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AVIATION IN SUPPORT OF DIVISION & CORPS OPERATIONS

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CH-47 Flight engineer SPC Daniel Austin, of B Co, 1-214th General Support Aviation Battalion, monitors the right side of his Chinook during a training flight over Bavaria, Germany on May 4, 2020. U.S. Army photo by MAJ Robert Fellingham

The Command Corner

As we continue to transform our aviation force to meet the challenges of 2028 and beyond, we must preserve the fundamentals that make Army aviation a relevant and invaluable maneuver force for Army operations. While the advancement of our systems and platforms change how we conduct reconnaissance, the principles and the fiber of an effective scout remains invaluable as we transform the employment of our aviation forces. Along with our enhancements in sensing and detecting our adversary in nearly all environments, it is imperative that our aviators refine and continue to use their inherent human curiosity, their instincts, and the ability to correlate relevant information to make timely decisions for the ground forces. The discussion in this issue about employing and training our reconnaissance forces is very timely and relevant.

Our transition from the counterinsurgency fight to the large-scale combat operation (LSCO) environment includes filling our reconnaissance gap, which requires an effort from both the institutional and the operational Army. Across our aviation force, we have to reinvigorate and reinstitute reconnaissance techniques and formations to enhance the employment of ground forces in an LSCO environment. At our warfighting training centers, we are learning once again to fight a division and rediscovering that reconnaissance and security are not a pickup game. Once the trademark of the Division Calvary Squadron, the counter-reconnaissance fight was designed to use active and passive measures, including combat action to destroy or repel enemy reconnaissance elements. This cultural shift in knowing the environment and owning the reconnaissance space is where we are heading with aviation in the LSCO fight.

Evolving our force toward LSCO includes revising our doctrine. The U.S. Army in Multi-Domain Operations 2028, known simply as the "MDO Concept," is the Army's operating concept and describes how U.S. forces must train, organize, deploy, and fight against a near-peer competitor in the future operating environment. As the "MDO Concept" moves closer to becoming a doctrinal reality, recent updates to Field Manual 3-04, "Aviation Operations," align with the LSCO requirements to support MDO. These updates include an additional focus on airspace integration, planning considerations in contested airspace, and expeditionary sustainment considerations. Furthermore, the revisions to Army Techniques Publication 3-04.1, "Aviation Tactical Employment," includes an increased focus on fighting platoons and companies, leveraging tactical scenarios, and Troop Leading Procedures. Our doctrinal focus going forward is clearly toward LSCO making our aviators and leaders maneuver-centric.

Institutionally, we are changing our flight training and our professional military education to build a more tactically focused aviator and leader. Warrant Officer education will make tactical employment the centerpiece of aviation instruction, training, and evaluations. Developing and employing unit trainer/evaluators focuses current instructors on tactics, distributes the training workload, and allows commanders to develop trainers at the unit level. Employing the Emergency Response Method helps our aviators during emergencies and is especially relevant as we move toward terrain flight altitudes to prepare to fight in a LSCO environment. The Terrain Flight Training Support Package aids commanders, staffs, and instructor pilots in planning for and executing safe and effective tactical missions at lower flight altitudes. Our combat aviation brigades are finding these training support packages useful in providing aircraft-specific academic topics, emergency procedure considerations, and mission planning tools/techniques, as well as proposed simulator instruction plans.

Additionally, our transformation includes modernization, which is paramount to fight and win against near-peer competitors. Future attack reconnaissance aircraft/Future long-range assault aircraft and Future Tactical Unmanned Aircraft System/air launched effects allow the Army to operate dispersed over wide areas with the ability to rapidly converge in order to penetrate the multiple layers of stand-off employed by the threat. Army aviation must develop and employ advanced teaming and autonomous capabilities to shorten sensor-to-shooter timelines, and gain overmatch within the Close and Deep Maneuver areas. Specifically, our modernization must improve reach, survivability, lethality, and sustainment of Army aviation contributing to the Joint force in the MDO environment.

Whatever the task, modernizing Army aviation or filling a reconnaissance gap, it is more than just a material solution or changing a few tactics, techniques, or procedures. We must comprehensively address doctrine, organization, training, materiel, leader development, and education, personnel, facilities, and policy, or DOTMLPF-P to operationalize the Army's vision. While our platforms, networks, and weapons systems will improve as the rate of our technological advancements and resources allow, we must embrace the fundamental skills that make aviation the preeminent option for finding, fixing, and destroying the enemy in support of our ground forces across the entire MDO continuum.

Above the Best!

David J. Francis
Major General, USA
Commanding

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Sustaining the Chaos of Large-Scale Combat Operations Part 1: Forward Arming and Refueling Point Operations

By BG Clair A. Gill & MAJ Bridget I. Day

King Henry V at the Battle of Agincourt. Contributor: Art Collection 3/Alamy Stock Photo (Image ID: HX26C8)

In 1415 during the Hundred Years War, the French Army faced King Henry V's English expeditionary force on home terrain in Agincourt. While France enjoyed interior lines of communication, better equipment, and numerical superiority, they were ultimately defeated. The French failed to adapt to the conditions of the day, they failed to modernize their warfare, and they fought the British using tactics and techniques that had worked in battles past, all ultimately leading to their demise. As the U.S. Army continues to modernize and shift focus to large-scale combat operations (LSCO), it is critical that we innovate every warfighting function and consider relevance with an eye toward the future of warfare. Specific to the sustainment warfighting function, we must relook our doctrine, training, manning, and equipping of our brigade combat teams (BCTs) and push logistical capabilities, such as forward arming and refueling points (FARPs), as far forward as possible. Because sustainment was the bill-payer for BCT 2020, units now lack critical organic logistical capabilities, and the echeloned capability cannot keep up with the demand of troop transportation, water purification, refueling, and the list goes on. If we modernize our force without a critical eye toward how we sustain the LSCO fight, history warns this oversight might cause our Army to suffer the fate of the French at Agincourt.

"You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics."

General Dwight D. Eisenhower

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DESERT STORM–The "Super FARP"

On 17 December 1990, the 101st rehearsed the "Super-FARP," an innovative fusion of divisional Class III distribution assets (as well as Air Traffic Controllers and Pathfinders), capable of refueling a single lift of 66x UH-60s and 30x CH-47s in as little as 43 minutes. This incredible synchronization of capability allowed the 101st to assault two infantry brigades, the Division Assault Command Post and the Division Support Command (DISCOM), forward into Iraq on 24 February 1991, the morning of G-day. With this synchronization, the 101st struck enemy targets in zone and established a foothold for follow-on operations in DESERT STORM. At the time, this was the largest air assault in history, but it was against an undisciplined, ill-equipped Iraqi military that proved no match for the U.S. and its Allies. While this singular capability proved decisive for the division to project combat power, its utility in today's modern battlefield against peer competitors might not result in such resounding successes. Just because it worked in the past does not necessarily mean it will be repeatable; the Super-FARP concept relevant in AirLand Battle has little chance of survivability in 21st century LSCO. However, just as DISCOM and the 101st Aviation Brigade spearheaded the "Super-FARP" concept in the 90s based on the BCT ground tactical plan, it is critical that the tactical force continues to drive innovation for the future.

Transition to LSCO

Since 2001, the U.S. Army has become quite proficient in counter-insurgency and counterterrorism operations. During the past 2 decades, however, several of the principal peer state threats to the U.S. and its Allies have taken note and modernized their militaries, while the U.S. consumed resources to win decisively in contact. Department of Defense leadership took note of the need for a generational shift when they authored the 2018 National Defense Strategy (NDS). The 2018 NDS focused on future modernization for LSCO against threats such as Russia, China, Iran, North Korea, and Violent Extremist Organizations. Like other U.S. Army divisions, the 101st Airborne Division (Air Assault) quickly shifted the focus of its collective training towards LSCO, while also supporting the Army's modernization strategy. The 101st is known for its ability to strike from a distance using helicopters to execute vertical envelopment, but with the resulting extended operational reach, aviation assets rely heavily on forward sustainment operations.

The 101st Combat Aviation Brigade (CAB) was designed to be self-reliant in terms of extending its operational reach through FARPs established by its organic battalion support companies. Forward arming and refueling points are decisive to the CAB (and the division), but FARPs established by the CAB are also large, cumbersome, slow to move, and generally are emplaced rearward in the consolidation area. In a LSCO fight, FARPs are desirable, easy targets for the enemy, and it is widely assessed that killing a FARP is easier and more effective than shooting at low-flying, highly maneuverable aircraft. The aviation brigade does not have enough redundancy to make its organic FARPs enduring and survivable in the battle zone; thus, we need to be innovative, creative, and bold in how we maintain our deep capability for the division. Brigade combat team FARPs would naturally be farther forward and would allow aviation assets to continuously fight forward. The BCT forward support companies (FSC) and the brigade support battalions (BSB) are the first to push resupply forward as the ground lines of communication open, and having a BCT FARP extends operational reach and creates multiple dilemmas for the enemy. Brigade combat team FARPs must be trained, resourced, and ready in the event the CAB FARP is destroyed or the division needs to extend operational reach quickly. Failure to adapt to the new era of combat will leave FARPs, Army aviation, and ultimately our ground forces to suffer the fate of the French–too big, too slow, too predictable, and too vulnerable to the modern era of warfare.

One Standard

If the CAB FARP is too large and cumbersome or positioned too far rearward, the LSCO fight will outrun the CAB's ability to refuel and extend its operational reach. This will ultimately hinder the Air Assault capability from the 101st. Identifying this LSCO capability gap, the 101st Airborne Division (Air Assault) adapted and directed its BCTs to purchase the necessary FARP equipment and to certify all of its 92F Petroleum Specialists to pump aviation-grade fuel. Each BCT was to train and certify its BSBs' Alpha Companies, and FSCs to set up, establish, filter, certify, and execute a two-point FARP using a heavy expanded mobility tactical truck (HEMTT) and HEMTT tanker aviation refueling system (HTARS) in less than 1 hour.

It is commonly misperceived the aviation support battalion distribution company and battalion FSCs in aviation brigades have different fueling capabilities than BCT BSBs. The only difference, however, is the filtration standards adhered to by the CABs. In fact, all 92Fs are trained in both ground and air fueling operations during their advanced individual training, but these skills are perishable. It is imperative that 92Fs continue to train to the standards required of circulating and testing fuel to aviation standards and actively train with aircraft per Army Techniques Publication 3-04.17, "Techniques for Forward Arming and Refueling Points," (Department of the Army, 2018). It will take commander emphasis to ensure that FARP training is an enduring change in BCT sustainment training; and to gain commander-level engagement, FARP operations must be added as a primary mission essential task list task for Alpha Company and FSCs. In the 101st, we are changing the

support structure and culture. Forward support companies are ordering hoses, fittings, nozzles, Aqua-Glo (water detector pad) test kits, filters, spares, and safety equipment, and BCT Soldiers are getting time and repetitions pumping fuel into live aircraft. In the 101st, EVERY 92F pumps aviation grade fuel!

Training the BCT Fuel Distribution Team

By certifying every brigade to establish and execute FARP operations in support of aviation operations, the division is expanding options available to commanders. The 3rd BCT, 101st Airborne Division (Air Assault) took the lead on executing training with CAB expertise and oversight to establish a FARP validation program for all of the division's 92Fs. This nested well with its innovative Concept of Support. The Concept of Support challenged doctrine by making the brigade support area (BSA) as small as possible and massing sustainment personnel and capabilities forward to the FSCs.

As GEN Mark Milley stated during his 2016 Association of the U.S. Army speech, *"The battlefield will also be non-linear, compartmented, and units will have non-contiguous battle space with significant geographical separation between friendly forces. This type of battlefield will place a very high premium on independent relatively small formations"* (Milley, 2016).

Heeding this sage guidance, the 187th Infantry Regiment Rakkasans adapted to limited echeloned communications, rapid aggregation and disaggregation, and constant movement to enhance survivability. Keeping the BSA small, augmenting FSCs with personnel and equipment capabilities, and extending the aviation operational reach will not only present additional challenges to the enemy, but will prevent sustainment from being outpaced by the operational demand.

In order to implement its Concept of Support, the 626 BSB, 3rd BCT, deliberately implemented a training glide path to train its 92Fs incrementally. The training began first with the Alpha Company, 626 BSB executing multiple iterations of familiarization and hot refueling operations and ultimately, being validated by the CAB safety officer. Once validated, 92Fs in Alpha Company will then conduct training with the FSC fuel teams until each battalion fuel team is validated to conduct independent FARP operations. Although the training can be as simple as refueling aircraft after an Air Assault School support mission, the 92Fs collaborated with the 101st CAB to provide the FARPs for two aerial gunneries. This provided realistic training that involved rearming, refueling, sling loads, and multiple iterations. In the near future, Soldiers will conduct a validation exercise where they will receive a date, time, and grid coordinate to tactically convoy to, find cover and concealment, establish communication with the aviators, and expeditiously conduct FARP operations under the security of organic gun truck crews. This culminating FARP operation will validate that the 101st Airborne Division Screaming Eagles outside of the CAB can safely and independently provide FARP capabilities, extending the division's reach throughout the battlefield. This will give the commander multiple options while presenting the enemy multiple dilemmas.

LSCO Concept of Support

In response to a fiscally constrained and reduced force cap, BCT 2020 drastically reduced the sustainment equipment and personnel at BSB and FSC echelons. The *Army Sustainment Magazine* article, "BCT 2020 Logistics: Where the Rubber Meets the Road," explains that the BCT 2020 sustainment force structure is not suitable to sustain the support requirements of the BCT and as a result, a BCT must rely on the division support brigade (DSB) to provide any support requirement gaps (Day, 2016). Brigade combat team 2020 was designed prior to the transition to the LSCO fight, and the modified table of organization equipment (MTOE) of the BSB and FSCs has continued to decrease and pull capabilities from brigades. Consolidating sustainment assets in the rear with the DSB cannot reasonably sustain or keep pace with the LSCO fight; the focus must shift to forward sustainment. On a battlefield where lines of communication between echelons will be challenged and the ability to move rapidly every few hours is the difference between life and death, it is necessary to have as many support capabilities for-

Pump rack module and tank rack module. Photo credited to the United States Army Acquisition Support Center

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From this day to the ending of the world,

But we in it shall be remember'd;

We few, we happy few, we band of brothers;

For he to-day that sheds his blood with me

Shall be my brother; be he ne'er so vile,

This day shall gentle his condition:

And gentlemen in England now a-bed

Shall think themselves accursed they were not here,

And hold their manhoods cheap whiles any speaks

That fought with us upon Saint Crispin's day.

(Shakespeare, 1599, Act 4, Scene 3).

–William Shakespeare
"King Henry V at Agincourt"

ward as possible to keep pace with demand. Adding BCT FARP capability throughout a division supports this concept. Brigade combat team MTOEs need to authorize both the personnel and equipment to support ground and air fuel requirements. Although 101st BCTs are experimenting with support structure changes to better support the LSCO fight (and training to execute FARPs), it is imperative that the MTOEs also change for support personnel and equipment to keep pace.

The infantry BCT MTOE has shifted away from M978 HEMTT fuelers in order to account for reduced manning. It now authorizes tank rack modules (TRMs). The MTOE for Alpha Company, BSB replaces 5x M978s for TRMs and in the FSC formations, TRMs have completely replaced M978s. Alpha Company, BSB is currently authorized 5x TRMs, 5x M978s, a HEMTT HTARS, and 10x 92Fs. Not only is this not enough personnel to simultaneously resupply FSCs while also executing FARP operations, but TRMs can only provide a FARP capability with an additional pump such as a pump rack module or the pump that would come in an advanced aviation forward area refueling system (AAFARS); additional pump capability is not authorized in an infantry BCT. It is clear from the authorization of the HTARS that infantry BCTs are intended to support FARP operations; however, now the LSCO problem set requires the ability to perform ground and air refueling missions simultaneously–for both planned air assaults and contingency situations. The 3rd BCT, 101st Airborne Division (Air Assault) recommends an equipment MTOE change for Alpha Company, BSB to 5x TRMs with an AAFARS, 5x M978A2s and 1x M969A3, and a personnel MTOE change to 26x 92F, 1x 92L (Petroleum Lab Specialist) and 1x 923A (Petroleum Systems Tech). These equipment and personnel additions would allow for Alpha Company to execute both air and ground refueling operations. Additionally, FSCs have lost their M978 HEMTT fuelers, which have been replaced entirely with TRMs. Every FSC, except for Echo Company FSC, is MTOE'd 4x TRMs, but Echo Company is only authorized 3x TRMs, which is a significant mismatch to their engineer equipment fueling needs. The 3rd BCT, 101st recommends that each FSC be authorized 4x TRM, 4x M978 fuelers, HTARS, and 8x 92F. The additional equipping of M978 fuelers back into the FSC formation would allow flexibility at the forward line of troops and free up the load handling system platforms to transport other necessary commodities, such as Class V. Again, in order to keep pace and give commanders options, BCTs must be equipped and manned to refuel both ground and aviation simultaneously in an LSCO fight.

Only when the sustainment warfighting function matches its capabilities to the LSCO fight will there be an enduring culture shift. In the meantime, the 101st continues to take a modernized approach to how it extends its operational reach using decisive maneuver and innovative and adaptive logistics to assault the Screaming Eagles into the fight. The Screaming Eagles of 1944 adopted the moniker as a "Band of Brothers" who, like the English of 1415, also jumped into northern France and fought an enemy using adaptive tactics supported by innovative logistics to win the day. Today's Air Assault troopers stand in the shadows of our forefathers ready for our next rendezvous with destiny. We continue to train new tactics, modernize our equipment, and seek innovative ways to operate from a distance to strike like an Eagle!

BG Clair Gill is the Deputy Commanding General (Support) of the 101st Airborne Division, where he previously served as both a company and battalion commander.

MAJ Bridget Day is currently the 3BCT, 101st ABN DIV Support Operations Officer. Previous assignments include commanding the Juliett Forward Support Company in 1BCT, 82nd ABN DIV and Congressional Fellow with the Office of Congressional Legislative Liaison.

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THE AIR CAVALRY LEADERS COURSE AND AVIATION PROFESSIONAL MILITARY EDUCATION

By MAJ Jeffrey R. Hayes

IF I had $1 for every time a Fort Rucker Course Director or Senior Leader visited my office to ask what the "magic formula" is for the Air Cavalry Leaders Course (ACLC), I might not be wealthy, but I could at least buy lunch for my two instructors and myself. The truth of the matter is—there is no magic. I have only been in the job several months now, but the strengths of ACLC, obvious to those who have attended the course, are observable and repeatable across the full range of Professional Military Education (PME) at Fort Rucker and elsewhere. Overt attempts to simply copy the course map and make slight modifications to include other programs of instruction miss the point entirely—the branch does not need watered-down versions of the ACLC floating around. What it does need, and what I believe drives the intent for spotlighting ACLC during the PME restructure, is using ACLC's strengths to enhance the value and effectiveness of other courses that have their own unique and necessary skills to impart. In this article, I will attempt to briefly list what I believe to be the major strengths of ACLC, how they may be applied to Warrant Officer (WO) and Commissioned Officer PME and skills training, and why the time for such a restructure is now.

First, this article is not a critique of aviation PME as it is. Let us agree as a baseline that any shortcomings of traditional courses (Basic Officer Leaders Course [BOLC], WO Basic Course [WOBC], Aviation Captains Career Course [AVC3], Aviation WO Advanced Course [AWOAC], and WO Intermediate Level Education [ILE]) are not through any lack of professionalism or talent on the part of its instructors, the developers, or of the students. However, a system that sufficed for nearly 2 decades of counterinsurgency (COIN) operations has been identified as needing an overhaul to turn out aviation leaders trained for large-scale combat operations (LSCO), particularly as there are few leaders left in the formations with LSCO experiences to reinforce academic concepts. In short, if they aren't learning it through PME, they are probably not going to pick it up "on the job" at units, because the units don't have uniform LSCO experiences to teach from. Of course, there are exceptions but exceptions are, by definition, not standardized. Using the ACLC as a model for success, as many of our alumni and many senior leaders point out, aviation PME can be updated to more effectively bring useful, necessary, tactical skills more efficiently to aviators across a spectrum of ranks and experiences.

