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Open Warfighter Forum

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Purpose: The ALSA Center publishes the ALSB three times a year. ALSA is a multi-Service Department of Defense field agency sponsored by the US Army Training and Doctrine Command (TRADOC), Marine Corps Combat Development Command (MCCDC), Navy Warfare Development Command (NWDC), and Curtis E. LeMay Center for Doctrine Development and Education (LeMay Center). This periodical is governed by Army Regulation 25-30. The ALSB is a vehicle to "spread the word" on recent developments in warfighting concepts, issues, and Service interoperability. The intent is to provide a cross-Service flow of information among readers around the globe.

Disclaimer: Since the ALSB is an open forum, the articles, letters, and opinions expressed or implied herein should not be construed as the official position of TRADOC, MCCDC, NWDC, LeMay Center, or ALSA Center.

Submissions: We solicit articles and reader's comments. Contributions of 1,500 words or less are ideal. Submit contributions, double-spaced in MS Word. Include the author's name, title, complete unit address, telephone number, and email address. Graphics can appear in an article, but a **separate computer file for each graphic and photograph (photos must be 300 dpi) must be provided.** Send email submissions to **alsadirector@langley.af.mil**. The ALSA Center reserves the right to edit content to meet space limitations and conform to the ALSB style and format.

Next issue: January 2014; Submission DEADLINE is close of business 1 October 2013. The theme of this issue is **"Pacific Rebalance: Tactical Implications".**

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Afghan National Security Forces (ANSF) soldiers and US Marines with Fox Company, 2nd Battalion, 8th Marine Regiment, Regimental Combat Team 7 provide security during Operation NIGHTMARE in Now Zad, Helmand Province, Afghanistan, June 5, 2013. Operation NIGHTMARE was a clearing operation led by ANSF and supported by US Marines. (Photo by Cpl Kowshon Ye, USMC)

DIRECTOR'S COMMENTS

For almost 40 years, the Air Land Sea Application (ALSA) Center has continued to adapt to changing operational environments to provide timely, relevant and compelling doctrine to meet the immediate needs of the warfighter. No one has embraced this effort more than our outgoing Director, Colonel Bruce Sones (USA), whose leadership in transformation will have a significant and enduring impact on ALSA for years to come. I am humbled and welcome the opportunity to take the reigns as we wish Bruce and his family all the best in their next assignment. Also, we send our best wishes with LTC Stephen Parker (USA) and LTC Troy Ewing (USA) as they depart ALSA. We welcome aboard Colonel John Smith (USA) as our new Deputy Director; and LTC Randall Weisner (USA); Lt Col Thomas Seeker (USAF); Maj William Harvey (USMC); MAJ Blake Keil (USA); and MAJ Shawn Herrick (USA) to the joint ALSA team.

Many challenges lie ahead, from operational drawdowns to force shaping and sequestration. But, in every challenge also lies opportunities. As the requirement for ALSA publications comes directly from the field, our ability to deliver cannot be accomplished without the expertise and direct contributions of warfighters from all Services. ALSA will continue to adapt to overcome shortfalls as it is essential now that we continue to capture into enduring doctrine the hard-fought lessons learned from the last decade of combat operations.

In that aim, this issue of the Air Land Sea Bulletin (ALSB) is an open forum for warfighters offering a great mix of lessons learned, current statuses, and future considerations for this bulletin. The first article, "Anyone for CAS Training?", authored by Lt Col Kenith Stone of the Indiana Air National Guard, expresses the need for remotely piloted aircraft pilots to train in similar environments to those they will encounter on the battlefield.

The second article, "B-1 Maritime Employment", by Maj Tim Griffith of the Air Force's 77th Weapons Squadron, explores the enhanced tracking ability of the B-1 in a maritime environment.

The third article, "Improving UAS Mission Effectiveness Across the Joint Battlespace", by Maj Randall Klatt of the Joint UAS Digital Information Exchange Joint Test Team, further discusses the need for codifying unmanned aircraft system tactics, techniques, and procedures (TTP) to make unmanned assets more effective on the battlefield.

