Branch to deliver success in the future.

Environment: It is true that our formations need to be organized correctly, and our personnel trained to their top potential for Army Aviation to be successful in combat. However, we can never forget the importance of where our missions occur, the operational environment. "The Army Aviation operating environment – the upper tier of the land domain – is becoming very congested" (Gill, 2025, p. 14). After all, nearly every unit in the Army, including standard ground units, have unmanned assets as part of their day-to-day battle kit. Unmanned vehicles are ubiquitous, and nearly every branch is looking to employ these airborne assets.

While more teammates will be joining Army Aviation in the upper tier of the land domain, it will be our branch that leads the Army in airspace management and control, setting conditions for co-use by our joint and multinational partners (Gill, 2025). We will operate in the upper tier of the land domain, alongside many of our CATs, but we will do it as capability integrators within the environment.

Leading in airspace is vital, but just as important might be how our advanced technology is quickly gaining dominance over environmental and weather-based visibility restrictions. These variables in the Aviation Branch operating environment were once a hinderance to go/no-go flight decisions. In fact, most senior aviators cringe at the thought of canceling a mission, especially because of limited visibility from obscurations. However, like our domination of the night, Army Aviation is approaching the ability to overcome DVEs, thereby allowing us to fight in weather conditions that once limited our collective application. Mission cancelations will reduce and so should risks of aircraft accidents due to visibility challenges, as our formations will once again seize definitive advantages in freedom of maneuver on the battlefield (Gill, 2025).

A Skydio drone equipped with a U.S. Army Combat Capabilities Development Command–designed dropper system sits staged for a demonstration during a Live Drop 5.0 exercise at Grafenwoehr Training Area, Germany. U.S. Army photo by SFC Arturo Guzman.

Aviation Warfighter Culture: As we train our next generation of Soldiers for the growing complexities of current and future warfare, it is vital their development include focused discussion and rigorous training designed to grow the character traits of an Aviation Warfighter. The branch is focused on cultivating an Aviation Warfighter Culture that highlights its professional identity as "committed, disciplined, hardened, technical and tactical experts who operate complex equipment, defying gravity, while managing and mitigating risk" (Gill, 2025, p. 14). Army Aviation Soldiers remain steadfast members of the Profession of Arms, the very same profession shared by those in movement and maneuver, fires, and other key warfighting functions. Just like those other Army professionals, the Soldiers of Army Aviation seek to contribute to decisive victory in support of the ground force commander through the application of technical expertise. Our Soldiers, now more than ever, must harden their constitutions and governing sense of professionalism to meet the intensity of potential future large-scale combat. Our profession is war, our tools are weapons of the sky, and we will deliver success to those that depend upon us most, our fellow Soldiers.

Future Development: The future is bright for Army Aviation, and unmanned systems, LE, and various autonomous capabilities imply that our forces will possess unparalleled situational awareness and battlefield competencies. Our formations are being shaped today to be prepared to maximize the full benefits of Human-Machine Integration. As our formations become leaner and more agile, our capabilities will be enhanced and multiplied through technological advancements like the MV-75, UAS, and LE.

The MV-75 promises to provide power projection from relative sanctuary with increased range, speed, endurance, mobility, and sustainability. The MV-75 is sure to enhance freedom of maneuver for our ground forces, and recent actions by Army Senior Leaders have accelerated the delivery of this capability.

Complementing Army Aviation's enduring fleet, both now and in the future, will be the continuously evolving family of UAS and LE. These resources, whether attritable or recoverable in nature, will help our forces detect, identify, locate, and report on the enemy. These assets will be able to leverage both lethal and non-lethal effects on the battlefield in support of reconnaissance, security, and attack during the penetration, disintegration, and exploitation of enemy anti-access/area denial systems in close and deep maneuver areas.

Biography:

MG Clair Gill was commissioned in Army Aviation from the United States Military Academy at West Point in 1994. He has served with a variety of units, to include command in the 101st Aviation Regiment and 10th Combat Aviation Brigade. In 2021, MG Gill served as Director, Army Aviation on the Headquarters, Department of the Army staff for 1 year, followed by his most recent 2-year assignment as Deputy Director for Regional Operations and Force Management (J35) on the Joint Staff. MG Gill is now the commander of the U.S. Army Aviation Center of Excellence.

Reference:

Gill, C. (2025, October). The Army Aviation Branch vision. *Army Aviation, 74*(8 & 9), 12–14.

BUILDING TRUST IN THE URBAN BATTLEFIELD: TRAINING THE MODERN ATTACK AVIATOR

Chief Warrant Officer 5 Michael A. Corsaro, Aviation Branch Chief Warrant Officer, conducts his final flight in the AH-64 Apache. U.S. Army photo by Brittany Trumbull.

By CPT Anthony J. DiNallo

Introduction

As the Army transitions toward large-scale combat operations (LSCO), the complexities of modern warfare demand a transformation in how we train and assess aircrews operating in densely populated environments. Urban warfare presents one of the most demanding operational environments (OEs) for AH-64 Apache crews, yet current training paradigms fail to adequately prepare pilots for its unique challenges. Attack aircrews in this environment are expected to make rapid decisions, employ precise munitions, and safely coordinate with troops on the ground to accomplish the mission. Current demand for this skill set is met by few experienced aviators who served during the counterinsurgency fight, but without a specified training requirement, this will soon be a lost art.

Institutionalizing Urban Operations (UOs) as a core training requirement within Army Aviation is essential to ensure that AH-64 Apache crews are fully prepared for the complexities of modern and future conflict. Designating UOs as an Aircrew Training Manual (ATM) task will formalize the development of crew-coordinated engagement preparation, precise weapons employment, and effective ground force integration, all of which are currently underemphasized, yet critical to mission success and protection of Soldiers on the ground in densely populated OEs.

Limitations in Current Training

Apache pilots are not trained to a high enough standard to earn the trust of a ground force engaged in an urban fight. This skill gap exists because pilots are evaluated only on basic gunnery skills. Minimum gunnery table requirements consist of utilizing each weapons system from varying ranges and modes of flight. While evaluation of foundational gunnery skills is essential, advanced tables stop short of challenging crews to utilize their full potential.

Consider the following analogy of a professional tennis player. No high-level athlete thinks through the form of their swing every time the ball comes at them. Instead, the competitor is focused on playing against a skilled opponent. Their swing comes naturally through muscle memory, allowing focus on finer elements of the game, such as positioning and ball placement.

A professional attack helicopter pilot should approach game time the same way as a professional athlete. Tomorrow's war will not be won by attack pilots who met the standard of pressing the correct sequence of buttons in the cockpit. Gunnery engagements should prepare crews for the complexities of facing a near-peer threat in the most challenging OEs. While gunnery training lacks the depth to meet this demand, the addition of an UOs ATM task will help aircrews gain the confidence to utilize the full potential of the AH-64E in LSCO.

Training at the Appropriate Echelon

The proposed UOs ATM task will directly target the education and training required for weapons employment in densely populated areas. The complexities associated with UOs are largely undertrained at the crew level, making the ATM the appropriate echelon at which to focus training. Urban Operations would be categorized as a mandatory 2000-series task, meaning it will serve as a building block for performing Army Aviation missions (Department of the Army, 2022, p. 2-1). The purpose of this task is to raise the minimum required proficiency of Readiness Level 1 aviators to minimize risk of collateral damage or fratricide in densely populated environments. The task will require advanced knowledge of weapons employment, engagement techniques, and mission planning. Pilots will develop this knowledge into procedural memory by training in the simulator and the aircraft.

To develop UOs' proficiency while adapting to the LSCO training model, this task must be emphasized during ATM continuation training at the team level and below. While large-scale, long-range operations are useful for preparing aircrews for LSCO, they do not thoroughly train attack crews for the actions on the objective portion of the fight, especially when surrounding densely populated objective areas. Therefore, Apache units must emphasize UOs' proficiency during ATM continuation training at team level and below. This foundation is necessary for Apache crews to master their portion of the LSCO fight, ultimately setting conditions for success in the more complex training exercises at echelon.

Weapons Employment and Engagement Techniques

Prioritizing the urban environment will require pilots to increase their knowledge base of all weapons systems and

Conditions	Standards	Procedures	Evaluation
In an urban environment during day or night conditions. The crew is briefed on mission objectives and is equipped with a full weapons loadout. Targets are located within complex urban terrain featuring vertical obstacles, cultural lighting, and potential collateral damage concerns. Engagements are scripted or dynamically generated by an observer/controller (O/C) aircraft or simulator.	1. Select and employ the appropriate munition based on target, environment, and desired effect.	Select appropriate weapons system	Academic / Simulator
		Select appropriate munition type	Academic / Simulator
		Select missile trajectory	Academic / Simulator
		Employ missile delay	Academic / Simulator
	2. Rapidly identify and engage targets.	Execute delivery technique (hover, running, diving fire)	Simulator / Aircraft
		Maneuver aircraft to minimize collateral damage and achieve intended terminal ballistic effect	Simulator / Aircraft
		Maintain situational awareness of friendly forces, enemy forces, and civilian noncombatants	Simulator / Aircraft
In an urban environment with friendly ground forces maneuvering in close proximity to enemy and civilian elements. The crew is briefed on mission objectives and control measures (e.g., phase lines, target reference points [TRPs], gridded reference guides [GRGs]). Communications are established with joint terminal attack controllers (JTACs) or ground controllers. The crew is equipped with a full weapons loadout and tasked with supporting ground maneuver through dynamic target handovers.	3. Maintain situational awareness of maneuvering ground force.	Pre-mission plan with supported force	Academic
		Battle track using TRPs, phase lines, GRGs	Aircraft
		Perform target handover using 5-line attack aviation Call for Fire	Aircraft
	4. Adjust fires based on evolving ground situation and incomplete or time-sensitive information.	Identify and mitigate laser targeting constraints (e.g., podium effect, entrapment)	Simulator / Aircraft
		Execute shift cold for munition offset	Simulator / Aircraft
		Conduct danger close engagement with clearance	Simulator / Aircraft

Proposed 2000-series ATM task: Perform UOs (provided by the author).

engagement techniques. Aircrews will have limited time from target identification to weapons employment because of vertical obstacles, night vision limitations (due to cultural lighting), and enemy maneuvering to locations with collateral damage concerns (Army et al., 2022, p. 47). This added complexity requires understanding of the aircraft beyond memorized engagement ranges; crews must plan for and quickly employ appropriate munition types to get a specific desired effect on target.

Urban weapons employment should be introduced in academic classes, seen again in the simulator, and evaluated in the aircraft. Prior to their 2025 U.S. Central Command (CENTCOM) deployment, Troop Alpha, 2-17 Air Cavalry Squadron, effectively implemented an urban training plan in this format. During academic classes, instructors taught the UOs planning process, stressing the importance of selecting a weapons loadout appropriate for the mission. In the simulator, crews faced complex engagements that best fit specific missile trajectories, delays, or warhead types. Training culminated in a dry gunnery table over a small local downtown area. An O/C aircraft read 10 scripted engagements to a two-ship Attack Weapons Team (AWT). In this scenario, the engagement set-up differed from typical prompts that give crews specified flight profile, target type, target location, and requested munition. Instead, the AWT was challenged to rapidly identify targets, decide on the best weapon and delivery technique, and then effectively maneuver the aircraft to employ munitions while considering collateral damage (Troop Alpha, 2-17 Air Cavalry Squadron, 2024).

Ground Force Integration with Mission Planning and Execution

The proximity of friendly forces, enemy forces, and civilian population in urban environments demand a higher level of detailed integration between ground forces and aviation fires (Army et al., 2022, p. 39). Training with the ground force is critical to avoid fratricide. Aircrews must be prepared for fast-paced target handovers from a ground force engaged in close combat that is potentially relaying incomplete or inaccurate information. Attack aircrews must accurately develop the situation on the ground to safely and effectively employ munitions. Fighting for information in a rapidly developing urban combat scenario is a learned skill that attack crewmembers must master to reliably support the ground force.

To maximize situational awareness in densely populated areas, aviators and ground forces must train together with common control measures. Phase lines, TRPs, and GRGs are most effective as an operation moves through an urban environment (Army et al., 2022, p. 40). Use of these control measures is not trivial; detailed planning and repetitive execution are essential to mastering urban situational awareness. Aviation units must plan missions with ground forces as part of a UOs ATM task to ensure these skills are continuously refined. Additionally, pilots must gain experience coordinating in person with a supported force to establish standard operating procedures prior to training and operational missions.

To prepare for CENTCOM missions in support of 5th Special Forces Group (Airborne), Troop Alpha, 2-17 Air Cavalry Squadron, conducted a deliberate ground force integration training process. The Troop first received academic classes from JTACs to understand the engagement process and airspace considerations in congested areas. Aircrews then learned about GRG use through target talk-ons using precise language. Next, JTACs joined the Troop at the Yano Digital Air-to Ground Integration Range in Fort Knox, Kentucky, and iterated their junior controllers through target talk-ons with aircraft performing gunnery tables. The training culminated with a live-fire exercise as a ground element cleared through two different air-ground operation villages, simulating an urban environment. Embedded JTACs controlled AWTs throughout the operation, requiring crews to maintain awareness of the maneuvering friendly ground force while firing live munitions. This type of training is essential to build confidence among attack aircrews supporting ground forces in a complex OE.

Conclusion

Urban Operations represent one of the most complex and demanding environments for Army Aviation; therefore, it must become a foundational element of Apache aircrew training. Institutionalizing UOs as an ATM task will ensure that attack aviators develop the necessary proficiency in crew coordination, weapons employment, and ground force integration. The experience of senior aviators who fought in previous urban conflicts must be deliberately codified into doctrine and transferred to the next generation of pilots. To best implement a new UOs ATM task, the specifics should be developed by the Directorate of Training and Doctrine's Flight Training Branch. This will not only establish a standardized approach to UOs training but also drive investment in realistic gunnery range infrastructure and strengthen habitual integration with ground forces. Army Aviation's current transformation and restructuring of attack battalions presents an ideal opportunity to embed these changes into the force, ensuring that the branch remains capable, adaptable, and trusted to support the ground fight in any OE.

Biography:

CPT Anthony DiNallo is currently a student at the Aviation Captain's Career Course at Fort Rucker, Alabama. He previously served in 2-17 Air Cavalry Squadron as an AH-64E pilot in Fort Campbell, Kentucky. CPT DiNallo commissioned from the United States Military Academy with a degree in Space Science.

References:

Army, Marine Corps, Navy, & Air Force. (2022, February). *Multi-Service tactics, techniques, and procedures for urban operations* (Army Techniques Publication 3-06.1). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN34839-ATP_3-06.1-000-WEB-1.pdf

Department of the Army. (2022, April 14). *Commander's aviation training and standardization program* (Training Circular 3-04.11). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN35119-TC_3-04.11-000-WEB-1.pdf

Troop Alpha, 2-17 Air Cavalry Squadron. (April 2024). *Urban engagement training*.

Innovate or Die: Our Fight to Stay Relevant

By MAJ Zachary D. Daker and MAJ Patrick J. Shaver, Jr.

Gun pilots, let's have a real talk about the Army's Transformation Initiative, or ATI. All of us live for that Apache rush, dropping buildings with Hellfires, eviscerating enemies with 30mm, full trust in the machine and the team. But let's face reality, we were all aware of our woefully undermanned formations, with pilots and maintainers spread too thin, further aggravated by a widening experience gap. The modern battlefield is evolving weekly, and now our branch stands at a defining crossroads. The ATI is not a distant policy. It is our rallying cry to evolve and reclaim our role as the Army's unrelenting force multiplier. As attack aviators, we have always charged forward, and this is no different. Ukraine's scorched skies and China's looming threats aren't warnings; instead, they're urgent signals that our old ways are obsolete. Although critics argue our era is over, we argue that this is our moment to adapt, dominate, and ignite innovation from the ground up—ensuring our legacy endures. **This is our inflection point**.

The Wake-Up Call: Change Isn't Optional

The war in Ukraine has exposed the heightened vulnerability of attack helicopters to proliferated low-cost drones, dense air defenses, and long-range precision fires targeting rear-area airfields. Proof that lingering in contested airspace without setting conditions invites destruction. The U.S. Indo-Pacific Command's nightmare is worse. China's anti-access/area denial (A2/AD) fortress bristles with advanced air defense artillery, industrial-scale drone production,

The Joint Multinational Training Group–Ukraine conducts a Live Drop 5.0 exercise with a Skydio X10D drone. U.S. Army photo by SFC Arturo Guzman.

Munition	Range	Payload	Guidance	Targets	Integration & Mods	Max Loadout	Cost	Key Vulnerabilities
Lockheed Martin Hellfire AGM-114R/K	8–11+ km	9 kg	SAL or MMW	Tanks, armor, bunkers, structures	M299 rail; none	16	~$120–150K	Short range; LOS laser; smoke/obscurants
Lockheed Martin JAGM AGM-179A	8–16+ km	9–12 kg	Dual SAL + MMW	Moving land/maritime targets	M299 rail; none	16	~$250–325K	Short range; seeker jamming; weather effects
Rafael Spike NLOS	32+ km	~13 kg	Fiber-optic + EO/IR; man-in-loop/F&F	Tanks, armor, ships, C2, structures	M299 + major mod (datalink antenna/software)	4	~$200–250K	Fiber-optic severable; subsonic; MANPADS
Anduril Barracuda-100M	157+ km	16 kg	GPS/INS + EO/IR; autonomous	Vehicles, armor, structures, C2	M299 rail; minimal adapter	16	<$150K	Subsonic; GPS jamming; low-alt SAMs
Anduril Altius-600M	160+ km	3–4 kg	Autonomous EO/IR/RF	Light armor, drones, artillery, troops	ESSS tube pod required	16	~$80K	Small warhead; RF jamming; engine failure
Anduril Altius-700M	160+ km	15 kg	Autonomous EO/IR/RF	Tanks, ships, bunkers, infrastructure	Same tube pod	8	~$150K	Heavier/fewer carried; RF jamming; limited loiter
Anduril Barracuda-250M	370+ km	16 kg	GPS/INS + EO/IR; autonomous	Vehicles, armor, structures, C2, corvettes, patrol boats	M299/ESSS; simple adapter	4	~$150K	Subsonic; long flight/fuel burn; GPS jamming
L3Harris Red Wolf Kinetic	370+ km	16–20 kg	GPS/INS + EO/IR/MMW/SAL; swarm	Armor, C2, radar, artillery, small–medium ships	M299 adapter; simple bolt-on	4	~$400–500K	Subsonic; GPS jamming; low-alt SAMs; high cost

Figure. Comparative technical characteristics of selected air-to-surface missile systems. Technical data table compiled from manufacturer data and provided by the authors, 2025. [1]

vast oceanic expanses and archipelagos, and electronic warfare (EW) that blinds our networks. Our counterinsurgency playbook, loitering for close support, may be a relic of the past. We need munitions with significant standoff and air-launched effects (ALE), resilient networks, a reindexing of manned and unmanned platforms, and, most of all, a mindset shift. However, ATI isn't entirely threat-driven; we were trending toward a static perspective at home as well.