For those who are not familiar with the ACLC, it is a 10 day functional course established in 2015 to teach graduate-level reconnaissance and

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security operations to AH-64 and unmanned aircraft systems (UAS) operators. As the experience with traditional LSCO continues to retire out of the force, with them goes most of the relevant experience in training and executing Cavalry operations at scale. For those familiar with it, the course has a reputation for excellence. It demands long hours, dedication to mastery of the subjects, teamwork across a spectrum of skills, and with a failure rate of approximately 15%, has the very real risk of non-graduation for students who do not meet a very high (but achievable) standard.

There are six major areas where ACLC is fundamentally different from the structure of PME. First, our staff is highly selective. While ACLC staff initially began at twice the present size, we are currently authorized only three instructors, including the course director. Because the staff is small, the chain of command can afford to be highly selective in which officers are chosen to work in this course. As the requirements for instructors increase, it becomes more challenging to be as selective, compared with a smaller pool. Frankly, aviation PME instructor positions are not as highly sought as similar positions at the Maneuver Center, and this is unfortunate. There are many reasons for this—foremost among them is the need for aviators with valid "upslips" to hold flying positions elsewhere. However, changing the perception of PME instruction as one of the more valued and highly selective positions within our community for both Commissioned and WOs would only increase both the quality of the instruction and the receptiveness of the students.

Second, our staff are experts in a very narrow, very specific skill set. As our ACLC Senior WO says so often, we can afford to be the master of one trade; whereas, our PME counterparts have to be proficient across a wide spectrum of topics. To the extent possible, instructors should specialize in narrow subject matters. Of course, they should be moderately well-versed across the broad range of topics in a course, but there is a pronounced difference between a small group planning an Air Assault mission with a Field Artillery small group leader vs. an aviation small group leader who spent 4 years at Fort Campbell. While the PME cadre can never afford to become decisively engaged with only one or two narrow skillsets, maximizing specialization in instructors increases the quality of the instruction. Creation of an Air Assault Leaders Course and an Attack Leaders Course could provide specialized instructors who, along with ACLC, could also guest-instruct in various PME courses, offloading some of the burden from the formal small group leaders. This increases the quality of the instruction within all courses and allows the PME instructors to more sharply focus on other aspects of their program of instruction.

Third, our ideal class is generally composed of four to six Apache captains (CPTs), two to four AH-64 CW3/CW4s, two to three UAS operators, a UAS WO, and a handful of non-aviation enablers (Field Artillery, Military Intelligence, Armor). Unlike PME, which instructs a cohort of roughly similar ranks and experiences at generally the same point in everyone's career, our class builds a team of highly diverse backgrounds, skills, and experience levels. These interactions allow for much more effective planning, synchronization of diverse assets, innovative employment concepts by subject matter experts, and building real-time appreciation of strengths and weaknesses of various ranks, experience levels, and positions. Our post-AVC3 CPTs have foundational planning knowledge but only a fundamental knowledge of the aircraft; our mid and senior WOs have a wealth of technical and tactical considerations, but have limited formal squadron planning experience; our UAS personnel typically lack any squadron-level experience but have the unique perspective of what UAS can and cannot do and common pitfalls and effective employment strategies; our non-aviators bring a realistic ground maneuver perspective that is often referenced in PME but rarely conveyed effectively. According to the Experiential Adult Learning Model, students learn most effectively when they are learning from one another, under the guidance of a facilitator. Expanding the diversity of the class beyond homogenous cohorts magnifies the effect (Pierson, 2017).

While PME probably must remain cohort oriented, imagine a scenario where, during their capstone, the WOBC/BOLC Officers are briefly partnered with students from AWOAC, AVC3, and WO ILE. Far from executing in a vacuum devoid of experience (small group leader oversight notwithstanding), the resulting team creates a valuable give and take across multiple courses with different focuses, while more closely replicating the structure of the team with which they will actually fight. The junior students get a more robust example of what "right looks like" and gain valuable mentorship through the short exercise. The value to the senior students in this relationship is in mentoring those younger officers who will be theirs to continue teaching and mentoring at the units in just weeks to come—in many cases literally at their actual unit. This can be repeated in the senior classes' capstone events, simply by pulling in junior officers to act as pilots in "receive mode." Along with the value of additional aircrews for simulator execution, it adds the "Napoleon's Corporal"[1] wartime strategy factor and more effectively

[1] "During the battle planning stages Napoleon (Bonaparte) would have one of his lowly corporals shine his boots, with the understanding that he knew the corporal would be listening in on his conversation with the rest of his commanders. Following the brief he gave to the other leaders in his army Napoleon would look to the corporal and ask him if the plans made sense. If he answered "yes" then they would go forward with the plans. But if he did not understand them then Napoleon and his staff would make changes or draft new plans" (Carlson, 2016).

tests the quality of the finished plan. Add in the traditional senior mentor, and now you have a truly robust training model for Army aviators at the entry-level, mid-grade level, and senior PME levels.

Fourth, students can fail the ACLC. This is not a point of pride for our instructors, and it is not meant to deride those who have attempted the course and did not meet the graduation standard. In fact, I would submit that as a staff, our proudest moments are when students resolve to re-attempt the course and finally make the grade. But I digress—I would surmise that the likelihood of failing a PME course, short of an honor violation or Uniform Code of Military Justice incident, is extraordinarily remote. I am not arguing that the possibility of failure, in itself, is a key motivator. Nevertheless, the linkage between the scope of the challenge presented and the appreciation for the education is clear. During the course, our students receive updated and detailed academics on a handful of topics with cavalry implications, plan and execute three Air Cavalry missions as a squadron staff, and then fight their plan as an Air Cavalry Troop in the simulator. To graduate, they have to pass an all-encompassing doctrine exam and present an individual practical exercise to an ACLC instructor, both completed with very little sleep compared to any other aviation school, and prepare for these during a class with a very high operating tempo. If it is true as the political philosopher and writer, Thomas Paine, said, "what we obtain too cheaply, we esteem too lightly" (1776), then graduates of ACLC have good cause to value their coin and certificate. I do not presume to know what the correct tempo and rigor is for various PME levels, and frankly, I think it is universally acknowledged that ACLC could do with an extra few days to maintain the rigor but increase the available sleep. One thing is for certain: there is no wasted time, no "home by 1500" days, and no free pass on graduation day.

Fifth, our students walk away with an immediate appreciation for the application of this training. Nearly all of them will return to an operational assignment where they become a member of a very small core group who understand the detailed requirements of effective reconnaissance and security. Contrast this with an AVC3 student who spends 5 months learning the military decisionmaking process, often after they've served in a primary staff role and are looking forward to an imminent company command. Or an AWOAC CW3 who learns the finer points of writing an Army memorandum. Or an aviation CW4 who learns about "Operational Approach" and campaign planning but will return to her unit as the squadron aviation mission survivability officer. Again, not a commentary on what right looks like, but a comparison that ACLC teaches skills with immediate application to the student where they are in space and time, not abstract skills for some undetermined date in the future.

During a downed aircraft training exersice, Soldiers of Company F, 3rd Battalion, 1st Air Cavalry Brigade, 1st Cavalry Division, Multi-National Division – Baghdad, go through the motions of treating the pilots as two UH-60 Black Hawk Helicopters from 3rd Bn., 1st ACB, bring in the downed aircraft recovery team to a training site, at Camp Taji, Iraq, north of Baghdad. U.S. Army photo credited to SGT Travis Zielinsky

Last, our students test their plan against a highly realistic enemy. The "back side" of the three scenarios that each class fights, along with the products that they are provided from with which to base their plans, are extremely realistic and well researched. The enemy composition and course of action is solidified in advance, and no "gotcha" changes are introduced during execution for the purposes of developing targeted skills. No, at ACLC, if your class builds a good plan and fights it well, incorporating the lessons and techniques taught throughout the course, you can be successful in the simulation—there is already plenty of friction without us adding to it!

There are teaching points and elements which are universal across each class, and there are unique takeaways from each class, as well. Some will violently execute a decent plan and be successful. Many will find that even a great plan executed with timidity is insufficient in the face of a determined enemy force.

Ultimately though, the execution of even simple concepts in the aircraft, across an Air Cavalry Troop—in contact—is vastly more difficult if the detail work hasn't been done thoroughly. This is why the ACLC's class days run so much longer than most other courses—as our students plan, fight, and learn, they grow a deeper appreciation for which details are truly important and which are less so. When the "alpha call" is predetermined, the only variable left to buy more planning time is paid for with personal time. Another oft-repeated question in our course is "How much time do you devote to planning?" And the answer is, as our alumni will respond is, "All that you have." Many of us view this as more of a 10-day field problem than it is platform instruction. While our staff demands students meet the minimum level of excellence to be mission complete for a given day, the amount of buy-in toward achieving a plan that the team can be proud of is something I have not seen matched anywhere else.

Leaders who will shape the various PME (and functional courses) going ahead may use all or any combination of these attributes to reshape courses going forward. Some of these would require a significant amount of energy and cooperation across multiple lines of effort; a few, like drawing students from various echelons of training to participate in other exercises are already being experimented with in a small scale and require only a formal commitment from the appropriate leaders to formalize. I have provided one possible example (Figure) for the interactions of various PME and skills course based on the Commanding General's vision, discussions with other course directors and leaders, and to some extent—my own imagination—but it is by no means the only way. The important takeaway is that with the input of others from across the force, I am certain that the best attributes of the ACLC can be brought to bear with great effect across the full range of aviation PME and skills training. We can ensure that the aviation force of 2028 and beyond is ready to fight and win the first engagement and every engagement after.

SCOUTS OUT!

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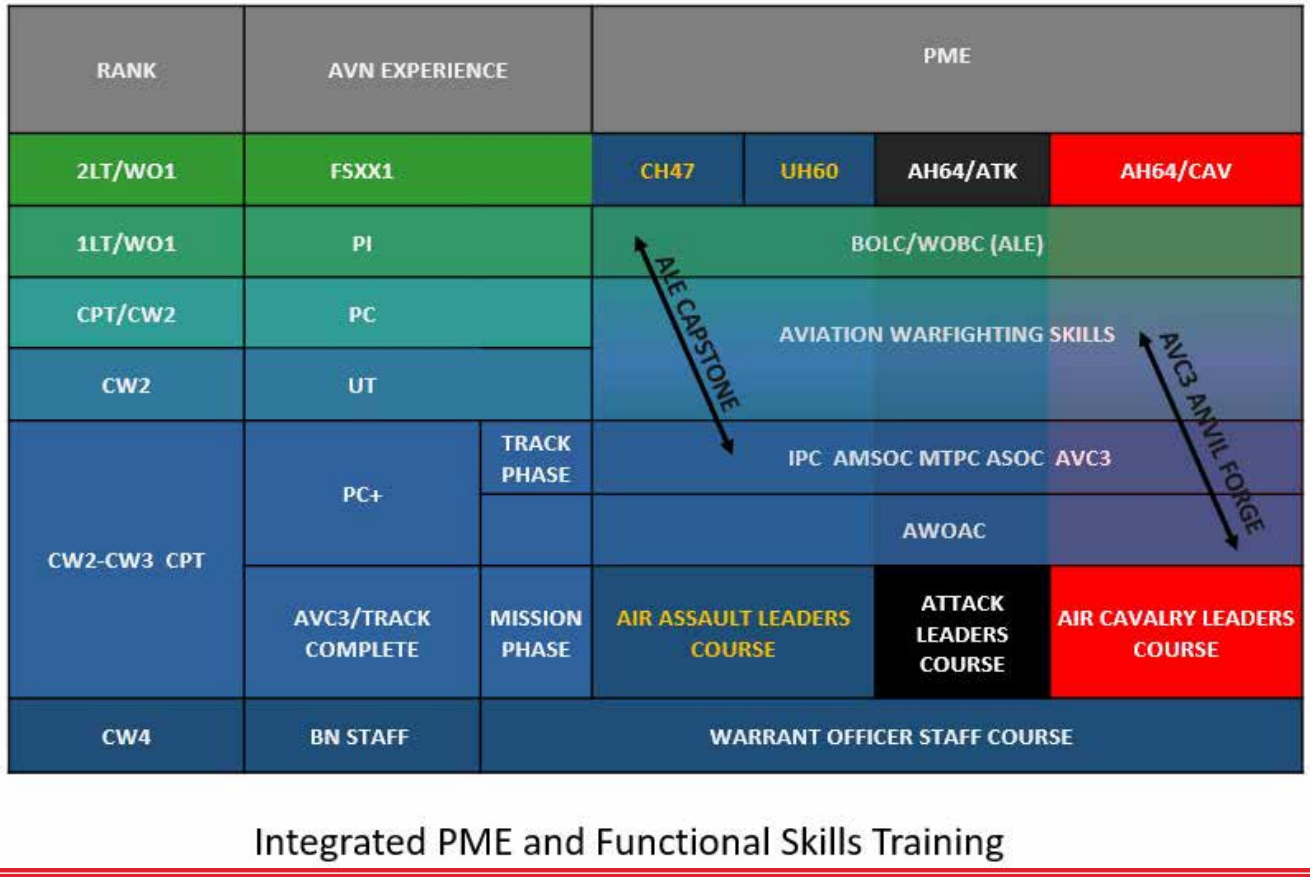

Figure. Possible concept of integrated PME and functional skills training (Hayes, 2020).

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DOWNED AIRCRAFT RECOVERY

GETTING IT RIGHT THROUGH TRAINING

By CPT Derek Hirsch and MAJ John Bolton

Downed UH-60 recovery. U.S. Army photo credited to CPT Derek Hirsch

In July 2020, the 25th Combat Aviation Brigade (CAB) successfully completed a live aircraft recovery from a field site back to Wheeler Army Airfield. After a hard landing during an early morning Air Assault supporting the division's 2nd Infantry Brigade Combat Team (IBCT), a UH-60M Black Hawk needed recovery from a remote training site. Initial assessment was that the aircraft was unflyable due to potential driveshaft damage near the tail-boom and a crack in the tail pylon. While the aircraft was in an open field, it came to rest on a 25-degree nose-high slope. Heavily wooded and narrow roads precluded ground recovery. The CAB commander elected to activate the Aviation Support Battalion's (ASB) Downed Aircraft Recovery Team (DART). Four days later, the Black Hawk returned to Wheeler Army Airfield via a CH-47 sling load, recovered safely with minimal damage.

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The safe, professional execution of this operation was not an ad hoc success but resulted from the hard work of the Aviation Support Company (ASC) DART leadership and battalion-level support structure. This article describes aircraft recovery operations, capabilities, and training requirements before closing with a narrative of the July recovery and recommendations. In doing so, we hope to provide "a way" to build an effective DART capability within Army aviation's tactical units.

WHAT IS DART?

The ASC provides each CAB with a unique recovery capability. Though every flight battalion within the CAB maintains DART capability, the ASC DART steps into a situation and exceeds flight battalion DART capabilities, typically whenever recovery extends beyond minimal maintenance to make the aircraft flyable (immediate recovery). According to Army Techniques Publication 3-04.13, "Aircraft Recovery Operations," the DART is comprised of personnel and equipment assigned to support immediate, delayed, or dedicated recovery. As of Fiscal Year 2019, only the ASC has the Unit Maintenance Aerial Recovery Kit (UMARK) assigned—making the ASC the brigade's lead organization for dedicated DART (Department of the Army, 2018, pp. 1-5 to 1-7). The ASC can recover downed aircraft in any environment, to include slinging the aircraft using a CH-47 (or other heavy-lift helicopters). However, just having the personnel and equipment on hand is not enough. Downed Aircraft Recovery Team training requires a deliberate training plan to build an effective team (Figure 1), develop familiarity with specialized equipment, and integrate with the ASB and larger CAB.

The ASC DART consists of maintainers and technical inspectors for each airframe, supplemented by airframe, hydraulics, engine, powertrain, avionics, and armament specialists. We recently added a dedicated security noncommissioned officer in charge (NCOIC) tasked with coordinating crash site security and entry/exit coordination.

TRAINING THE TEAM

During the year prior to the UH-60 recovery, Bravo Company, 209th ASB (B/209th) made DART training a priority, building and validating a standard operating procedure (SOP) and integrating DART training alongside regularly executed Army Regulation 350-1, "Army Training and Leader Development," training (Department of the Army, 2017). We also executed monthly telephonic and muster alerts, along with quarterly full-scale DART Exercises (DARTEXs). To develop Soldier skills, we planned a robust Sergeant's Training Time plan focused on convoy operations, along with UMARK training on each aircraft, including non-standard airframes such as an S-60 and an OH-58 hull. The quarterly exercises served as cumulative events, helping to validate SOPs and identify shortfalls. When able, the company incorporated DART exercises into larger events to practice a handover from the owning flight battalion to the ASC (Department of the Army, 2018, pp. 1-5 to 1-7). Each quarter, we focused on a different airframe. This differentiation allowed Soldiers to rotate through weekly security training focused on basic warrior tasks, as well as airframe-specific rigging procedures. The team trained on a stripped S-60 Seahawk for live-sling operations (a training aid unique to Hawaii), and became proficient in AH-64s, CH-47s, and UH-60A/L/M rigging procedures.

The UMARK familiarization was a primary focus area. The UMARK is a set of sling legs and attachments, allowing different configurations for multiple airframes across the Department of Defense, to include cradle and one- or two-point configurations, should an aircraft roll following an accident. While the kit enables recovery of each Army airframe, it requires extensive training to understand the rigging and slinging procedures.

Training increased in complexity as we included sister flight battalions and companies by incorporating live aircraft, medical personnel, and other ground support such as a wrecker crew. For example, our

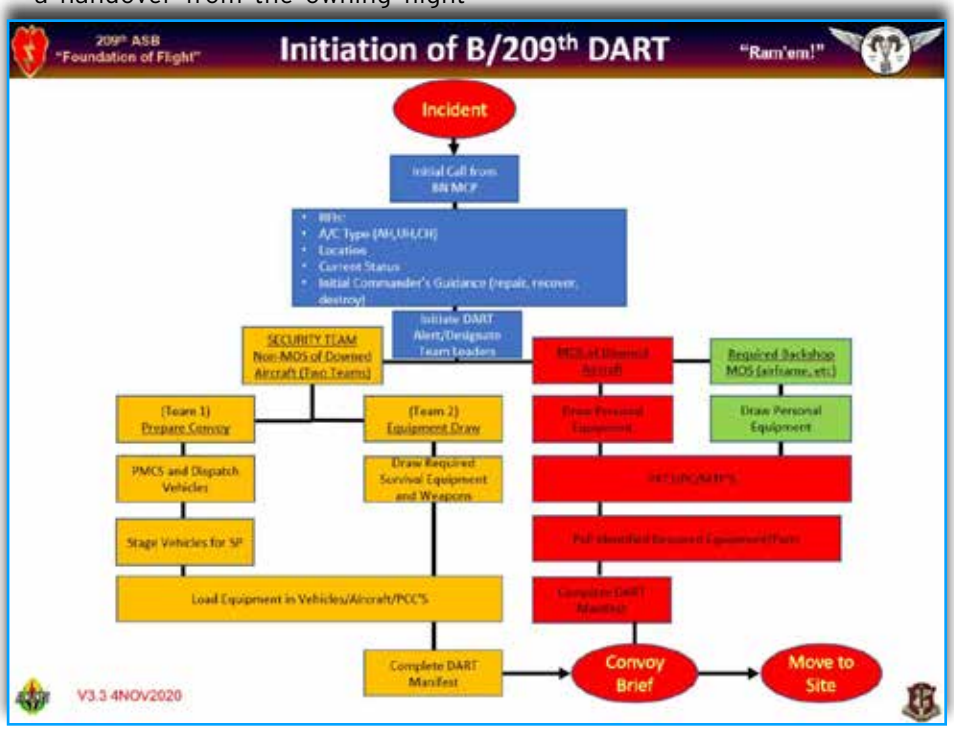

Figure 1. B/209th DART battle drill (Bolton, 2020).

Seahawk used for DART training. U.S. Army photo credited to CPT Derek Hirsch

May 2020 exercise consisted of an AH-64D providing aerial escort and landing zone (LZ) reconnaissance before landing to be the "recovered aircraft." Each DARTEX consisted of an alert, staging, convoy operations, securing the helicopter LZ, assessing the aircraft damage, and using the UMARK to rig the aircraft for sling load. Fundamental to this effort was building SOPs to include packing lists, alert checklists, and designating leads and teams by airframe event. We created templated manifests, which are adaptable to a ground, air, and mixed deployment (Figure 2). Each Soldier had a "go bag" loaded in the designated DART container, packed with 3 days of supplies. Additionally, we ensured our alert and notification, as well as critical information requirements such as airframe condition, were clear to the battalion and brigade headquarters.