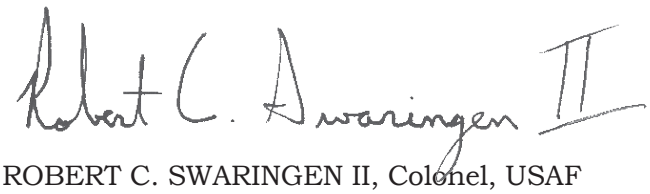
Capt Stacey Neece of the Air Force's 561st Joint Tactics Squadron delivers our fourth article, "NKO: A Tactician's Perspective," explaining the importance of such operations in future conflicts.

The fifth article, "Over the Horizon, Not Through the Woods: Methods to Leverage the Air Force ISRLO", by USAF Capt Jaylan Haley of the 10th Air Support Operations Squadron emphasizes the importance of ISR liaisons at and below the brigade level during our country's last two major combat operations.

Finally, CW4 Brian Filibeck of the Electronic Warfare Branch and CW4 Corey Swetz of the Electronic Warfare Technician Warrant Officer Advanced course describe the importance of integrating electronic warfare professionals in combat aviation brigades in the last article, "Achieving Spectrum Dominance in the CAB".

As we approach another fiscal year of significant change, we eagerly seek your participation in ALSA joint working groups and in writing articles for future ALSBs. It is your opportunity to have a voice and capture your expertise to meet the challenges ahead. We also look forward to your feedback and encourage you to visit our Web page at **http://www.alsa.mil** to find multi-Service TTP, previous ALSBs and information on upcoming joint working groups.

Let us know how we are doing and what we can do for you!



ROBERT C. SWARINGEN II, Colonel, USAF

Director

ANYONE FOR CAS TRAINING?

An MQ-1 Predator with the 46th Expeditionary Reconnaissance and Attack Squadron prepares to land at Joint Base Balad, Iraq, after a mission November 2008. Predators provide armed intelligence, surveillance, and reconnaissance capabilities for ground force commanders. (Photo by TSgt Erik Gudmundson, USAF)

By Lt Col Kenith Stone, Indiana Air National Guard

In December 2012, the Air Force released the *2025 Air Test & Training Range Enhancement Plan Interim Report*. The report lays out six priorities, adherence to which is supposed to ensure viability of the range structure through 2025. It also emphasizes that this vital national resource must be relevant and available. While I agree, I would add this resource must be more adaptive and effectively used than has historically been the case. The goal then should not be just for the benefit of ensuring viability, but to develop tactics, techniques, and procedures (TTP), hone the skills of the mission crews, and develop the world's finest integrated fighting force. The Air Force's priority must be to train combined armed forces and do so in a complex, evolving environment with the support of ranges. This is especially relevant to the close air support (CAS) mission.

The strength of the RPA is also its weakness; i.e., the availability of the aircraft. They are in demand and deployed, thus unavailable for training.

As a remotely piloted aircraft (RPA) pilot, I have not conducted a training sortie since my initial qualification training. Flying an RPA is not inherently difficult. The difficulty is operating in a dynamic, potentially kinetic environment with multiple assets (i.e., air and ground), in combat every time, without rehearsal. The strength of the RPA is also its weakness; i.e., the availability of the aircraft. They are in demand and deployed, thus unavailable for training. Compounding this weakness, the lost training opportunity is not isolated to the RPA crew, but is lost to all assets that are operating in the digitally integrated environment. The distributed ground station (DGS) units are suffering from the same atrophy. Also, the supported units, including ground force commanders, have very little insight to mission capabilities due to the lack of after action reporting. Time proven attributes of training, such as developing TTP in a collective, combined-arms environment, are lost. While we are completing the mission, we are not completing it with the greatest effect or efficiency.

While operating the mighty MQ-1 Predator one night, I noticed there were 171 people in the Mardam-Bey internet relay chat (mIRC) mission room. Would all of those people benefit from training sorties? I argue, yes. This is not a throwback to the days in the F-16 where the training benefits were isolated to "the few in my flight" or to maintenance supporting the sortie, where training was going to the range and preparing for major combat operations. The emphasis now is that effective training needs to consider and satisfy a broader customer base.

My concern is that in the vision of the *2025 Air Test & Training Range Enhancement Plan Interim Report*, ranges must determine how these intricacies relate to their individual training complexes while creating a space to meet future training requirements. It is critical that the ranges understand what the mission requirements are in their expanded iteration. The cost of missing the mark is qualitatively high. Potentially, years will be lost to range and operational development.