In Fiscal Year 2026, the AH-64D costs $7,954 per flight hour, nearly double the AH-64E's $4,318 per flight hour, which is simply not sustainable in a flat-budget environment (Department of the Army [DA], 2025). However, the previous manning and experience gaps weren't much better. Pre-ATI, the average attack battalion/squadron was manned at ~75% and ~50% in key billets like instructor pilots and maintenance test pilots (DA, 2025). These numbers aren't just data in a spreadsheet—they are facts on the ground. They choke our readiness, forcing lose-lose choices between training and maintenance, while global threats continue to evolve around us.

ATI's Blueprint: Adapt to Dominate

So, what does ATI do for Attack Aviation? The goal from the top is to rebalance our current overinvestment in manned assets, streamline costs, and transform to the emerging threats, and like all change, it's not pain-free. Here's what it means for the active-duty attack community:

- Elimination of all air cavalry squadrons and consolidation into 1x attack battalion at each combat aviation brigade (CAB)

- Divesting of all 133x remaining AH-64Ds

- Translating the excess AH-64Es into 6x AHs as operational readiness floats per attack battalion

- Branch-wide reduction in ~6,500 spaces, which, with our current undermanned levels, will translate to a reduction in ~1,600 personnel (100 Officers, 200 Warrant Officers, and 1,300 enlisted Soldiers)

This consolidation allows CABs to attain 90% on tracked positions. Units will remain 125% fill until the rebalance in the 26-02 movement cycle. For those ~1,600 personnel, the Aviation Talent Panel continues in its efforts to stratify the cohorts and provide options (DA, 2025). A subjective endeavor, the goal is to retain our top talent, while still finding venues where those below the cutline can contribute to the larger fight. As of writing this article, the branch is firmly committed to maximizing voluntary options and sees involuntary separation as a last resort measure that is not under consideration for action over the next year. By April 2026, the results of the Voluntary Transfer Incentive Program/Officer Rebranch Program should be published, marking the conclusion of the process. Though not perfect, the Aviation Talent Panel aims to bridge experience gaps by retaining seasoned aviators and maintainers and fostering a culture where expertise drives progress by investing in our most promising warfighters.

Tactical Revolution: Innovation From Within

Modernization provides tools, but their true potential is unlocked through iterative refinement at the unit level. Attack Aviation must evolve beyond Global War on Terror close-combat paradigms to address peer A2/AD networks and proliferated unmanned aircraft systems (UAS). The ATI's six float aircraft should serve as a battalion-level test bed, enabling organic experimentation in lethality and survivability. Equally vital is the rapid dissemination of these

[1]Sources include Lockheed Martin Corporation Hellfire Air-to-Ground (AGM) Missile 114 R/K (2025a); Lockheed Martin Corporation Joint Air-to-Ground Missile (JAGM) AGM 179A (2025b); Rafael Advanced Defense Systems SPIKE® Non-Line-of-Sight Missile (2025); Anduril Industries Barracuda-100/250 (2025b); Anduril Industries Altius-600-700 (2025a); L3Harris Technologies Red Wolf Kinetic (2025).

new ideas and lessons learned across the broader community. Here are some questions to provoke thought:

• How do we employ ALE to enable organic suppression of enemy air defenses ("self-SEAD")? Moreover, are we the optimal launch platform, or is this a better fit for lift aircraft, allowing us to focus on the deep fight?

• No A2/AD architecture is invulnerable. How do we exploit radiating windows, operationalize minimum engagement altitudes, and maximize terrain masking/ground clutter to penetrate? Leveraging institutional knowledge from the 160th Special Operations Aviation Regiment's Aviation Denied Area Planning Team never hurts.

• How should manned-unmanned teaming mature? Is an F-35 Collaborative Combat Aircraft-equivalent model feasible with attritable systems? What novel UAS employment concepts suit increased engagement distances? What about crewed/partially crewed teaming?

• What is the attack helicopter's expanded role in the deep fight? The AGM-114 Hellfire's limited range is inadequate for large-scale combat operations. Emerging standoff munitions demand parallel internal tactical innovation to maximize their employment (Figure).

While industry develops materiel solutions, units retain agency to innovate internally by prototyping techniques, validating concepts in training, and feeding requirements upward. This grassroots approach, executed with discipline and intellectual rigor, complements strategic modernization and accelerates overmatch against pacing threats—*Transformation in Contact*. Junior officers proposing novel concepts, warrant officers developing technical and tactical solutions, and noncommissioned officers conducting daily experimentation are how we remain relevant. Leadership's primary role is to foster this culture. Battalions should harness internal talent to spur an innovation cell, tackling tough problems like countering drone swarms or adaptive tactics against EW. Commanders should treat promising initiatives like venture investments—commit resources to high-potential experiments, terminate failures quickly, and rapidly scale successes across the formation. This disciplined, bottom-up ingenuity is how the attack community regains the initiative. Now let's address the inevitable, but warranted, pushback about needing to be good at the basics before moving on to graduate-level initiatives. The critique is fair: grasping the fundamentals before chasing innovation.

"Although critics argue our era is over, we argue that this is our moment to adapt, dominate, and ignite innovation from the ground up—ensuring our legacy endures. This is our inflection point."

-MAJ Zak Daker & MAJ Patrick Shaver

We've all watched units falter because of an undisciplined foundation—maintenance hinders operations, Q2-heavy gunneries, and greater "unknown risks" assumed on Risk-Common Operating Pictures. We will be perfectly clear—priority number one is to be the most lethal attack formation, having a strong handle on maintenance and decisive in the deep fight. However, excellence in the basics and bold experimentation are not mutually exclusive. Master fundamentals with iron discipline and then channel that same grit into prototyping tomorrow's fight. Demand excellence in daily operations, while giving your sharpest minds space to experiment. It's not either/or—it's a cohesive attack community that outthinks the Chinese threat.

Gauntlet Thrown: Your Move

Gun pilots, this is our call to action. The mission that drives us, delivering lethal aid in support of the ground force, remains unchanged, but the pacing threat has outgrown our playbook. The counterinsurgency era is over; we now face a peer adversary in the Pacific that demands new tactics, ranges, and survivability. For too long, we accepted understrength formations, experience gaps, and unsustainable costs as the new normal. The Army Transformation Initiative is not a threat to our identity. It provides the necessary disruption to end stagnation and retool our community. We can resist the change, or we can own it, but history shows that Attack Aviation thrives when we confront hard problems head-on. Embrace ATI as the catalyst. Test bold ideas, resource sharp teams, prototype aggressively, fail quickly, capture lessons, and disseminate them widely.

The choice is yours. Fade into irrelevance or innovate to redefine Attack Aviation for the Chinese fight ahead. You have the controls.

Default Aggressive.

Biographies:

MAJ Zak Daker is the Vice Chief of Staff's Artificial Intelligence Advisor. Just prior, he served as the Brigade (BDE) S3 for the 25th CAB.

MAJ Patrick Shaver currently serves as the BDE S3 for the 16th CAB. For his next assignment, he will be pursuing a Master of Business Administration degree at the College of William & Mary, as part of the MG James M. Wright Program.

References:

Anduril Industries. (2025a). *Altius*. https://www.anduril.com/altius

Anduril Industries. (2025b). *Barracuda*. https://www.anduril.com/barracuda

Department of the Army. Deputy Chief of Staff, G-3/5/7, Aviation Directorate (DAMO-AV). (2025). *ATI aviation structure* [PDF document]. U.S. Army.

L3Harris Technologies, Inc. (2025). *L3 Harris' pack of launched effects*. https://www.l3harris.com/all-capabilities/l3harris-pack-launched-effects

Lockheed Martin Corporation. (2025a). *HELLFIRE*. https://www.lockheedmartin.com/en-us/products/hellfire.html

Lockheed Martin Corporation. (2025b.). *Joint-air-to-ground missile*. https://www.lockheedmartin.com/en-us/products/jagm.html

Rafael Advanced Defense Systems Ltd. (2025). *SPIKE® NLOS*. https://www.rafael.co.il/system/spike-nlos/

Army Aviators gain tilt-rotor experience in the MV-22 (Osprey) to shape MV-75 doctrine. U.S. Army photo by Dr. Leslie Herlick.

The Future Long Range Assault Aircraft Program: Building Readiness for the MV-75

By CW3 Joshua D. Baker

The Directorate of Training and Doctrine (DOTD), Fort Rucker, Alabama, serves as the proponent for all aviation doctrine and training. This includes new systems training development. For several years now, DOTD, specifically the New Systems Integration Branch, alongside several other organizations at Fort Rucker, have been conducting extremely detailed training needs analyses to determine how to get after training for the Army's first new aircraft in nearly 40 years.

The U.S. Army has chosen Bell's V-280 for the Future Long Range Assault Aircraft program and officially designated as MV-75. The "MV" stands for Multi-Mission Vertical Takeoff and the number "75" honors their birth year, 1775. (Bell Textron, Inc., 2025).

Since the Army selected Bell Textron, Inc.'s (Bell) V-280 Valor to become the next Army multi-role platform, there has been a mad dash to determine how the first unit will be fielded and trained on the MV-75. Currently, the two contenders are new equipment training teams and a centralized fielding and training site. Both options have strong advantages but also some costly downsides. The DOTD, working with G 3/5/7, the Capability Development and Integration Directorate, the Army Capabilities Manager-Lift/Fixed Wing, and U.S. Forces Command, have conducted quarterly working groups focused on answering questions like "Where do we train, how do we train, and how do we get the right people to train?" However, the reality is that until the Army gets a chance to test prototype aircraft, all our analyses revolve around some facts and a lot of assumptions. All the agencies mentioned above are working diligently alongside the original equipment manufacturer and program manager (PM) Future Long Range Assault Aircraft (FLRAA) to change assumptions to facts.

Next, we need to determine the institutional training strategy. This is a massive undertaking without prototypes to gain much needed analyses, but the Army has been quietly leveraging our oldest sister-service over the past year. It's no secret that the V-22 is employed by the Navy, Marine Corps, and Air Force; however, after site visits to their respective training squadrons and talking with cadre, we have found that the Marine Corps most closely aligns with how the Army does business. We fully acknowledge that no other service is a mirror image of how the Army operates, but it doesn't get any closer than Marine Medium Tiltrotor Squadrons. After we made this determination, we took a hard look at how the Marines train their aviators and maintainers. We also conducted numerous site visits to operational squadrons

Army Chief Warrant Officer 3, Joshua Baker, receives a crew brief from Marine Corps Capt. John Albertini on the MV-22 Osprey. U.S. Army photo by Dr. Leslie Herlick.

to observe how they conduct everything from routine training flights to operational deployments. All these analyses will be used to make decisions on how to stand up institutional training, which we're planning on occurring early during the fielding process. While the first unit begins to receive its aircraft, deliveries will also begin at the institution, allowing a cadre base to begin training and aid in program of instruction development.

Ahead of these aircraft deliveries, cadre for operator and maintenance training will take delivery of training aids, devices, simulators, and simulations. This enables our pool of cadre for the respective institutions to begin learning systems, procedures, and developing training plans long before aircraft arrive, allowing us to get ahead of the curve.

Beginning in January 2025, DOTD sent two pilots and one non-rated crewmember to Marine Corps Air Station New River, North Carolina, to attend V-22 familiarization training and audit the non-rated crewmember training pipeline and maintenance training. During this training, we participated in the full academic syllabus that all Marine and Air Force pilots attend, as well as 60 hours of simulation. The maintainer training included concepts new to the Army, such as advanced composite and fiber optic repair. The culminating event was a 2-hour flight for each of the DOTD training developers in the MV-22, which really tied together the concepts we were exposed to during the familiarization course.

A distinct advantage the Army has with the MV-75 over the Osprey program is the ability to leverage 25 years of tiltrotor experience. As we build a pool of tilt crewmembers through familiarization training, the next logical step is to integrate several of these individuals into Marine units to learn how to actually employ the aircraft. The Army and Marine Corps are working through what an exchange program would look like, but the idea is that a small number of Army pilots would get the unique opportunity to receive a full MV-22 qualification. They would then become assigned to an operational Osprey unit, culminating in a deployment to gain real-world experience. The trade-off

MV-75 special user evaluation at Redstone Arsenal highlights operational relevance. U.S. Army photo by Matthew Ryan.

would be pulling a small group of Marine aviators into key events like critical task site selection boards (CTSSB), test events, and early tactics development events to lend their expertise, while we build our own.

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

In July 2025, ahead of Industry Days at Fort Rucker, we received a virtual prototype (VP) at both Fort Rucker and Redstone Arsenal in Huntsville, Alabama. You might consider the VP a simulator of sorts; however, it's a very rudimentary first look at early aircraft design. As the program matures and production aircraft begin rolling off the line, the purpose of the VP is to inform design early on, as well as allow us to begin task analysis ahead of prototype aircraft. We are currently using the VP to start developing the foundation for what will become the aircrew training manual (ATM) for the MV-75. Along with ATM development, tactics, techniques, and procedures development is the other major focus for the VP. Cruising en route between 240–280 knots brings a paradigm shift to Army Aviation. The incredible capability of the tilt-rotor platform will require us to rework our tactics in the Army as a whole. Aside from the new ATM, we'll be required to update several publications including, but not limited to, Field Manual 3-04, *Army Aviation*; Army Techniques Publication 3-04.1, *Aviation Tactical Employment*; and Training Circular 3-04.4, *Fundamentals of Flight*, concerning aviation employment, air assault tactics, and medical evacuation doctrine (Department of the Army [DA], 2025; DA, 2020; DA, 2022). The VP allows us to get in on these changes at the ground floor as opposed to waiting for aircraft. Procedures developed in the VP will be codified once we get production aircraft to validate tactics. Another major undertaking is the doctrinal updates needed to encompass a new platform and new tactics. The Army has cracked the code on helicopter tactics. We dominate what has been referred to as the low-tier air domain. However, the answer may not always be 200 feet and below. The advantage we gain from the MV-75's speed and range quickly becomes negligible if we are forced to operate below 200 feet at helicopter speeds. The MV-75 isn't a helicopter, it's a plane that takes off and lands vertically. The sooner we adopt this mindset, the sooner we can exploit the potential that tilt-rotor offers. Doctrine **must** and **will** change to incorporate future tactics and how the Army does business. Along with this tactical change, Army aircrews, planners, and staff must step outside our foxholes and leverage joint enablers to allow us to get to the fight. It's no surprise that anti-access and area denial in the form of integrated air defense systems, cyber effects, and electronic warfare pose a significant threat to the way we conduct operations. We must incorporate our advanced sensors and enablers, which will allow us to rapidly transition to the operational environment and accomplish our mission.

Everything DOTD has worked on up to this point is to inform training needs analysis leading up to CTSSBs for MV-75 aviators, non-rated crewmembers, and backshops maintainers. The CTSSB is typically conducted every 3 years to determine if changes to the critical task list are necessary. The CTSSBs for the above-mentioned military occupational specialty, however, represent a massive muscle movement because of the system's newness. During a CTSSB, a group of subject matter experts come together to make these determinations and provide a recommended critical task list, likely in the form of an ATM, as well as which tasks are taught in institutional training. Because this is a completely new system, our subject matter experts will be comprised of a mix of fixed- and rotary-wing aviators and crewmembers, as well as tilt-rotor pilots from across our sister services. While the Army has some learning to do with this platform, we have 25 years of experience across the Department of War to leverage, so we're not starting from scratch.

Finally, as the program matures and becomes larger, we need more expertise where we can best leverage it. Currently, we only have a handful of experts on our team at Fort Rucker, but that changes with the introduction of the operational development team (ODT). Some may already be familiar with this concept, but the ODT will serve as the primary go-between for MV-75 development. Members will have the distinct responsibility of drawing on their own unique expertise based on a wide range of experiences to help guide informed decisions on the project. They'll also be tasked with liaising between Bell, Program Manager FLRAA, Redstone Test Center, and other entities at Fort Rucker.

The DOTD will continue to work with program offices and Bell to ensure development isn't completed in a vacuum. User input and analyses over the next couple of years are critical to this program's success. As we drive forward with ODT establishment, we will continue to lean on sister services to ensure we don't ignore their hard-learned lessons from 20 plus years of operational employment.

Biography:

CW3 Josh Baker is a UH-60 A/L/M pilot and Aviation Mission Survivability Officer presently assigned to DOTD as a FLRAA Training Developer.

References:

Bell Textron, Inc. (2025). MV-75: *Transforming Army Aviation*. https://www.bellflight.com/products/bell-mv-75

Department of the Army. (2020, May 7). *Aviation tactical employment* (Army Techniques Publication 3-04.1). https://armypubs.army.mil/ProductMaps/PubForm/Details.aspx?PUB_ID=1009144

Department of the Army. (2022, July 5). *Fundamentals of flight* (Training Circular 3-04.4). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN35749-TC_3-04.4-000-WEB-1.pdf

Department of the Army. (2025, March 27). *Army Aviation* (Field Manual 3-04). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN43343-FM_3-04-000-WEB-1.pdf

Optimizing the Ammunition Process:

Bridging Tactical Gaps Toward a Data-Centric Army

Photo credit: Pixabay.com

By CW2 Dennis L. Puccini, Jr., and SSG Devante J. Mckenzie

Introduction

As the Army transitions toward a data-centric model of command and control, ammunition forecasting and accountability remain trapped in legacy systems, manual processes, and fragmented coordination. While strategic efforts, such as the implementation of Enterprise Business System–Convergence (EBS-C)[1] promise Enterprise-level integration, operational gaps continue to impact sustainers at the brigade level and below. The result is an accountability model failing to meet the operational tempo or digital expectations of the modern force. This article analyzes current shortfalls, evaluates the limitations of upcoming systems, and presents tactical-level solutions that align with the Army Chief of Staff's modernization priorities, while reinforcing readiness, audit compliance, and mission success.