JULY 2020 UH-60 RECOVERY

On July 10, 2020 at approximately 0130, having received notice from the CAB commander, the ASB alerted the Bravo Company Commander via cell phone and issued the WARNING ORDER. The DART was not postured for immediate recall, but was prepared nonetheless, with all equipment staged in a container (per SOP). The team OIC and NCOIC acted with haste to alert Soldiers across the island for a 2-hour recall.

We quickly utilized established alert procedures to dispatch our DART vehicles, which included light medium tactical vehicles, Single Channel Advanced Military Strategic and Tactical Relay System (MILSTAR) Terminal Program (SCAMP), bob tail with low bed trailer, aircraft tool kits, and personal equipment. By 0700, all equipment was staged, and NCOs completed pre-mission checks per the SOP. We also implemented a brigade-wide text chat to maintain situational awareness for all key players. We discussed all possible courses of action (COA) for repair and recovery, given our limited information, and tailored our SOP packing list accordingly. The recovery mission was officially assigned to the team 3 hours later.

During DART training, we simulate a combat environment with an enemy presence and time constraints. While this prepared us for a tactical environment, deliberate garrison operations should not be executed with similar time constraints. The crash site was secure; the crew was safe and already recovered. Additionally, brigade safety personnel required 48 hours to complete their investigation before allowing the recovery team to perform hands-on assessment of the aircraft. Therefore, we decided to fly only key leadership to the crash site for a reconnaissance and Battle Damage Assessment that morning, just 10 hours after the accident.

Arriving on scene, the DART re-

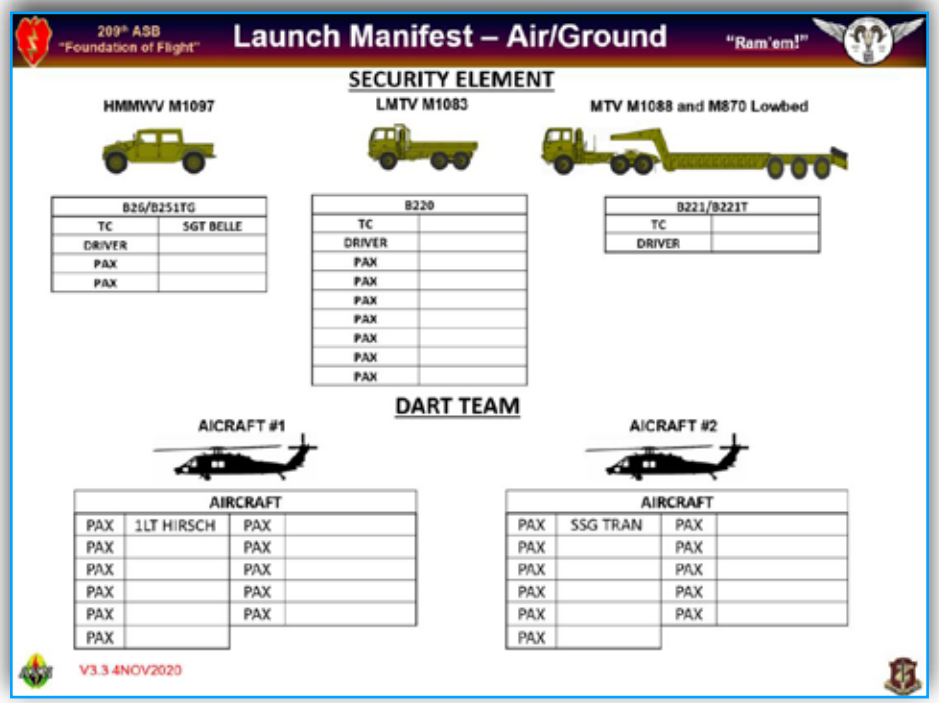

Figure 2. B/209th DART manifest (Bolton, 2020).

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M984A1 wrecker securing the downed aircraft. U.S. Army photo credited to CPT Derek Hirsch

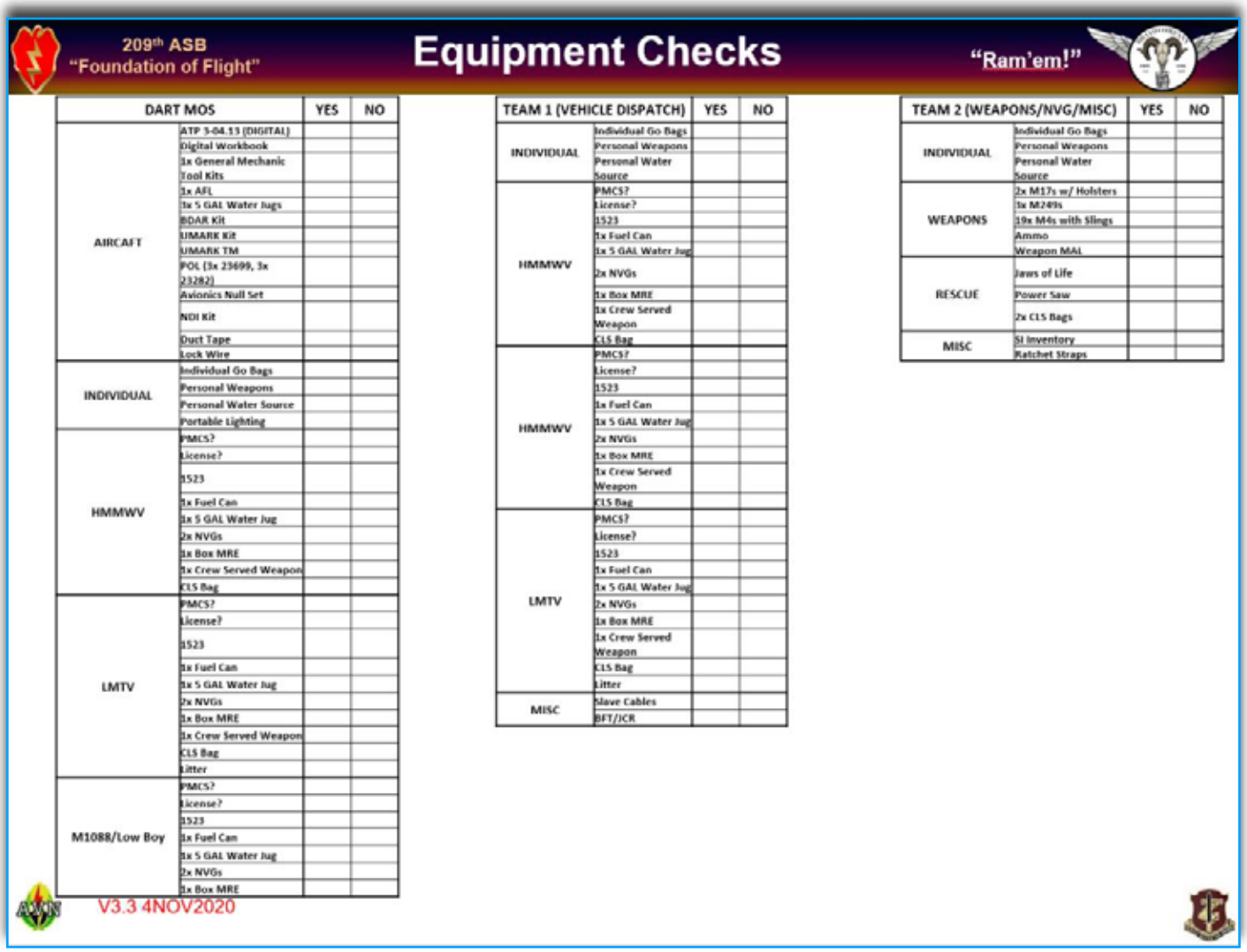
quirements became clear. The UH-60 was resting on a 25-degree nose-high slope with the tail yoke snapped off and the tail resting on a broken stabilator. There was no sign of any sudden rotor stoppage or any further damage forward of the tail pylon. We assessed the aircraft to be unrepairable in the field due to the tail pylon damage and likely driveshaft compromise, so our focus turned to either ground or aerial recovery.

Over the next 24 hours, we developed two COAs. Course of action 1 was to sling the downed aircraft using the UMARK. The team would need to stabilize the aircraft, remove the main rotor blades, and attach the UMARK sling legs so a CH-47 could sling the aircraft home. Course of action 2 was to ground recover the aircraft. Because of the UH-60's wide wheelbase, a standard Army trailer was not suitable, and with the 25th Infantry Division being a light division, a tracked crane capable of lifting the aircraft was not readily available. Due to the rough terrain, a commercial crane and truck could not access the site without substantial modification to the road, (in fact, our SCAMP had to off-load nearly a mile from the site) leaving the team with the only option of slinging the UH-60 back home. Our COA was approved after presenting a detailed plan to our battalion and brigade commanders.

Essential air-ground communications. U.S. Army photo credited to MAJ John Q. Bolton

Before we could sling the aircraft, we identified multiple tasks and challenges, some of which required creative solutions. The CAB's designated de-fuel unit, E/3-25 General Support Aviation Battalion (GSAB) removed nearly 1,200 pounds of fuel to make the aircraft safer and easier to move. To prevent the aircraft from rolling down the hill, we secured the aircraft using the winch from an M984A1 heavy expanded mobility tactical truck wrecker placed 30 meters uphill, attached to the side-step fairings using two borrowed tow plates from an air transportability kit (normally used to tow an aircraft for air or sea load). We also braced each wheel with a dozen sandbags and set the aircraft brakes. These steps allowed the team to safely climb on top of the aircraft and remove the main rotor blades using the SCAMP. Following blade removal, a Chinook from B/3-25 GSAB arrived with blade boxes to safely recover the blades back to Wheeler Army Airfield. In order to reduce the risk of further airframe damage upon landing at Wheeler, we decided to replace the tail yoke and strut assembly in the field, making the aircraft towable and eliminating the need to cushion the tail after sling operations. We placed three 5,000-pound cargo straps around the tail cone and lifted the aircraft tail off the ground using our SCAMP, while still secured to the wrecker. While lifted, the team replaced the tail yoke and removed the damaged stabilator.

The final day began with aircraft-specific UMARK refresher training at the ASC followed by sling load rehearsals with the Chinook aircrew. To ensure the aircraft did not spin, we used the dual point UMARK hookup technique to the Chinook, eliminating the need for a drogue chute. Two hours after arriving at the crash site, the aircraft was rigged, certified, and the crash site was swept for debris prior to the Chinook arriving on scene. A spotter for the Chinook was required because the UMARK sling legs are 182 feet, much longer than a normal sling payload, which limits the crew's ability to locate itself relative to the load. The spotter stood 200 meters away from the downed aircraft with direct communications with the pilots using a manpack ra-



DART MOS		YES	NO
AIRCAFT	ATP 3-04.11 (DIGITAL)		
	Digital Workbook		
	1x General Mechanic Tool Kits		
	1x AFL		
	1x 5 GAL Water Jugs		
	BDAR Kit		
	UMARK Kit		
	UMARK TM		
	POL (3x 23699, 3x 23282)		
	Avionics Null Set		
	NDI Kit		
	Duct Tape		
	Lock Wire		
INDIVIDUAL	Individual Go Bags		
	Personal Weapons		
	Personal Water Source		
	Portable Lighting		
HMMWV	PMCS?		
	License?		
	1523		
	1x Fuel Can		
	1x 5 GAL Water Jug		
	2x NVGs		
	1x Box MRE		
	1x Crew Served Weapon		
	CLS Bag		
LMTV	PMCS?		
	License?		
	1523		
	1x Fuel Can		
	1x 5 GAL Water Jug		
	2x NVGs		
	1x Box MRE		
	1x Crew Served Weapon		
	CLS Bag		
	Litter		
M1088/Low Boy	PMCS?		
	License?		
	1523		
	1x Fuel Can		
	1x 5 GAL Water Jug		
	2x NVGs		
	1x Box MRE		

TEAM 1 (VEHICLE DISPATCH)		YES	NO
INDIVIDUAL	Individual Go Bags		
	Personal Weapons		
	Personal Water Source		
HMMWV	PMCS?		
	License?		
	1523		
	1x Fuel Can		
	1x 5 GAL Water Jug		
	2x NVGs		
	1x Box MRE		
	1x Crew Served Weapon		
	CLS Bag		
HMMWV	PMCS?		
	License?		
	1523		
	1x Fuel Can		
	1x 5 GAL Water Jug		
	2x NVGs		
	1x Box MRE		
	1x Crew Served Weapon		
	CLS Bag		
LMTV	PMCS?		
	License?		
	1523		
	1x Fuel Can		
	1x 5 GAL Water Jug		
	2x NVGs		
	1x Box MRE		
	1x Crew Served Weapon		
	CLS Bag		
	Litter		
MISC	Slave Cables		
	BFT/JCR		

TEAM 2 (WEAPONS/NVG/MISC)		YES	NO
INDIVIDUAL	Individual Go Bags		
	Personal Weapons		
	Personal Water Source		
WEAPONS	2x M17s w/ Holsters		
	1x M249s		
	19x M4s with Slings		
	Ammo		
	Weapon MAL		
RESCUE	Jaws of Life		
	Power Saw		
	2x CLS Bags		
MISC	SI Inventory		
	Ratchet Straps		

Figure 3. DART equipment checklist (Bolton, 2020).

dio. On day 4, the downed UH-60 lifted off the ground underneath the CH-47 to head home.

Recovery at Wheeler Army Airfield required prior coordination. Airfield management required us to set the aircraft down on grass in the middle of the airfield to minimize the risk to personnel and ground equipment. Once on the ground, a separate dedicated recovery team was postured with a tug. They taxied the aircraft to a parking spot at the ASC hangar for follow-on assessment and repairs.

SUMMARY AND RECOMMENDATIONS

The events of July 2020 validated our DART training and technical competence. It also highlighted several areas to sustain and some areas for improvement. Adequate planning time and NCO leadership were the reasons for our success. Early reconnaissance of the aircraft and site conditions allowed us to identify shortfalls and friction points, along with a deliberate P4T3 (problem, people, parts, plan, tools, time, and training) for each individual task prior to execution and published it early, allowing leaders enough time to plan and rehearse their individual responsibilities. Additionally, the senior UH-60 Technical Inspector utilized the brigade's Logistics Assistance Representatives often.

We identified the need for varying degrees of readiness and recall. While deployed, the DART will likely maintain 24-hour recall ability (1-hour show, 3 hours to ready, for example). In garrison however, units should consider elevating DART readiness during major training exercises; however, generally, garrison DART is a deliberate mission without recall requirements.

We updated our SOP to include alert criteria for DART missions, including personnel and appropriate recall times, as well as updating our checklists (Figure 3). The event exposed some inoperative special equipment such as inflatable airbags and rescue saws, which had not been previously used or required unique training. Deliberate maintenance plans for these items will improve our DART capabilities. Future consideration will be given to removing anything vulnerable to damage during sling operations. As the CH-47 lifted the aircraft, a sling clevis struck and chipped the tail

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rotor of the Black Hawk, requiring additional repairs. Although not required per the technical manual, the tail rotor could have been removed. We also secured our own set of tow plates and a set of field-worthy ladders to our DART equipment, as well as a DART-specific set of battery-operated tools (e.g., reciprocating saw and impact driver).

Detailed planning paired with having skilled and effective NCOs and the trust of the command team allowed for the plan to be executed as briefed. The climate for mission success was created long before the DART by entrusting NCOs to lead and train.

CPT Derek Hirsch is the Maintenance Platoon Leader and DART OIC for Bravo Company, 209th ASB. He previously served as a MEDEVAC Section Leader and Assistant S3 Operations Officer in 3-25 GSAB. He holds a physics degree and is a UH-60M Pilot in Command with over 550 flight hours.

MAJ John Bolton is a doctoral candidate at Johns Hopkins SAIS through the Army's Advanced Strategic Policy Planning Program (ASP3). He previously commanded Bravo Company, 209th ASB and served as the Executive Officer for 2-25 Assault Helicopter Battalion in the 25th CAB. He is a graduate of the Command and General Staff College's Art of War Scholars Program and holds degrees in military history and mechanical engineering. An AH-64D/E Aviator with over 1,800 flight hours, his assignments include 1st Engineer Battalion, 1-1 Attack Reconnaissance Battalion, and 4/25 IBCT (Airborne) with multiple combat deployments.

B/209th DART. U.S. Army photo credited to MAJ John Q. Bolton

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CAVALRY OPERATIONS IN THE DIVISION FIGHT AND THE NEED FOR A SCOUT

BY CW4 ELDEN ENGELHARD

We've all seen that Soldier wearing a weathered and stained Stetson as he walks across post. Those outside of the Cavalry Brotherhood gibe him; he remains steadfast and undeterred, simply disregarding them. All have their own perceptions about cavalry, based on individual experiences, but what is the meaning of Cavalry Ethos beyond the accoutrements? Anyone who has served in a cavalry organization can provide any number of historical examples, but does that equate to the cavalry still being relevant in today's operational environment (OE) where space, cyber and electromagnetic activities, unmanned aircraft systems (UAS), and other advanced technologies flood the modern battlefield? What purpose will the cavalry serve, and more pertinently, what is its role in future large-scale combat operations (LSCO)?

The 1st Air Cavalry Brigade deployed in support of Hurricane Dorian relief effort September 2. The lead federal agency for hurricane response is the Federal Emergency Management Agency (FEMA) and with the U.S. Department of Defense (DoD) forces, the Air Cavalry has the ability to rapidly move and sustain personnel and equipment, and, if needed, conduct search and rescue operations. U.S. Army photo by MAJ Paul M. Oliver

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We've all received numerous professional development sessions, read articles, and carried on discussions about the transition back to LSCO after the last 15+ years of counter-insurgency (COIN) operations. I believe the bottom line is that Army aviation must continue to regain its proficiency in LSCO through rigorous and accurate training. That being said, how do we move forward and properly train for it? A cornerstone is conceptualizing the OE of the future and how LSCO will unfold within it. This future OE will be unlike any other yet experienced in history, at least initially. Through this understanding, only then can one truly appreciate the purpose of each formation within the division, and ultimately, the division's need for cavalry.

The 1st Air Cavalry Brigade deployed in support of Hurricane Dorian relief effort September 2. U.S. Army photo by MAJ Paul M. Oliver

So what does the next fight look like? Insight gleaned from various open-source reports and a touch of tactical logic can give one a good idea. Take for instance, the official birth of Space Force, emerging only recently from the celestial realm of the Air Force. While much of Space Force's capabilities will remain highly classified, it is no secret our adversaries are actively working to counteract and/or overtake our own capabilities. Can we simply rely on such advanced technologies to win the next conflict? That is a trap we cannot fall prey to.

Should the next global conflict start, the fight will certainly initiate in the advance domains of space and cyber. Fires and effects from these domains, plus those of the intercontinental ballistic missile, long-range kinetic weapon, hybrid threat, etc., will target key objectives of our respective adversary. Of those key objectives, advanced technologies will be a priority. As the conflict develops, each side will quickly find themselves without, or in a best case scenario, with very limited use of, these technologies. The remaining forces will eventually find themselves back at a basic level of combat, facing off in hand-to-hand and direct fire battle.

A great analogy to grasp this is reviewing the novel use of hot air balloons during the Civil War. Balloons were used by both sides to gain intelligence about the enemy many miles ahead of one's forces and to direct cannon fires onto them (American Battlefield Trust, n.d.). Through these shaping effects, ground maneuver forces closed with each other and battled via direct fires until a decisive outcome was achieved. Cannons prepared and were a force multiplier to the fight, but they did not finish it. Applying that thought to the future conflict but at a greater scope, space and cyber will prepare, shape, and support (to whatever limited capability) the required direct fires that are needed to finish the fight, where souls behind sights and sensors aim guns and spew lead with exceptional violence toward their enemy.

This is where the future conflict returns to force-on-force scenarios, where the tactical unit of execution returns to the division (Field Manual 3-0, "Operations") (Department of the Army, 2017). Divisions will be pitted against the adversary's divisions, each side looking to gain an advantage as the confines of the OE such as terrain, weather, and civil considerations allow. Support from satellites and long-range communications is sparse at best. The same can be said with cyber. Units must rely heavily on locally sourced intelligence and direct communications. Understanding how a U.S. Army division doctrinally fights is imperative, as is understanding the enemy's playbook. The side who has the best intelligence and maneuvers their forces accordingly, wins. Behold, the need for cavalry.

