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Army Airspace Management During Large-Scale Combat Operations

CW3 Christopher Cronen, USA

CW3 Michael Rich, USA



A group of four AH-64E Apache helicopters arrive at Hunter Army Airfield, Georgia after a four-day journey on July 16, 2021. (U.S. Army photo by Sgt. Savannah Roy)

Introduction

The Air Defense Airspace Management/Brigade Aviation Element (ADAM/BAE) is a critical combat multiplier for Army brigade formations during large-scale combat operations (LSCO). Airspace is a finite resource which is under the purview of the joint commander, yet the number of airspace users utilized in the brigade area of operations continues to grow at an exponential rate. The ADAM/BAE remains uniquely situated to provide airspace management of the growing number of airspace users required for success against a peer competitor in LSCO.

Development of the ADAM/BAE

The need for trained and equipped Army airspace managers has been identified throughout the rise of the air domain, but was made most apparent during the early days of Operation Iraqi Freedom. In 2004, at the direction of Chief of Staff of the Army General Peter Schoomaker, the Army transformed the brigade combat teams to incorporate additional fires, command and control, and sustainment capabilities¹. The newly transformed Army brigade combat teams would incorporate new equipment and organizations, combining different units from various Army branches and warfighting functions under a single brigade commander. These units brought new capabilities with them, in the form of indirect fires from the direct support field artillery battalions, and the RQ-7 Shadow unmanned aerial system (UAS) from the attached military support company, among others.

Other airspace users that required dedicated airspace management continued to develop during this period as well. Small UAS systems, such as the RQ-11 Raven, were fielded and issued to units at the company, troop, and battery level to provide low-echelon intelligence support². Cyber-electromagnetic activities were employed throughout the battlefield, which could potentially impact airspace and required coordination to utilize. Aviation task forces were employed to support the brigade combat teams (BCT), offering reconnaissance, attack, lift, and assault capability to deployed maneuver forces³.

The newly transformed BCTs brought a lot of versatility and flexibility to the fight, but required dedicated airspace managers to ensure that these new capabilities could be integrated and synchronized in a safe and efficient manner. The ADAM/BAEs filled that gap during the counterinsurgency (COIN) years of Iraq and Afghanistan, providing airspace management for counterfire missions, medical evacuation, UAS employment, air assault operations, and planned fire missions⁴.

Brigade Airspace Management during LSCO

In its current incarnation, the BCT ADAM/BAE is a small team, consisting of air defense and aviation personnel and equipment. Each ADAM/BAE varies in terms of personnel and equipment, depending on the type of brigade it is designed to support (an armored BCT has a different ADAM/BAE setup compared to a field artillery brigade, for instance). While the composition of each ADAM/BAE varies, there are generally anywhere from 8-12 personnel, with little to no overlap in terms of personnel expertise⁵. For instance, there is only one air defense officer, one air mission survivability officer, and one airspace control sergeant. The small size and lack of redundancy in skill sets highlights the critical need to ensure cross-training of disciplines occurs between ranks (officer/enlisted) and branches (air defense/aviation)⁶.

While the ADAM/BAE may be small in size with no redundancy in terms of skills or experience, it is well equipped to provide air defense, aviation, and airspace management expertise to the supported brigade. The air defense component of the ADAM/BAE consists of an air defense officer, a command and control systems integrator warrant officer, and enlisted battle system operators with the military occupational specialty (MOS) of 14G. These personnel provide the expertise needed to plan and synchronize air and missile defense operations with brigade's scheme of

maneuver. The air defense personnel, using the organic air defense command and control systems in the ADAM Cell shelter, are able to integrate with the joint datalink network in order to provide external sensor coverage, air track data, and aerial situational awareness to the brigade staff and subordinate units.

The aviation personnel within the BAE includes rated aviators, specifically the brigade aviation officer, deputy brigade aviation officer, and an air mission survivability officer. Ideally, these positions should be filled by aviators from across the full spectrum of Army rotary-wing aircraft (i.e. Apache, Blackhawk, and Chinook) so there is experience with all Army aviation mission sets (attack, reconnaissance, lift, and assault). However, these personnel assignments are not generally manned with this goal in mind. The aviation branch enlisted personnel consists of aviation operations sergeants (MOS: 15P) and airspace control sergeants (MOS: 15Q). The aviation operations sergeant produces and processes air mission requests providing needed aviation support to brigade operations for all aviation tactical, enabling, and sustaining tasks (screen, attack, reconnaissance, air assault, air movement, aeromedical evacuation, and C2 support)⁷. The airspace control sergeant provides airspace management expertise and operates the Tactical Airspace Integration System (TAIS) C2 system in support of brigade airspace activities.