The National Training Center located in Indiana and operated by the Indiana National Guard, has chosen a path for its range complexes that enhances the quality and complexity of training through a cost-sharing model. The focus is on setting a complex environment replicating decentralized planning and execution from state and non-state actors. The Indiana Range Complex presents threats to evaluators, trainees, and allies that require the skill sets of all assets across the spectrum of the United States Government to gain resolution. This is similar to our current approach in the areas of responsibility, however, with a goal of designing a training environment that ensures TTP are developed and "trained to" with proficiency. The emphasis is not individual unit training but combined arms, reaching across the spectrum of CAS, intelligence surveillance and reconnaissance (ISR), cyber, RPA and electronic warfare (EW).

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An unidentified joint terminal attack controller marks a target for a close air support mission. (Photo courtesy of 181st Intelligence Wing, Indiana Air National Guard Public Affairs, USAF)

As a white cell member and range commander, I have been involved with numerous large-force CAS exercises that occur regularly in our range complex. However, the components most weakly represented are assets the air and space forces bring. Until integration of these assets occurs, the ISR portion will not realize its full potential. Evolutions of enhanced capabilities will only occur by accident or because of persuasive individuals' ideas. This is juxtaposed with the ideal of establishing a forum for lessons learned.

Recognizing the cited gaps, Indiana is reaching out to involve the various components to achieve this collective knowledge. We are aligning the airspace to the Global Area Reference System. The Indiana National Guard has worked well with the local Federal Aviation Administration in establishing air traffic control assigned airspace and temporary military operating areas as well as several courses of action for RPA use, yielding a more adaptive airspace. The Indiana National Guard established support through letters of agreement (LOA) which will allow for using category 3 and higher RPA at non-joint use airports in the surrounding area. Further, these LOA allow for transit via positively controlled airspace, and launch and recovery of some category 3 and smaller RPA within two of many restricted areas. The Guard is also ensures a robust EW-capable space by providing unfiltered electromagnetic spectrum training areas. Local community support coupled with a geographically isolated electromagnetic spectrum within an urban setting enable replication of various spectrums, while ensuring outside agencies that use these capabilities do not have freedom of movement in the cyber operating environment.

We cannot continue to use ops tempo in the current war as a reason not to train for the next war.

In providing for these capabilities, Indiana benefits from its partnerships. Crane Naval Surface Warfare Center and the Air Force Research Lab at Wright Patterson Air Force Base bring technical expertise to the ranges, which has helped develop the cyber, EW, and RPA environment. This includes internet connectivity in real time that allows for distributed testing and evaluation across the nation. Indiana's A-10 unit provides excellent support to the various exercises while meeting its training requirements via replicating the kinetic events.

Still missing are the complexities of data collection in a potentially contested electronic environment. The focus is still on the physical space while the threat has evolved to encompass a more diverse battlespace, which we are alarmingly ill prepared to meet. As outlined in the *2025 Air Test & Training Range Enhancement Plan Interim Report*, the Air Force is taking steps to incorporate space and cyber capabilities. As these assets become available for operational and tactical level training, their incorporation at all National Training Centers is paramount. These space and cyber gaps are challenging the traditional definitions of CAS, and Indiana has positioned its ranges to help resolve this challenge.

CAS, by definition, is operating in close proximity and with detailed integration. The historical intent is to mitigate fratricide and civilian causalities from kinetic weapons effects. The joint terminal attack controller (JTAC) is the instrument for mitigating this risk. As the battlespace changes, however, does proximity still imply operating only in the physical space? Are weapons effects limited to only kinetic events? How does one ensure accurate collateral damage estimation during a cyber-attack? As the ability to positively identify hostiles evolves, are JTACs the proper instruments for prosecution? Should the JTAC assume the role of detailed integration?