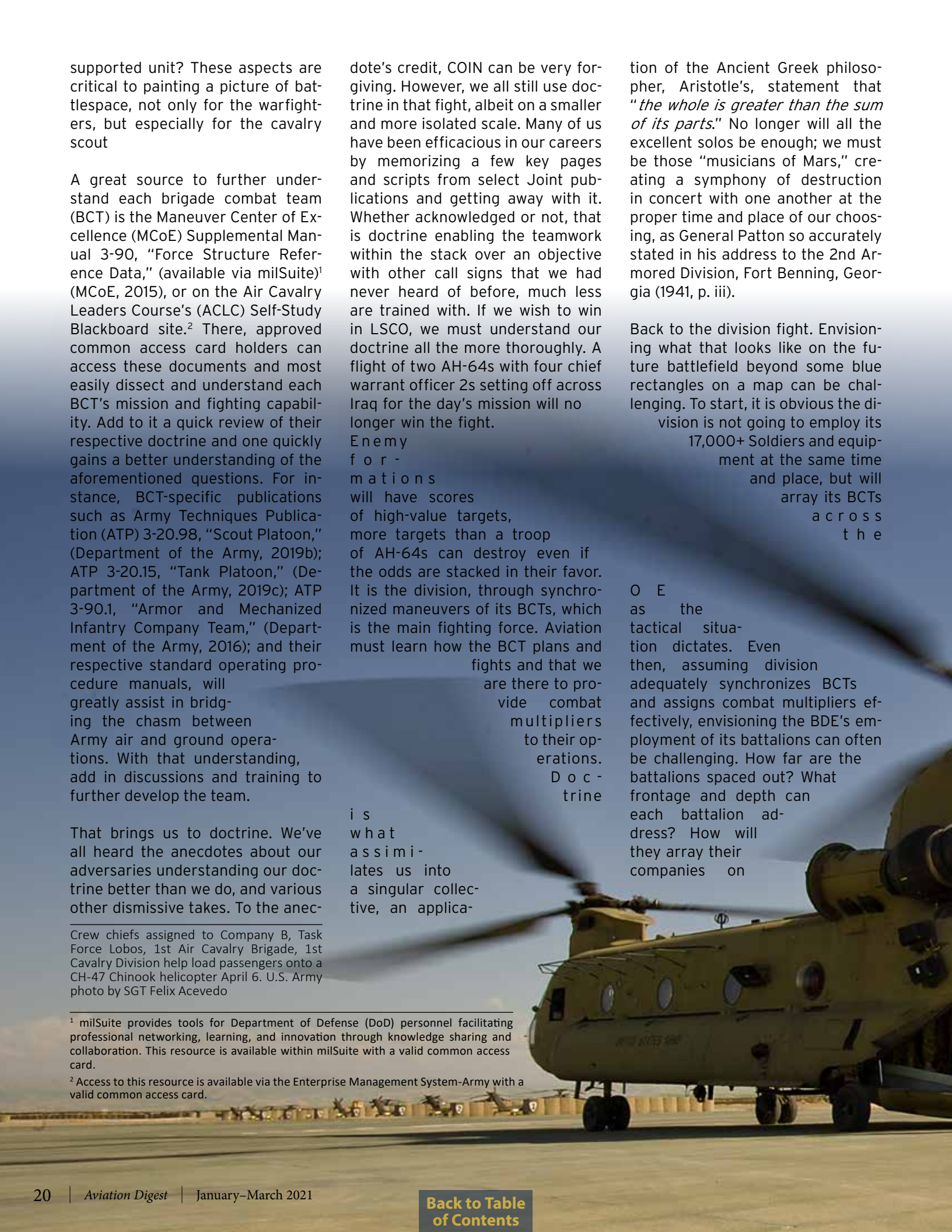
To be successful in the future battle, one must first understand it and how they fit in to the division's mission. To comprehend this division battle, one must understand both the forest and the trees; battlespace is the key. How do subordinate commanders refine their portion of the plan while remaining synchronized with the division's maneuver? How does a friendly division doctrinally array and fight its brigades? How do brigades array and fight its battalions? How far can the supported unit see or sense the enemy? What are the engagement ranges and weapon systems being used by the

supported unit? These aspects are critical to painting a picture of battlespace, not only for the warfighters, but especially for the cavalry scout

A great source to further understand each brigade combat team (BCT) is the Maneuver Center of Excellence (MCoE) Supplemental Manual 3-90, "Force Structure Reference Data," (available via milSuite)[1] (MCoE, 2015), or on the Air Cavalry Leaders Course's (ACLC) Self-Study Blackboard site.[2] There, approved common access card holders can access these documents and most easily dissect and understand each BCT's mission and fighting capability. Add to it a quick review of their respective doctrine and one quickly gains a better understanding of the aforementioned questions. For instance, BCT-specific publications such as Army Techniques Publication (ATP) 3-20.98, "Scout Platoon," (Department of the Army, 2019b); ATP 3-20.15, "Tank Platoon," (Department of the Army, 2019c); ATP 3-90.1, "Armor and Mechanized Infantry Company Team," (Department of the Army, 2016); and their respective standard operating procedure manuals, will greatly assist in bridging the chasm between Army air and ground operations. With that understanding, add in discussions and training to further develop the team.

That brings us to doctrine. We've all heard the anecdotes about our adversaries understanding our doctrine better than we do, and various other dismissive takes. To the anecdote's credit, COIN can be very forgiving. However, we all still use doctrine in that fight, albeit on a smaller and more isolated scale. Many of us have been efficacious in our careers by memorizing a few key pages and scripts from select Joint publications and getting away with it. Whether acknowledged or not, that is doctrine enabling the teamwork within the stack over an objective with other call signs that we had never heard of before, much less are trained with. If we wish to win in LSCO, we must understand our doctrine all the more thoroughly. A flight of two AH-64s with four chief warrant officer 2s setting off across Iraq for the day's mission will no longer win the fight. Enemy formations will have scores of high-value targets, more targets than a troop of AH-64s can destroy even if the odds are stacked in their favor. It is the division, through synchronized maneuvers of its BCTs, which is the main fighting force. Aviation must learn how the BCT plans and fights and that we are there to provide combat multipliers to their operations. Doctrine is what assimilates us into a singular collective, an application of the Ancient Greek philosopher, Aristotle's, statement that "*the whole is greater than the sum of its parts*." No longer will all the excellent solos be enough; we must be those "musicians of Mars," creating a symphony of destruction in concert with one another at the proper time and place of our choosing, as General Patton so accurately stated in his address to the 2nd Armored Division, Fort Benning, Georgia (1941, p. iii).

Back to the division fight. Envisioning what that looks like on the future battlefield beyond some blue rectangles on a map can be challenging. To start, it is obvious the division is not going to employ its 17,000+ Soldiers and equipment at the same time and place, but will array its BCTs across the AO as the tactical situation dictates. Even then, assuming division adequately synchronizes BCTs and assigns combat multipliers effectively, envisioning the BDE's employment of its battalions can often be challenging. How far are the battalions spaced out? What frontage and depth can each battalion address? How will they array their companies on



Crew chiefs assigned to Company B, Task Force Lobos, 1st Air Cavalry Brigade, 1st Cavalry Division help load passengers onto a CH-47 Chinook helicopter April 6. U.S. Army photo by SGT Felix Acevedo

[1] milSuite provides tools for Department of Defense (DoD) personnel facilitating professional networking, learning, and innovation through knowledge sharing and collaboration. This resource is available within milSuite with a valid common access card.

[2] Access to this resource is available via the Enterprise Management System-Army with a valid common access card.

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the given terrain, as that's where aviation will often find its end users? Knowing our capabilities and doctrine, as addressed earlier, helps us understand and plan accordingly.

Addressing our adversary, the same level of understanding must be applied. Proper intelligence preparation of the battlefield (IPB) is a must if we are to create a plan that will facilitate our team winning the fight. Aviation units, as a whole, are behind the power curve. Units need to dig into ATP 2-01.3, "Intelligence Preparation of the Battlefield," (Department of the Army, 2019a) and *train* on this (reading is not enough). While you're there, note the excellent content in appendices A and B. Intelligence Preparation of the Battlefield is critical to successful aviation mission planning, as outlined throughout Field Manual 3-04, "Army Aviation," Chapter 3 (Department of the Army, 2020). There's no excuse not to be familiar with it.

When we evaluate the enemy, we have two sources: doctrine and experience (which include input from the three-letter agencies). A great resource for this information is CPT Lindsay G. Heisler's *Aviation Digest* article (2020), *Tactical Mission Planning: How Enemy Threat and the Eight Forms of Contact Should Drive Friendly Scheme of Maneuver*. It is a great piece and worth your time.

Now that we have the source knowledge, **let's put it to use through this hypothetical vignette**:

Through the escalation of your choosing, World War III has started. Global forces choose sides and begin delivering spectacular multidomain attacks. Advanced technologies do their part, but are within weeks, nearly nonexistent for both sides. Wills are not broken, and conflict ensues. Donovian forces are now pushing west, fighting their way through contiguous partnered countries with minimal resistance. On the western edge of Atropia, the U.S. and partnered forces are working to rapidly build combat power and set the defense. This defense is tasked to stop the advance of the Donovians and seize the initiative. Once accomplished, the forces will rapidly transition to the offense and begin the counterattack.

To support this operation, a U.S. infantry division (ID) is tasked to disrupt Donovian logistical operations within the deep area. After a successful Joint-Force Entry (JFE) mission, the ID rapidly builds combat power in the northern portion of Atropia, midway between the Atropian defense and border of Donovia. The division must move south, identify their target's center of gravity (COG), and destroy it. The Donovians, after receiving intelligence of the JFE operation, reinforce logistical nodes and prepare a counter-attack force.

After the JFE operations, the U.S. ID prepares its movement south. Using the latest intelligence, though sparse, the staff begins refining combat plans. On the map table, the area of operation is laid out and the modified combined obstacle overlay is developed. Known and suspected enemy locations are plotted, including their objective some 150 kilometers away. Terrain is generally rolling hills with winding rivers and moderate vegetation, offering numerous positions of advantage for the side that is prepared. Seven primary mobility corridors are identified and broken down into three avenues of approach (AA), all with distinct advantages and disadvantages. Intelligence from one of the few remaining high-altitude satellites suggests an enemy division task group is forming near the ID's objective. Future intelligence from the satellite is unlikely, and in no way can it come soon enough. The division further develops the corps assessed plan of how the opposing Donovian division will deploy their four brigade tactical groups. Using Training

Crew chiefs assigned to Company B, Task Force Lobos, 1st Air Cavalry Brigade, 1st Cavalry Division help load passengers onto a CH-47 Chinook helicopter April 6. U.S. Army photo by SGT Felix Acevedo

Circular 7-100.2, "Opposing Force Tactics," (Department of the Army, 2011) and other appropriate resources, the division refines the enemy's course of action (COA) down to the battalion level (ATP 2-01.3) (Department of the Army, 2019a, paras. 5-68 and 6-48), labeling respective units as either the Action Force or as an Enabling Force (Department of the Army, 2011, Chapter 2).

Division issues appropriate warning orders (WARNORDs) to their BCTs and prepares them for the movement south and eventual attack. Based on the staff's enemy COA analysis, the staff expects the enemy to either defend the objective or conduct a counterattack to the north. Critical points for the ID's success are: 1) identifying which COA the enemy is conducting, including their COG, and 2) finding the most suitable AA to move south. To capture this, priority intelligence requirements are created and must be answered. Unfortunately, modern U.S. Army divisions do not contain organic cavalry assets.

This leaves the division at a place of disadvantage. Based on the vision the commander and staff have of the fight, they must choose a method to conduct this reconnaissance. Knowing his forces, the commander chooses the 1st Stryker Brigade Combat Team's (SBCT) Cavalry Squadron (CAV SQDN) to move out and answer the priority intelligence requirements. For

this operation, the CAV SQDN is assigned two troops from the Air Cavalry Squadron (ACS), one platoon of CH-47s from the general support aviation brigade (GSAB), an aviation forward arming and refueling point package, and three platoons from their SBCT's field artillery battalion.

After being task organized and receiving WARNORD 1, the augmented cavalry squadron (CAV SQDN+) begins their hasty planning. Soon comes WARNORD 2: they must depart their start point (SP) 26 hours from now. Inside the planning tent, the staff, complete with ACS and GSAB planners, rapidly continues their planning process. Up next is mission analysis. The staff pull all data from the two WARNORDs they have received. In the corner of the tent, a planner draws a hasty timeline where key events will be depicted, helping to facilitate a shared understanding across all planners. From the timeline and intelligence provided, a probable line of contact is drawn on the map. This focuses the CAV SQDN+'s planning efforts on this snapshot in time and space. Enemy COAs are refined with planners relying on their knowledge of enemy doctrine and the latest, though limited, enemy information received. An initial information collection (IC) matrix is developed in addition to the assigned tasks from the division.

After the mission analysis brief, the commander provides a directed COA to the staff. The staff quickly develop the commander's plan to the extent possible, tasking the troops but planning down to the platoon level. Troop leading procedures (TLP) are started, and the troops begin movement and provide bottom up refinement. As division has not yet completed its combat plans, the planners rely on their knowledge and experience of the ID's capabilities to forecast the future fight to more accurately develop their reconnaissance objective and guidance. The lack of information about the enemy and terrain leaves the plan with three decision points, which are incorporated into their IC plan and decision support matrix. As the plan nears finalization, the staff conducts a hasty war game to identify friction points, complete any missing information on products (most notably the IC plan and synchronization matrix), and work through battle drills.

The CAV SQDN+ then issues the completed order to the troops, who, if the planning was done correctly, will have minimal refinements and can hastily complete the remaining TLPs. Vehicles are prepared, aircraft are armed, packets are produced, and crews posture for the upcoming SP.

The plan: RQ-7B UAS from the ACS detachment will lead the CAV SQDN+ followed closely by their AH-64 wingmen. Behind the aerial scouts, ground scouts split their three troops evenly among the three AA, towing a battery of their M777 howitzers. The other platoon of M777s is staged and ready to be airlifted forward by the CH-47 platoon for rapid fire support. The CAV SQDN+, following their commander's reconnaissance guidance,

A RQ-7B Shadow tactical unmanned aircraft system from Regimental Engineers Squadron, 2d Cavalry Regiment climbs for altitude at Balli UAS Airfield on Rose Barracks, Vilseck, Germany, July 26, 2019. U.S. Army photo by Gertrud Zach

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U.S. Soldiers assigned to Iron Troop, 3rd Squadron, 2nd Cavalry Regiment, dismount from their Strykers as they start a live fire exercise at a range near the Bemowo Piskie Training Area, Poland, March 13, 2018. These Soldiers are part of the unique, multinational battle group comprised of U.S., U.K., Croatian, and Romanian soldiers who serve with the Polish 15th Mechanized Brigade as a deterrence force in northeast Poland in support of NATO's Enhanced Forward Presence. U.S. Army photo by SPC Andrew McNeil/ 22nd Mobile Public Affairs Detachment

will continue south until their displacement criteria are met, either by reaching their limit of advance, or achieving the necessary amount of intelligence about the enemy. In the event enemy contact is made, the CAV SQDN+ is to maintain contact with the enemy until either a forward or rearward passage of lines is conducted with their parent SBCT.

From this simple vignette, one can begin to appreciate the ethos of the cavalry scout. Without the luxury of time, these Soldiers will soon be the first to enter the OE and make contact with an unknown enemy. With minimal knowledge they set out, equipped with the skill sets and tenacity that they need to be successful. Their actions will set in motion a chain of events that will shape the outcome of the war. The success of their parent division, and subsequently the divisions further to the west, rely on these tenacious and cunning Scouts to be the commander's eyes and ears within the OE.

I know not with what weapons World War III will be fought, but World War IV will be fought with sticks and stones-Theoretical physicist, Albert Einstein

CW4 Elden Engelhard currently serves as the Tactics and Survivability Instructor in the Air Cavalry Leaders Course at Fort Rucker, Alabama. His primary rating is in the AH-64D/E, but also holds ratings in various other non-standard rotary-wing airframes. He attended the Tactical Operations Course in 2009 and has continued to pursue JOINT tactics throughout his career. He has served as a lead planner for 2-159 ARB, U.S. Aviation support, and 4-4 ARB, with deployments to Iraq, Afghanistan, and Syria.

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Future Vertical Lift in a Great Power Conflict:

Improving Army attack aviation's tactical proficiency to meet the Future Attack Reconnaissance Aircraft's technological prowess

By CPT Harrison Florence

A priority of the Army Modernization Strategy, Future Vertical Lift, will provide Army aviation with the necessary capabilities to compete in a great power conflict. Specifically, the Future Attack Reconnaissance Aircraft (FARA) is projected to significantly increase Army attack aviation's maneuverability, endurance, lethality, and survivability on the battlefield (Department of the Army, 2019). While the Apache helicopter has been an indispensable asset in the Global War on Terror, its outdated design and insufficient airspeed and range capabilities are inadequate for large-scale combat operations (LSCO). In contrast, FARA's projected top speed of 235 miles per hour (mph), compared to the Apache's 176 mph, allows aviators to "sprint" through momentary air-defense openings. Coupled with its compact, lighter build and greater fuel efficiency, FARA's 207 mph cruising airspeed stretches its combat radius to 135 nautical miles (Freedberg, 2018). Moreover, increased engine power improves maneuverability and weapons-carrying capability.

In addition to improvements to aerodynamic characteristics, continued weapons innovations will augment FARA's combat effectiveness. Compared to the Romeo Hellfire's 8-kilometer maximum range, the newly tested Israeli Spike Non-Line-of-Sight (NLOS) missile can engage targets more than 30 kilometers away, improving aircrew survivability by decreasing proximity to the target (Egozi, 2018). New laser-guided rockets improve accuracy and consequentially, lethality, relative to traditional unguided rockets.

An AH-64 helicopter from Company B., 4th Attack Reconnaissance Battalion, 4th Combat Aviation Brigade, 4th Infantry Division, hovers while acquiring targets during aerial gunnery training at Fort Carson, Colorado, Dec. 4, 2017. U.S. Army photo by SSG Jeremy Ganz

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While laser-guided rockets are compatible with the Apache, they are not widely available. Additionally, mounting the Spike NLOS on the Apache would require aircraft modifications. As these weapons capabilities are contemporary, FARA will likely possess greater armament technology when the aircraft is fully integrated in 2035.

However, FARA is not a panacea for Army attack aviation's extant tactical inadequacies. In the Global War on Terror, air superiority and freedom of navigation are the norm; aircrews shoot, move, and communicate relatively unfettered. Army attack aviation is a combat multiplier, decisively engaging and destroying the inferior enemy and significantly aiding ground force commanders. Yet, air superiority will not be guaranteed against a great power competitor. The 2017 National Security Strategy states, "The Department of Defense must develop new operational concepts and capabilities to win without assured dominance in air, maritime, land, space, and cyberspace domains…" (Trump, 2017, p. 29). As FARA achieves the capability threshold, new operational and tactical concepts must follow to ensure Army aviation is integrated into the multidomain operational concept.

Counterinsurgency (COIN)-centric tactics are insufficient to fight and win a great power conflict. Currently, Army attack aviators navigate with satellite-reliant global-positioning systems (GPS), communicate on corruptible digital networks and radio frequencies, and fly at altitudes and profiles untenable in a ubiquitous radar environment. Yet, we continue to train as if our aerial supremacy and technological advantage is perennial, thereby inadvertently molding the next generation into Global War on Terror-esque aviators. The problem is institutional, but it can be overcome through focused, specific training strategies.

A focused and specific training strategy requires a prescient strategic assessment of where conflict is likely to erupt. As "the single most consequential region for America's future," the Indo-Pacific region stands out (Department of Defense, 2019, p. 1). China's continued militarization of the South China Sea, increasingly hostile opposition toward Taiwan's independence, and regional hegemonic aspirations set off alarm bells. In addition to geopolitical factors, economic security is vital—approximately one-third of global shipping passes through the South China Sea annually (Department of Defense, 2019, p. 1). The global economy relies on a free and open South China Sea, but China's unwavering adherence to its nine-dash line claim threatens the sea's accessibility. Admiral Philip S. Davidson, commander of United States Indo-Pacific Command, gave testimony to the U.S. Senate Armed Services Committee that indicated the region is a powder keg: "in short, China is now capable of controlling the South China Sea in all scenarios

U.S. Marine, Lt. Col. Brandon Turner, 2nd Battalion, 3rd Marines Commanding Officer, delivers a brief to U.S. Navy ADM Phil Davidson, United States Indo-Pacific Commander, on how the Marine Corps utilizes the Pohakuloa Training Area (PTA) on Oct. 09, 2020. Units from all U.S. military services, as well as allied militaries, train at PTA due to its realistic training opportunities. U.S. Army photo by SGT Effie Mahugh/28th Public Affairs Detachment

short of war with the United States" (U.S. Senate Armed Services Committee, 2018, p. 18.).