The requirement for the brigade to manage airspace users in the brigade area of operations during LSCO relies on the combined expertise of both air defense and aviation personnel within the ADAM/BAE section. While planning operations, this unique pairing of air defense and aviation personnel allows for planning of airspace use, development of the airspace control appendix to the operations annex, and analysis of airspace usage to identify, determine, and resolve conflicts. In the current operations fight, the ADAM/BAE monitors airspace usage, provides immediate airspace coordinating measure requests (ACMREQs) for airspace usage that conflicts with current operations, and executes near-real-time management of Army airspace users.

To manage Army airspace users in the brigade area of operations during LSCO, the ADAM/BAE utilizes procedural control. Due to the decentralized nature of Army operations, procedural control is the Army's preferred airspace methodology⁸, as it relies on the dissemination and distribution of previously-agreed upon orders and procedures. The ADAM/BAE utilizes tactics, techniques, and procedures (TTP), standard operating procedures (SOP), planned airspace coordination measures (ACM), and their developed airspace control appendix to help plan, coordinate, synchronize, and integrate airspace users operating in support of the brigade.

A well-planned and well-rehearsed unit airspace plan utilizing procedural control will allow for the timely synchronization of decentralized airspace users to support the warfighter and minimize conflicts during current operations. Timeliness is always a consideration during combat operations, as any delay will result in degradation of desired effects. For this reason, it is imperative that brigade airspace plans need to be as free of conflict as possible when developed, built, and submitted for use in the airspace control order. While airspace conflicts are inevitable, they should be identified and mitigated during the planning phase to minimize their impact and allow for brigade resolution of these airspace conflicts during current operations.

If brigade airspace conflicts cannot be resolved internally, however, the airspace conflict must then be elevated to the division joint air-ground integration center (JAGIC) for resolution. The JAGIC, consisting of an Army division aligned with an Air Force air support operations center (ASOC), is a current operations TTP that arranges Army and Air Force personnel for the purpose of controlling division-assigned airspace. The intended purpose of the JAGIC is to support division-level current operations through the rapid execution and clearance of joint fires and airspace deconfliction⁹.

While the JAGIC TTP enables decision-making authority to provide for responsive air-ground operations supporting the division commander's scheme of maneuver, the JAGIC's success is reliant on subordinate brigades planning airspace and managing airspace users appropriately. A poorly constructed brigade unit airspace plan that leads to airspace conflict requiring JAGIC resolution will slow down the pace of LSCO. Slowing the pace of LSCO will hinder planned and dynamic fires, UAS employment, and aviation operations at the brigade, thereby allowing the enemy to exploit friendly inaction. The division must then allocate JAGIC resources, time, and effort to resolving airspace conflicts that could have been prevented with proper planning. This diversion of resources and time reduces the division's capability to rapidly execute joint fires in support of division operations.

Integration of Brigade Airspace Users during LSCO

The ADAM/BAE's chief responsibility is to provide airspace management of brigade airspace users to support the commander's scheme of maneuvers while preventing fratricide and maximizing combat power. The main task supporting this responsibility is the requirement to identify and determine airspace users and their requirements¹⁰. Brigade organic airspace users and external airspace users operating in support of the brigade are found across the six Army warfighting functions, and must be fully synchronized and integrated in order to fully support brigade operations. This synchronization of airspace manage efforts across all six warfighting functions (movement and maneuver, fires, intelligence, protection, sustainment, and command and control) masses combat power at the decisive place and time and is vital to success in LSCO.