These questions need to be addressed. We cannot continue to use ops tempo in the current war as a reason not to train for the next war. We employ effectively as an integrated cell across the physical and electronic spectrums. Indiana is setting the conditions to train in this fashion, and is training to a more diverse threat in

Intelligence analysts are at work in the distributed ground station, 181st Intelligence Wing, Terre Haute, Indiana. (Photo courtesy of 181st Intelligence Wing, Indiana Air National Guard Public Affairs, USAF)

a controlled environment. CAS joint training occurs in the Indiana complex daily and includes, for example, Air Force Special Operations Command, Naval Special Warfare Command, and Marine Special Operations Command elements working RPAs with JTACs and A-10's with support of RPA sensor feeds to DGS elements.

Indiana recognizes the challenges outlined and has taken steps to meet them. The Indiana Range Complex's vision is to: "provide the nation the most realistic, fiscally responsible, contemporary operating environment possible in which to mobilize and train the whole of government/whole of nation team; to accomplish missions directed towards protecting the homeland and winning the peace; provide to that team responsive reach-back capability once deployed; and support the conduct of operational testing and evaluation of technologies that support those missions". It is from this synergetic vision that Indiana is reaching out to provide full spectrum ISR, CAS, cyber, EW, and RPA missions to Departments of Defense and Homeland Security agencies. In reaching out, Indiana is identifying what the mission requirements are currently and anticipating those to come.

The motivation for this paper is to highlight the need to incorporate Air Force capabilities and train as an RPA pilot in this environment (i.e., for my command to train in an integrated environment offering a forum for after action reporting). Further, I wish to see continuation training established and for units to be equipped to accomplish training. We must bring all possible assets to bear upon the complicated and unforgiving CAS mission.

Lt Col Stone works in the 181st Intelligence Wing, Indiana Air National Guard at Jefferson Range, Indiana.

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B-1 MARITIME EMPLOYMENT

An Air Force B-1B Lancer from the 34th Expeditionary Squadron, configured with a sniper pod, patrols over Afghanistan on November. 11, 2008. (Photo by SSgt. Aaron Allmon, USAF)

By Maj Tim "NOGS" Griffith, USAF

JIATF-S is faced with the challenge of limited sensor coverage over a wide search area.

On January 12, 2012, two B-1's (SLAM 1 and 2), departed Dyess Air Force Base (AFB), Texas, for the Caribbean Sea off the coast of Honduras. They rejoined on a formation of KC-135s over the Gulf of Mexico and continued south to their operating area. Their mission was to detect and monitor surface vessels suspected of smuggling narcotics from South America to the United States (US) and facilitate the intercept and boarding process by talking-on friendly surface vessels. They were working with the Joint Inter-Agency Task Force South (JIATF-S), located at Naval Air Station Key West, Florida. JIATF-S facilitates the interdiction of illicit trafficking and other narco-terrorist threats in support of national and partner nation security. In other words, they run the war on drugs in the Caribbean Sea and all international waters surrounding Central and South America. They are responsible for planning and executing missions with the cooperation of the Department of Defense, US Coast Guard, Federal Bureau of Investigation, US Customs and Border Patrol, and international partners (French, Dutch, and British Naval Forces). JIATF-S is faced with the challenge of limited sensor coverage over a wide search area. Enter the B-1 with its sniper pod, ground moving target (GMT) radar, and extended loiter time.

JIATF-S called on the B-1 in an attempt to use training sorties for a real-world mission as and provide the B-1 an opportunity to develop maritime tactics. The 77th Weapons Squadron (WPS) partnered with the 337th Test and Evaluation Squadron (TES) to meld the test and evaluation aspect of this mission with the maritime tactics development.

On that night in January, SLAM 1 and 2 were packaged with an E-8 joint surveillance target and attack radar system (JSTARS) and an E-3 airborne warning and control system (AWACS). The AWACS was charged with command and control and airspace deconfliction, while the JSTARS was responsible for wide-ar-

ea search using the moving target radar. At the end of the night, the B-1 positively identified 11 surface tracks of interest: eight of which were passed by the JSTARS while the remaining three were found using the B-1 GMT radar. SLAM 2 maintained targeting pod coverage of two suspicious tracks for over three hours monitoring the passage of items between boats. This was a successful mission for JIATF-S in that they were able to use the B-1 sensors to detect and monitor surface tracks suspected of illicit trafficking. It was an even more productive mission for the B-1 because it provided an opportunity to train in an environment unparalleled by any other training range currently available. The B-1s were able to integrate with platforms typically only seen in combat or flag exercises, while crews tracked and monitored surface vessels that did not follow a script, a straight line, or adhere to airspace and range restrictions. The B-1 executed a real-world mission to develop maritime tactics that have current-day implications in many areas of responsibility (AOR).