The Problem: Disconnected Systems and Tactical Consequences

The Army's current ammunition supply chain and accountability processes suffer from inefficiencies that begin at the lowest levels and cascade upward. At the company and platoon levels, forecasting is often driven by assumption, not data. Training calendars may shift, but those changes rarely propagate into munitions forecasts, resulting in over-ordering, underutilization, and inaccurate returns. Junior leaders lack real-time visibility into what has been requested, what has been approved, and how their forecasts affect higher-level authorizations or availability.

At the battalion and brigade levels, support operation (SPO) sections are the tactical executors of ammunition planning and accountability. They must reconcile requests from subordinate units with allocations, coordinate issue and turn-in with ammunition supply points (ASPs), and report usage accurately. However, the digital infrastructure they currently rely on, primarily Total Ammunition Management Information System (TAMIS) and the Digital Training Management System (DTMS), do not support seamless communication. These systems operate independently, and the lack of integration forces sustainers to manually reconcile data, often across separate spreadsheets and disconnected workflows.

Division and corps-level allocation processes are equally constrained. Their models often lack flexibility and responsiveness, relying on historical usage data that fail to reflect modern training conditions. Allocation decisions are based on forecasts, not actual demand, and real-time visibility across subordinate formations remains limited or entirely absent.

TAMIS, DTMS, and the Accountability Lifecycle

Total Ammunition Management Information System is the Deputy Chief of Staff for Operations, Plans, and Training's (DCS G-3/5/7) official system for managing ammunition forecasts, allocations, and requests. The system calculates requirements based on standards in weapons training and program of instruction data, manages sub-authorizations, and collects expenditure reports across all commands. However, its practical utility is often hindered by poor alignment with training schedules, limited user training, and its detachment from DTMS.

The Digital Training Management System governs training calendars and exercises, yet it does not automatically adjust ammunition forecasts when training plans change. There is no procedural feedback loop to ensure unused munitions or updated training objectives influence future forecasting. These gaps contradict the intent of Department of the Army (DA) Pamphlet 700-16 (2021b), *Ammunition Management*, which emphasizes lifecycle accountability, feedback-informed planning, and integration across systems.

Units typically forecast 90 days in advance based on anticipated training, but when changes occur due to weather, mission shifts, or leadership turnover, those forecasts remain static. The result is a breakdown in resourcing that impacts everything from live-fire qualifications to full-scale collective training. Even the ammunition request and turn-in process remain partially manual, with inconsistent tracking, prolonged return

[1] "EBS-C is a modern, agile, cloud-based solution designed to deploy sustainment capabilities quickly, reduce costs and risks, and provide easy access to users at all levels. It will converge five of the Army's current logistics and finance systems into one platform with the opportunity to replace dozens more" (Cabezas & Cummins, 2025).

A U.S. Army Pacific Command Soldier observes munitions being loaded onto a military vehicle near an ammunition supply activity in the Philippines. U.S. Army photo by SFC Joshua Brandenburg.

timelines, and reconciliation errors that affect audit readiness.

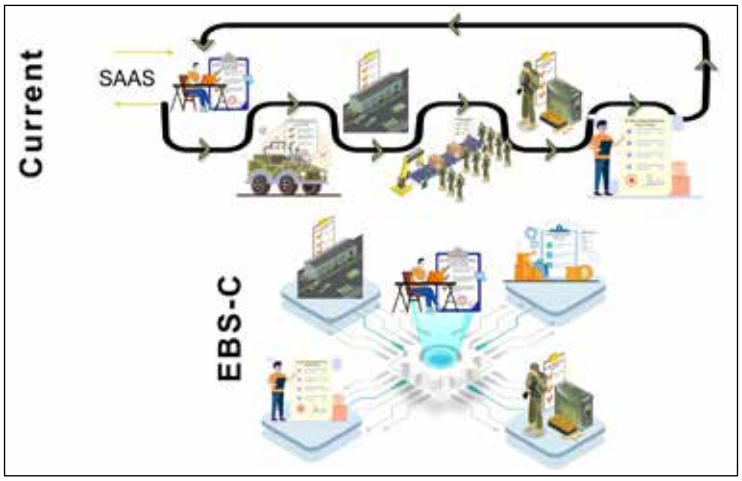
The Promise and Limits of EBS-C

The Army's next-generation Enterprise Resource Planning solution, EBS-C, is intended to resolve many of these issues. With its cloud-native, open-architecture design, EBS-C will replace legacy systems and offer Enterprise-level visibility into ammunition (Class V) movement and accountability. It supports full-spectrum logistics planning, enabling commanders to assess ammunition posture in real time and adjusts based on operational need. Its early fielding success, such as the rapid deployment of the first ammunition management module, demonstrates agility and commitment to transformation (Christ, 2025).

However, we anticipate that several key limitations will persist, even as EBS-C comes online. One major concern is that petroleum, oils, and lubricants (Class III) and Class V operations will still depend on partial integration with legacy systems or external platforms. Total Ammunition Management Information System and Standard Army Ammunition System Modernization (SAAS-MOD) will continue to play a role, but their full interoperability with EBS-C remains unresolved. This introduces audit and readiness risk, especially when information must be manually reconciled across systems.

Another limitation we anticipate is EBS-C's dependence on stable non-secure internet protocol router (NIPR) connectivity. Its cloud-based infrastructure assumes consistent access, which is simply not a reality at the tactical edge. Field units, particularly those in forward support companies, aviation maintenance units, and brigade support battalions operating in austere or disconnected environments, cannot rely on EBS-C unless it incorporates robust offline functionality. The absence of a sync-later feature or tactical buffer for data capture renders the system ineffective in environments where it is needed most. This limitation directly undermines the Army's ability to sustain lethality in multidomain operations.

The human factor will compound these issues. Soldiers responsible for forecasting, requesting, and reconciling ammunition—including those in 92Y, 92A, 89B, 92F, and 88M military occupational specialties (MOSs)—are not yet trained on the nuances of the new system. Brigade-level SPOs will also shoulder the burden of adapting planning, reporting, and coordinating tools without losing operational tempo. Without a deliberate training and force adaptation plan, the Army risks losing continuity and compliance during the transition.



The EBS-C process. Image provided by the author.

Tactical Solutions to Bridge the Gap

Until EBS-C is fully implemented, brigade- and battalion-level leaders must adopt adaptive solutions that reconcile current system limitations with the operational demands of a modern, fast-paced force. One critical area requiring immediate attention is the coordination between TAMIS and the handling of signed issue documentation. Currently, when delinquent documents are flagged, the brigade ammunition team lacks visibility into the quantities of missing items. The only available reference is the document number in TAMIS, which necessitates manual research to determine what was issued to the unit. Once potential shortages are identified, the team must engage both the unit and the ASP to confirm discrepancies and collect all signed pickup and turn-in documentation, none of which are stored within TAMIS.

There is no centralized system at the brigade level to archive signed issue and turn-in documentation unless the unit or ASP proactively emails the records. The ASP uses SAAS-MOD to record real-time transaction history, but this system is restricted to ASP personnel and supports only retail-level ammunition operations. This lack of visibility creates significant challenges for oversight of both training and operational load ammunition. The SPO ammunition team requires a system capable of providing real-time updates on signed documentation, live and residue turn-ins, appointment scheduling, and memorandum agreements for training extensions. Total Ammunition Management Information System currently offers limited real-time data to brigade-level approvers, such as issued quantities and document reconcilia-

tion status. However, this information is often unreliable and subject to change without notification, resulting in wasted time and operational inefficiencies.

For example, a unit may submit an electronic DA Form 581, *Request for Issue and Turn-In of Ammunition* (2021a), with a scheduled pickup date in TAMIS but later reschedule directly with the ASP. Total Ammunition Management Information System remains unchanged, and only battalion and company-level personnel are aware of the update. Similarly, if a unit extends its training period and submits an approved extension memo to the ASP, TAMIS continues to reflect the original required delivery date, creating discrepancies in planning and accountability.

These gaps become especially problematic during Army Regulation 15-6 *(Procedures for Preliminary Inquiries, Administrative Investigations, and Boards of Officers)* investigations into missing ammunition, such as cartridge-actuated devices and propellant-actuated devices, which often remain installed on aircraft for extended periods (DA, 2025). By the time a loss is identified, documentation may be missing or inaccessible, and the ASP typically does not retain these records. A system that enables real-time uploading and access to signed documentation at the brigade level would significantly enhance accountability and streamline investigative processes.

To mitigate these challenges, the 1st Armored Division Combat Aviation Brigade (1AD CAB) has instituted recurring coordination meetings between the SPO and brigade S3 operations staff. These engagements ensure alignment between training schedules and ammunition forecasts, reducing mismatches contributing to waste and readiness degradation.

Soldiers assigned to the 53D Brigade Support Battalion prepare to unload ammunition at Camp Shelby, Mississippi. U.S. Army photo by SFC Shane Klestinski.

The 1AD CAB has also integrated a Microsoft Power BI (Business Intelligence) dashboard to track real-time usage, authorization, and forecast data across subordinate units. These tools do not require Enterprise integration but can dramatically improve transparency and responsiveness at the brigade level.

In the absence of EBS-C's offline functionality, units should develop tactical standard operating procedures for disconnected ammunition tracking. These can include digital or analog tracking methods, barcode logs, or mobile forms that reconcile once NIPR access is restored. These workarounds are not ideal, but they are essential to maintain audit integrity and Class V continuity until the final solution is delivered.

Finally, training must begin now. Leaders should leverage existing training environments, simulations, and sustainment forums to familiarize Soldiers with EBS-C concepts, workflows, and vocabulary. This proactive approach will prevent future friction and ensure a smoother transition when the system becomes mandatory.

Conclusion

Optimizing the Army's training ammunition process is a readiness imperative. Although EBS-C offers a path toward full integration, the reality is that tactical-level leaders will carry the responsibility of bridging the accountability gap until full convergence is achieved. Support operations sections at the brigade level are the linchpin of Class V success. Their ability to adapt, coordinate, and modernize under imperfect conditions will determine whether modernization is a theory or a capability.

As the Army prepares for future combat environments and adopts data-centric warfare as its north star, the ammunition forecasting process cannot be left behind. The solution is not simply software, it is also leadership, initiative, and trust in the tactical sustainers who already keep the fight resourced, one round at a time.

Biographies:

CW2 Dennis Puccini (890A), serves as the 1AD CAB Ammunition Tech, having previously held the role as the accountable officer at 84th Ordnance Company, Korea. With more than 15 years of experience in ammunition operations, CW2 Puccini has contributed to various operations, including Operation Enduring Freedom, Operation Inherent Resolve, and Operation Atlantic Resolve.

SSG Devante Mckenzie (MOS 89B), serves as the 1AD CAB Ammunition Inspector, Ammunition Inspector, with more than 11 years of technical expertise and mission-focused support. He previously served as the 25th Infantry Division Instillation Ammunition Manager at Schofield Barracks in Hawaii. SSG Mckenzie is instructor-certified, specializing in ammunition management and logistics.

References:

Cabezas, N., & Cummins, C. (2025, April 18). *EBS-C: Transforming the way the Army sustainment community sees and creates operational readiness and lethality.* U.S. Army. https://www.army.mil/article/284120/ebs_c_transforming_the_way_the_army_sustainment_community_sees_and_creates_operational_readiness_and_lethality

Christ, E. (2025, July 11). *Enterprise Business Systems—Convergence goes live ahead of schedule, modernizing Army ammunition.* https://www.army.mil/article/287007/enterprise_business_systems_convergence_goes_live_ahead_of_schedule_modernizing_army_ammunition

Department of the Army. (2021a, June 1). *Request for issue and turn-in of ammunition* (Department of the Army Form 581). https://armypubs.army.mil/ProductMaps/PubForm/Details_Printer.aspx?PUB_ID=1021676

Department of the Army. (2021b, June 23). *Ammunition management* (Department of the Army Pamphlet 700-16). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN31667-PAM_700-16-000-WEB-1.pdf

Department of the Army. (2025, June 22). *Procedures for preliminary inquiries, administrative investigations, and boards of officers* (Army Regulation 15-6). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN43931-AR_15-6-000-WEB-1.pdf

From Tradition to Transformation: Army Training in Metamorphosis

Photo courtesy of Pixabay.com

By Dr. Ruth A. Busby, Mr. Dietrek G. Louis, and Dr. Keith A. Stampley

The U.S. Army made 2025 a memorable year with the announcement of the Army Transformation Initiative (ATI), a plan to "transform to a leaner, more lethal force by adapting how we fight, train, organize, and buy equipment" (Driscoll & George, 2025). This plan requires a fundamental shift in how we train. The transformation of a caterpillar into a butterfly is a fitting analogy for the changes needed in Army Aviation training. For Army Aviation, this means shedding outdated training methods—like a caterpillar sheds its chrysalis—for innovative approaches that address modern operational challenges. This article explores how the ATI will transform Army Aviation training and what that will look like in practice.

ATI: A Call to Change

The term "transformation" has become a frequently discussed concept recently, but what does it mean for the Army? Shared understanding is a key principle of the U.S. Army's Mission Command that ensures clarity in communication and in goals, thereby ensuring the force is unified in the mission (Department of the Army, 2019b). In this article, we seek to contribute to a shared understanding of what transformation means, to avoid fragmented perspectives and ensure consistent implementation.

Jack Mezirow's (Taylor & Laros, 2014) transformative learning theory provides a framework that explains how people progress through stages as they change their beliefs through a process of questioning preconceived ideas and assumptions. This process is different from simply adding new knowledge to what they already know. For Army Aviation, transformation means rethinking how Soldiers and leaders are trained rather than simply updating old methods. Soldiers develop critical thinking and teamwork skills to solve problems as they adapt to new challenges, some of which are unexpected. The Table (page 24) illustrates how Mezirow's stages of transformation might apply to Army training.

Image created by Bill Herrin with Grok artificial intelligence.

Why Army Aviation Needs Transformation

Historically, Army Aviation training included a combination of classroom instruction, simulators, and live flight hours. While effective in the past, these methods are time- and resource-intensive. Additionally, they are unable to keep up with the rapidly evolving nature of threats and technologies.

Lessons learned from exercises such as Defender Europe 2023 provide insights into the need to transform training methods for modern warfare. The exercise involved more than 20,000 troops from 17 nations and emphasized the need for interoperability, dynamic decision-making, and adaptability in complex environments (Prohaska, 2023). Army Aviation units were tested in scenarios involving cyberattacks, electronic warfare, and contested logistics (Crockett, 2023). Gaps in traditional training methods were revealed, including reliance on predictable scenarios and outdated communication systems.

Stage	Explanation of the Stage	Connection to Army Training Transformation	What Must Change	Example
Stage 1: Disorienting Dilemma	A person encounters a problem or experience that challenges their current beliefs, causing them to question their assumptions.	Soldiers encounter realistic, high-stakes scenarios that challenge their assumptions about traditional warfare.	Training must shift from static, predictable exercises to dynamic scenarios that reflect modern warfare complexities.	Soldiers are presented with a simulated cyberattack that forces them to question their reliance on current communication systems.
Stage 2: Critical Reflection	Individuals' underlying assumptions are scrutinized during a period of self-reflection. Resistance to change can result.	Soldiers analyze their decisions, question assumptions, and identify gaps in their knowledge and skills.	Training programs must incorporate structured opportunities for self-reflection, such as after-action reviews (AARs).	Soldiers critically reflect on their responses to a cyberattack during an AAR, assessing gaps in adaptability.
Stage 3: Exploration of Alternatives	The person explores new ways of understanding the problem, often through dialogue with others and testing new ideas.	Soldiers collaborate to develop and test new approaches to solving challenges identified during critical reflection.	Training must prioritize creativity, collaboration, and experimentation, encouraging Soldiers to test new strategies.	Soldiers work with cyber teams and space assets to develop alternative communication methods after a cyberattack.
Stage 4: Acquisition and Testing of New Knowledge	The individual acquires new knowledge, experiences "aha" moments, and tests their new paradigm in real-life situations.	Soldiers apply new paradigms in real-life or simulated scenarios, refining their skills through iterative testing and feedback.	Training must integrate advanced technologies like synthetic training environments (STEs), virtual reality (VR), and artificial intelligence (AI) to create immersive, realistic training scenarios.	Soldiers use STEs to practice decision-making in multidomain operations (MDOs) within a reorganized or decentralized command structure.

Table. Transformative learning stages and Army training transformation. Table developed by the authors, 2025.

Advanced technologies such STEs, VR, and AI proved valuable for training by providing realistic, unpredictable battlefield scenarios and immediate feedback. Opportunities to practice decision-making under stressful, degraded conditions were provided (Burton, 2023). This new reality demands that Soldiers think critically to analyze data, adjust to rapid changes, and make decisions quickly. General James B. Hecker maintains, "I have established Agile Combat Employment (ACE) as one of my five priorities … to regain some of the agility and interoperability in how we maintain and support our aircraft … We must train and exercise like we fight—already in peacetime and make it part of the fabric of national education, training, planning, operations and future investment" (U.S. Europe World Affairs, 2024, para. 10).

The Army Learning Concept should guide modernization efforts for Army Aviation training. Transformation may "require challenging, and in some cases, wholly new efforts from teachers, trainers, instructional designers, material developers, and other contributors" (Training and Doctrine Command, 2024, p. 18).

Opportunities for Transformation

The ATI challenges us to incorporate more learner-centered instruction by creating experiences, rather than just delivering information. Learner-centered instruction includes self-discovery, critical thinking, and learning by doing facilitated by open-ended questions (Conover, 2024). Advanced technology, leadership development, and innovation are three key areas identified in the ATI for this new approach (Driscoll & George, 2025).