Chief among airspace users in the movement and maneuver warfighting function is Army aviation, which includes the rotary wing missions of attack, reconnaissance, lift, and assault. The combat aviation brigade (CAB) in a LSCO environment will likely be employed as a maneuver formation by the division commander. It is unlikely that the CAB will be broken down to battalion-sized task forces to support the brigade combat team, similar to what was experienced in Iraq and Afghanistan. While the CAB will probably be used as a maneuver element for the division, the firepower and tactical mobility provided by Army rotary-wing aircraft are not replicated anywhere else in the Army footprint. The ADAM/BAE (and brigade aviation officers in particular) must be proactive in requesting the rotary-wing assets they need to support brigade operations.

Other movement and maneuver airspace users in the brigade footprint that must be managed and integrated into the unit airspace plan include those at the company level. Small UAS, such as RQ-11 Ravens, will be employed to support low-level intelligence collection for the company, and if not planned for and executed appropriately, will put

other airspace users (specifically low-flying manned aircraft) at greater risk. However, ADAM/BAE airspace managers that are too cautious and put up burdensome restrictions to employing small UAS may be denying a critical capability to company commanders. Mortars are similar in concept to small UAS, in that they should be responsive to the company commander in order to maximize combat power during LSCO but must be integrated appropriately to mitigate risk to other airspace users.

Within the fires warfighting function, field artillery is the preponderance of airspace users within the brigade area of operations. To support maximum combat power in a LSCO environment, brigade airspace plans should be built to emphasize a permissive fires environment while providing protective control measures for friendly aircraft operating within the brigade area of operations.

Maneuver Short-Range Air Defense (M-SHORAD) is making a return to the contemporary battlefield and must be integrated within the brigade area of operations as well¹¹. With tactical air defense units operating in close concert with other friendly manned airspace users while hostile aircraft are present, there must be additional emphasis on air-ground coordination in order to prevent fratricide. The potential for a friendly aircraft getting shot down by friendly air defense fires will remain high if not properly addressed during planning. These should incorporate airspace coordination measures for aircraft returning from forward positions, positive identification procedures, and rules of engagement for air defense forces. For aviation considerations, aviator check-in procedures to friendly air defense units must be incorporated as well.

The intelligence warfighting function brings unique capability to the brigade formation. Brigade tactical UAS assets, such as the RQ-7 Shadow, provides intelligence collection capability to the brigade commander but requires special integration requirements. Their range, speed, and altitude often puts them in the vicinity of low-flying aircraft within the brigade area of operations. Additionally, the lack of real-time situational awareness of environmental considerations on the remote-piloted aircraft requires additional buffer space between itself and other manned airspace users.

Protection and sustainment warfighting functions possess their own airspace management integration criteria. While not traditional airspace users, chemical, biological, radiological, and nuclear (CBRN) and engineer effects (to include mine-clearing activities and explosive ordnance disposal) can potentially affect airspace usage within the brigade area of operations. The sustainment warfighting function includes several capabilities that require ADAM/BAE airspace managers to effectively integrate into brigade operations during LSCO. Among these are low-cost, low-altitude (LCLA) resupply drops, a cost-effective means of providing resupply across the LSCO battlefield¹². "Ring routes," employed by the division to resupply brigades via lift rotary-wing in the forward area, traverse across subordinate boundaries in the division area of operations and require close coordination to ensure they are deconflicted from both SHORAD fighting positions and employed field artillery batteries.



Oklahoma Army National Guard soldiers conduct their required Additional Flight Training Period (ATFP) hours with the RQ-7 Bravo or "Shadow" at Muldrow Army Heliport in Lexington, Oklahoma, Jan. 29, 2018. (USANG photo by Staff Sgt. Jason Lay)

Trained, equipped, and proficient airspace managers at the ADAM/BAE are required to integrate all these capabilities from across the warfighting functions. A poorly trained and undermanned ADAM/BAE will result in an inability to integrate critical capabilities such as artillery, mortars, UAS, and M-SHORAD, directly impacting that brigade's ability to fight. The capabilities listed above are merely the current capabilities. As technology continues to develop and improve, other airspace users will emerge to support brigade operations in the LSCO arena. Directed-energy weapons are being tested for future use to support the brigade's counter-UAS mission¹³. Advances in artificial intelligence, miniaturization, UAS development, and other manned and unmanned platforms will greatly increase the number of airspace users that require detailed synchronization and integration in the brigade footprint¹⁴.