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The 77th WPS, combined with the 337th TES, took many lessons from this mission. The first lesson learned was the requirement for detailed mission planning between friendly surface vessels and air assets. Traditionally, the Air Force is excellent at planning with other assets within the organization and, to some extent, outside the organization. The Air Force is poor at detailed planning with other government agencies, at times, by fault of our own. For example, while planning for this mission, a JSTARS representative traveled to Dyess AFB to formulate the air game plan but did not consider involving the surface vessels in the planning process to ensure end-game coverage was available. After all, the tac-

Airborne maritime assets identify and track suspected targets, then pass those targets to intercept forces. A US Coast Guard Law Enforcement Detachment (LEDET) precision marksman aboard an SH-60B Sea Hawk helicopter from the guided-missile frigate USS Carr (FFG 52) monitors a suspected drug smuggler "fast boat" during Operation MARTILLO (Spanish for 'hammer') in the eastern Pacific. Carr and the Coast Guard LEDET confiscated 1,719 pounds of cocaine worth an estimated wholesale value of $15.6 million, when the suspect boat was stopped and contraband recovered. (Courtesy photo by US Navy)

tical problem was to facilitate intercepting the suspect vessel with a friendly vessel, and boarding and prosecuting it if the presence of narcotics was confirmed. The result this night was the inability to intercept suspect tracks because the search area was too far away from the location of the friendly surface vessels and they were unable to reach the tracks within the B-1's time on station. Additionally, the knowledge of adversary tactics was lacking by B-1 crewmembers. As with any new or unfamiliar AOR, everything looks suspicious. The same problem occurred when the sniper pod was brought into Afghanistan and Iraq. Every person viewed through the sniper pod looked suspicious because aircrews were not familiar with their pattern of life. The same goes for the Caribbean Sea. The aircrews were not prepared to determine suspicious activity because they did not know what was "normal." Aircrews were also unfamiliar with nautical terms and visual identification of boats. All of which tie into knowing the enemy and the environment in which the operation takes place. Detailed intelligence planning is required to ensure the crew members are familiar with the AOR and are able to identify suspicious activity as not to mistakenly identify normal fishing activity as drug trafficking.

Detailed intelligence planning is required to ensure the crew members are familiar with the AOR and are able to identify suspicious activity as not to mistakenly identify normal fishing activity as drug trafficking.

The second lesson learned was an increased ability to use the sniper pod over water. The sniper advance targeting pod was able to identify vessels at ranges that double, and sometimes triple, those normally seen over land. Ultimately, the pod was extremely effective as a search tool as well as identification and tracking tool. Tracks on the water had significant infrared (IR) signatures compared to the relatively cool water, especially at night. Using the cueing from the JSTARs (bullseye range and magnetic bearing), the B-1 would put the sniper pod on the bullseye location and search in Wide Field of View. It took an average of three minutes to get the sniper pod on the track after tasking receipt. Additionally, it was noticed that, due to the relatively slow speed of the surface vessels (5-25 knots) and the tendency to travel in a straight line, it was extremely easy to re-acquire a track or maintain situational awareness on multiple tracks. There is little opportunity to take cover or conceal a boat in the open ocean, especially when using an IR sensor to find and fix the tracks.

Although this mission was purely focused on the find, fix and track steps of the find, fix, track, target, engage, and assess (F2T2EA) dynamic targeting process, the target, engage and assess steps were not overlooked. Most B-1 training missions focus on the target, engage and assess steps of F2T2EA, but very few missions have any consideration as to how those targets were found, fixed and tracked. This mission enabled aircrew to dedicate time and sensors to finding and fixing targets while also executing simulated engagements using GBU-54s on the moving vessels. No other training range in the world can provide multiple moving targets executing non-cooperative tactics in such a wide and dynamic AOR. This mission has real-world implications in multiple hot spots around the world to include the Middle East and the Pacific theaters.