1. Embracing Advanced Technology

The Army's transformation efforts depend on advanced technology. Technology tools will revolutionize training methods by creating realistic training exercises while reducing risks associated with live exercises (Rozman, 2020; Arjun & Sanjay, 2024).

- **STEs and VR**: These tools immerse Soldiers in complex situations, such as responding to cyberattacks and coordinating MDO. Soldiers practice decision-making in high-stress environments—all within the confines of the classroom. Opportunities requiring critical thinking, such as making judgments and using data analysis to make decisions, are provided to adapt quickly and make decisions in unpredictable circumstances.

- **AI**: AI can provide realistic battlefield scenarios that challenge Soldiers in unpredictable ways, more closely aligning with real warfare. Immediate, data-driven feedback can be provided that personalizes training for individual Soldiers' strengths and weaknesses. The National Training Center is one example of how AI can create and modify training exercises to simulate current and future conflicts, including incorporating geopolitical, cultural, and technological factors (Coombs, 2024). The University of Southern California Institute for Creative Technologies "is using AI to create military training materials in (near) real-time" (Nye, 2025).

2. Leadership Development

Like Soldiers, leaders must also be adaptable, innovative, and capable of operating in rapidly changing environments of modern warfare (Department of the Army, 2019a). Cultivating these traits should be an integral part of leadership development. Hands-on simulations, peer learning, and collaborative scenarios will replace long PowerPoint presentations to provide the training leaders need to adapt and innovate.

Photo courtesy of Pixabay.com

3. Innovation

For transformation to take root, the Army must nurture a culture of innovation that encourages experimentation, including taking calculated risks as creative solutions are sought for complex problems (Department of the Army, 2021a). More than 70 transformation projects are already being implemented and tracked by digital dashboards to monitor progress (Ponder, 2025). For training developers in aviation, the most promising development is the Modular, Adaptive, Relearning Training (MART) model from the Cyber Center of Excellence. The MART model allows instructors to update lessons as systems evolve, instead of waiting years for course rewrites. Aircraft systems, mission software, and unmanned teaming technology change faster than manuals. Training that adapts in real time can create the agile aviators needed for modern warfare (Lynch, 2024).

Challenges

The path is not without challenges. Historically, the Army has been resistant to change by reverting to familiar methods. For example, the Future Combat Systems program failed in part because training could not keep pace with technology that never fully arrived, resulting in few measurable changes in how Soldiers learn and fight (Gouré, 2011). The ATI offers a unique opportunity to get it right by embracing change. Focusing on adaptive training models and leveraging technologies can address past shortcomings and become an example for building a force ready for future challenges. Many current training methods still rely on models that worked in the past, such as lecture slides, PowerPoints, and "sage-on-the-stage" instruction, which produce passive learners and limit initiative. Transformation in training should not be considered a supporting effort but rather a vital component of developing a lethal force (Department of the Army, 2021b).

If you don't like change, you'll like irrelevance even less.

–General Eric Shinseki, former Chief of Staff of the Army

Recent efforts, such as redirecting nearly $5 billion in legacy divestments toward modernization and training priorities, show that the Army is serious about change (Judson, 2025). In Congressional Research Service Report R48606 (2025), author Andrew Feickert has urged the Army to define clear "measures of effectiveness" to prove that transformation is producing tangible outcomes and improved readiness.

The ATI is the right step, but it will not succeed through revision alone. Transformation means creating a learning culture that prioritizes agility, experimentation, and critical thinking for all ranks. Modernization efforts by the Army are not new. The difference this time will be whether training itself transforms, rather than solely, the tools supporting it. If the ATI can deliver that kind of change, the Army will not just train better; it will fight better. Moreover, that is the only transformation that counts.

Conclusion

The ATI provides a shared understanding of the transformation needed for Army Aviation to move forward. We must not get distracted by updating tools or processes such as AI and VR; instead, we should focus on the real changes that must happen in our classrooms and culture. Like a butterfly emerging from its chrysalis, this transformation will create a more lethal force that can adapt to rapidly changing threats. Moving from tradition to transformation means creating a culture where agility, innovation, and critical thinking are the norm, not the exception. By shifting from passive instruction to active, experience-based

learning, we will not just train better; we will fight better. While there will be challenges, there will also be growth opportunities. If we commit to this change, we can ensure Army Aviation is ready to meet whatever challenges the future may bring. The time to act is now, and it is up to all of us to make it happen.

Biographies:

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References:

Arjun, B. C., & Sanjay, K. R. (2024). Enhancing military training through VR applications. *International Scientific Journal of Engineering and Management, 3*(5), 1–10. https://doi.org/10.55041/ISJEM01739

Burton, L. (2023, May 25). *435th AGOW JTACs train with Allies during Defender Europe 23 exercise Swift Response*. Ramstein Air Base. https://www.ramstein.af.mil/News/Article-Display/Article/3404274/435th-agow-jtacs-train-with-allies-during-defender-europe-23-exercise-swift-respo/

Conover, J. M. (2024, July–September). Refining our teaching methods inside the cockpit and out. *Aviation Digest, 12*(3), 11-12.

Coombs, R. A. (2024, May). *AI integration for scenario development: Training the whole-of-force*. Military Review. https://www.armyupress.army.mil/Journals/Military-Review/Online-Exclusive/2024-OLE/AI-Integration-for-Scenario-Development/

Crockett, A. (2023, June 21). *Army sustainment leaders sync to meet readiness, modernization priorities*. U.S. Army. https://www.army.mil/article/267753/army_sustainment_leaders_sync_to_meet_readiness_modernization_priorities

Department of the Army. (2019a). *Army leadership and the profession* (Army Doctrine Publication 6-22). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN42975-ADP_6-22-002-WEB-8.pdf

Department of the Army. (2019b). *Mission command: Command and control of Army forces* (Army Doctrine Publication 6-0). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN34403-ADP_6-0-000-WEB-3.pdf

Department of the Army. (2021a). *Army modernization strategy: Investing in the future* (SD 08 Strategy Note 2021-02). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN34818-SD_08_STRATEGY_NOTE_2021-02-000-WEB-1.pdf

Department of the Army. (2021b). *Training* (Field Manual 7-0). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN35076-FM_7-0-000-WEB-1.pdf

Driscoll, D., and George, R.A. (2025, May 1). *Letter to the force: Army transformation initiative*. U.S. Army. https://www.army.mil/article/285100/letter_to_the_force_army_transformation_initiative

Feickert, A. (2025, July 22). *Army transformation initiative (ATI) force structure and organization proposals. Background and issues for Congress*. Congressional Research Service Product Number R48606. https://www.congress.gov/crs-product/R48606

Gouré, D. (2011, February 7). *Future combat system: What went wrong?* Lexington Institute. https://lexingtoninstitute.org/future-combat-system-what-went-wrong/

Judson, J. (2025, June 26). *Army seeks $197 billion FY26 budget with transformation plan at center.* Defense News. https://www.defensenews.com/land/2025/06/27/army-seeks-197-billion-fy26-budget-with-transformation-plan-at-center/

Lynch, E. (2024, August 16). *The U.S. Army releases a new training concept*. Signal. https://www.afcea.org/signal-media/us-army-releases-new-training-concept-0

Nye, B.D. (n.d.). *How ICT's learning sciences lab is using AI to create military training materials in (near) real-time*. USC Institute for Creative Technologies. https://ict.usc.edu/news/essays/how-icts-learning-sciences-lab-is-using-ai-to-create-military-training-materials-in-near-real-time/

Ponder, R. (2025, May 21). *CECOM town hall introduces new DCG, highlights Army transformation initiative*. https://www.army.mil/article/285720

Prohaska, E. (2023, June 22). *Public affairs flexes strategic communication capabilities during DEFENDER 23*. U.S. Army. https://www.army.mil/article/267784/public_affairs_flexes_strategic_communication_capabilities_during_defender_23

Rozman J. (2020, December). *The synthetic training environment*. Association of the United States Army, Spotlight 20-6. https://www.ausa.org/publications/synthetic-training-environment

Taylor, E. W., & Laros, A. (2014). Researching the practice of fostering transformative learning: Lessons learned from the study of andragogy. *Journal of Transformative Education, 12*(2), 134-147. https://journals.sagepub.com/doi/abs/10.1177/1541344614548589

Training and Doctrine Command. (2024). *The Army learning concept for 2030-2040*. https://adminpubs.tradoc.army.mil/pamphlets/TP525-8-2.pdf

US-Europe World Affairs. (2024, June 3). *An exclusive interview with Hon. General James B. Hecker commander allied air command*. https://useuworldaffairs.com/2024/06/03/an-exclusive-interview-with-hon-gen-james-b-hecker-commander-allied-air-command/

Cartridge-Actuated Device and Propellant-Actuated Device Accountability

By 1LT Letherio R. Jones, Jr.

Combat aviation brigades (CABs) routinely face administrative and logistical challenges in managing cartridge-actuated devices (CADs) and propellant-actuated devices (PADs). These devices, critical to aircraft egress systems, require continuous oversight due to their limited shelf life and strict accountability procedures. Failures in tracking and reconciliation contribute to overdue documents, inaccurate property records, and complications during aircraft transfers. To maintain readiness, brigades must ensure accountability in record-keeping and comply with the 5-day turn-in guidelines in Army Regulation (AR) 700-28, *Ammunition Management Policy* (Department of the Army [DA], 2020, pp. 16, 25, and 26). These recurring failures make one point clear: Current CAD/PAD management processes are insufficient, and meaningful policy and technological reforms are required.

Background

The average shelf life of a CAD/PAD ranges from 5 to 15 years, requiring units to routinely monitor expiration dates, order replacements, install new devices, update property records, and return expired items. To manage this, aviation units have shifted from manual logs to digital systems, which are intended to improve accuracy and streamline workflows. The Army Aviation community now uses several platforms, including the Aviation Configuration and Notification (ACN) system, the Global Combat Support System–Army (GCSS–Army), the Modernized Standard Army Ammunition System (SAAS-MOD), and Total Ammunition Management Information System (TAMIS).

A U.S. Army Soldier prepares 7.62mm ammunition for an aerial gunnery exercise from a UH-60 Black Hawk helicopter at Novo Selo Training Area, Bulgaria. U.S. Army photo by CPT Regina Koesters.

The ACN platform, for instance, generates airframe-specific alerts for upcoming expirations, helping maintainers schedule replacements in advance. When a CAD/PAD nears expiration, units request replacements via TAMIS and inform their Property Book Officer (PBO) to update records in GCSS–Army. However, these systems were never designed to manage the CAD/PAD lifecycle end-to-end. The ACN's maintenance projections, for example, are not aligned with the ammunition request lead times in TAMIS. This misalignment frequently results in extension requests for expired items while units await new components. Once received, expired items must be turned in to the Ammunition Supply Point (ASP) using a DA Form 581 or electronic (e) 581, *Request for Issue and Turn-In of Ammunition*, to complete the accountability cycle (DA, 2021).

This fragmented process demands excessive manual effort and creates recurring gaps in ordering, documentation, and turn-ins. During preparations for an Operation Atlantic Resolve rotation in early 2025, the 1st Armored Division (1AD) CAB attempted to resolve backlogged CAD/PAD documentation. Despite efforts to conduct large-scale turn-ins, missing initial-issue files and gaps in digital records forced the use of manually produced documents, delaying reconciliation. This resulted in more than 50 delinquent CAD/PAD items as units rotated into European Command. Further research revealed that other formations were experiencing similar discrepancies, underscoring a systemic issue. Such inaccuracies generate false reports that units are retaining expired munitions, raising concerns about regulatory compliance and control of sensitive Class V (ammunition) items.

Case Study

In this paper, two cases are presented to provide a greater understanding of these challenges.

The first case involves an aircraft the 1AD CAB received through a lateral transfer. The aircraft arrived without the required CAD/PADs installed. The gaining battalion submitted an e581 through TAMIS to request replace-

The 1-229 Attack Battalion conducts SPIKE non-line-of-sight missile testing at Yuma Proving Ground, Arizona. U.S. Army photo by SGT Brandon Bruer.

ments, but TAMIS flagged the request as delinquent. The losing unit had never turned in the CAD/PADs previously issued to that aircraft, and because the system manages them as a one-for-one swap, the gaining unit's valid request triggered a delinquency for an item it never possessed.

In a second case, a battalion completed the required turn-in of expired CADs/PADs, but the documents remained unreconciled with the ASP due to a Department of Defense Identification Code (DODIC) mismatch. The battalion turned in MH92 components, but the ASP was tracking the items under the newer WB53 DODIC. These designations can change over a component's multi-year lifespan. Because of normal personnel turnover, neither the ASP staff nor the new battalion ammunition managers were aware of the historical DODIC change. As a result, the turn-in could not be cleared, even though the battalion followed the correct procedures.

These cases illustrate how the systems provide mismatched views of reality. The ACN accurately documents when CAD/PADs are removed from an aircraft but it doesn't track their final disposition at the ASP. Simultaneously, GCSS-Army may still list the old parts on a commander's property book, while TAMIS may show the ammunition-management side of the process is closed. Together, these systems capture only slices of the lifecycle, leaving no single, synchronized picture.

Outlook

The challenges described are not the result of unit-level shortcomings but the predictable outcome of a system built on disconnected platforms. The solution is not more standard operating procedures or inspections, but Enterprise-level action. An effective path forward could involve leaders at the Army Aviation and Missile Command and other aviation decision-making entities partnering with industry to design an integrated, automated CAD/PAD lifecycle-management architecture.

Such a system should consolidate data from ACN, TAMIS, SAAS-MOD, and GCSS–Army to automatically reconcile removals, issues, and turn-ins, providing a single authoritative record. In a modernized system, a maintainer documenting a CAD/PAD removal in ACN would trigger automatic updates to the ASP's records, the PBO's property book, and the unit's TAMIS account. This automation would eliminate false delinquency alerts and ensure accountability is maintained, regardless of personnel turnover. Human involvement would be limited to oversight and exception handling, not routine data entry and troubleshooting.

Conclusion

Munitions accountability is essential to aviation readiness. The recurring difficulties in CAD/PAD management stem from these structural shortcomings, not unit-level execution. As the case studies show, disconnected systems and inconsistent data flow create unavoidable gaps. While disciplined turn-in practices and internal coordination remain necessary, they only mitigate the symptoms of a fragmented process.

Long-term improvement requires Enterprise-level modernization to develop an integrated system that synchronizes data across all platforms. Until then, units will continue to devote excessive time and effort to managing a process that should be largely automated. Modernizing CAD/PAD accountability is not simply an administrative refinement; it is a readiness imperative.

Biography:

1LT Letherio Jones is a Quartermaster Officer and currently serves as the Deputy Support Operations Officer, 1AD CAB. He holds B.A. in Political Science from Sewanee.

The author would like to acknowledge the 1AD CAB SPO section, 127th Aviation Support Battalion leadership, LTC Trevor "Scott" Jackson, LTC Linus Wilson, and MAJ Herman Tisdale for their guidance and assistance with this article.

References:

Department of the Army. (2020, October 9). *Ammunition management* (Army Regulation 700-28). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN30988-AR_700-28-000-WEB-1.pdf

Department of the Army. (2021, June 1). *Request for issue and turn-in of ammunition* (Department of the Army Form 581). https://armypubs.army.mil/ProductMaps/PubForm/Details_Printer.aspx?PUB_ID=1021676

A U.S. Army trooper secures a command post at the Joint Multinational Readiness Center, Hohenfels, Germany. U.S. Army photo by MSG David Ruiz.

Targeted and Exposed: Why Command Post Survivability Demands a Paradigm Shift

By SFC Samuel K. Karoki

Introduction

Modern Army Aviation command post (CP) survivability demands a shift from legacy practices rooted in counterinsurgency (COIN) operations to agile, dispersed, and low-signature configurations. Drawing lessons from the Russo-Ukrainian War, this article emphasizes the need for mobility, CP design modularity, CP dispersion, and emissions control (EMCON). The protection warfighting function takes primacy in the survivability of CPs, aviation assets, and structures. The role that aviation plays in threat engagement, reconnaissance, logistics, and sustainment warrants a sober conversation in how to ensure the mission set is enhanced and protected. It highlights the importance of doctrinal relevance to mirror the current and emerging threat picture, mission command, and decentralized operations to enhance resilience against near-peer threats.

Modernizing CP Survivability (Limitations)

A young commander eagerly tells an experienced 1SG, "1SG, we are going to transform the Shop Equipment Contact Maintenance into the Company Delta command post…" The 1SG mulls it for a moment and retorts in monotone, "Ma'am, I think we need to set up at least one A-frame tent." This is a classic Einstellung effect, a bias that hinges on familiar solutions as opposed to the exploration of different possibilities (The Decision Lab, n.d.). A limitation is created when you have rigid deference to experience in informing solutions to new problem sets. It can be a deterrent to adopting new ideas in response to the rapidly evolving threat landscape and near-peer adversary capabilities. There appears to be a resistance to shedding the COIN mindset, where the grand "Taj Mahal" setup of command posts (CPs) littered a unit's footprint. This viewpoint is informed by observations made during multiple rotational training units going through their Combat Training Center (CTC) rotation at the Joint Multinational Readiness Center (JMRC) at the Hohenfels, Germany, training area. The vestiges of COIN are evident in how units train and conduct operations during these CTC rotations at JMRC.

Observer, Coach/Trainers (OC/Ts) at the CTCs must coach units to adopt doctrine-based practices that match current and emerging threats. Observations inform the OC/Ts' evaluation of a unit, and heavy coaching is needed to expand their aperture so they can be postured to execute novel, but doctrinally-based techniques and procedures. That responsibility requires that OC/Ts be well-versed in the doctrine that advises their coaching content.

Lessons Learned

Aligning tactical and operational procedures with high-intensity conflict readiness requires training and implementation at various echelons. Units assume strategic liability when they employ COIN-optimized tactics to train for large-scale combat operations (LSCO). These tactics are outdated when overlaid against the backdrop of recent conflicts. Lessons from the Russo-Ukrainian War's tactics and challenges are driving changes in the United States Army's tactical operations and security posture. Command post survivability is a recurring theme of these lessons learned and is critical because it is the command and control (C2) node.