ADAM/BAE Airspace Planning

The ADAM/BAE relies on detailed planning in order to integrate and synchronize as many airspace users as possible to support the brigade commander's scheme of maneuver. LSCO airspace planning requires the ADAM/BAE to coordinate airspace users and airspace user requirements from across warfighting functions, staff elements, and adjacent and subordinate units. A means to achieving this is the airspace control working group (ACWG)¹⁵. The purpose of the ACWG is to synchronize contributions and requirements of all airspace users to best support the brigade commander's

operations. Identification of airspace users and their requirements is critical for the development of ACMREQs designed to maximize employment of airspace-using assets, to include aviation, field artillery, and air defense.

Ideally, any brigade staff element with a stake in airspace, or representing an airspace user, would be an ACWG attendee. The ACWG is chaired by the brigade aviation officer and a non-comprehensive list of ACWG attendees would include the brigade fire support officer (representing the fires warfighting function), the brigade air defense officer (representing the supporting air defense unit), and the air liaison officer (representing the joint air element). Other attendees should include the military intelligence company (representing the brigade RQ-7 Shadow capability) and the aviation or air defense unit liaison officer (if the brigade is provided direct or general support by an aviation or air defense unit).

Outputs of the ACWG include developed ACMREQs for airspace users supporting the brigade, developed airspace usage priorities and risk acceptance guidance, the air-ground operations communications plan, and the completed brigade unit airspace plan. Developing airspace usage priorities during planning are especially important, in that they will guide timely decision-making during current operations as to what airspace user takes precedence over others in the event of an airspace conflict. Risk acceptance guidance will determine where the commander is willing to take risk when there is an inevitable airspace conflict while conducting operations. Receiving the commander's risk acceptance guidance ahead of time will decentralize decision-making and allow for timely responses during current operations. The air-ground operations communications plan will identify frequencies, call signs and check-in procedures for rotary and fixed-wing aircraft, highlighting how aircraft will check in to the ADAM/BAE or supported unit while traveling through airspace above the brigade area of operations.

The product of brigade airspace planning efforts is the unit airspace plan. The unit airspace plan incorporates guidance from higher headquarters operations orders, the theater airspace control plan, and area air defense plan, as well as the brigade's own ACMREQs and fire support coordination measure requests built to support the brigade commander's scheme of maneuver. Utilizing the brigade TAIS, the unit airspace plan and its associated ACMREQs are then transmitted digitally to the division and onward, for incorporation in higher organization's unit airspace plan and ultimately for inclusion into the airspace control order for execution. Building a flexible, simple, and well-understood unit airspace plan is critical for success while conducting air-ground operations, as both organic and external airspace users operating in support of the brigade will be required to know and understand their task and purpose to support brigade operations.

LSCO Airspace Management

ADAM/BAE airspace managers not only plan airspace for future operations, but also manage airspace users during current operations. Airspace management during LSCO is reliant upon detailed analysis and integration during the planning phase. A good unit airspace plan will facilitate better decision-making by informing commanders of where other airspace users are operating, what the airspace usage priorities are, and what risk acceptance should be implemented during operations. Conversely, a poor unit airspace

plan will lead to airspace conflicts, impacting combat power by delaying response times during critical time-sensitive missions such as counterfire. This also prevents airspace utilization by critical assets such as company UAS, brigade tactical UAS, and planned fire missions. Worst-case scenarios for poor airspace planning includes the potential for fratricide and possible destruction of critical warfighting platforms (rotary-wing and fixed-wing aircraft).

Airspace management operations during LSCO must utilize the digital systems that the ADAM/BAE possesses, to include the air defense systems integrator (ADSI), the air and missile defense workstation (AMDWS), the forward area air defense (FAAD), and the tactical airspace integration system (TAIS)¹⁶. While all possess tactical datalink capability to some degree, each provides a unique capability to the brigade command post during LSCO. The AMDWS will provide the air defense personnel the capability to plan air defense weapon and sensor employment against enemies forces, while the FAAD will provide the ability to monitor the air defense fight of supporting air defense forces against hostile aircraft. The ADSI was largely utilized during the COIN years for beyond line-of-sight tactical datalink capability in fixed static locations, such as forward operating bases. However, the ADSI will be critical in the LSCO environment for supporting Link 16 operations via the Multifunctional Information Distribution System (MIDS). The brigade command post must be mobile and displace often to avoid destruction due to enemy detection and engagement via long-range precision fires, and the MIDS Link 16 capability will support this mobility requirement¹⁷.