Fortunately, China is still not on par with the United States militarily. However, in accordance with President Xi Jinping's "Chinese Dream of national rejuvenation" and pledge to build a world-class military (Jinping, 2017), China is rapidly diminishing America's relative advantage. By 2035, if not earlier, the People's Liberation Army (PLA) will likely be able to contest all domains of conflict throughout the Indo-Pacific region (PLA military modernization, 2018, p. 2). Army aviation's strategic, operational, and tactical leaders and warfighters have a momentary window of opportunity. They must utilize this period to improve tactics, techniques, and procedures to prepare a battle-hardened force for the potential great power conflict.

Tactical-level leaders who do not have experience in one of Army aviation's few assignments with an overwater mission set may think that the emerging Indo-Pacific maritime strategic problem is not a land-oriented army's concern. However, Army aviation doctrine in Field Manual 3-04, "Army Aviation," clearly states:

Army Aviation operates in the maritime domain by using seabasing…. or land basing to project combat power in DS [direct support] of joint forces… Based on the depth of anti-access measures, seabasing provides Army Aviation the ability to expand the options for entry into an AO [area of operations] due to the mobility of the basing platforms and the inherent speed and range of Army Aviation… In support of joint or multinational naval forces, using Army Aviation to conduct reconnaissance and attack operations over water enables the joint or multinational force commander to defeat small boats and small surface combatant threats… or attack area denial capabilities in the littorals. (Department of the Army, 2020, p. 1-16 and 1-17).

In the Republic of Korea (ROK), the 4-2 Attack Reconnaissance Battalion (ARB) exemplifies Army aviation's strategic maritime utility. In the event of war, the 4-2 ARB will conduct overwater missions in support of its ROK navy partners to neutralize/destroy North Korean amphibious forces. As the era of great power competition intensifies, maritime missions will become more prevalent across the force. In particular, strategic-level commanders may rely on Army attack aviation as the primary tactical asset if conflict in the South China Sea erupts.

Currently, PLA island outposts in the South China Sea house significant anti-access/area denial (A2/AD) assets: long-range surface-to-air missiles, anti-ship cruise missiles, airfields, long-range bombers, naval vessels, and high frequency radars Department of Defense, 2019, p. 8). Additionally, electronic, cyber, and space weaponry that targets navigation, position, and communication systems could greatly impede American tactical effectiveness (Harrison, et al., 2020, p. 11–18). Amalgamated, China's A2/AD capability could potentially prevent U.S. Navy and Air Force incursion, freedom of maneuver, and operation in the South China Sea.

A viable solution, as presented in this fictitious operations plan, is a 21st century island-hopping campaign employing Army attack aviation within the multidomain operational concept. Staged on the sea's periphery, FARA aviators could conduct quick-strike missions targeting A2/AD sites. Flying at nap-of-the-earth (NOE) altitudes to avoid air-defense radar detection, aviators would increase survivability and maintain the element of surprise. Utilizing Spike NLOS, FARA aviators would target airfields, radar, and missile-launch sites. With a pathway into the A2/AD umbrella created, joint forces could seize the initiative and attack and occupy neutralized PLA island outposts. Methodically and systematically, China's A2/AD veil would be rescinded. Enemy outposts would transform into friendly staging areas for the joint force to conduct follow-on operations.

While the presented scenario is an over-simplified illustration of a fictitious operations plan, Army aviation's usefulness as a strategic first-strike asset is not far-fetched. In 1991, Apache helicopters destroyed Iraqi air-defense radars to initiate Operation Desert Storm (Robinson, 2011). Vulnerable high-altitude fighters and bombers were inadequate for the mission because the night raid necessitated stealthy, low-altitude flight to avoid radar detection. Accomplishing their mission, the Apaches provided a 10-kilometer-wide corridor though which allied fighters and bombers could approach Iraqi targets undetected.

Future Attack Reconnaissance Aircraft's integration provides Army aviation the potential to accomplish similar strategic missions, but aircraft technological and material prowess alone is insufficient. Individual and aircrew tactical proficiency will ultimately decide mission success. Attack aviators must possess the necessary skills to navigate, maneuver, and fight in a sophisticated A2/AD environment. Gaining proficiency necessitates sustained focused training; ergo, time. Unfortunately, Army aviation's current high operational tempo is a time constraint. General Joseph M. Martin, Vice Chief of Staff of the Army, highlighted the problem in his April 2020 *Aviation Trends* memorandum:

"Nobody says no"– a perception exists that there is insufficient dialogue and subsequent pushback on aviation demand, at echelon. Examples include CTC [Combat Training Center] multifunctional task organization, home station training support, and collective exercises for external units. Inside our Combat Aviation Brigades (CABs), there is often the perception that **not enough priority is placed on individual and crew** flight training requirements, and the time necessary to complete

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them. (Martin, 2020, p. 1)

Additionally, he noted that several aviators are not achieving flight hour requirements because 80% of their time is spent on nonflying duties. As top-level leaders re-evaluate the current training environment, they must solidify individual and aircrew warfighting aptitude as Army attack aviation's unambiguous priority. Primarily, this means allocating white space for tactical-level units to conduct focused and specific autonomous training.

As their training calendars become less cluttered, tactical-level leaders are responsible for developing training scenarios that emulate a pervasive A2/AD operational environment. Aviators must become experts at operating without the crutch of GPS, line-of-sight and over-the-horizon communications, and high-altitude freedom of maneuver. Training that incorporates NOE flight, time-distance-heading navigation, and corrupted radio and digital communications is an adequate start. General Martin observed that, "**Aviators are not yet comfortable flying at the low levels demanded to support LCSO tasks, largely a result of 18 years of COIN-focused tactics**" (Martin, 2020, p. 3). Therefore, units should incorporate NOE flight, low-speed and high-speed, into every phase of training including aerial weapons employment qualifications. Additionally, aviators must learn to navigate off paper maps, utilizing a compass for direction and a timer for position calculation. Training missions that simulate corrupted and jammed communications systems will require leaders to conduct detailed mission briefs and rehearsals so aircraft-to-aircraft and aircraft-to-headquarters transmissions are unnecessary. If leaders hesitate to implement changes until FARA is integrated, they will squander the current window of opportunity. Changing how Army attack aviation trains and fights is an arduous and challenging endeavor. Yet, it's on leaders to make the hard decisions now so their subordinates are equipped for future success.

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A U.S. Soldier with 1st Battalion, 3rd Aviation Regiment (Attack Reconnaissance), 12th Combat Aviation Brigade, conducts routine maintenance on a AH-64 Apache helicopter on Sept. 20, 2018, at Katterbach Army Airfield in Ansbach, Germany. U.S. Army photo by Charles Rosemond

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National Guard Civil Support Operations:

MISSION COMMAND DURING THE MAMMOTH POOLS RESERVOIR RESCUE

By COL David Hall and MAJ Sean Summerall,
in collaboration with CW5 Kipp Goding and CW5 Joseph Rosamond

On the evening 05 September 2020, California Army National Guard (CA ARNG) aircrews executed a dramatic rescue of more than 260 people from the Mammoth Pools Reservoir high in the Sierra Nevada mountains. Over the course of 10 hours, CH-47F and UH-60M aircrews repeatedly braved hazardous conditions to evacuate civilians trapped by the fast-moving Creek fire.

Creek fire. Photo credited to the National Aeronautics and Space Administration

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Throughout the night and early into the next morning, California Army Aviation was able to meet the moment by exercising effective Mission Command and Incident Awareness & Assessment to mitigate and accept prudent residual risk in order to save lives.

The Mammoth Pools Rescue

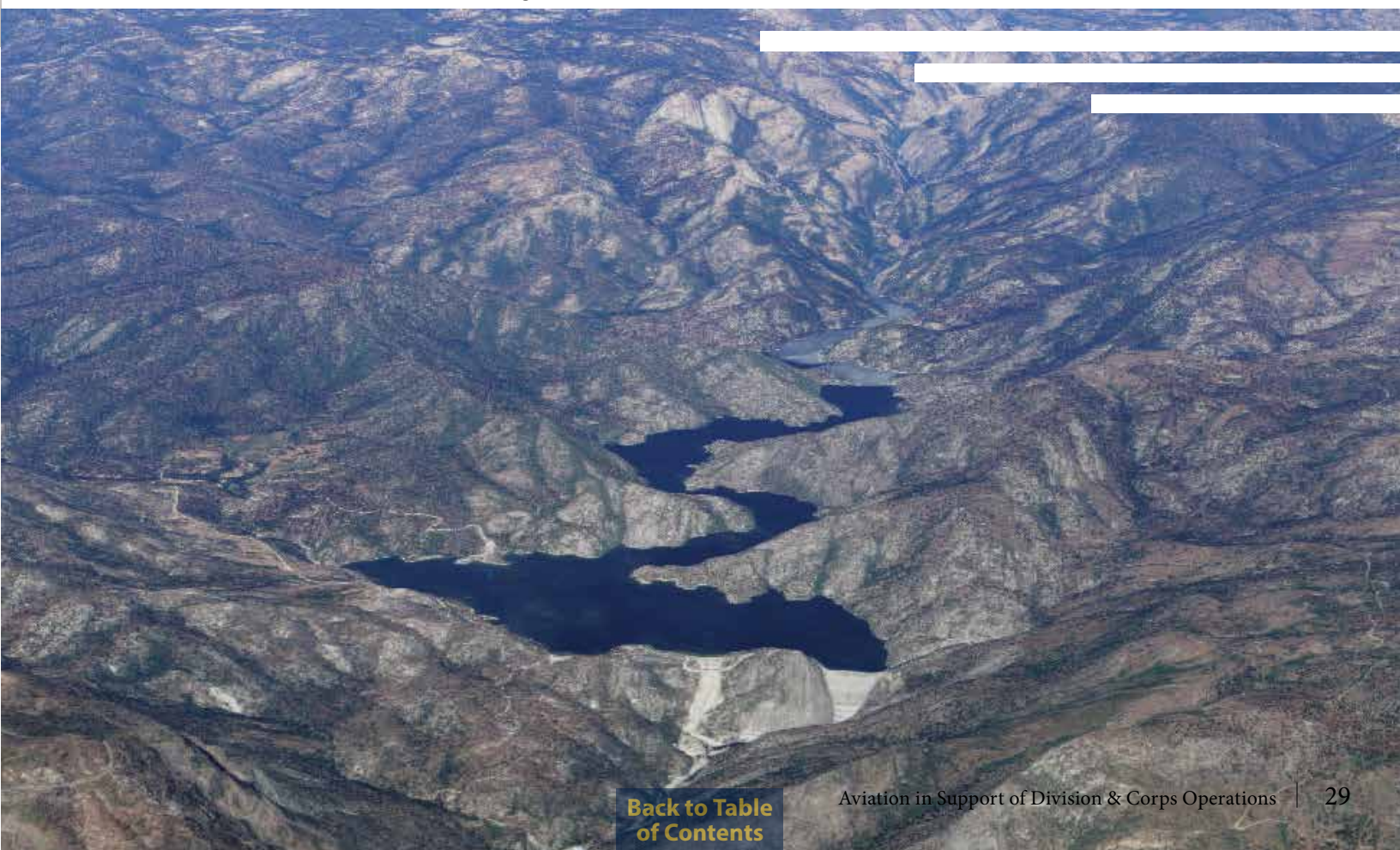
At 1630 on 05 September, the Madera County Sherriff's Department requested support through the California Governor's Office of Emergency Services. This request, received by the California Military Department's Joint Operations Center, sought to evacuate 30 people stranded at Mammoth Pools. Within 2 hours of notification, a CH-47 crew, based out of Stockton and a UH-60 crew, based out of Fresno, launched from their respective support facilities to the incident location.

In flight, the aircraft coordinated with the regional emergency communications center by radio to obtain communications data for the fire traffic area's controlling agency, Creek Air Attack. Shortly after receiving clearance to enter the incident area of operations, both aircrews transitioned to night vision goggles to conduct an in-flight linkup. After an initial search, crews were advised by Creek Air Attack and California Department of Forestry and Fire Protection (CALFIRE) operations that the conditions were too smoky to affect a successful rescue at Mammoth Pools. Ultimately, both crews found a safe ingress route and made the joint decision to continue, regardless of the smoke advisory. The deteriorating visibility, coupled with increasing hazards, led to greatly increased communication and coordination between the two aircraft. Constant reporting and updates from both crews enabled the flight to cross through the smoke and across an active fire line to attempt an ingress along the San Joaquin River. Through their night vision goggles, the crews were able to make out the closest terrain from the prevalence of small fires providing ambient light. Concurrently, the crew relied on their digital terrain elevation data-enhanced maps to identify potential spots for those terrain hazards and adjust their flight profile to mitigate the risk.

On approach, crews continuously assessed the situation relative to crew comfort and experience, each time reaching consensus to continue the mission. Approximately halfway along the ingress route, the UH-60 crew lost visual contact with the CH-47 and proceeded to execute an orbit to increase their distance while searching for an alternate approach route. Upon arrival at the lake, flashing hazard lights and headlights from a group of vehicles near a boat dock queued the crews to the isolated personnel.

On final, both aircraft encountered strong fire-induced winds and degraded visual environments due to blowing sand. Use of their automated flight control systems, combined with effective coordination with their nonrated crewmembers, en-

Mammoth Pools reservoir. Photo credited to Google Earth



CH-47 on boat ramp. Photo credited to the Army Aviation Support Facility (AASF) #2

abled both aircraft to avoid spatial disorientation and execute a safe 13–15 degree slope landing.

Once on the ground, the flight engineers and crew chiefs organized the pickup zone (PZ) and systematically triaged the civilians. There were no apparent first responders on the PZ, so the crew took it upon themselves to identify those with severe injuries (burns, compound fractures, etc.) and physically assist non-ambulatory personnel into the aircraft. After loading the aircraft to nearly double their standard capacity, both crews returned to Fresno. The CH-47 crew coordinated with emergency management personnel by radio, and flight operations personnel were able to monitor emergency transmissions online and assemble support personnel.

Once on the ground, both crews had a coordination meeting to plan the next lift and discuss risk with COL Dave Hall, the 40th Combat Aviation Brigade (CAB) Commander and high-risk approval authority. This allowed the final mission approval authority to personally assess environmental risk, fighter management, and check in with each crewmember. The team assessed that they could safely conduct a second lift and proceeded back to the PZ at Mammoth Pools.

Deteriorating conditions along the route of flight prompted a fear that their window of opportunity would close, so the crew made the decision to maximize the passenger load on the second lift. The CH-47 crew loaded 102 passengers, estimating that they were operating at 52,000 pounds—3000 pounds over the maximum—according to their performance charts for the conditions. The UH-60 crew loaded more than 22 personnel and judged the weight to be within the limits of their aircraft's performance. Both crews leveraged high-altitude training to enable their climb out, relying on contingency power to safely clear the mountainous terrain. Upon arrival back at Fresno, the CH-47 crew aborted a roll-on landing in favor of a runway length progressive in-ground-effect deceleration due to personnel loaded on the aircraft's ramp.

After another coordination meeting and risk appraisal, the crews attempted a third lift, requiring the selection of another ingress route. On the way to the PZ, both aircrews exhibited nausea and watering eyes from the density of the smoke. This last lift was successful in evacuating the remaining evacuees, with the exception of two people, who demanded to stay behind. With the fire raging only a few feet from the rotor disk of the aircraft, both departed with their passengers and safely completed their mission at 0230 hours on 06 September.

The Mammoth Pools rescue occurred in the middle of a record-breaking fire season. According to the California Department of Forestry and Fire Protection, over 4 million acres and 10,000 structures burned this year due to nearly 10,000 separate wildfire incidents (State of California, 2020). Prevalent fire conditions over the past decade have put California's communities at risk, especially those in the wildland urban interface. This increasingly dynamic and complex operating environment presents numerous challenges for California's emergency responders.

Employment of Army Aviation in National Guard Civil Support Operations

The use of National Guard forces during domestic operations normally falls under the category of National Guard Civil Support (NGCS). The NGCS support is similar to Defense Support to Civil Authorities (DSCA), but is performed by the National Guard under control of a State's governor in either a State Active Duty or Title 32 status (Figure) (National Guard Association of

the United States, 2018).

According to Army Doctrine Publication 3-28, "Defense Support of Civil Authorities," one of the biggest challenges for federal forces during DSCA operations is the complexity of the Joint, Interagency, intergovernmental, and multinational (JIIM) environment. Title 10 forces must often forge relationships with civilian partners, and may find it challenging to build trust, assess risk, and navigate the unique command and control considerations found in a domestic emergency (Department of the Army, 2019).

The National Guard is uniquely prepared to conduct domestic operations in a JIIM environment because of its training, habitual relationships, familiarity with the incident command system and National Response Framework, and its interagency cooperative agreement for wildland firefighting (cosigners include CALFIRE; U.S. Forest Service, Region 5; National Park Service; and the California Military Department). The California Military Department maintains a standing Aviation Joint Task Force (JTF) comprised of the 40th CAB and elements of the 129th Rescue Wing. While these formations are nominally part-time, Army aviation support facilities/flight activities provide the full-time support needed to train and maintain the CA ARNG aviation enterprise.

In the case of the Mammoth Pools rescue, both the 40th CAB Headquarters and the Fresno Army Aviation Flight Activity leveraged existing relationships with the Madera County Sheriff's Department to quickly deploy a tactical command post and establish communications with the incident command team. This directly enabled the development of a shared common operating picture and improved situational understanding of conditions on the ground. In parallel, the aviation JTF's main command post (organized from the CA ARNG Directorate of Army Aviation and Safety and augmented by 40th CAB personnel) remained in Sacramento to coordinate actions with the California Military Department's Joint Operations Center. This model maintains military chain of command but enables additional lines of communication/coordination between JIIM partners at echelon to provide responsive support.

Because of continued fire danger, rescues continued for several days following the events described above. A Naval Air Station Lemoore search and rescue asset joined CA ARNG aircrews. By the third night, the Lemoore MH-60S, callsign LASSO 02, was able to cover a gap in CA ARNG aviation coverage. Despite operating under different authorities, the CA ARNG was able to effectively coordinate with the Navy crew. After deploying to Fresno, the crew of LASSO 02 received a briefing from the CA ARNG aircrews and successfully rescued 46 civilians.