Mobility

Aviation CP survivability critically hinges on the ability to be mobile, highly camouflaged, and rapidly deployable. The CP needs to be small to minimize the unit's signature, quick to tear down, and move at a moment's notice. The prevalence of detection capabilities, such as electromagnetic spectrum signature detection, heat sensors, and the massing of reconnaissance drones necessitates mobility and rapid displacement.

Units training at the JMRC are locating their CPs in the back of tactical vehicles and seeking concealment in heavily wooded areas. These include the Light Medium Tactical Vehicle (LMTV) variants, such as the M1079 LMTV van and the M1087 MTV expandable van. This reduces visual detection but also complicates establishing a reliable communication signal due to thick foliage.

CP Design Modularity

The Army is working on a solution to enhance CP mobility called CP Modernization (CPMod). At its core, CPMod is about mobility, survivability, and adaptability. The focus is on modular designs that units can tailor to their mission and terrain.

Command post Mod's tailorable CP configurations support modular aviation

Units training at the JMRC locate their CPs in the back of tactical vehicles. U.S. Army photo provided by the author.

support packages. These modular packages should include mobile maintenance shelters with integrated secure communication capabilities, parts, and fuel that can extend the range of rotary aircraft. Collocating mobile modular packages with aircraft in hardened structures enhances maintenance continuity, survivability, and addresses the exposed aircraft parking Army Aviation is so accustomed to. These hardened maintenance modules could be repurposed industrial buildings, tunnels, or underground bays used as forward maintenance zones.

CP Dispersion

"Future CPs must be smaller, more mobile, and more capable of operating in dispersed mode—and preferably on the move as well. The CPs of the future also must employ advanced signature modifications, emissions controls, and state-of-the-art cybersecurity" (Goure, 2023).

According to Army Techniques Publication 6-0.5, *Command Post Organization and Operations*, "Survivability is often obtained at the price of effectiveness" (Department of the Army, 2017, p. 17). This should be executed with proper regard to preserving combat effectiveness. Mission command has previously relied on collocation to enable synchronized lines of effort. Dispersion can disrupt that synchrony and consequently, degrade C2 if not deliberately trained and executed, resulting in CP survivability without combat effectiveness.

Ukrainian CPs are often characterized by geographical dispersion, autonomy, and redundancy. Commanders must empower subordinate commanders to exercise disciplined initiative and make decisions within the commander's intent without fear of reprisal. Army Doctrine Publication 6-0, *Mission Command*, dictates that mission command requires commanders to issue mission orders. Mission orders are "directives that emphasize to subordinates the results to be attained, not how they are to achieve them" (Department of the Army, 2019, p. Glossary-3).

Army Aviation would benefit from mobile, decentralized, and autonomously operated distributed maintenance nodes geographically dispersed from primary CPs to enhance operational resilience. The maintenance nodes will have to integrate logistics and maintenance planning into their operations. Since they are autonomous, they will need to communicate needs for resupply. This autonomy enhances logistics agility in LSCO and aircraft readiness in contested, sensor-saturated environments.

EMCON

"Command and Control (C2) nodes are an example of High-Value-Targets (HVT) targeted by adversary doctrines … mobile SIGINT [signal intelligence] collectors locate command nodes, UAS [unmanned aircraft systems] confirm the target location, and artillery at echelon execute massed fires strikes before blue force commanders can react" (Dolan, 2025).

U.S. Soldiers secure a helicopter for sling-load during a notional Downed Aircraft Recovery Team (DART) simulation at exercise Saber Junction 25 at the JMRC's Hohenfels Training Area, Germany. U.S. Army photo by 2LT Courtney Rorick.

Lessons from the Russo-Ukrainian War reveal that the large thermal, acoustic, and electromagnetic signatures emitted by communications equipment and generators threaten operational security. Units must plan and train for degraded communications within EMCON standard operating procedures. Emission control coaching by the Falcon Team, JMRC, emphasizes redundancy by developing analog products alongside digital ones in the event of degraded communications. A North Atlantic Treaty Organization (NATO) aviation unit successfully employed EMCON techniques while at JMRC. They did this by running analog telephone lines between CPs to communicate and burying their generator exhaust hoses underground, while also limiting use to reduce their thermal signature.

The prevalence of communication systems, generators, and static life-support equipment was a mainstay during COIN operations against a technologically inferior enemy. A near-peer enemy capable of multidomain operations, like China, has detection and jamming capabilities that would enable precision targeting based on emissions. Techniques to control this include burying or berming generators, employing noise dampening, using camouflage netting, and limiting how long they are kept running. The NATO aviation unit also placed restrictions on the use of personal electronic devices, specifically prohibiting phones with non-central European subscriber identity module, or SIM, cards. A vulnerability exists as they do not blend in with the local economy, as observed through mobile SIGINT collectors. Rotational training units at JMRC have been adopting the "no/limited cell phone policy" to minimize a unit's signature.

Conclusion

Command post survivability is not just a technical challenge; it is a cultural one. Leaders must challenge legacy mindsets, empower disciplined initiative, and train to operate under degraded conditions. Threat analysis must drive offensive and defensive responses across multiple domains. Strategy and tactics are rapidly evolving and so should aviation units, if they are to survive the onslaught that awaits against a near-peer multidomain enemy. The end state is to effectively project combat power while remaining survivable. Recent changes in U.S. Army operations and structuring, to include investments in future technology, points to the fact that the way we used to do things demands a paradigm shift.

Biography:

SFC Samuel Karoki is a highly accomplished Army Aviation Noncommissioned Officer with more than 15 years of experience shaping aviation excellence across U.S. Army Forces Command, U.S. Central Command, the Army Transformation and Training Command (formerly Training and Doctrine Command), and NATO-aligned forces. He now serves as an OC/T with Falcon Team at JMRC, where he evaluates aviation units on mission-critical tasks, including Downed Aircraft Recovery, battle damage assessment and repair, and survivability.

References:

Department of the Army. (2017). *Command post organization and operations* (Army Techniques Publication 6-0.5). https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/ATP%206-0_5%20(final).pdf

Department of the Army. (2019). *Mission command* (Army Doctrine Publication 6-0). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN34403-ADP_6-0-000-WEB-3.pdf

Dolan, P. (2025, July). *Like moths to a false flame: Lethality and protection through deception operations*. U.S. Army. https://www.army.mil/article/286861/like_moths_to_a_false_flame_lethality_and_protection_through_deception_operations

Goure, D. (2023, September 5). *Lessons from Ukraine: Command posts must be more agile.* 1945. https://www.19fortyfive.com/2023/09/lessons-from-ukraine-command-posts-must-be-more-agile/

The Decision Lab. (n.d.). *Why do our past experiences prevent us from reaching the best possible outcome?* https://thedecisionlab.com/biases/einstellung-effect

Forging Aviation Maintainer Warfighters:

The Best Squad Competition in Advanced Individual Training

By CPT Cameron D. Torres

The aviation battlefield of today does not respect the old boundary between flight line and front line. Contested logistics, distributed operations, and near-peer threats demand that every aviation Soldier be a fully capable warfighter from the day they arrive at their first unit. To meet that imperative, the 128th Aviation Brigade at Fort Eustis, Virginia, has transformed the Aviation Maintainer Advanced Individual Training, or AIT, culminating phase by incorporating a rigorous, 5-day Best Squad Competition featuring squads of future aviation warfighters competing in a progressive gauntlet of physical, mental, and tactical events.

Future aviation warfighters compete in the 128th Aviation Brigade's Best Squad Competition (Fiscal Year 2026). U.S. Army photo provided by the authors.

The competition begins on Day 1 with the Army Fitness Test, immediately followed by a 6-mile ruck march carrying 35-pound dry weight. There is no recovery time between events. Squads finishing the ruck in the top tier set the early leaderboard, while those who fall behind learn quickly that every second and every rep counts for the rest of the week.

Day 2 tests collective problem-solving on the Leader Reaction Course. Squads rotate through a series of timed obstacles that can only be solved through communication, innovation, and distributed leadership. Each lane deliberately inserts friction with confined requirements, adding weight, removing equipment, and being penalized for mistakes to replicate the chaos of combat decision-making when plans fail and time is short.

Day 3 shifts to mental and physical domains. Squads complete comprehensive written and hands-on exams covering Sexual Harassment/Assault Response and Prevention, Equal Opportunity, weapons fundamentals and familiarity, land navigation, aviation history, and basic 15-series tasks. Immediately afterward, they attack the obstacle course, requiring individual and buddy-team movement. The combination of mental fatigue, followed by raw physical exertion, weeds out squads that cannot compartmentalize and push through.

Day 4 is pure lethality and technical-tactical integration. Squads execute React-to-Contact (direct and indirect fire) and move directly into the Downed Aircraft Recovery Team lane. Under simulated artillery, small-arms fire, and battlefield effects, they locate a downed aircraft, establish 360-degree security, and recover "aircrew" casualties. This is where aviation skills meet infantry fundamentals—maintainers learn that protecting and recovering the aircraft is now part of their fight.

The competition concludes on Day 5, with its most demanding evolution—a combined Tactical Combat Casualty Care Lane under simulated direct and indirect fire, followed by extended litter carries through a series of physical exercises. These exercises include T push-ups, pull-ups, tire flips, lunges, and a 1-mile run. Simulated direct and indirect fire and battle noise create an environment that mirrors large-scale combat operations. Squads that have conserved energy, maintained equipment, and built cohesion over the previous 4 days are the ones still moving fast and making good decisions when every muscle is screaming, and the air is filled with chaos.

Future aviation warfighters compete in the 128th Aviation Brigade's Best Squad Competition (Fiscal Year 2026). U.S. Army photo provided by the authors.

The Best Squad Competition is not a check-the-block event; it is a deliberate warfighter development accelerator. By fusing aviation-specific tasks with warrior tasks and battle drills under direct-fire stress, simulated live-fire conditions, and cumulative physical exhaustion, the competition builds muscle memory that cannot be replicated in a classroom or hangar bay.

These young maintainers learn to transition instantly from technical troubleshooting to tactical decision-making, treating a casualty while returning fire, accessing a downed aircraft while bounding a security element forward, or navigating to an objective with the presence of enemy unmanned aircraft systems. The result is a Soldier who arrives at their first unit not just technically proficient, but tactically lethal—ready to protect the aircraft, the crew, and the flight line the moment they land in theater.

Future aviation warfighters compete in the 128th Aviation Brigade's Best Squad Competition (Fiscal Year 2026). U.S. Army photo provided by the authors.

In an Aviation Enterprise that prides itself on generating combat power through readiness, this competition is proving to be one of the most effective force multipliers available. It takes technically skilled maintainers and transforms them into warfighters who directly increase the lethality, survivability, and sustainment capability of every assault, lift, and attack battalion in the Army. The Best Squad Competition proves the Army can produce world-class aviation maintainers who are also lethal, adaptable Soldiers—without adding time to the training pipeline.

In an era when the enemy can range every echelon of the battlefield, the aviation maintainer who can seamlessly shift from phase maintenance to perimeter defense is no longer a force multiplier—it is a baseline requirement. The 128th Aviation Brigade's Best Squad Competition is ensuring the Aviation Center of Excellence meets that standard from day one.

Biography:

CPT Cameron Torres is a UH-60M pilot commissioned through the Reserve Officers' Training Corps in 2017. He began his career with the 25th Combat Aviation Brigade at Wheeler Army Airfield, Hawaii, serving as a flight company platoon leader and assistant operations officer. He currently serves as a company commander within the 128th Aviation Brigade, Fort Eustis, Virginia, where he is responsible for the training and development of Army Aviation's future aircraft maintainers.

A U.S. Army South Dakota National Guard flight medic rappels down from a UH-60 Black Hawk during hoist training with 10th Special Forces Group (Airborne) Green Berets on Fort Meade, South Dakota. U.S. Army photo by SGT Rhianna Ballenger.

THE BULLDOG INITIATIVE: NEXT-LEVEL DOWNED AIRCRAFT RECOVERY TRAINING

By CPT Christopher M. Vitols

Introduction

As the Army's primary maneuver asset in support of ground forces, Army Aviation is undergoing a massive reformation and modernization to counter near-peer adversaries. As threats develop, countertactics and gathered intelligence increase, and two constants remain: Aircraft break, and the enemy gets a vote. When responding to downed aircraft in austere and hostile conditions, Downed Aircraft Recovery Teams (DARTs) repair the aircraft to self-recover, conduct a deliberate recovery of the aircraft, or in the worst scenario, destroy it and prevent enemy exploitation.

Opening Images. Downed Aircraft Recovery Team Exercises being conducted by the Soldiers of B/603D Aviation Support Battalion (ASB), 3D Combat Aviation Brigade (CAB), 3D Infantry Division at Hunter Army Airfield (HAAF). U.S. Army photos by CPT Christopher Vitols and SSG Dean Johnson, 3D CAB.

Company B, Aviation Support Company (ASC), 3D Combat Aviation Brigade (3 CAB), has embraced the recent push for doctrinal changes and pioneered the movement for realistic and innovative DART training within 3 CAB. Through actual aerial recovery training, recreating battle damage for repairs, aircrew extraction drills, and aircraft destruction exercises, the Company B Bulldogs are prepared to respond to any downed aircraft incident. Company B/603D has developed a robust, adaptable training program directly supporting Army modernization. Our approach—structured around the aircraft maintenance P4T3 framework (Problem, Plan, People, Parts, Time, Tools, Training)—offers a model for aviation maintenance and ASCs across the force.

Problem: *Training Limited by Imagination*

In most CABs, DART training is limited and restricted to planning exercises with maintainers, Soldiers filling out P4T3 sheets, and connecting Unit Maintenance Aerial Recovery Kit (UMARK) ropes to a fully mission-capable aircraft. In the forward leaning maintenance companies, they also conduct convoy training, incorporating security, and react-to-contact training objectives. These fundamentals are important to expose junior maintainers to recovery concepts and serve as a baseline for the organization; however, these efforts often stop short of fully realistic recovery scenarios.

The problem herein lies: *How do you practice recovering a downed aircraft without a downed aircraft?* Regulations prohibit intentionally grounding aircraft, requiring creative simulation. Solutions such as aligning major component replacement training with inspections/tasks on aircraft currently in phase (an example being engine removal and reinstall) and conducting battle damage assessment and repairs (BDAR) on scrap sheet metal exist. Tabletop and planning exercises are also good to gain repetitions conducting troop leading procedures. But how can we train for large-scale combat operations (LSCO) further, replicating the complexity, friction, and lethality of the modern battlefield?

Plan: *Crawl, Walk, Run, Sprint*

The B/603D mission-essential task (MET) list consists of three collective tasks common to ASCs:

1. Conduct Aircraft Maintenance Support
2. Perform DART Missions
3. Conduct Expeditionary Deployment Operations

In late 2023, Perform DART Missions became B/603D's priority MET. Our plan was to incorporate a progressive crawl-walk-run model of training with each phase, incorporating difficult military occupational specialty (MOS) tasks, different methods of DART/BDAR, and greater mission complexity with hybrid threats. The objectives of this series of exercises were:

1. Develop DART training scenario with battalion staff
2. Achieve 6-hour mobilization time, culminating with mission brief
3. Conduct tactical convoys with security elements
4. Validate UMARK operations with the sling-load of an actual victim aircraft
5. Gain proficiency in BDAR with real airframe and component repairs
6. Train extraction and stabilization of simulated aircrew injury
7. Integrate with ground units for joint security or objective-based training
8. Execute dynamic, hybrid DART missions under LSCO conditions

To achieve these training objectives, our annual training plan incorporated a series of six brigade-level DART Exercises (DARTEX I-VI).

People: *Training the Trainers and Staff Integration*

The progression began with Leader's Time Training (LTT). Noncommissioned officers introduced the UMARK kit, BDAR kit, medical training, and convoy operations. Every Soldier attended iterations of these LTTs with the mentality that any maintainer could be integrated at a moment's notice for a DART response. We maintained this approach with the subsequent exercises, allowing all members of the company to gain repetition in training to prepare everyone collectively.

After initial LTTs, Company B executed DARTEX I, which was a planning exercise lasting a week with three DART responses tailored for each airframe type. Engagement from the operations and intelligence sections was crucial for scenario realism. Figure 1 shows the operations and intelligence update briefs given to our DART. Combating Donovian forces and tasked with providing a standby DART, the Bulldogs supported aerial screens, air assaults, and air movements conducted during the exercise window. This initial exercise focused on following the troop leading procedures and coordinating with our battalion staff, setting the tone for every subsequent exercise and real-world DART mission that followed.

Parts: *Creative Training Aids*

Downed aircraft recovery team exercises DARTEX III and V used the UMARK on actual airframe hulls, validating the kit and team through elevator drills and traffic patterns. The first hull was an OH-58D Kiowa static display refurbished by backshops personnel. Airframe maintainers built brackets, locking bars, and riveted every panel shut, and powertrain maintainers inspected the structural

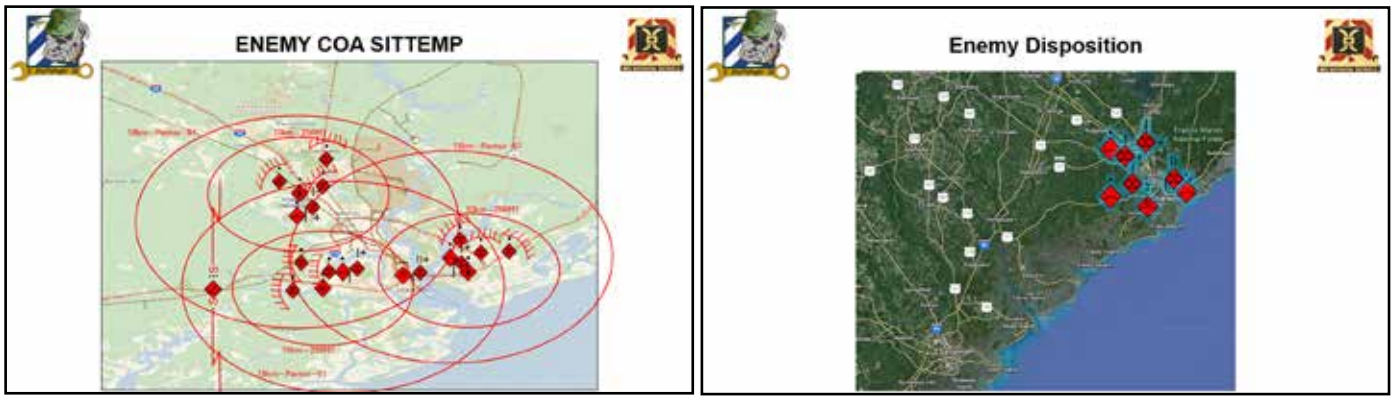

Figure 1. Friendly/enemy situational template provided by 603D S2 for battalion operations and intelligence brief for Operation Virtuous Defender (DARTEX I). Products developed by 603D ASB, 3 CAB.