Digital sustainment training is critical to building and maintaining individual and collective skill task proficiency. The C2 systems within both the ADAM/BAE and the brigade fires cell are technically demanding and prone to skill degradation if not exercised. Operators must be proficient on their assigned C2 system. Digital sustainment ranges using organic equipment must be conducted often at home station, and incorporated onto the training schedule and annual training guidance. Every opportunity to employ the ADAM Cell shelter and its associated equipment must be taken, to include battalion live-fire exercises, artillery battalion gunnery, and aviation gunnery. Any time there is weapon systems operating or training within the brigade, the ADAM/BAE should be present to both employ the ADAM/BAE C2 systems and to conduct airspace planning and airspace management for the associated weapon system.

There is no question that the digital systems within the ADAM/BAE are a combat multiplier and must be utilized to the maximum extent possible. However, brigade airspace managers in a LSCO environment must be ready to operate in a degraded environment. The enemy possesses a wide assortment of capabilities and effects that can disrupt friendly computer networks, radio frequencies, and digital systems¹⁸. ADAM/BAE airspace managers must rehearse their capability to manage airspace while operating in a degraded or analog fashion. The unit airspace plan must identify provisions to account for enemy activity to disrupt the network. This should include planning to identify primary, alternate, contingency, and emergency means of conducting air-ground communications, unit airspace plan submission, and tactical datalink operations. Analog methods of tracking airspace usage, including physical maps and overlays, running estimates, and other hardcopy methods of capturing and

managing information, should be considered for any period where digital system usage is impacted.

Key to an ADAM/BAE's performance during LSCO are rehearsals. As the brigade airspace element, the ADAM/BAE must participate in brigade combined arms rehearsals to synchronize airspace utilization within the brigade scheme of maneuver and scheme of fires. Throughout the rehearsal, the ADAM/BAE must identify key decision points, ensure that the commander's airspace usage priorities are known and understood, and ensure that planned airspace usage during all phases is consistent with the commander's intent.

Other required rehearsals for successful airspace management during LSCO includes battle drill rehearsals. The ADAM/BAE must identify and delineate battle drills and TTPs to support common LSCO activities requiring airspace management, such as medical evacuation (MEDEVAC) operations, counterfire missions, immediate fire support, immediate close air support, and deliberate rotary-wing attack operations. These battle drill rehearsals should include all affected sections within the brigade command post and should be rehearsed often to build proficiency, develop technical proficiency (if utilizing C2 systems), and to maximize responsiveness while conducting the LSCO fight.



Guardsmen conduct RQ-11 Raven training at Fort Stewart, Ga. to better prepare these Soldiers and their units to conduct reconnaissance missions with the lightweight unmanned aerial vehicle on April 16, 2014. (Georgia ANG photo by Maj. Will Cox)

Conclusion

The ADAM/BAE was conceived from a need to manage Army airspace users in the COIN environment. While the ADAM/BAE grew and developed during the COIN years

of Iraq and Afghanistan, the need for airspace management grows even greater during operations against a peer competitor in LSCO. As technology develops, the number of airspace users and their capabilities will continue to grow, and our enemies capabilities grows as well. The brigade ADAM/BAEs must be trained and equipped to integrate and synchronize air defense, aviation, and airspace management to support brigade operations. The ADAM/BAE remains the Army's solution to managing airspace users at the brigade echelon, providing for the safe, efficient, and flexible use of airspace while maximizing combat power and preventing fratricide.

Author Bio Summaries

Chief Warrant Officer 3 Christopher Cronen is the ADAM/BAE Air-Ground Operations lead instructor and is assigned to Headquarters and Alpha Battery, 2nd Battalion, 6th Air Defense Artillery at Fort Sill, Oklahoma. He has served in a variety of positions at the battalion, brigade, and division, both in garrison and deployed.

Chief Warrant Officer 3 Michael Rich is the ADAM/BAE Air-Ground Operations course manager and is assigned to Headquarters and Alpha Battery, 2nd Battalion, 6th Air Defense Artillery at Fort Sill, Oklahoma. He has served in a variety of operational positions, from ADAM Cells to Patriot and THAAD.

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