The ability of National Guard service members to operate successfully in a complex domestic environment with a myriad of partners provides state and national leaders an incredible resource. Many of the operational and tactical variables

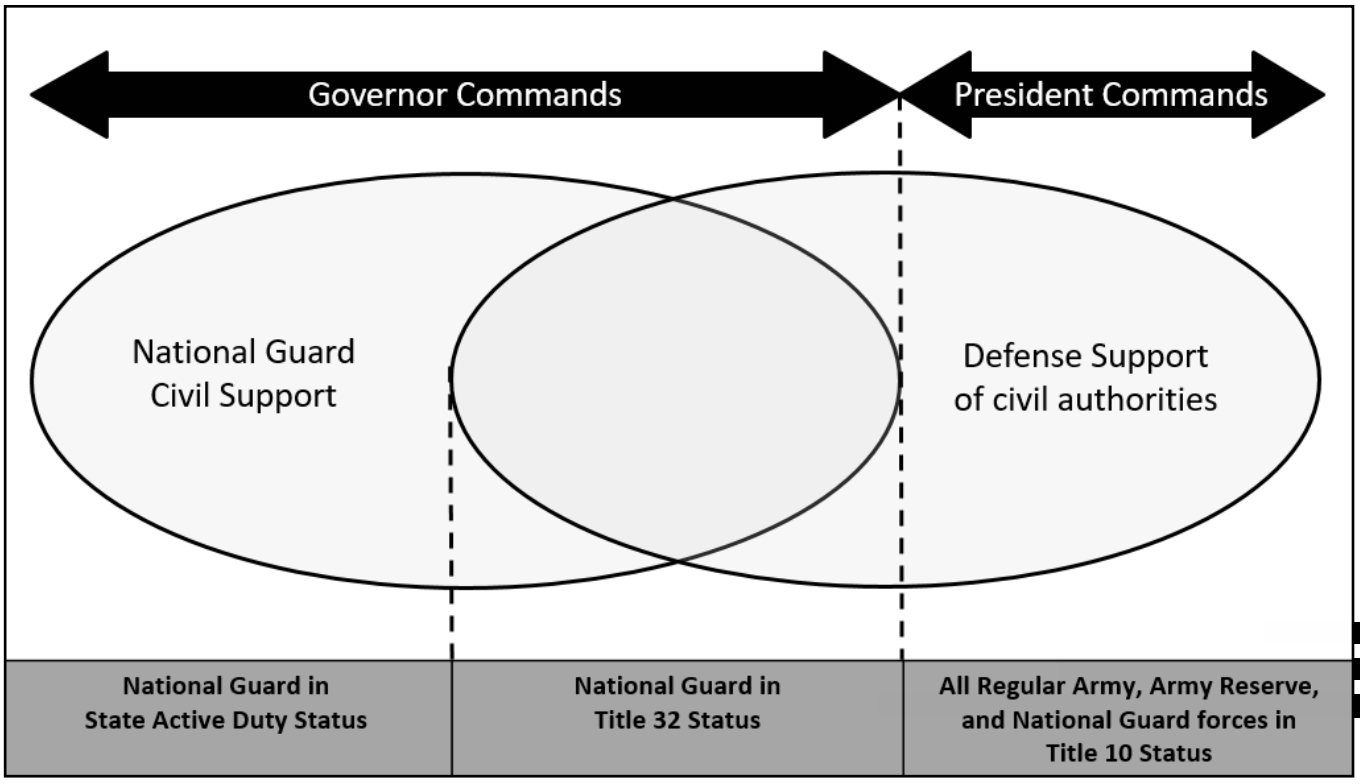


Figure. Range of response (Department of the Army, 2019, p. 4-2).

translate directly to large-scale contingency operations. From an aviator perspective, these rescues were enabled through effective unit and aircrew training programs. Fortunately, many CA ARNG aircrews have attended high-altitude power management training at the High-altitude ARNG Aviation Training Site in Colorado, or through local Army Aviation High-Altitude Mountain Environmental Training programs. Sustaining these training opportunities as units shift toward large-scale combat operations will retain capability and continue to mitigate risk.

Resourcing the Army Aviation for NGCS

Concurrent and proportional fielding of modern equipment has strengthened the National Guard's ability to respond to incidents domestically. Without modern systems to decrease crewmember workload and prevent fatigue, the already high risk assumed by the rescuers would have likely increased beyond acceptable levels. Additionally, National Guard and reserve equipment account funds are critical to procure additional equipment vital to NGCS operations, such as the Mammoth Pools rescues. Civilian-compatible multiband emergency radios and modern firefighting equipment have increased the effectiveness of aircrews during emergency situations.

During this fire season, the DoD's commercial virtual remote environment proved invaluable to flattening lines of communication and enabling mission command. During the incident, the 40th CAB immediately established a Microsoft Teams chat in order to synchronize between geographically dispersed systems. Microsoft Teams allowed Soldiers in the Joint Operations Center, Base Operations, in the aircraft, on the flight line, or at home to continuously collaborate during ongoing operations. While the decisive operation was the evacuation of personnel isolated by the Creek fire, supporting search and rescues continued throughout Fresno and Madera Counties. This system proved to be invaluable in maintaining situational awareness vertically and laterally. In addition to the commercial virtual remote environment, operations personnel maintained situational awareness through the use of two computer-based friendly force tracking programs, in addition to standard modified tables of organization and equipment. The Geospatial Environment for Command and Control of Operations, or GEC20 4.0, a U.S. Army Research, Development, and Engineering Command's communications-electronics center product that ties imagery from Google Earth maps into mission command systems, and the U.S. Northern Command's Situational Awareness Geospatial Enterprise, or SAGE, applications enabled real-time friendly forces tracking of aircraft during this, and other emergencies. Aircrews leverage onboard joint battle command-platforms, as well as an issued iridium SHOUT nano two-way satellite communication device. This redundancy enables an effective Primary, Alternate, Contingency, and Emergency plan during domestic emergencies. When paired with over-the-horizon communications, these tools provide commanders with dramatically improved understanding of events as they unfold.

LRAD mounted inside UH-72. Photo credited to the Army Aviation Support Facility (AASF) #2

Another potential commercial solution for effective civil support response is the use of long-range acoustic devices (LRAD). The LRAD is a speaker system that allows air-to-ground communication to isolated personnel. During some of the subsequent rescues, some individuals would run away from the aircraft, even though they were in a wildfire danger area. The 40th CAB mounted the LRAD system (designed for an HH-60) to a UH-72 Lakota in a field-expedient manner to address the need to communicate to civilians on the ground. This enabled the incident commander access to a highly mobile public address system that could disseminate information in otherwise inaccessible areas.

The California Army National Guard leveraged liaisons effectively in a JIIM environment. Soldiers were dispatched to the Madera County Incident Command Post at Minaret's High School with vehicles, radios, and computer equipment in order to establish communication. Talented sergeants ran 24-hour operations in order to ensure synchronization between the Fresno County

Incident Command Post, Office of Emergency Services Law Branch for Fresno and Madera Counties. Eventually, liaisons were placed at several critical locations to ensure that all rotary-wing operations conducted for the counties were synchronized with the CALFIRE Air Operations Branch Directorate. Maintaining liaison capability at echelon requires additional training and equipping. These skills are as relevant in large-scale combat operations as they are in domestic emergencies. Without consistent attention to training, equipment readiness, and full-time manning, the National Guard will not be able to respond when disaster strikes.

COL Dave Hall served as the CA ARNG Director of Aviation and Safety dual-hatted as the Commander of California's standing Aviation JTF and Commander, 40th CAB at Hammer Field Armory in Fresno California. COL Hall is a UH-60L Instructor Pilot and graduate of the U.S. Army War College.

MAJ Sean Summerall currently serves as the 1-140th AHB S3 at Los Alamitos Army Airfield in Southern California. He concurrently serves as the operations and plans officer at the CA ARNG Directorate of Army Aviation and Safety. During the 2020 wildfire season, he served as the CNG JTF-Aviation J33. Previously he served as aide-de-camp to the Adjutant General, California National Guard.

CW5 Kipp Goding was the UH-60M PIC during the Mammoth Pools rescue and currently serves as the 40th CAB Aviation Mission Survivability Officer at Hammer Field Armory in Fresno California. He concurrently performs duty as the Fresno Army Aviation Flight Activity (FAAFA) Commander / State Aviation Mission Survivability Officer as a dual-status military technician. CW5 Goding is also a UH-60L/M Standardization Instructor Pilot and a qualified Aviation Safety Officer.

CW5 Joseph Rosamond was the CH-47F PIC during the Mammoth Pools rescue and currently serves as the 40th CAB Aviation Safety Officer at Hammer Field Armory in Fresno California. He concurrently performs duty as the AASF#2 Aviation Safety Officer / State Army Aviation Safety Officer as a dual-status military technician. Joe is also a Standardization Instructor Pilot in the CH-47F.

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Righting the Aircraft in Times of Uncertainty

By 1LT (P) Mark J. McGinnis and LTC Chaveso "Chevy" Cook

In an exceptionally young but competent aviation branch, cockpit professionalism and informed leadership will be paramount to building talented formations of aircrews. As new commanders take over and more experienced pilots transition out, it is important that we remove the blinders and produce future pilots-in-command (PCs) who are not just leaders in the aircraft, but also outside of the aircraft. Perhaps the attrition of more seasoned aviators has something to do with recent organization analysis arguing that gross lying anti-intellectualism in the form of failed foreign policy and bureaucracy has contributed greatly to mismanaged talent, thus causing a gap in certain ranks and experience sets (Wong & Gerras, 2015; Snider, 2016; Kane, 2012). Fluctuating between upsizing and downsizing, the military has inevitably struggled to keep many qualified leaders engaged in the profession of arms. Some leaders believe that we have an identity crisis (hence the variety of motto, branding, and uniform changes) that will push others to think they may have to exit. With all that is going on in a period of uncertainty, the question must be asked, how do we best "right the craft?"

A U.S. Army UH-60 Black Hawk from the 1-150 Assault Helicopter Battalion approaches a clearing to pick up a concrete block during sling load training at Joint Base McGuire-Dix-Lakehurst, New Jersey, Dec. 1, 2017. U.S. Air National Guard photo by MSgt Matt Hecht

In aeronautical terms, maybe we just need to tighten our grip on the cyclic and set the collective at the right pitch. In other words, we should set our direction toward our most fundamental principles to push through the ambiguity.

In May 2008, the Army Chief of Staff established the Army Center of Excellence for the Professional Military Ethic (ACPME). Located at the United States Military Academy at West Point, the ACPME was redesignated in 2010 as the Center for the Army Profession and Ethic (CAPE) and realigned to fall under the command and control of the U.S. Army Training and Doctrine Command and its Combined Arms Center. The Center for the Army Profession and Leadership (CAPL) is the outcome of combining the Center for Army Leadership (CAL) and the CAPE into one organization at Fort Leavenworth, Kansas in 2019 (Center for the Army Profession and Leadership, 2021). The CAPL is our control tower. So, what does that mean for the lieutenants and warrant officers who are trying to mentor their troops to not only be good, but great?

The CAPL has given us many tools to develop ourselves and to teach, coach, and mentor those around us, as well as the next generation. A set of those items are the three Cs of the Army Profession: *Character, Competence, and Commitment*. There are many definitions for each of the three Cs and how they manifest in leaders; for our purposes, we will walk through each of the three Cs via the CAPL's doctrinal definition.

CHARACTER

The CAPL defines **character** as:

"An Army professional's dedication and adherence to the Army Values, and The Profession's Ethic as consistently and faithfully demonstrated in decisions and actions" (Center for the Army Profession and Ethic, 2012).

A CH-47 Chinook from the 2nd Battalion, 135th General Support Aviation Battalion, currently attached to the 185th Theater Aviation Brigade maneuvers into position during sling load training, Sept. 24, 2015, in Al Jaber, Kuwait. Having both aviation and ground assets at the same location allows for more training opportunities that reserve component units may not receive at home station. U.S. Army National Guard photo by SSG Michael Needham/Released

This definition brings up a few keywords that stand out, namely **dedication, adherence, consistently, faithfully,** and **demonstrated**. This tells in very certain terms that character is derived from what you believe, espouse, and enact daily. Leaders are decision-makers, and decisions are judged via one's character. Research on character tells us that followers in a group believe that leaders with integrity *will make decisions and take actions based on values and verifiable facts,* which for them then alleviates the *hidden agenda* (Snider, 2008, p. 91-115) The 'video matches the audio;' what's said is also believed and done, allowing the leader to be trusted. Character also establishes the stickiest bonding material—trust (Covey & Merrill, 2006). The basis for this trust is a congruence of **honesty**–truthfulness, sincerity, frankness (think freedom from deceit or fraud), and **integrity**–adherence to principles, morals, and ethics (think soundness of character). If you picture the two elements as circles in a Venn diagram, you want them to overlap as much as possible. Character is where it all starts. A literary parallel to this idea can be found with author Chris Widener, who lays out the importance of character as the first rule of his Four Golden Rules of Influence; 'live a life of undivided character' (Widener, 2008, p. 55).

COMPETENCE

The CAPL defines **competence** as:

"An Army professional's demonstrated ability to successfully perform their duties and to accomplish the Mission with discipline and to standard" (Center for the Army Profession and Ethic, 2012).

Again, there are very specific keywords, such as **demonstrated, successfully, accomplish**, and **discipline**. Competence here is not about

CH-47 Chinooks from B Co, 1-214th General Support Aviation Battalion are prepped for the next day's flight operations as the sun sets on the island of Cyprus on Jan. 17, 2020. U.S. Army photo by MAJ Robert Fellingham

education or how many courses you have attended and passed. It is about getting the job done to standards. Success then comes from competence; you cannot make the right decisions that lead to achievement without the intellectual aptitude to execute. Research into leadership in dangerous/combat situations tells us competence is the primary indicator of a few vital factors; *leader effectiveness, adaptive skill sets*, and *depth of understanding* (Sweeney, et al., 2011, p. 5). Today's threat environment and generational differences require knowledgeable professionals who can display competence. This must be with respect to both **capability**–gross intellectual aptitude put toward a singular or prototypical application (think *learned and applied knowledge*) and **capacity**–synthesized application of capability in varying environments, contexts, or circumstances (think adapted and leveraged knowledge). If you can, picture firing at stationary targets on a range. The routine procedures to fire a weapon and hit the target accurately develop a *capability*. Now picture using the same weapon but figuring out how to fire it in a new way—skipping the bullets off a surface—say under a car off the concrete, to hit a target on the opposite side of the car. That practice would develop *capacity*. Studies in combat environments indicate that Soldiers rate competence the highest directly because it edifies a leader's decision-making ability to ensure mission accomplishment while minimizing risk (Sweeney, 2010).

COMMITMENT

The CAPL's definition of **commitment** is:

"The resolve of Army professionals to contribute Honorable Service to the Nation, to perform their duties with discipline and to standards, and to strive to successfully and ethically accomplish the mission despite adversity, obstacles, and challenge" (Center for the Army Profession and Ethic, 2012).

A few keywords to highlight are **contribute**, **standards**, **strive**, and interestingly, **despite**. Let us first look at 'despite' because of the context of its use. For you to be truly committed, it must be while overcoming issues and trials. What we also find is that this definition ties character and competence together through the ideas of *demonstration, adherence to discipline*, and *accomplishment of the mission*. But one must ask, "commitment to what?" It may seem obvious that we are committed to our organization and its people, but which one first? An oft used phrase is 'mission first, people always,' but that does not help us differentiate which is a priority. Both *horizontal loyalty*–left and right; peers, friends, co-workers, etc., and *vertical loyalty*–up and down; chain of command, subordinates, but mostly the institution are

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important factors with respect to commitment. The key is to understand that the institution will outlast us all. While we forge bonds to our brothers and sisters in arms and ensure that we never leave a fallen comrade, we must consistently put those horizontal allegiances in the context of upholding the vertical fidelity to something bigger than us all. This will help us to always put other's interests first; commitment is hard-earned but is much better than compliance. The three social-psychological outcomes of influence are *commitment* (I would love to do it), *compliance* (I will do it because you say so), and *resistance* (I will not do it) (Natemeyer & McMahon, 2001, p. 212).

Leaders are influencers who horizontally connect with others to build vertical commitment. Keenly remember that all three outcomes are much better than apathy, a place devoid of feeling, conviction, and initiative. Within any profession, more specifically aviation, crew members need to be able to apply the Army's three Cs in order to correctly and properly execute the right maneuver or emergency procedure in a time of uncertainty. This is not something that comes overnight; rather, it is developed over time through constant repetition. It is important to note that all three Cs require not only repetition but opportunities to achieve through personal experience, a clear message to become comfortable with empowering the inexperienced with a chance to develop. Once all of the constants to the three Cs equation have been connected, then we know the team has done all it can to prepare for that moment.

In the aviation branch, character, competence, and commitment are paramount to achieving proper aircrew coordination in and out of the cockpit. In both a garrison and combat environment, *trust* is essential between a pilot and his/her crew chiefs. This brings us to the first C, **character**. Whether you are a medical evacuation crew hoisting a patient stateside or an aircrew evading from an enemy threat overseas, pilots must have a strong bond with their crew chiefs so that they feel comfortable expressing themselves under pressure. The more proactive we are about fostering an atmosphere where crewmember's judgment is never called more into question, regardless of rank, the more our fellow crew will speak up. This all starts with leadership from not just the "front-seaters," but also the "back-seaters" by building a bond before entering the aircraft. A pilot's thoroughness during an aircrew brief will be helpful if that pilot can impart the emotionally intelligent declaration that all crew members are a valued part of the same team. In doing so, this will allow every member to have the right to speak

U.S. Army SGT Jeff Angle, a UH-60 Black Hawk crew chief with the New Jersey National Guard's 1-150 Assault Helicopter Battalion, prepares for a training mission at Joint Base McGuire-Dix-Lakehurst, New Jersey, Dec. 1, 2017. U.S. Air National Guard photo by MSgt Matt Hecht

up during the mission if accomplishment or safety is ever called into question. Demonstrated emotional intelligence within a crew dynamic, as seen in the previous example, is a clear and appropriate approximation of aviation-centric character. Such character demonstrations go a long way toward establishing both professional and meaningful bonds across teams of aircrews, regardless of their age or experience.

In order to achieve and cement this bond, we need to build a certain level of **competence**. As a crew, we can all accomplish this by being fully engaged from the moment we push the engine power control levers to fly to the second we turn off the auxiliary power unit. Outside of clearing the aircraft left or right, we need to have the capacity to not just follow the instructions, but to ask "why?" in order to understand the process. The more we sharpen our skills on various maneuvers, such as different ways of conducting an instrument flight rules flight take-off, to successfully landing a multiship time on target, the more the crew grows as a whole. We are in a branch where we're always learning and tackling new problems, so in order to develop, we need to adhere to standards to achieve mission success while at the same time, challenging ourselves to improve the process. Within aviation, our branch is forever changing, which causes us to constantly grow every day. To build a basic and meaningful level of trust within our crews, we (as pilots) need to demonstrate a certain level of competence by constantly reading up on governing flight regulations and associated technical manuals. Whether you are a young pilot or a subject matter expert, you can always learn from one another both on the ground and in the air, building competence to enhance team dynamics and leadership.

Once you've demonstrated that you have the basic level of **character** and **competence**, then, and only then, will you gain **commitment** from your crew. It is our job as pilots of any aircraft that we step foot on to create an atmosphere where Soldiers have the courage to speak when they feel uncomfortable. To achieve this, we have to be honest with ourselves about the importance of conducting a mission, as well as demonstrating the depth of knowledge that we have on that particular mission. In doing so, the crew as a whole will strive to achieve mission success according to the standard that the unit has put forth. The moment either of the three Cs are brought into question is where problems begin to arise.

These areas emphasized by the CAPL allow one to build a philosophy that ultimately informs our philosophy and effectiveness as leaders. Think back, reader, and ask yourself questions about what has or has not influenced your philosophy on leadership. Was it an instructor pilot that helped to improve and sharpen your three Cs? If you are a PC mentoring another, how are you building up the three Cs, thus *paying it forward* via leader development across your portion of the branch? How do the three Cs intertwine with each other, and what are some derivative characteristics that stem from these (courage, candor, loyalty, etc.)? These fundamental characteristics form a sound triumvirate for the basis of the Army as a profession, and they will always be your control tower in rough winds.

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LTC Chaveso "Chevy" Cook is an active-duty Psychological Operations officer. He recently completed his Ph.D. at Tufts University in Human Development, specifically focusing on the development of character at the individual and institutional level. He also previously served as a TAC and an Instructor at the United States Military Academy.

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The *Aviation Digest* Annual Writing Award for 2020 is presented to **SSG Douglas R. Robillard** for his contribution in penning, **"Unmanned Aircraft Systems in Large-Scale Combat"** published in Volume 8/ Issue 3 (July-September 2020, p. 7).

Congratulations, SSG Douglas R. Robillard!!