Figure 2. B/603D conducts UMARK Training on OH-58D training aid (LEFT) and conducts real-world recovery of an Air Force HH-60G (RIGHT). U.S. Army photos by CPT Christopher Vitols, 3 CAB.

integrity of the rotor head to ensure it could withstand the UMARK stress. Figure 2 (Left) shows the OH-58D UMARK with a CH-47F in the training area at Hunter Army Airfield (HAAF), Savannah, Georgia.

The second hull was a CH-47F airframe provided by Summit Aviation from Delaware. The airframe was stripped for parts to salvage and refurbish components, and only the airframe remained. The CH hull required more extensive preparation, but after verification, the UMARK CH work packages validated the 13,000-pound training load (Opening image, Left). Ingenuity and utilizing networks created these training aids, but more importantly, just starting a simple dialogue with Project Manager-Cargo sparked the process to procure them.

Time: *Making Start Point (SP) Time and the Golden Hour*

The incorporation of tactical convoys in DARTEX II, III, and IV, revealed a weakness in our DART responses. Using Light Medium Tactical Vehicles and up-armored High Mobility Multipurpose Wheeled Vehicles with mounted M2s and MK19 systems, we focused on the fundamentals of timeline management, sectors of fire, and interserial communication (Figure 3, Right).

We found that we were inefficiently and incorrectly conducting precombat checks and inspections (PCC/PCIs) while preparing for the DART convoys, thus consistently missing our SP times. Issues with filling radios for secure communications, delays when mounting weapons, and equipment serviceability plagued DARTEX II but highlighted key takeaways and lessons learned for future operations. Exercise IV incorporated a night convoy using night vision optics and opposing forces, and the team managed its timeline correctly, maintained secure communications throughout, and reacted appropriately to enemy contact.

In addition to the tactical convoys, the white cell for these exercises incorporated Army Warrior Tasks, such as providing security on the objective, moving under fire, and evaluating casualties. Using feedback from medical evacuation (MEDEVAC) crew evaluators, the teams called in 9-line reports to extract personnel from the objective (Figure 3, Left). When MEDEVAC support was unavailable, we initiated casualty evacuation and exercised ambulance exchange points (AXPs) to transfer patients to a higher role of care. Reinforcing fundamentals from PCC/PCIs to requesting MEDEVAC is important when crafting a holistic DART training plan.

Tools: *Jaws of Life and BDAR Repairs*

Colloquially known as the "Jaws of Life," the Bulldogs maintain the aptly named rescue system. Not organically assigned to an ASC and intended for emergency services, the system is designed for the extraction of personnel from wreckage. Continuing the push for innovative training, the DARTEX IV scenario consisted of three aircraft that hard landed in the pickup zone after encountering enemy fire. The first, a single UH-60M, suffered stabilator failure and damage to a tail rotor drive shaft, while damage to the two successive aircraft proved catastrophic and unrecoverable. The Quick Response Force secured the site, and the DART deemed the first aircraft recover-

Figure 3. Medical evacuation (MEDEVAC) training on objective egret (LEFT); Convoy training conducted during DARTEX II (RIGHT). U.S. Army photos by CPT Christopher Vitols, 3 CAB.

Figure 4. B/603D conducts aircrew extraction operations under instruction from HAAF Emergency Services. U.S. Army photo by CPT Christopher Vitols, 3 CAB.

able with BDAR and component replacement, while surviving, but trapped, aircrew members were identified in the other aircraft.

Simulating the aircraft was a battered UH-1 airframe training aid and salvaged cars donated by a scrap yard in Savannah, Georgia. The HAAF Fire Department provided life-sized mannequins, "Rescue Randys," to simulate trapped aircrew members. After dispatching the team via convoy, extraction of personnel was successful, and maintainers stabilized and transported aircrew to the nearest AXP. Figure 4 shows HAAF Emergency Services assisting Soldiers in the proper and most effective use of the tools prior to the DARTEX.

The opening image (Right) depicts DART personnel using the rescue saw to remove panels and recover simulated injured personnel. Bulldog Soldiers completed BDAR and prepared the aircraft for a notional flight back to friendly forces.

Training: *Training How to Blow in Place (BIP)*

What happens if an aircraft containing sensitive components and information must land near or beyond the forward line of own troops and, for various reasons, is unrecoverable? To deny enemy exploitation, destruction of the wreckage with indirect fire, precision munitions, or using placed charges may be a sound tactical decision. Stepping into the final phase, the Bulldogs completed their DART progression with DARTEX VI, a BIP (demolition) exercise.

Working with the 541st Sapper Company from Fort Stewart, Georgia, the Bulldogs conducted a BIP demolition range using salvaged cars to simulate aircraft. The engineers taught the maintainers to construct satchel charges, electromagnetic warheads, shaped charges, and how to place and detonate them safely. Then, maintenance test pilots instructed both engineers and maintainers on priority aircraft components and systems to sabotage. Figure 5 displays the destructive power and effectiveness of the charges. This exercise completed the Bulldogs' DART progression, resulting in teams trained to repair, recover, and destroy aircraft in contested environments.

Conclusion

Aircraft break, and the enemy gets a vote. In LSCO, maintainers will not only repair aircraft, they will also fight, secure objectives, extract casualties, and make critical decisions under fire. In this environment, joint operations with differing security elements will be requested, but maintainers will need to understand basic Soldier tasks as casualties accumulate. Aircraft and aircrew will fly in support of the ground force but may need recovery assets when engaging with the enemy. Knowing this, maintainers must understand that their impact is greater than just turning a wrench during a phase. Thus, proficiency in MOS tasks and an "out of the box" mentality amongst leaders is crucial for future conflicts.

The lessons learned from these DARTEXs instilled confidence and experience that proved invaluable during a real-world incident. Amid the training progression, an Air Force HH-60G executed an emergency landing in Okeechobee, Florida, after sustaining damage to its blades and an engine. Using the UMARK and CH-47F heavy-lift support, the Bulldog team successfully evacuated the aircraft to a maintenance facility 30 miles away (Figure 2, Right). As the first recovery mission executed by the Bulldogs in recent years, it demonstrated the value of the DARTEX series and fostered critical inter-service cooperation, which is a vital skill for the next fight.

In summary, it is the commander's onus to advance their DART programs in parallel with the Army's modernization initiative. The DART mission is already complex, making the emphasis on next-level training vital; creative training produces innovative responses to challenges in the operational environment. Ground forces place their trust in aviation assets; therefore, aircrews and commanders must have the same confidence in their maintenance and recovery support. This level of DART readiness serves as a critical insurance policy for every mission and is fundamental to sustaining combat power and upholding the unwavering promise to leave no one behind.

Figure 5. Blow in Place operations on simulated aircraft (DARTEX VI). U.S. Army photo by CPT Christopher Vitols, 3 CAB.

Bulldogs! No Mission Denied! Marne Air!

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Aviation TAA Survivability in the Multi-Domain Fight

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Introduction

War is evolving, but Army Aviation units continue to establish the same, exposed tactical assembly areas (TAA). Observations captured by Falcon Team (Aviation Observer Coach Trainers - OCTs) at the Joint Multinational Readiness Center (JMRC) in Germany show regular, disappointing trends in how rotary wing aviation task forces (AV TFs) deploy and operate in force-on-force exercises that simulate multi-domain threats seen in large scale combat in Europe. Aviation task forces consistently establish large, static tactical assembly areas that resemble exposed flight lines and motor pools with no aircraft concealment. These positions are easily identifiable via UAS or satellite and are regularly destroyed by fires and UAS.

The modern battlefield punishes exposed high value targets. Aviation task forces persistently operate with an "iron mountain mentality," creating dense concentrations of helicopters, FARPs, and maintenance assets in open terrain. Air Crews are adapting to emerging threats by increasingly training TTPs to defeat enemy Integrated Air Defense Systems (IADS), but AV TFs have not adopted basic protection measures to remain survivable while at their most vulnerable: while on the ground. This article presents the critical need for survivability as the foremost priority in tactical assembly area planning and execution to ensure aviation units survive initial enemy attacks. It provides a framework for combat aviation brigades to shift toward dispersed, concealed tactical assembly areas with decentralized maintenance and sustainment to maintain operational viability against multi-domain threats.

The Persistent Legacy of the Iron Mountain

There are consistent trends of aviation task force rotational training units (RTU) establishing their TAAs in open terrain approximately 50 KM from the FLOT with crews arranging aircraft in neat, maintenance-friendly rows directly adjacent to their FARP. OPFOR UAS consistently identify their position and utilize a barrage of artillery and one way attack UAS to destroy the AV TF's combat power. During multiple rotations, aviation units establish TAAs as if they are operating in a COIN environment. Units maintain a deeply ingrained "iron mountain" mentality that prioritizes convenience over tactical necessity. The dense aggregation of fuel, aircraft, and personnel transforms TAAs into one-stop-shops for enemy targeting. When we concentrate assets, we simplify the adversary's kill chain.

Exposed Aircraft: The Most Obvious Target

Enemy sensor operators easily detect the lineup of 6x UH-60, 4x CH-47s, and 7x AH-64s parked on airbases or in large open fields. Aircraft rotor blades and bodies create distinctive signatures, readily identifiable through both UAS and satellite imagery. Despite this, aviation task forces repeatedly emplace unconcealed aircraft together with zero overhead cover and remain emplaced for days at a time. A peer threat, equipped with drones and space-based sensors will find and target the TAA. During the Russian-Ukraine War, OPERATION SPIDERWEB demonstrated how vulnerable strategic air assets can be when they stay in one place for too long. Helicopters provide superior agility to operate in austere environments compared to the bombers targeted by Ukraine. They maneuver rapidly across the battlefield, offering tactical advantages in contested environments. Ground equipment requires cover and concealment for protection, while helicopter survivability depends on their inherent agility.

Figure 1. Vulnerable Aviation Task Force TAA with aircraft concentrated on a single flightline and HEMTT fuelers arranged in motor pool formation. Enemy UAS reconnaissance enabled simulated artillery strikes that destroyed four fuelers and three aircraft. (JMRC)

Commanders should move helicopters every 24 hours, even just 200-400 meters away to keep adversaries in a constant targeting cycle. Concealment requires deliberate planning, rehearsals, and a shift in culture.

Dispersion: The Antidote to Mass Targeting

Concentration of aviation assets is a surefire way to lose them. Dispersion is essential to survival against peer threats. "Dispersion may be the best damage-limiting measure. Proper dispersion of a unit and equipment lessens target density and reduces lethal effects of the ordinance used against that organization."[1] Dispersed operations have become increasingly feasible as flight companies rotating through JMRC now utilize government-issued or personal Starlink/Starshield systems that enable improved command and control capabilities. AV TFs must deploy their AV TAA over a wide footprint, dispersing combat power and sustainment teams into decentralized nodes.

Leaders must deliberately plan dispersion for aircraft, Class III/V resupply, maintenance teams, and mission command elements. Each node must be semi-autonomous and able to operate with degraded or decentralized C2. This requires training, SOP refinement, and a fundamental redesign of how aviation units sustain themselves in the field.

During a recent rotation, an AV TF demonstrated expert dispersion by detaching an AH company away from the main TAA. The attack company, supported by the BN TAC, maintainers, and a fuel element, executed three successful attack missions over three days while maintaining lethality and survivability. This approach requires commanders to assume risk in maintenance, conducting only 50-hour inspections at dispersed locations and deliberately planning to relocate aircraft needing 125 and 250 hour inspections.

Satellite ISR and UAS

UAS represent the most persistent threat at JMRC. Our OPFOR routinely use drones to locate TAAs and execute call for fire missions. Simulated artillery or one-way strike UAS target and destroy spotted aircraft, sustainment assets, and command posts.

[1] ATP 3-01.81, *Counter-Unmanned Aircraft System*. 23 May 2025.

Aviation units must develop and incorporate a counter-UAS plan. "Commanders, leaders, and planners must include the simultaneous application of both passive and active measures during operational planning and employment as part of a layered defense strategy against UAS threats."[2] This includes early warning systems, layered defenses (small arms, jammers, and if available, kinetic defeat systems), and most importantly, preventative concealment and dispersion. Aviation task forces also must develop and practice scatter plans, which are increasingly rare at JMRC.

Satellites maintain continuous surveillance operations without interruption. "Planners must assume that the majority of manned and even unmanned flights will be observed via one or more of the nine forms of contact, and that the patterns and routes flown will telegraph critical locations as well as unit boundaries and fire support control measures."[3] Peer adversaries can access both national and commercial constellations, providing persistent overhead coverage.

With machine learning models, our adversaries can process satellite imagery faster and more effectively by the day. Exposed units face detection and subsequent destruction.

Training the Survivability Mindset

Survivability begins with a mindset that prioritizes tactical necessity over convenience despite the inherent challenges. Leaders must train their formation to prioritize concealment, deception, and dispersion as core combat skills. Units demonstrating the highest survivability at JMRC enforce it as a discipline through planning, SOPs, and leader engagement rather than relying on superior equipment.

Army doctrine must evolve to reflect the reality of peer-threat ISR and fires capabilities in updated field manuals. Home-station training must reinforce signature reduction, mobility, and counter-reconnaissance tactics. Aviation leaders must be willing to accept risk in complexity and discomfort to gain protection through dispersion. The iron mountain cannot be the default mindset for aviation units.

Figure 2. Satellite imagery of "40S" shows a Division Support Area with clearly identifiable aircraft, ground support equipment, and command posts. Long-range precision one-way attack drones have rendered these concentrated "Iron Mountain" airfields vulnerable to destruction. (Google Maps)

Conclusion

Aviation units must adapt to today's battlefield. Modern adversaries employ sensor-to-shooter kill chains with lethal precision against large, exposed, and static TAAs. Effective TAAs require dispersion and concealment, making them smaller, dispersed, displaceable, and harder for enemies to detect. Aviation leaders must recognize the threat of persistent satellites and UAS ISR sensors that enable long range UAS and fires systems. Soldiers must evolve from the COIN "Iron Mountain" mentality to survive in LSCO. Army Aviation's ability to win future conflicts depends first on its ability to survive them.

Figure 3. A vulnerable Battalion main command post (MCP) with multiple tents and vehicles positioned outside the tree line, fully exposed. A single UAS operator detected this easily visible target, executed a strike causing two simulated casualties, then called for artillery fire on exposed medical responders, resulting in simulated mass casualties.

[2] Ibid.
[3] Field Manual (FM) 3-04, *Army Aviation*. 27 March 2025.

Modular Reorganization of the Aviation Support Battalion

By MAJ Bryan J. Welch

The future of Army Aviation sustainment hinges on adaptability, scalability, and mission-focused alignment. The current structure of Company Bravo, 96th Aviation Support Battalion (ASB), although historically effective, now strains under the weight of emerging operational demands, modernization imperatives, and contractor-dependent operations. The solution is a forward-thinking reorganization that increases output, is threat-driven, executes within the existing budget, and informs future total Army analysis.

Dividing a battalion-sized aviation support company (ASC) into modular, platform-centric companies—with the flexibility to form multifunctional units capable of meeting operational demands—is not just timely; it is essential. This transformation directly supports Army structure prototyping force design updates (FDU) and the Army's Transformation in Contact (TiC) priorities, offering a blueprint for how sustainment units can evolve to meet the challenges of multidomain operations (MDO) and large-scale combat operations (LSCO).

Identifying Gaps in the Legacy Model

Company Bravo, 96th ASB, is an ASC charged with sustaining all rotary-wing aircraft of the 101st Combat Aviation Brigade (CAB), part of the 101st Airborne Division "Air Assault!" As the largest ASC in the Army, Company Bravo's modified table of organization and equipment was recently expanded by 104 Soldiers, bringing its total authorized strength to 421 personnel across a single company. This force structure is more expansive than other battalions within the CAB and supports three distinct rotary-wing platforms (AH-64 Apaches, UH-60 Black Hawks, and CH-47 Chinooks) dispersed across multiple hangars and airfields in the Fort Campbell, Kentucky, area. While the scope of this company's mission set is impressive, it has also resulted in an overly broad span of control for the echelon of company leadership, diminished platform-specific accountability, and reduced agility in supporting modular task organizations. Consequently, the current structure, though substantial, lacks the flexibility and alignment necessary to fully meet the Army's FDU criteria for effectiveness, efficiency, and scalability.

A Modular Blueprint for Aviation Sustainment

The solution is to reorganize the ASB using a modular blueprint for aviation sustainment. This reorganization divides the current Company Bravo into four distinct maintenance companies aligned by platform. Each is comprised of autonomous phase maintenance teams that can be reconfigured into multifunctional units to meet operational requirements:

• Company Alpha (Lifeblood)–an AH-64 Apache support company, primarily consisting of 15Rs (AH-64 Helicopter Repairer) and 15Ys (AH-64 Armament/Electrical/Avionics Systems Repairer), and capable of conducting two phase maintenance lanes at full strength.

CH-47 Chinook phase. U.S. Army photo provided by the author.

• Company Bravo (Bandits)–a UH-60 Black Hawk support company, primarily consisting of 15Ts (UH-60 Helicopter Repairer) and capable of conducting three phase maintenance lanes at full strength.

• Company Charlie (Airedale)–a CH-47 Chinook support company primarily consisting of 15Us (CH-47 Helicopter Repairer) and capable of conducting four phase maintenance lanes at full strength.

• Company Delta (Big Ugly)–a company providing production control, quality control, aviation support equipment, tool room, and tech supply to the three aircraft-specific support companies. Company Delta will absorb component repair and avionics platoons but provide rotational backshops and avionics attachments to the aircraft-specific support companies. This rotational design cycles the component repair and avionics attachments between the three companies every 4 months, promotes cross-platform proficiency, and aligns sustainment practices with emerging doctrine. Company D will also command and control Downed Aircraft Recovery Teams and expeditionary deployment operations (Port Ops).

The new ASB will be comprised of seven total companies. The four new companies (Alpha, Bravo, Charlie, Delta) will be named after retired historic 101st companies (8-101 Aviation Intermediate Maintenance) to establish an immediate identity. The new companies will eventually report under unique unit identification codes (UICs) to preserve clear command lines and tailored support responsibilities. The legacy Company Alpha (Distribution) will be reflagged to Company Echo, and legacy Company Charlie (Sig-

nal) will be reflagged to Company Fox. There will be no change to Headquarters and Headquarters Company.

Force Design and Prototyping in Action

This reorganization model enables specialized focus, greater technical proficiency, and enhanced operational readiness. It is not theoretical. It is designed to be piloted within the 96th ASB, and our current Central Command (CENTCOM) deployment is being exploited to test this innovative approach, providing data-informed feedback to influence broader force design. By aligning with the FDU objectives of enhanced effectiveness, increased efficiency, and modular scalability, the proposed model supports Army transformation without expanding the current infrastructure footprint. Moreover, it positions future ASBs Army-wide to support LSCO and MDO with scalable, multifunctional unit-formation potential tailored to mission requirements and operational needs.

Enabling Army Modernization Through Doctrine

Doctrine underpins this transformation. Field Manual 3-0, *Operations*, calls for modularity in formations, while the force generation process, Regionally Aligned Readiness and Modernization Model, or ReARMM, emphasizes aligning readiness cycles with modernization (Department of the Army, 2025; Suits, 2020). Army Structure enables this as a live prototyping tool, and tactical logistics and financial information systems, such as the Global Combat Support System-Army, will benefit from improved data fidelity when organized around single-platform units. This structure also enhances alignment with sustainment warfighting functions (enabling freedom of action, extending operational reach, prolonging endurance) and ensures seamless integration into joint and divisional operations, which can be further validated in future brigade and division-level training densities.

Downed Aircraft Recovery Team exercise. U.S. Army photo provided by the author.

From Vision to Execution

Execution began with a single ASB pilot (96th ASB) during a CENTCOM rotation. Future coordination with G3 and Army Forces Command elements will enable synchronized UIC and personnel changes. Lessons from previous reflagging efforts, such as the transformation of 8-101 and 9-101 into the 96th and 563D ASBs, provide a historical roadmap. Performance metrics and leader feedback will be captured and disseminated via Microsoft Power BI (Business Intelligence) dashboards, after-action reviews, and TiC learning outcomes.

Conclusion

The modular reorganization of the ASB is a low-cost, high-impact initiative that meets the Army's urgent need for scalable, effective, and efficient aviation sustainment formations. It supports TiC experimentation, advances FDU implementation, and ensures Army Aviation remains capable and lethal in the next fight. This reorganization is not merely a restructuring—it is a deliberate modernization effort that prepares the 101st Airborne Division "Air Assault" for tomorrow's battlefield.

Biography:

MAJ Bryan Welch is the Company Bravo, ASC Commander serving in the 101st CAB. He recently served as an operations officer and executive officer at 2-17 Air Cavalry Squadron at the 101st CAB and previously served as the aide-de-camp to the Commanding General at the Combat Readiness Center, Fort Rucker, Alabama. His education includes a BA in Political Science from the University of Iowa and a Masters of Operational Studies from the Command and General Staff College.

Company B, 96th ASB, supports critical port operations at the Jacksonville Port Authority in Jacksonville, Florida. U.S. Army photo provided by the author.

References:

Department of the Army. (2025, March 21). *Operations* (Field Manual 3-0). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN43326-FM_3-0-000-WEB-1.pdf

Suits, D. (2020, October 20). *ReARMM to help stabilize training, modernization, mission requirements*. Army News Service. https://www.army.mil/article/240100/rearmm_to_help_stabilize_training_modernization_mission_requirements#:~:text=The%20Regionally%20Aligned%20Readiness%20and%20Modernization%20Model,Competition%20*%20Crisis%20*%20Conflict%20*%20Change

Sustainment Forces and Survivability in Large-Scale Combat Operations

By CPT Peter P. Cho and CPT Reed T. Marshall

Introduction

Army Aviation survivability in large-scale combat operations (LSCO) depends on more than just aircraft maneuver; it requires sustainment forces that can survive, move, and react effectively in contested environments. With the heightened threat of indirect fires and unmanned aircraft systems (UAS), our sustainment forces must be more mobile than ever before. As defined in the 2025 Field Manual (FM) 3-04, *Army Aviation*, the Area for Forward Arming and Refueling (AFAR) establishes a temporary site capable of rapidly arming and refueling aircraft. The speed at which an AFAR site can activate, conduct rearm and refuel, and then exfiltrate is critical to survivability for both and ground forces.

During **Operation Saber Shield**, Echo Forward Support Troop, the 5-17 Air Cavalry Squadron, executed multiple AFAR missions in the Korean theater to extend the operational reach of AH-64 Troops, while reducing sustainment exposure during rearm and refuel operations. This operation provided a critical opportunity to evaluate the survivability of the AFAR concept compared to a traditional Forward Arming and Refueling Point (FARP). The following analysis highlights key lessons learned in three areas essential to mission success: communication networks, Class (CL) V (ammunition) transportation, and terrain map rehearsals.

Concept of the Operation

Area for Forward Arming and Refueling sites are an aircraft pit stop, similar to those seen during stock car auto racing (Figure 1).

Our AFAR team remained on standby, similar to a quick reaction force, waiting for a mission from higher headquarters. Once a mission was received, the AFAR team displaced to a concealed hide site, established communications with inbound aircraft, and employed the short-range Skydio drone or a larger multi-mission drone for the landing zone's CHERRY/ICE call (Figure 2).

After the small UAS (SUAS) team completed enemy-focused reconnaissance, the AFAR officer-in-charge (OIC) directed aircraft to the landing zone and simultaneously secured the perimeter with gun trucks. Then, the CL III (petroleum, oils, and lubricants) and CLV vehicles were staged. The aircraft landed, and the staged vehicles conducted their resupply. Upon completion of arming and refueling, the AFAR team would exfiltrate the site and return to the tactical assembly area to prepare for subsequent missions. Our AFAR mission was executed in three distinct phases. Figure 3 outlines the critical actions, sequencing, and timing required to ensure successful operations. Like a pit crew, precision and speed were essential to minimizing risk and increasing survivability.

Figure 1. Macro overview of AFAR sites. Figure provided by the authors.

Figure 2. Micro-imagery of AFAR site 1. Figure provided by the authors.

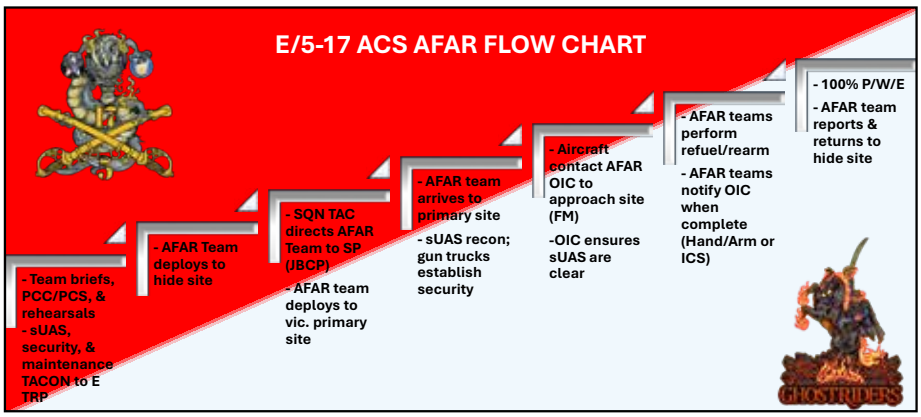

Figure 3. Area for Forward Arming and Refueling flow chart. Figure provided by the authors.

Communication Networks

Unlike static FARPs, AFAR sites do not benefit from fixed command posts or robust communications networks. Command and control (C2) must be lean, mobile, and redundant. Initially, we relied on Single Channel Ground and Airborne Radio Systems (SINCGARS); however, terrain, convoy movement, and even minor disruptions often caused disturbances to line-of-sight communication. This made SINCGARS unreliable for the precise timing required in AFAR operations. To extend communication beyond line-of-sight, we shifted to Joint Battle Command-Platform (JBC-P) as an alternate. The JBC-P was also the primary means of communication with higher headquarters. While the JBC-P offered more reliable over-the-horizon connectivity, once aircraft were in range of the SINCGARS, voice communication was preferred by both the AFAR team and pilots. Additionally, our AFAR team utilized the MPU-5 mobile ad-hoc radio, which allowed them to tether to their SINCGARS radios mounted in the vehicles while moving around the AFAR site. Furthermore, the team experimented with an MPU-5 attached to a multi-mission SUAS to extend the range of the mesh network over several terrain features. This provided the AFAR team beyond line-of-sight voice communication, accelerating decision-making and communication dominance.

Clarity in roles and responsibilities were just as important as equipment. We developed a communication flow chart to codify who talks to whom and when. While specific roles will depend on mission, enemy, terrain and weather, troops and support available, time available, and civil considerations, our thought process was that in combat, the forward support troop must anticipate the fuel and ammunition needs of the unit it supports. Troop commanders make sustainment decisions using discipline initiative, running estimates, and time-distance analysis. Preparation of fuel and ammunition packages enable maneuver functions to stay in the fight. Logisticians apply continuous assessment to be ready for resupply requirements when communication is degraded or lost. Understanding the unit's missions and needs enables the AFAR OIC to be flexible. Flexibility was critical when one AFAR site was compromised by enemy activity. The distribution platoon leader, assessing the ground situation in real time, immediately redirected aircraft to an alternate site. His ability to act decisively prevented delays and reduced risk to both aircraft and sustainers.

Example of the **initial** method. Photo provided by the authors.

Example of the **improved** method. Photo provided by the authors.

Class V Transportation

Fueling aircraft is routine for distribution platoons, and after several iterations we were able to use 2 x 50-foot hoses to fuel directly from our Heavy Expanded Mobility Tactical fuel trucks. Truck-to-aircraft refueling with rotor blades turning took practice for leaders to assume the risk; however, after a few iterations, it became second nature. The greater challenge we faced was moving Class V, particularly rockets and AGM-114 Hellfire missiles. Loading and survivable transportation of munitions to each aircraft became our primary friction point. We tested several methods to find the optimal method for arming:

Example of the **best** method. Photo provided by the authors.

Example of the **best** method. Photo provided by the authors.

Example of the **best** method. Photo provided by the authors.

• **Initial Method**: Based on an article we read from another unit, we attempted pre-packaging rockets and missiles on SKEDCO litters. This worked but required significant manpower to load and offload from our Light Medium Tactical Vehicles (LMTVs), increasing personnel packaging.

• **Improved Method**: We assigned designated LMTVs to each aircraft. This reduced handling steps but increased the number of vehicles in the area, raising detection risk and lowering survivability.

• **Best Method**: We used a Load Handling System (LHS) with a flat rack, which proved to be the fastest and most efficient method for arming. The LHS driver could rapidly move a flat rack of ammunition to each aircraft, reducing transportation time by half and cutting down the number of vehicles and Troopers required.

Loading ammunition is labor-intensive and requires a well-thought-out personnel package. The LHS offered the best balance of efficiency, survivability, and speed. Although completed on a smaller scale during our training, we estimated up to 45 Hellfires will fit on a flat rack, which is enough to rearm more than one platoon of AH-64Es. Practice was critical to making this process smooth and safe. The LHS operator requires significant experience and repetition to build confidence in maneuvering flat racks under field condition. Operating the system on uneven or restrictive terrain demands precise control to safely drag, position, and offload the flat rack without damaging the munitions or equipment.

It is important to note that not all munitions are suitable for loading at an AFAR site. In LSCO, we expect our Apaches to consume mostly rockets and Hellfires, while using 30mm mostly for self-defense. Loading 30mm can be a sluggish process and increases the amount of time the aircraft are on the ground for rearming. This creates the need for the AFAR team to be on site longer than its intended purpose. We currently assess that 30mm loading should be conducted farther from the forward line of own troops (FLOT) at a more traditional FARP.

Terrain Map Rehearsals

Executing AFAR is not intuitive. Unlike a fixed FARP, there are no established pads,

permanent communication networks, or predictable aircraft traffic patterns. Every aspect of the mission, from convoy operations and timing to integration with SUAS and sequencing with aircraft, places heavy demands on sustainers. To mitigate this, we prepared three terrain models for each of the three landing zones within our AFAR zone. Before every mission, each participating element briefed its role to build shared understanding. Walking through the terrain model rehearsals ensured not only that every Trooper knew their specific AFAR tasks, but also how they fit into the bigger picture. This allowed the entire team to execute as if it were running a playbook (Figure 4).

Figure 4. The Ghost Rider distribution platoon conducts AFAR rehearsal. Figure provided by the authors.

Even with rehearsals, no AFAR mission went perfectly. However, by making rehearsals part of the battle rhythm, our Troopers internalized the importance of urgency and survivability. Through multiple iterations, we refined convoy staging, site establishment, integration with our SUAS and Military Police security elements, and communication with inbound aircraft. Each rehearsal shaved critical minutes off our timeline. By the final execution, our AFAR team could establish, operate, and displace less than 30 minutes from arrival on station to displacement—a fraction of the time it took on our first attempt. Every second we saved could mean the difference between survival and vulnerability. That sense of urgent precision became a shared understanding among our AFAR team.

Conclusion

The AFAR concept is still developing, but our experience proved its potential. By emphasizing lean C2 through disciplined communications, solving Class V distribution challenges with mobile solutions, prioritizing rehearsals, and cross-training sustainers, we transformed AFAR from a theory into a practical, repeatable capability. Every Soldier in the AFAR team should not only master their primary task but also understand the jobs of others. If one person goes down, another must step in. For a distribution platoon, this means knowing both fueling and ammunition tasks. This flexibility not only improves efficiency but also maximizes survivability.

Going forward, the Army must be able to execute AFAR missions at multiple locations simultaneously. We believe it is possible to open two sites at a time to spread the combat power and further reduce risk to force. Further training and iterations are necessary to ensure feasibility for C2 of two separate teams. Ultimately, AFAR operations extend the supported aviation element's operational reach and freedom of maneuver. In LSCO, we must have alternate methods to refuel and rearm beyond static FARPs. Sustainers are the enablers of all combat operations; without survivable rearm and refuel operations closer to the FLOT, Army Aviation's reach becomes limited.

If given the opportunity to expand on this, the 5-17th would emphasize the ability to displace an AFAR team from the traditional FARP. To provide realistic training, we would focus on the FARP's transition to multiple AFAR teams to provide a logistical train closer to the FLOT. For the AFAR to succeed, our sustainers learned aviation terminology, procedures, and missions. Simultaneously, the aviators needed to understand the sustainment perspective regarding the challenges of convoy movement, ammunition handling, and fuel distribution that make continued operations possible. We built confidence among our Troopers through active involvement in the planning process. Having sustainers present during mission planning meetings gave us the opportunity to think through problems from an aviator's perspective. This experience not only broadened our understanding of their mission but also sharpened our ability to anticipate requirements. As we developed shared understanding, we were able to provide timely support. This allowed us to better support the mission set in the Korean Theater.

Biographies:

CPT Peter Cho is a U.S logistics officer with 7 years of service. He currently serves as the Troop Echo Commander, 5th Squadron, 17th Cavalry Regiment, 2D Combat Aviation Brigade, 2D Infantry Division (Combined Republic of Korea [ROK]-U.S.). His previous assignments include serving as the Operation Officer (C4) for 2D ROK-U.S. Combined Division at Camp Humphreys; Executive Officer for Echo Company 2-158th Assault Helicopter Battalion, 16th Combat Aviation Brigade; and Platoon Leader in the 523D Composite Truck Company, 13th Combat Sustainment Support Battalion, Joint Base Lewis-McChord, Washington.

CPT Reed Marshall is a U.S. Army Aviation officer with 4 years of service, currently serving as the Distribution Platoon Leader, Troop Echo, 5th Squadron, 17th Cavalry Regiment (5-17 ACS), 2D Combat Aviation Brigade, 2D Infantry Division (Combined ROK-U.S.). Upon graduating flight school in 2021, he was stationed at Camp Humphreys, South Korea. His previous assignments include Troop Charlie Platoon Leader and Assistant Operations Officer, both within the 5-17 ACS.

Reference:

Department of the Army. (2025, March 27). *Army Aviation* (Field Manual 3-04). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN43343-FM_3-04-000-WEB-1.pdf

THE FORGOTTEN MISSION-ESSENTIAL TASK:

Soldiers conduct a downed aircraft recovery team (DART) exercise at Hunter Army Airfield, Georgia. U.S. Army photo by SGT Andrew McNeil.

Reprioritizing Army Aviation's Battle Damage Assessment, Repair, and Recovery in Contested Environments

By CPT Caleb M. Kifer

Introduction

Several challenges exist in effectively training and executing battle damage assessment and repair (BDAR) and dedicated recovery operations. These challenges include inconsistency in doctrine and evaluation, difficulties in effectively training maintainers, and task organizing for these operations. As with any complex problem, there is no one-size-fits-all solution; Army Aviation must take a multifaceted approach that addresses each deficiency to effectively equip the force to maintain its combat power in a contested environment.

By the Numbers

The U.S. ranks first globally in military helicopter fleet size, with over 5,500, followed by Russia with over 1,500 (Global FirePower.com, 2026). Of the U.S. helicopter fleet, approximately 4,000 are assigned to the U.S. Army. The U.S. Army ranks fourth, according to the World Directory of Modern Military Aircraft's (WDMMA) Global Air Powers Ranking 2026. The only nation with a higher ranking than the U.S. Army in this metric was the Russian Air Force, which ranked third; the U.S. Air Force and Navy ranked first and second, respectively (WDMMA, 2026). With the U.S. Army having the largest military helicopter fleet in the world, and with more than twice as many helicopters as the next-largest fleet, it is reasonable that the Army Enterprise has a vested interest in effectively recovering or salvaging downed aircraft.