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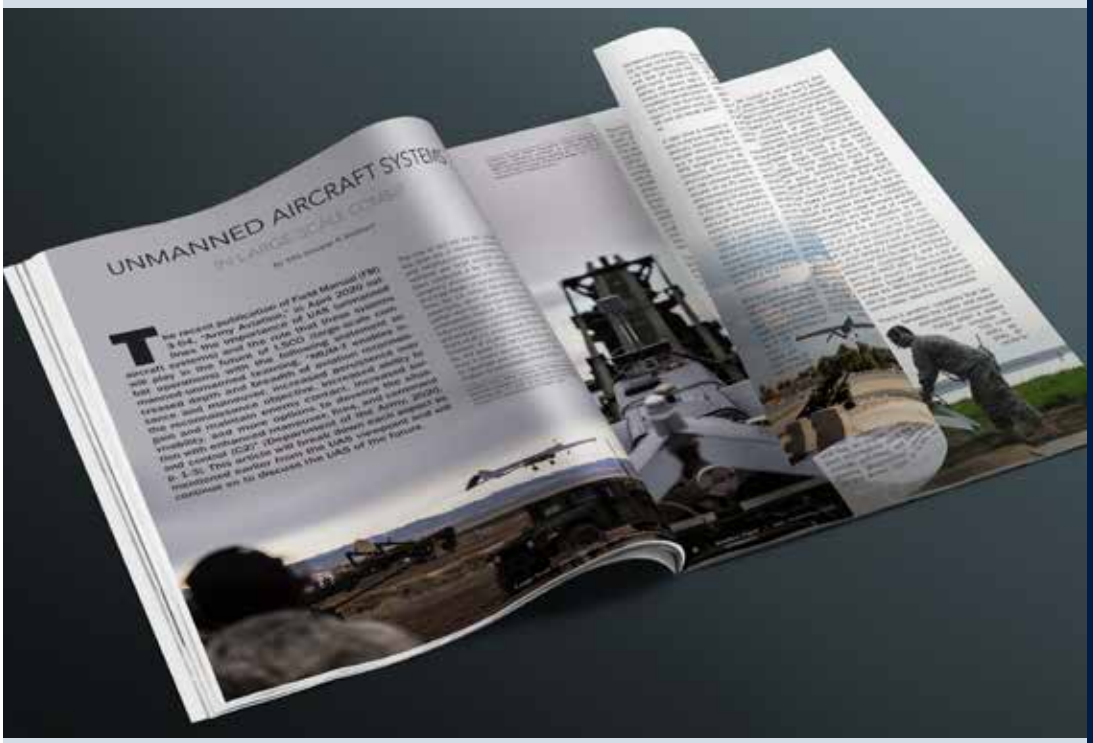

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Does the article have a purpose?

Has the author identified an issue within the aviation branch requiring command attention/action to improve existing procedures or operations?

Has the author recommended revised tactics, techniques, and procedures for commonly accepted operational practices that simplify and increase effciencies?

Has the author presented an article that improves audience knowledge of doctrine or other established operational procedures?

Has the author related an experience that others may benefit from professionally or that may potentially prevent an aircraft accident?

Does the author present factual and researched information to support the article?

Has the author recommended a realistic solution to remedy or improve those conditions causing a perceived deficiency?

Has the author presented a discussion based on facts and not suppositions, generalizations, or vague innuendos?

Does the author present his/her article as an organized discussion—introduction to the issue, background information, and meaningful presentation of discussion points, summary, and conclusion?

Was the article easy to read, and did it follow the discussion points?

Did you understand the author's message?

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The Impact of Geography on Army Aviation in Support of Large-Scale Combat Operations

By CW4 Leonard S. Momeny and MAJ Nicholas P. Boisvert

There are many things that professional aircrews and crewmembers take time to study. From flight regulations to technical manuals, aviation branch Soldiers are steeped in the knowledge that governs the launch and recovery of their assigned aircraft. After all, these are common areas that dictate the safe operations of aircraft during a standard duty day. However, there can be great benefit to the aviator who takes time to study areas outside of typical aeronautical subjects. These subject areas, while not dictated points of study, can be considered supplementary elements in support of the greater Profession of Arms. Supplementary elements can include history, current events, and international politics, as such variables are constantly found intertwined within the framework of armed conflict. Another supplementary area of study that tends to receive little engagement with respect to potential impact upon the actions of aircrew preparing to execute their wartime missions abroad, is geography.

Why isn't geography more actively studied? It may be that *semi-contained* conflicts within most of the Central Command Area of Responsibility, or CENTCOM AOR, have equipped Soldiers with the muscle memory of past rotational experience, thus giving sufficient justification to perhaps forgo any significant study related to theater geography. Another reason there is little impetus to study geography is that things external to operations that are constantly conducted from a fixed-base position, a trait indicative of past counterinsurgency (COIN) operations, seem unnecessary. Yet, as the United States seems to be consistently drawn away from COIN operations, there becomes a whole new set of concerns associated with large-scale combat operations, or LSCO, thus negating previous experience sets associated with operating in a predictable AOR. Thanks to the driving needs presented by the challenges associated with LSCO, it would appear that geography is once again up for study by the professional aviator.

The Basics of Geography

Geography carries with it the burden of being oversimplified as merely "a description of the earth," thus supplying the academic area of study with a sense of palpable fatalism, as though it could never escape the limits of "relief maps and population studies" (Kaplan, 2013). However, geography can be so much more than the simple topic everyone studied during high school or even their undergraduate course of study in college. In a more detailed setting, geography is known as the "science that deals with the description, distribution, and interaction of the diverse physical, biological, and cultural features of the earth's surface" (Merriam-Webster, 2021). In many ways, aviators across the force are incredibly familiar with the geography of many regions across the globe, as we often deal with countless aeronautical charts and various maps.

Still, maps are not the only thing of interest when it comes to geography. Cultural features can be of extreme importance within an area of operation. As recent as 2017, Iraq had to bear witness to the destruction of precious cultural heritage sites in Mosul, as ISIS ravaged the northern city, thereby stripping something irreplaceable from the geography (Alkhshali, et al., 2017). Geography also brings with it the history of a land as country names, borders, and current social economic conditions are typically due to various conditions that have been brought about by those within or surrounding a nation. The repetition of some the history that geography is forced to watch is almost paradoxically cyclical, seemingly improbable. Yet, all the catalysts for struggle, and the struggles themselves, which impact nation after nation can be found within the confines of geography. These items are easily attributed to either the presence, or lack thereof, of something critical within borders of a nation's geography.

AH-64 Apache helicopter crews assigned to 3rd Squadron, 6th Cavalry Regiment, 1st Armored Division Combat Aviation Brigade conduct aerial gunnery December 5, 2017, maintaining their combat readiness and lethality at Fort Bliss, Texas. U.S. Army photo by CPT Tyson Friar, 1st Armored Division Combat Aviation Brigade Public Affairs

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For example, cultural conflict lies at the heart of many cross-border actions that occasionally play out within a nation's geography. Jerusalem, throughout its history, has been the site of numerous violent incursions, as political and religious ideas have clashed with great vigor over who should control the holy city (Montefiore, 2012). Also, it should be interesting to note that cultural influence can even exceed the borders of geography, as in the case of Alexander the Great and the period of Hellenism he ushered into the annals of history through the conquering of the then known world (Nystrom & Nystrom, 2003). Obviously, Alexander the Great's siege on the history within the world's geography left a lasting legacy that would influence various parts of the world, dotting countrysides with eventual foundations for what would influence concepts like The United Nations Educational, Scientific and Cultural Organization, or UNESCO, the organization responsible for the education on World Heritage Sites. A fine indicator of a growing sense of collectivism that grips at least a portion of humanity, indicating that cross-border geographical cultural interests do occur and demand observation. So how does this all intersect with LSCO?

THE GEOGRAPHY OF COIN VS. LSCO

A number of units today still manage to deploy in support of scenarios that mirror, or at least draw heavily, upon the tactics of past COIN operations from the previous 20 years of combat experience. The geography of such armed conflict was fixed, with aviators deploying to fixed-base positions and conducting operations within the borders of a single country. Multiple back-to-back rotations seemed to have built a muscle memory of sorts. Most missions over this time were asymmetric in nature, at least when compared to engagements of previous generations. Perhaps this can be contributed to the nature of the deployment, or even the nature of the aircraft that Army aviators typically employ, the helicopter. It is only fair to measure both in turn.

The helicopter tends to lend itself to the nature of war as envisioned by then President John F. Kennedy when U.S. Special Forces were initially crafted. War was seen as becoming bouts of small, but intense, conflict requiring smaller units of highly trained individuals with the means to "hop" in and out of conflicts. It was being supposed that war would not be fought in the same manner as WWII, but differently. This ideology and perspective were only solidified further throughout the Vietnam conflict as the helicopter lent itself to the nature of asymmetric warfare from fixed-based units. While the wars that would follow tended to include brief glimpses of former days of war, (e.g., the opening moments of Desert Storm) for the most part, the duration and scope of large-scale warfare had seemed to disappear. Maybe the helicopter itself became the root cause for this shift in appearance of warfare, as doctrine caught up to technology, the Army adjusted itself and capabilities to fit the new ride to war. There is no right answer in this situational comparison, only historical and even geographical context. Small, but intense, conflict governed by the borders of geography that would surround the efforts of military in every action outside of WWII forced the distinctive change. Global politics saw strong reaction against conflict that spilled over borders and so, the geography became more restrictive, driving a need for technology, like the helicopter, to empower contained efforts on the field of battle. As such, rotary-wing assets saturate the pages of history in modern warfare. This is clearly seen from Grenada to Iraq.

This COIN-oriented perspective seemed solidified to continue well beyond the wars in Afghanistan and Iraq; instead, previously amicable nations would become increasingly more provocative regarding their action on the global stage. These actions would produce significant language guiding national documents that insisted our focus begin to include an awareness of both potential peer and near-peer militaries. Large-scale combat and its associated variables were now back in the zone of consideration. With this, came an implication that the military and its leaders must once again strive to understand the impact of geography upon Army actions during LSCO.

Large-scale combat operations are not something easily contained. Conflicts such as WWI and II best fit the description of LSCO, as these wars occurred "in the form of major operations and campaigns aimed at defeating an enemy's armed forces and military capabilities in support of national objectives" (Department of the Army, 2017, p. 1-1). Both wars occurred over large swaths of land, all across the world, spilling across borders into nearly every nation in Europe and parts of Asia. Every domain of battle was experienced and as such, both the physical and sociopolitical geographies of affected nations were ravaged. Humanity was forever changed, and leaders in the military had to maintain awareness of their geography. Sometimes the geography involved changing landscapes and seasons that limited maneuver, mobility, and logistics. Other instances saw delicate alliances, political, and even cultural geography constantly flexing and impacting the conduct of both wars.

The truths of geography and its impact upon war that were discovered in both WWI and II remain just as impactful today as they were in those moments. Aware and educated leaders make all the difference in the world, as future conflict has the potential to cross borders, thus refusing containment, and thereby changing how Army aviation must plan and conduct mission sets in the face of LSCO. What follows is an attempt to codify realistic and applicable geographical concerns relevant to Army aircrews operating at

the tactical level in support of LSCO.

ARMY AVIATION AND GEOGRAPHY AT THE TACTICAL LEVEL

Geography in the LSCO setting will affect Army aviation at the tactical level, and that much is certain. The ability to understand the full degree of impact remains unnecessarily complicated, as solution dependency relies almost completely on operational scenario. To put things into context of LSCO, Army aviation is certain to find a majority of its forces supporting division- and corps-level commanders, a distinct change from a refined experience set acquired throughout 2 decades of COIN operations. Depending on the area of operation and the mission, both mission variables and geographical considerations may predetermine aviation tactics within aviation tactics within large-scale defensive operations or large-scale offensive operations (Department of the Army, 2017). In either case, there is a high probability that Army aviation will find itself operating from the Consolidation area, Close area including the forward line of own troops (FLOT), and Deep area up to or beyond the fire support coordination line (FSCL). Considering the potential distance a division or corps can cover in LSCO, the associated geography of an AOR can drastically change, modifying potential planning, tactics, techniques, and procedures employed by Army aviation at the tactical level.

According to the theoretic, political, and historical writings of Carl Von Clausewitz, geography and ground can affect military operations in the following three ways: 1) creating an obstacle to the approach, 2) impediment to visibility, and 3) providing cover from fire (Clausewitz, 1976). All other associated kinetic challenges attributed to ground and geography within military operations can be traced back to these three prime concerns. Many are probably quick to recognize that our own doctrine uses these principles, mainly during Intelligence Preparation of the Battlefield, and especially while conducting terrain analysis. Terrain analysis is the search for knowledge of geography and terrain that map analysis alone cannot provide, and it is this analysis which then influences potential courses of action (Department of the Army, 1994). Large-scale combat operations bring to bear a constant need for both planners and aviators to be constantly considering various impacts changing cross-border geography may have upon the ability to successfully employ Army aviation.

Sometimes historical context assists the student of the profession in garnering valuable insights into future conflicts through the association of challenges experienced during prior large-scale engagements. One such valuable engagement to study from WWII is the Battle of the Bulge, or the Battle of the Ardennes, where terrain played a key role. The battle itself lasted approximately 6 weeks during exceptionally cold weather conditions and was stretched across 85 miles of densely wooded forest. During this engagement, more than 30 German divisions attacked U.S. Army lines that ultimately repelled the counter-offensive, but only at an extremely high cost of 75,000 casualties (MacGregor, 1988).

The scenario of the Battle of the Bulge would likely prove to be a challenge for any maneuver unit, and especially stressing for modern Army aviation. Medical and casualty evacuation of 75,000 killed or wounded alone would prove to be a challenge for both ground and air units working in concert. The struggle would be firmly fixed within the fight to negotiate avenues of approach impeded by countless acres of land choked off by uneven terrain and forest. Imagine the challenges under this theoretical scenario, as all casualties would have to be evacuated through functioning avenues of approach and unchallenged lines of communication in order to average a rate of 1,500 casualties a day for approximately 45 days. This evacuation scenario could only work in a completely permissive environment with open airspace and perfect weather. Now consider the potential impacts of geography on this battle as further enhanced by modern day multidomain concerns, e.g., a denied, degraded, and disrupted space operational environment, coupled with an aggressive enemy integrated air defense. Obviously, LSCO in the modern era will be nothing that Army aviation, or even other conventional forces for that matter, has ever experienced in either current training or deployment.

The example from the Battle of the Bulge demonstrates a front stretched across 85 miles of territory, but this can obviously flex depending upon conditions and location. The geographic scale in terms of miles or nautical miles to a potential modern day LSCO scenario may be much larger than what our current tactical level force has witnessed in the last 20 years. Country clearances to fly through friendly or not so friendly airspace could be a factor. Semi-permissive, non-permissive, weather, enemy threat systems will paint a geographical landscape that will determine when, where, and in what flight levels Army aviation will operate. Tactical assembly areas (TAAs) and forward area rearm/refuel point (FARPs) areas will be directly affected by geography, and their vulnerability will pose significant risk to battlefield survivability. Use of physical terrain may help mask aircraft and aircrews flying to and from objective areas or even protect TAAs, FARPS, and Lines of Communication (LOCs); however, depending upon the size of the front, these various aspects of geography in play may not be a fluid set of conditions aircrews can simply negotiate at will. Additional time for planning and course of action development in the face of geography that is limiting due to political or cultural reasons can possibly

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delay aviation response and application on the modern battlefield. A more holistic approach to planning and development is demanded in the face of LSCO.

Modern warfare also consists of enemy disruption zones, cultural, and ethnic hot zones, etc., adding a level of complexity to typical conditions associated with a region's cultural or sociopolitical geography. For example, according to the Asymmetric Warfare Group, Moscow has made increasing use of allied irregular forces and private mercenary companies to lead operations in Ukraine and Syria, bolstered by Russian advisors, military equipment, and training, thereby complicating the effectiveness of various instruments of national power. Russia's concept of "hybrid warfare," or the so-called Gerasimov doctrine—a term used to describe a blend of conventional and irregular warfare, as well as political and cyber warfare, has only enhanced the typical problem set of battlespace geography (Roblin, 2019). This all demonstrates that both cultural and especially sociopolitical geography can impact the application of aviation at the tactical level, creating a need for specialized planning for Joint Force entry operations to divisional- and corps-level operations, especially true when considering the fixed range of rotary-wing assets.

An example straight from Field Manual 3-0, "Operations," can give us a clue as to what potentially can happen in a more modern LSCO-centric engagement:

In July 2014, the Ukrainian Army moved several mechanized brigades into a position near the Russian border to prevent the illegal movement of military equipment across the frontier to rebels in eastern Ukraine. Early on the morning of 11 July, soldiers at the position noticed a drone orbiting above them for some time. Not long after the drone disappeared, rockets fired from 9A52-4 Tornado multiple launch rocket systems began landing on one of the brigades. The barrage lasted four minutes. Rockets carrying a mixture of high explosive, cluster, and thermobaric munitions smothered the unit's position. Cannon rounds followed the rockets with devastating effect. The Ukrainian soldiers took appalling losses. One battalion was virtually destroyed, and others were rendered combat ineffective due to heavy losses in vehicles and personnel. Casualties quickly overwhelmed army and local medical facilities. In the days that followed, rocket and cannon strikes continued, disrupting the Ukrainian Army's ability to defend that region of eastern Ukraine (Department of the Army, 2017, p.1-3).

Again, this an example of what has happened and what could be impactful concerning geography and the application of Army aviation in support of large-scale operations. The challenges of warfare have evolved and contextual analysis of past engagements can increase the awareness and attention to detail of aircrews preparing for operations in an uncertain global operational environment. With modern weaponry being developed and fielded, coupled with long-range fires capabilities by competitive nations, our TAAs, and FARPs have to be considered as a point of concern. The alignment and strategic placement of such supporting assets across a dramatically large front could either hinder or enable the success of Army aviation. This article does not even fully address other potential adversarial capabilities that could be employed to identify friendly locations through the use of drones or even the electromagnetic spectrum, thus further completing the effective use of operational geography by Army aviation.

In the end, given the situational ambiguity that applies to the unknown challenges surrounding LSCOs, planners and aircrews must embrace a more holistic geographical perspective to better ensure mission success. All aviators planning, training, or even one day supporting such mission sets must never fail to consider how the modern battlefield geography, to include the impacts of new domains, affects the key basics of military operations of maneuver, cover, and concealment (Clausewitz, 1976).

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In the aftermath of the devastating California earthquake of 1989, Aviation Support Facility 27 mechanics assisted with MEDEVAC and relief support operations. They developed the ''pitstop'' or ''gang maintenance'' approach to minimize aircraft turnaround times.

ALL THAT WE COULD BE

Mr. Charles D. Rhodes
124th U.S. Army Reserve Command
Aviation Support Facility 27
Hamilton Army Airfield, CA

AT THE TOP of San Francisco Bay, on old Hamilton Air Force Base, CA (now Hamilton Army Airfield), lies Aviation Support Facility (ASF) 27. The facility, as we have come to know it, is largely contained in one big, old hangar. We share it, such as it is, with the Active Component aviation assets of Sixth Army Directorate of Plans, Training, Mobilization and Security (DPTMSEC).

The building, abandoned by the Air Force and pressed into service by the Army, is a humble place—cold in the winter, hot in the summer. The floors are exceedingly uneven. When it rains, it rains indoors as well as out. It's not much but, between the 91st Division Aviation Section and the 343d Medical Detachment, we and our seven UH-1 Hueys call it home.

All of the facility's technicians wear two name tags and more hats than I care to think about—not uncommon for dual status Reserve technicians

these days. On 17 October 1989 at 1704 hours, I was upstairs engaged in a planning session with the unit supply/food service noncommissioned officer, who also functions as a Huey crewchief and is our petroleum, oils and lubricants (POL) technician during the week. The opening ceremony for the third World Series game was on the radio down the hall. Ahead of us lay another drill weekend with flights to schedule and meals to get "laid on" for those of us on the ground.

Suddenly, the floor "went four directions at once." It was like being in a fun house at an amusement park—only this was a little scarier. As the rumbling continued to worsen, the fun aspect vanished. Outside, the fire escape beckoned. A quick look at my companion and we decided to leave. Out on the ramp, the last flight of the day had just shut down. The flight crew clung precariously to their Huey as acres of 15-inch thick concrete ramp rose and fell in the long ground swells.

What we didn't know was that about 65 nautical miles to the south, near the town of Santa Cruz, deep within the earth the San Andreas Fault was shifting. In those awful 15 seconds the entire Pacific Plate, including the Santa Cruz Mountains, would move northward 5 feet and gain some 4 feet in altitude. In its wake would come the tragic loss of lives, limbs and property. The San Francisco Bay area would be changed forever.

After we had regrouped according to the facility evacuation plan, our "California calm" set in. Living as we do with the periodic shifting of the earth, we tend to be somewhat cavalier about earthquakes. This one was, however, "healthier" than our usual rumblings. The boss was somewhat concerned about our entering the hangar, with the threat of aftershocks ever present. Quitting time was near anyway, so he decided to call it a day and sent us home to check out our dwellings. This served two purposes. First, it allowed him to check the premises without worrying about injury to his employees. Second, it allayed our concerns about our homes and families.

The radio station in my truck continued with the World Series. Like me, the announcers were unaware of the disaster that had befallen the Bay area. So it was business as usual. The first fragment of information on the quake reached me only after I had pulled into a gas station just outside Hamilton Field. The information came from a Sixth Army member from the other side of the hangar. He had just come off the Cypress Structure en route to Hamilton.