The Downed Aircraft Recovery Team's Purpose

When a U.S. Army helicopter is unable to return to its home station, the owning unit typically mobilizes a downed aircraft recovery team (DART). The team's purpose is to assess the fault or damage and then perform one of two functions: repair the aircraft to enable self-recovery, or set conditions for an alternate form of recovery to friendly control for repair (Department of the Army [DA], 2021). These teams are a standing package that can conduct battle damage assessment and battle damage repair. Battle damage assessment and repair is, by definition, non-standard maintenance (DA & Marine Air-Ground Task Force Training Command, 2025).

The U.S. Army's organic capability to tactically recover aircraft is atypical. While the U.S. Air Force has a Crashed, Damaged, or Disabled Aircraft Recovery program, its focus is on recovering aircraft from on or near airfields rather than from austere tactical environments (Carter, 2017). Neither the U.S. Coast Guard nor the Royal Canadian Air Force has dedicated, organic aircraft recovery teams. While this list is not comprehensive, it demonstrates the unique capabilities Army Aviation possesses to maintain combat power in a contested environment.

The challenges these teams face will be exacerbated in large-scale combat operations (LSCO). Large-scale combat operations will involve non-contiguous battlefields and an unprecedented concentration of intelligence, surveillance, and reconnaissance (ISR) assets, alongside the constant threat of loitering

munitions and effective artillery fire. As the U.S. Army pivots from counterinsurgency to LSCO, it must understand and adapt to the expanding challenges posed to preserving aviation combat power.

Inconsistency in Doctrine and Evaluation

The first challenge stems from apparent indifference to the DART and BDAR missions, as evidenced by the absence of lessons learned and inconsistencies in Army Aviation doctrine. "Perform Downed Aircraft Recovery Missions" is a mission-essential task (MET) assigned to aviation maintenance companies (AMC) (DA, 2024a). Despite being core to Army Aviation's maintenance capability, the dialogue concerning aircraft recovery and repair operations remains deprioritized. I submitted a request for information (RFI) to the Center for Army Lessons Learned (CALL) in July 2025 to obtain lessons learned from DART operations over the past decade.[1] The responses received offered few clear lessons learned; instead, the sources provided were either challenges units face in deploying their repair/recovery teams or anecdotes from a sustainment perspective on how vital DART will be to conserving combat power. One of the only pertinent references found was an excerpt from CALL's *Updated Leader's Guide to Maintenance and Services*, which stated, "aviation maintenance company *[sic]* consistently arrive at [the] National Training Center unequipped and untrained in their two most critical METs, downed aircraft recovery team (DART) and battle damage assessment and repair (BDAR)" (CALL, 2024, p. 40). This evidence suggests that Army Aviation does not prioritize downed-aircraft repair and recovery training and that AMCs remain unprepared to perform a fundamental MET.

> ***"[aircraft] Recovery in decisive action is the greatest challenge."***
>
> **-Army Techniques Publication 3-04.13, 2021, p. vii**

Looking beyond the limited discourse on operational lessons, the U.S. Army Training and Doctrine Command demonstrates a similar lack of prioritization of the downed aircraft repair and recovery mission set. Since 2020, it has significantly reduced its publications on aircraft repair and recovery operations. Army Techniques Publication 3-04.13, *Helicopter and Small Aircraft Battle Damage Assessment, Repair, and Recovery* (DA, 2021), has been trimmed to nearly half of the content of the two previous versions (now rescinded), reducing the length from 92 pages to 50 pages as published in both 2008 and 2018, then titled, *Aircraft and Recovery Operations*. The 2021 version omits valuable information that helped define recovery types and provided checklist examples units could use to build their internal DART standard operating procedures, such as the 11-Line Downed Aircraft Recovery Report and Pre-Execution Check/Inspections Checklists (DA, 2018, p. B-3; DA, 2021). While inconsistencies existed in previous versions, such as the disconnect between the "Fallen Angel" Procedure and the 11-Line Report, they nevertheless provided a foundational understanding of DART roles, responsibilities, and operations to junior officers and noncommissioned officers.

Maintenance Training Difficulties

Army Aviation units face specific challenges in training and standardizing DART and BDAR tasks and exercises. Since the Army adopted the Aviation Maintenance Training Program (AMTP), many units have struggled to ensure that the program accurately reflects the real-world experience their maintainers gained prior to its implementation. This program documents the experiences and evaluations of tasks listed on a maintainer's individual critical task list (ICTL), justifying a maintainer's maintenance level (ML), which ranges from ML0 (*Apprentice*) to ML4 (*Master Repairer*) (DA, 2024b, p. vi). Maintenance-level ratings authorize maintainers to conduct, supervise, or inspect specific aircraft maintenance tasks. The AMTP's implementation

A U.S. Soldier performs DART training during a National Training Center rotation, Fort Irwin, California. U.S. Army photo by SPC Jordan Leroy.

[1] CALL RFI submitted by author on July 4, 2025: Requesting any information regarding "Downed Aircraft Recovery Team" (DART) or general aircraft recovery operations lessons learned in the last 5-10 years. Specifically, if any data is captured regarding DART/aircraft recovery in a contested environment (near-peer) and/or in austere environments (swamp, arctic/muskeg, overwater/shore, etc.).

U.S. Soldiers recover a simulated downed Black Hawk that was rigged by the DART at Fort Drum, New York. U.S. Army photos by SPC Mason Nichols.

created a backlog of paperwork and experience validation that had to be manually captured across the branch to keep wrenches turning. Battle damage assessment and repair and DART operations are not required to progress to any ML; however, ML records serve as focal points during the 2- to 3-year Aviation Resource Management Survey inspection cycle (DA, 2024b, p. 3). As a result, DART and BDAR training were often deprioritized in AMC annual training to focus on meeting the Army's AMTP intent.

A concurrent challenge with training BDAR is its reliance on field-expedient, non-standard maintenance practices. Non-standard repairs are typically improvised, essential repairs intended to enable the aircraft to fly for a "limited duration" (DA, 2021, p. 1-1). The goal is to return the aircraft to a one-time flight status, allowing it to self-recover to the nearest maintenance facility for standard repairs (DA, 2021). In a garrison or training environment, commanders are highly unlikely to assume the risk associated with non-standard repairs. This inability to simulate realistic BDAR operations creates a training gap, leaving maintainers unable to practice developing creative solutions to maintenance problems.

If a repair to enable self-recovery is not feasible for a downed aircraft, dedicated recovery operations, either aerial or ground-based, may be undertaken. These dedicated recovery techniques require maintenance procedures that are rarely trained in realistic conditions. A combat aviation brigade's (CAB) aerial recovery package includes the Unit Maintenance Aerial Recovery Kit (UMARK), developed and tested from 1992 to 1998 to recover disabled aircraft using medium to heavy-lift helicopters. The UMARK was developed when the UH-1 Huey, AH-1 Viper, and OH-58 Kiowa were still in service (Bielefield, 1998). While UMARK rigging procedures exist for the UH-60, CH-47, and AH-64, they require significant maintenance to ensure the aircraft are correctly rigged and meet weight requirements. These procedures are rarely trained in garrison due to the risk of airframe, blade, or pylon damage. Training hulls are a helpful training aid; however, they are not available at every installation. Because of limited training aids and the risks of training on actual aircraft, aviation maintainers across the Army have limited opportunities to train in aerial recovery.

Required Task Organization

The only Army Aviation units with doctrinal capability to conduct both

BDAR and DART are general support aviation battalions and aviation support battalions (ASB); however, in practice, most recovery missions within a CAB, whether aerial or ground-based, are executed through task-organized formations drawing personnel and equipment from multiple battalions. General support aviation battalions can independently conduct aerial recovery because they field both an air mission command element and heavy-lift aircraft, while ASBs provide the majority of maintainers and ground recovery vehicles under their modified table of organization and equipment (MTOE). Assault and attack battalions retain limited BDAR capability but lack the resources to conduct recovery operations independently.

As Army Transformation Initiative efforts reshape CAB structure, there is little indication that future formations will be resourced to enable every battalion to conduct DART independently. Instead, recovery operations will continue to rely on brigade-level task organization. The principal operational challenge, therefore, is not the employment of task-organized forces itself but the complexity it introduces for collective training, certification, and mission rehearsal. Without structural or resourcing changes that institutionalize recovery capabilities across battalions, CABs will remain responsible for integrating disparate elements into cohesive recovery teams, a requirement that demands deliberate planning and sustained training emphasis at the brigade level.

Conclusion

The challenges confronting AMCs may include some or all of the issues discussed; nevertheless, the Army Aviation community will benefit from a candid assessment of its BDAR and DART capabilities. No single reform will resolve every deficiency, but units must take ownership of local challenges and pursue innovative solutions that preserve combat power.

Aviation maintenance doctrine should provide a stronger foundation for developing unit BDAR/DART standard operating procedures. Standardized tools, such as a downed-aircraft recovery report that can be integrated into pre-accident plans, could accelerate and synchronize DART responses. If combat training centers consistently observe ineffective recovery operations, the Aviation Branch should reassess whether sufficient time, resources, and training opportunities exist at home station. When training aids or risk constraints impede realistic execution, the branch must either reallocate resources or recalibrate expectations for the "Perform Downed Aircraft Recovery Missions" MET.

Within the AMTP, BDAR tasks and evaluations should be incorporated into the ML2 Repairer ICTL to reflect the proficiency required to lead field maintenance teams. Units should also develop training aids for both backshop and aircraft-series maintainers to enable deliberate practice and cross-training. Aviation maintenance company personnel must likewise remain proficient with all equipment listed in their MTOE, from BDAR kits to aerial recovery systems such as the UMARK.

Because BDAR and recovery operations will continue to rely on brigade-level task organization, commanders should deliberately train composite teams for contested environments. These missions demand rapid coordination among security, personnel recovery, and lift or ground recovery assets, and will increasingly require commanders to weigh risk against the preservation of combat power. The proliferation of ISR across the modern battlefield will compress recovery timelines, and in some cases, rapid cannibalization may become the only feasible option. As the Army prepares for LSCO, sustaining aviation combat power will remain a central challenge requiring continued adaptation across doctrine, training, and force design.

Author's Note:

All civilian sources cited in this article are open source. All U.S. Army doctrine publications are approved for public release with unlimited distribution.

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Biography:

CPT Caleb Kifer is an Army Aviation officer and UH-60 pilot. While stationed at Fort Wainwright, Alaska, with D/1-52D Aviation Regiment, he served as the DART Officer-in-Charge and helped establish the unit's DART standing operating procedures, with special considerations given to Alaska's austere environment. He led four real-world DART operations, including the recovery of Coast Guard 6016 from Read Island, Alaska.

References:

Bielefield, M. (1998). *Unit maintenance aerial recovery kit (UMARK)* (Final Report). Kaman Aerospace Corporation. https://apps.dtic.mil/sti/pdfs/ADA359915.pdf

Carter, A. (2017, February 15). *CDDAR team critical to keeping three aircraft mission capable*. Travis Air Force Base. https://www.travis.af.mil/News/Features/Display/Article/1085047/cddar-team-critical-to-keeping-three-aircraft-mission-capable/

Center for Army Lessons Learned. (2024). *Updated leader's guide to maintenance and services*. https://api.army.mil/e2/c/downloads/2024/09/11/46834aa3/23-08-682-leader-s-guide-to-maintenance-and-services-aug-23-public.pdf

Department of the Army. (2008, July). *Aircraft recovery operations* (Field Manual 3-04.513). https://irp.fas.org/doddir/army/fm3-04-513.pdf

Department of the Army. (2018, April). *Aircraft recovery operations* (Army Techniques Publication 3-04.13). https://irp.fas.org/doddir/army/atp3-04-13.pdf

Department of the Army. (2021, November). *Helicopter and small aircraft battle damage assessment, repair, and recovery* (Army Techniques Publication 3-04.13). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN34174-ATP_3-04.13-000-WEB-1.pdf

Department of the Army. (2024a, March). *Training and evaluation outline report: Perform downed aircraft recovery missions* (Task Number: 01-CO-8066). https://rdl.train.army.mil/catalog-ws/view/100.ATSC/ECE32CC2-4AC8-4D61-8ECD-29C3170D2445-1351198595524/report.pdf

Department of the Army. (2024b, April). *Commander's aviation maintenance training program* (Training Circular 3-04.71). https://rdl.train.army.mil/catalog-ws/view/100.ATSC/44E3F960-4BD9-44CF-B516-D312B61693D3-1532613127707/tc3_04x71.pdf

Department of the Army and Marine Air-Ground Task Force Training Command. (2025, April). *Ground equipment battle damage assessment, repair, and recovery* (Army Techniques Publication 4-31/ Marine Corps Reference Publication No. 3-40E.1). https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN43423-ATP_4-31-000-WEB-1.pdf

GlobalFirePower.com. (2026). *Helicopter fleet strength by country 2026*. https://www.globalfirepower.com/aircraft-helicopters-total.php

World Directory of Modern Military Aircraft. (2026). *Global air powers ranking 2026*. https://www.wdmma.org/ranking.php

D.B. Cooper and Flight 305

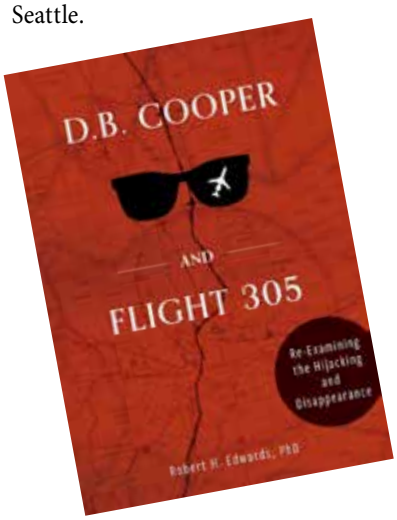
Author: Robert H. Edwards, Ph.D.; Schiffer Publishing; 264 pages

A book review by COL Jayson A. Altieri, United States Army (Ret.)

United States (U.S.) history is replete with popular cultural myths and legends, some based on facts and some fiction–Davy Crockett at the Alamo and the UFOs of Area 51 being but two examples. One legend, involving the 1971 hijacking of a Northwest Airline's Boeing 727 by an individual known only as D. B. Cooper, still captures the public's imagination nearly 54 years later. Aside from the myths and legends of the hijacking, what is sometimes lost in the folklore is the amount of detailed planning and analysis that took place to accomplish this daring crime. It is the thorough preparation for the hijacking on which author Robert H. Edwards focuses and why his book is a useful historical example of how the Army's design methodology and military decision-making process thinking works in solving a complex challenge.

Airpower historians, criminologists, and military planners will find Robert Edwards' book intriguing, tracing how the man who highjacked Northwest Flight 305 planned the only unsolved act of air piracy in U.S. history. Though many Americans may associate heightened airport security with the Islamic terrorist attacks on September 11, 2001, it was a wave of hijackings in the late 1960s and early 1970s that laid the foundation for today's airport security protocols. During that period, a hijacking occurred, on average, once every 5 days globally. The U.S. dealt with its own spate of mile-high crimes, convincing reluctant government officials and airport executives to adopt the first important airport security protocols. While U.S. law enforcement's response to the crimes reduced the number of hijackings, most of which ended in the arrest or killing of the hijackers, one case remained unsolved to this day—the case of D.B. Cooper.

On the morning of November 24, 1971, the eve of Thanksgiving, Northwest Airlines Flight 305 departed Washington, D.C., on a cross-country flight to Seattle, Washington. The aircraft was a Boeing 727-100, registration number N467US. After disembarking and receiving passengers at regional city airports in Minneapolis, Great Falls, Missoula, Spokane, and Portland, the Northwest Flight continued on to Seattle. At Portland, the second-to-last passenger to board Flight 305, a polite and nondescript man approximately 35–50 years old, 5-feet, 10 inches to 6-feet, 1 inch tall; 170 to 190 pounds; Latin or Hispanic complexion; and carrying a briefcase, informed the crew after taking off that he had a bomb. He asked for $200,000 (U.S.) and four military style parachutes to be brought to the aircraft upon landing in Seattle.



After landing, the man released all the passengers and two of the cabin crew. Upon receiving the money and the parachutes, the hijacker instructed the plane to depart for Mexico and agreed to allow the aircraft to land in Reno, Nevada, for a refuel stop. The 727 departed Seattle at 7:36 p.m. Pacific Standard Time. When the aircraft arrived in Reno at 11:03 p.m., the hijacker, the money, the briefcase, and two of the parachutes were gone. The hijacker was never apprehended or identified. The only other postscript to the story was in 1980. An 8-year-old boy found three bundles of $20 U.S. bills totaling $5,880 in a sandbar on the east side of the Columbia River, 10 miles northwest of Portland. The river is upwind of the 727's presumed flight path (this being well before the age of the global positioning system), and the FBI confirmed the serial numbers on the $5,880 matched those of the $200,000 demanded by the hijacker.

Robert Edwards' analysis of the hijacking is written from the perspective of a mathematician and pilot. His book uses previously unexamined data and original sourced documents, combined with the tools of statistics, aeronautics, and meteorology, to show where and how the FBI could resume the search and find out—at last—who D. B. Cooper really was. His well-researched book breaks the crime down into individual parts of how the still unknown suspect selected the parachutes, airline, and airplane to hijack (for example, the 727's were famous for their "airstairs" ramp allowing passengers to board and exit from the back of the airplane), to the airliner's flight path and selection of the drop zone, and the weather and exfiltration from the drop zone once the hijacker was safely on the ground. The author also breaks down the science of how FBI agents began to unsuccessfully investigate the crime (in an era before DNA and other 21st century investigatory techniques), to some reasonable speculation by the author on just who D.B. Cooper was, and what happened to him.

As a former military operational planner for both air and ground units and with a degree in Criminal Justice, I would highly recommend this book to anyone interested in how the Army's design methodology and military decisionmaking process thinking works to analyze a historical case study and how such processes can be applied outside of the military, especially in the area of criminal science. This book is both detailed and comprehensive without boring the reader. It is a great book for any military or aviation planner to have in their professional reading collection.

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Paratroopers assigned to the 3-82 General Support Aviation Battalion, 82D Combat Aviation Brigade, 82D Airborne Division, conduct pre-flight checks prior to departure. U.S. Army photo by SGT Vincent Levelev.

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