I refueled and headed home. My mind wrestled with the problem of how to fathom a mile-long, double-decker freeway collapse at rush hour. I was numb. Now there was confusion at the ball park and a report of the Bay Bridge collapse. I picked through the radio dial in search of more information and found that some of the stations were off the air. Slowly, as the bits and pieces of news were put on the air, I realized that this might just be the "big one" we had always feared. If it were, things were going to get a lot worse before they got better. The ride home was more cautious than usual as I "eyeballed" each overpass and bridge as I approached them.

Around the bay, San Francisco International Airport, its tower shattered and in shambles, shut down. Oakland's International Airport, the San Francisco counterpart, had large, gaping cracks across its main runway. With both of its main runways cut, Alameda Naval Air Station (NAS) likewise had lost its capability to handle fixed-wing aircraft. To the south, Ft. Ord's Fritche Field began to stagger back to life on generator power. Back in San Francisco, Moffett Field NAS in the south bay and ASF 27's Hamilton Army Airfield in the north were the only operational military airfields left. Of these two, only ASF 27 had a dedicated medical evacuation (MEDEVAC) capability.

As I approached the halfway point on my journey home that evening, the first of our facility personnel were already returning to work. Our maintenance records technician, who is a Reserve Huey crewchief on weekends, was first to arrive back at the facility. He located log books, got the lights on and generally opened things up.

Not far away the two last flight Reserve and Individual Ready Reserve pilots walked into a local pizza parlor and "watering hole" for dinner and to watch the game on their big screen television. The

ASF 27 and UH-1V on the morning of the first day after the earthquake. The UH-1V belongs to the 343d Medical Detachment, which is supported by ASF 27.

picture, however, was not of Candlestick Park but rather that of the Marina District in flames. They stared for a moment, did an about face and returned to the facility. There they linked up with our records technician/crewchief and the 343d Medical Detachment's Active Guard Reserve (AGR) supply sergeant. He is a former Green Beret and was freshly certified as a California emergency medical technician. Together they loaded and preflighted a MEDEVAC Huey. After briefing with Sixth Army flight operations, they launched for Presidio of San Francisco. The time was 1755 hours. Less than an hour had passed since the earthquake had struck.

When the shop foreman returned, he immediately began to take stock of the situation—first, manpower. Two of our mechanics were on temporary duty at Ft. Ord. The maintenance test pilot and one of the other mechanics commute to the South Bay, so they were temporarily out of it. In fact, it was 2 days before they were heard from again. This left him four men short. However, the remaining mechanics were all seasoned veterans, used to working under pressure in hard times.

Next—the aircraft. Statistically, we were in good shape. Only three were in the hangar for maintenance. One needed a night vision goggles modification; the second was in for a minor repair; and the third required only tail rotor hangar assembly inspection/repack to be flyable. A fourth, however, was down at direct support at Ft. Ord. The aircraft's status was questionable at this point as

damage to Directorate of Logistics Maintenance was unknown.

Technical supply was in good shape and likewise POL. Or was it? True, our minifuel farm came through the quake in good working order but, if an aftershock had disrupted electrical power, we would have been like the ancient mariner, "Water, water everywhere, but not a drop to drink." Only in our case it would have been JP-4 aviation fuel, and not a drop to pump!

It took several tries to get through to the home of our POL technician only to find out that he was already en route back to the facility. He had discovered to his chagrin that, in his haste to get home to his family, he had accidentally pocketed the keys to the fuel truck. Other than that, we were "good to go."

Not much later our POL technician arrived on the scene. At the foreman's bidding, he fueled all of our aircraft and bulked both trucks. For the time being at least we were ready.

Several of the facility's mechanics arrived with the POL technician. Those members of the 343d Medical Detachment who lived nearby and could reach Hamilton began to arrive. Most important, among them were pilots and medics.

It was a late night for many of us. For the people of San Francisco, it was a dark one as well. They were without electricity, gas and even telephone service. Not that the phones were out, they were so jammed with traffic that communication beyond one's own immediate community was impossible and remained so for several days. This proved to be a headache for us because communication with our homes or members of our respective units was severely hampered or just not possible at all.

By the next morning we had been placed under operational control of Sixth Army DPTMSEC under the direction of their new commander. He was formerly an AGR officer with the 343d Medical Detachment. He was thoroughly familiar with our Reserve facility's assets and capabilities. This added insight served him well over the course of the next few days.

Thanks to the mechanics' work the night before, we had only one helicopter to get out. After a quick briefing by the foreman, we set upon that machine en masse. The severity of the crisis was reflected in an incident that took place that first day. The aircraft that had been left in the hangar from the night before was the one with the half-finished tail rotor hangar inspection and repack. As the repack drew to a close, we began to work to push the ship out as early as possible. The mood was unusually somber; the usual hangar banter was not heard. As a matter of fact, we barely spoke at all. We were all seeing grimly to the task at hand.

I was atop the machine looking over the rotor system and mast. The other mechanics were working on various locations around the aircraft. A small trembler, barely felt, rolled through the area. We all froze in place; no one breathed. Then, our technical inspector broke out in song, "I feel the earth, move, under my feet." Instantly, we all joined in, including accompaniment on the tail boom by one of the mechanics. This bewildered the modification team hard at work on another nearby helicopter. (They were from out of state.)

By 1130 hours the aircraft completed its maintenance operational check and subsequently was released for flight. We were now 100-percent fully mission capable (FMC)!

By close of business the first day, we had begun to get a handle on the turnaround requirements necessary to keep the mission going—enough to satisfy the critical eye of the foreman who released us in rotation to fly as spare crewchiefs on those missions' lacking the third crewmember.

The next morning's brief was simple. We were to break up into teams of two and three and get the aircraft ready for the day's mission...and check everything twice. Throughout that entire period that we were 100-percent FMC, 17 through 31 October, an attitude prevailed that, "good enough was not good enough." On more than one occasion, as the week wore on, sharp words were exchanged between mechanics about techniques used and the best way to accomplish a given task. In all cases, though, safety was uppermost on everyone's mind.

The foreman "snagged" another mechanic and me as we were coming out of the break area and

ALL THAT WE COULD BE

Two ASF 27 mechanics repair an electrical problem during a daily inspection. The two mechanics are both pilots on weekends; also, one is the 343d maintenance officer and the other is the ASF 27 avionics technician.

sent us to Alameda NAS via an unscheduled maintenance flight. We were to check on one of our helicopters operating from that facility.

The aircraft turned out to be in good working order so we gave it a good preventive maintenance for general principles. The field maintenance we did on that Huey does not stand out in my mind, but rather the flight down and back grabbed my attention.

The devastation of the 880 Freeway and the rest of Oakland was far more impressive than what was seen on television—at least, what we could see from our route of travel. The airspace was restricted above the disaster areas and control was maintained tightly by Oakland Center.

Upon our return, we were happy to hear that contact with our two mechanics at Ft. Ord had been established. Other than being a little worse for wear and somewhat hungry, they were fine. They had spent the night in their motel room without power. Their dinner was a package of peanut butter and cheese crackers by the light of a cigarette lighter. Ft. Ord and the local community were without power for several days; hence, no restaurants or gas stations were operational. The mechanics had not topped off their car upon arrival at Ft. Ord so they were unable to pack up and head for home.

Even if they had had gas, what route could they have used? Virtually every major road through the Bay area had fallen bridges, land slides, buckled overpasses—or were still out of action because of earthquake-related damage of one sort or another.

By noon, Friday, we had pretty well nailed down the quick turnaround business. As one observer put it, "We had some moves that would make an Indianapolis pit crew green with envy."

During one of those pit stops, I noticed something about the flight crews. Not that they were tired, it was something else—something I had seen

in a little fracas I attended in Southeast Asia some years back. Most noticeable was their skin color, or the lack of it. The crews had begun to pale, and their walk had changed ever so slightly—almost as if an invisible weight had been hung on them. Maybe it was a type of forced aging; I don't know. But there was a change noticeable to the keen eye.

Over lunch we found out that our counterpart facility, the 63d Army Reserve Command (ARCOM), Los Alamitos, was sending up half a dozen Hueys to participate in the relief of San Francisco. As we went home that night, I told myself the cavalry had arrived and now the pressure was off. The drill weekend had arrived. After that it would be business almost as usual.

Saturday morning, division headquarters kept our missions to a minimum. About mid-morning a phone call from a Marin-based relief organization got our attention. Someone had promised them a forklift to unload supplies to be airlifted to the Santa Cruz area. The "culprits" were not readily available, so the burden fell to the 91st to provide the forklift and manpower. With the blessing of the commander, we commandeered the facility's forklift and performed a combat assault on the supplies. As we moved the cargo, I noticed the children of Marin were sending their stuffed animals and other toys to the children of quake-damaged areas. We finished up Saturday evening and surveyed the hangar that was filling with goods. I noticed that in the center of the vast pile sat Minnie Mouse next to Snoopy atop some boxes. The famous beagle had his paw around Minnie's shoulder. He looked for all the world as if he were comforting his companion. As it should be, he was dressed as a World War I flying ace. (No foolin'.)

By close of business Sunday night, we had unloaded and collated 10 truckloads of supplies. Then, along with civilian volunteers, we staged and loaded about 100 light aircraft for sorties to the Santa Cruz/Watsonville area. As we drove home Sunday evening, the sun was setting behind the mountains to the west and the traffic was light. I felt we had acquitted ourselves well. We members of the facility had done "good." So "warm and fuzzy," we headed for home, mission accomplished. Well, not quite. Dear old Mother Nature and Fate wanted one more pass with the dice, just for grins.

In the predawn hours of Monday, 23 October 1989, the Bay area was struck by a dramatic storm that brought rain and high winds to confound the rescue efforts of those working to restore some semblance of normalcy.

Upon arrival at work, we immediately climbed into our wet weather gear and headed out to bring in the aircraft. We managed to shoehorn 14 Hueys into the space meant for 10. When the doors were closed, 3 inches of standing water were on the hangar floor. To the amazement of the 63d ARCOM guys, it was still raining inside the hangar. We pointed out the 18-inch gap above the door, then set to work getting the aircraft ready for the missions ahead.

As I reentered the shop area, the foreman confronted me. He stood before me slump shouldered and shook his head in disbelief. The aircraft condition evaluation (ACE) team was here to inspect our aircraft! They were "only" a full 30 days early—not scheduled until the middle of November. I remember one of the crew from the 63d standing, soaked to the skin, in water up to his ankles. With a big smile he said to a couple of inspectors from the ACE team, "Come on in, the water's fine!"

Thanks to a couple of privates first class from the 343d, we finished the inspection in good style, well ahead of schedule. By noon the storm was past and the aircraft were pulled outside again. We squeegeed out the hangar and went back to work, business almost as usual.

The 63d remained another week and were relieved by the 343d, now up to operational strength. The aircraft remained at 100 percent FMC through the end of the month. It didn't rain again and the 343d stood down on 10 November. The rest, as they say, is history.

In the aftermath of the earthquake of 1989, I'm sure there will come a lot of stories—some happy, some sad and some will make us all think about what happened to us during those 7 dizzy days in October. For our part here at the facility, I feel safe in saying we were, in fact, all that we could be.

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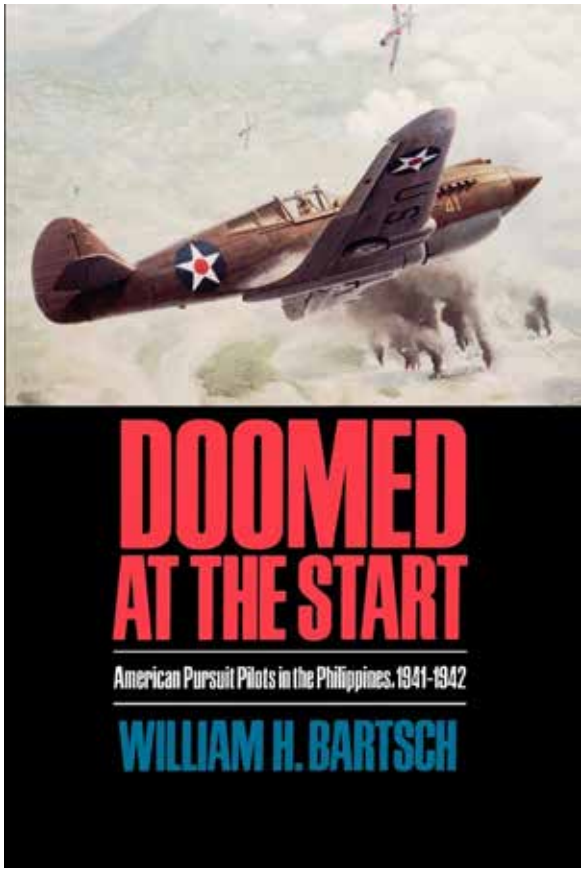
Doomed at the Start: American Pursuit Pilots in the Philippines, 1941-1942

Author, William H. Bartsch; Texas A&M University Press; 1995; 528 pages
A book review by CW4 Charles J. Boehler

Doomed at the Start is a book written by William H. Bartsch that chronicles the plight of U.S. Army Air Corps fighter pilots on the Philippines at the beginning of WWII. This book was clearly a labor of love for the author, who as a young man listened with great interest to the descriptions of the struggle in the Philippines on the radio. Later in life, Mr. Bartsch found that there were no books written that did this part of history justice and sought to do it himself. The exhaustive research that he did is apparent throughout the book, and his factual approach to telling this story without embellishing makes it more enjoyable to the reader.



The U.S. recognized that the Philippines would become a target for Japan in order to reach Australia and, as such, had been building forces to counter an expected attack. The U.S. Army Air Corps solution to building aviator strength in the country was to send entire flight school classes to the island. As such, there was much urgency made in preparing the fighter pilots for the inevitable Japanese invasion. To complicate matters, however, ammunition was not made available for training in even a remotely satisfactory number. This resulted in not only the obvious lack of proficiency among the pilots, but since the weapons hadn't been fired, many, if not most, P-40 machine guns malfunctioned. Many questionable maintenance practices also contributed to loss of aircraft and crews. Still, the pilots and mechanics of the fighter units in the Philippines lived and worked in some of the most difficult conditions imaginable, but they did their absolute best to continue the fight.

The pace of the book followed the events in a steady fashion; however, I would have appreciated a more thorough look at events immediately preceding the initial attack and the day of that attack, since those were the decisive moments. There are a large number of pilots written about in this book, but the author still does a commendable job of relaying as many details as possible, especially about some of the more famous pilots such as Buzz Wagner. Another thing I enjoyed about this book was its focus on the people—no matter their rank—unlike many other accounts of this campaign that are centered on General MacArthur or General Brereton. Bartsch did an enviable job of providing as much personal information as possible about every aviator that he could, humanizing what would end up being some very dehumanizing events.

However, there are some things to nitpick about. The book was copied from what is likely the original source and contains some annoyances. The margins are excessive for the page size, leaving a lot of wasted space. Many paragraphs have numbering throughout, which is unnecessary and, in some places, detracts from the readability. Additionally, the font and print type could use an update for clarity. Given renewed interest in the first Philippines campaign, the publisher would likely find interested readers with a reprint of this book.

This book has relevancy to today's military and Army aviators in particular. The U.S. has historically been unprepared for war, and the first campaign in the Philippines in WWII is a prime example of that. While today's Army is undoubtedly more professional and prepared for the most part, there are some things we could certainly do better. One of the more profound takeaways I had from this book was the detrimental effect accidents and fratricide had—not just on combat capability—but on morale as well. I wouldn't hesitate to recommend this book to anyone interested in WWII history or history in general.

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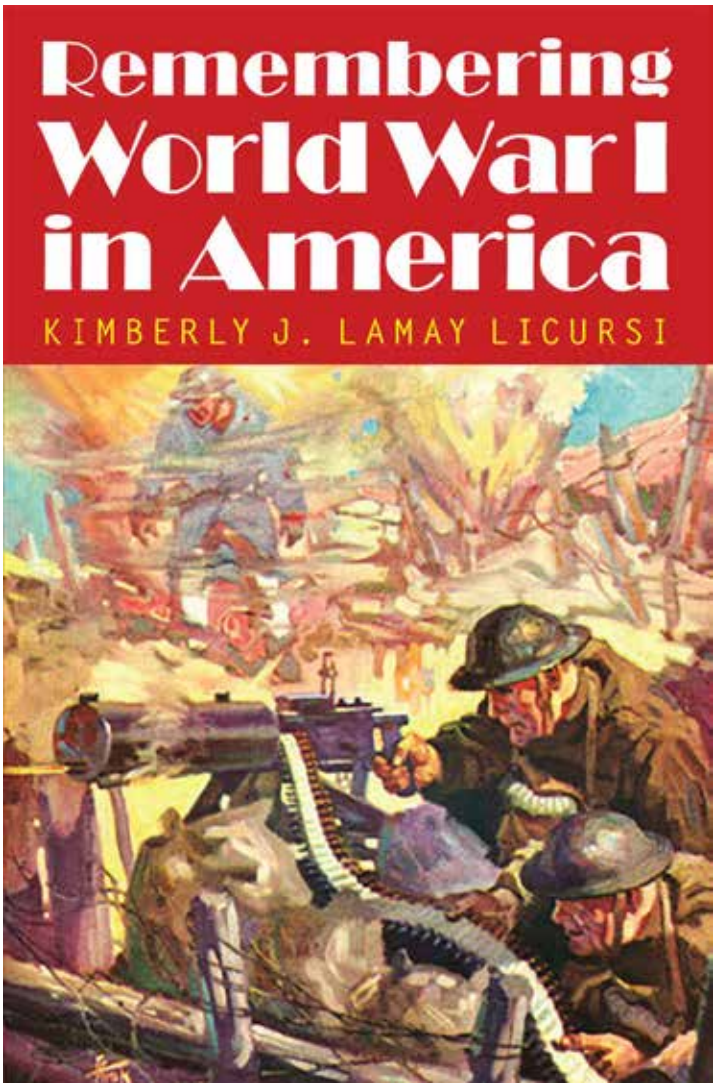
Remembering World War I in America (Studies in War, Society, and the Military)

Author, Kimberly J. Lamay Licursi; University of Nebraska Press, 2018; 294 pages
A book review by COL Michael F. Charnley



Kimberly J. Lamay Licursi's *Remembering World War I in America* addresses the root cause of American public's apathy regarding the First World War. Licursi makes the case that America's collective memory of The Great War is limited because the "vectors of memory" all failed to sear this conflict into the national consciousness at the same level as the Civil War or World War II. As a result, the national remembrance of the conflict, despite the recent centennial, remains as little more than a prequel to World War II.

Licursi serves as an Adjunct Instructor of History at Siena College in New York. Her interest in how popular culture remembered World War I developed from a course she took during her graduate studies. Her work in that course led her to expand her research to encompass the subject of her current book.

Remembering World War I in America is a succinct scholarly work. Licursi writes in an easy-to-read style for the non-academic. A short work of just over 200 pages, its four chapters each dealing with four avenues, or "vectors," that Licursi argues work to establish how the United States remembers its wars: official state histories, Soldiers' memoirs, literature, and film. Each chapter works as a stand-alone source for the academic or casual enthusiast with a specific interest.

The constant theme throughout the book focuses on an American public during the interwar years with a general apathy toward the war. Each chapter, or "vector," demonstrates the desire to move on from the war to focus on contemporary or future events. Perhaps the rapid succession of the Spanish Flu, Prohibition, the Roaring Twenties, the Great Depression, and then World War II worked to divert American collective memories from better memorializing this conflict. On one hand, the vast majority of Veterans largely refused to provide information to the various commissions established by the state to collect data. On the other hand, the public's appetite trended largely to literature and films that did not address the war, or that only used the war as a backdrop (Licursi provides good analysis of this).

If you are looking for a general First World War history, this is not it. It is an excellent book for those that have interest in how popular culture of the interwar period shaped American collective memory of the war. Licursi's sections on film and literature are noteworthy in this regard. For anyone with a deeper or enduring interest in World War I, she includes an impressive bibliography of personal narratives and novels of the Great War. The first two chapters on war histories and war memoirs are an excellent reference to repositories, sometimes little-known. Researchers looking for first-person accounts of the War will find Licursi's bibliography quite impressive. Likewise, the individual interested in the popular culture of the interwar years will find this work useful, particularly the chapters on War Fiction and War Films and the analysis she provides.

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