Ultimately, the formation of B-1s received and identified tracks in a very efficient manner. Their ability to operate as two independent aircraft in lieu of flying formation was key in being able to split formation tasks and execute parallel operations. Based on the President of the US' policy shift towards the Pacific AOR and the obvious abundance of water in that region, the Air Force needs to be prepared to employ in that environment. While nontraditional intelligence, surveillance and reconnaissance is not a primary mission of a long range bomber, the range and flexibility of the B-1 provide the combatant commander a perfect platform for future kinetic operations. One must remember that the target must be found and identified before it can be killed.

Maj Griffith is currently a student at the National Intelligence University under the Defense Intelligence Agency, Washington, D.C.

IMPROVING UAS MISSION EFFECTIVENESS ACROSS THE JOINT BATTLESPACE

An Air Force MQ-1 Predator flies a combat air patrol. Both live and simulated MQ-1 Predators were used in the first and second Joint Unmanned Aerial System Digital Information Exchange field test. (Photo by Lt Col Leslie Pratt, USAF)

By Maj Randall Klatt, USAF

In Iraq, Afghanistan, and other locations, the United States (US) military has achieved significant operational successes from using unmanned aircraft system (UAS) assets. These successes have come about despite the use of ad hoc, informal, and non-standard information exchange (IE) tactics, techniques and procedures (TTP) that were developed on the fly and passed down from deployed unit to deployed unit. This lack of formalized UAS joint TTP, recognized throughout the joint warfighting community, has resulted in reduced battlespace situational awareness (SA) and delayed or missed target prosecution opportunities. Most of the non-standard IE TTP utilized in the combat arenas were developed using well known close air support and joint fires doctrine modified for use by UAS units for intelligence preparation of the battlefield and combat engagement events such as high value target raids, close air support and high value individual kinetic strike operations.

As forces continue to return to their home stations from these combat areas, the lessons learned from these warfighters must be captured and incorporated into a joint TTP publication. Chief amongst these lessons learned is the need for standardized UAS cross-component coordination procedures and communications. Development of these standardized coordination procedures is a primary task of the Joint UAS Digital Information Exchange (JUDIE) Joint Test (JT) team. Chartered by the Office of the Secretary of Defense, the JUDIE JT is managed by the Joint Test and

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Evaluation Program Office specifically to find solutions to the problem statement: "Warfighters lack established tactics, techniques, and procedures for standardized cross-component unmanned aircraft systems information exchange to support battlespace situational awareness and target prosecution."

The process of answering this requirement involved investigating the problem from the viewpoints of the supported unit (SU) and supporting unit (SIU) and developing techniques and guidance addressing the root causes of the problem. JUDIE's efforts have produced comprehensive TTPs using established practices pulled from each of the military service's specific UAS publications, undocumented best practices currently fielded, and new procedures and techniques developed through input from warfighters at all levels of UAS operations backed by field trials and statistically significant empirical data.

As part of its mission to develop standardized coordination procedures, JUDIE JT has developed TTP for both the SUs and SIUs, ensuring necessary information is exchanged in a timely, accurate, and complete manner. The TTP further delineates and prioritizes key IEs, crucial to mission success, for use during deliberate, time-critical, and dynamically tasked UAS missions. Standardizing these IEs necessitated the creation of joint nomenclature and brevity terms, sensor directing and managing techniques, procedural checklists, and post-mission reports that must be exchanged to maximize the effectiveness of UAS supported missions.

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A typical UAS mission includes three primary phases of operations: planning, execution, and post-mission wrap-up. Each phase has different IEs that must be exchanged between the supporting UAS and the supported ground unit. In most military operations, effective mission execution often hinges on performing quality planning and coordination during the planning phase. This fact is particularly true when dealing with joint UAS supported operations where the involved units are often from different services and operating from geographically separated locations. The planning phase typically includes two distinct subphases: internal unit mission planning and external pre-mission coordination. Internal planning processes and procedures are well developed and captured within the UAS and ground units' standard operating procedures or TTP. It is during pre-mission coordination that the two components of a UAS mission must begin to satisfy the other's information requirements. For instance, it is common practice for a UAS crew to request gridded reference graphics, concepts of operations, and schemes of maneuver from the SU. Concurrently, the SU will typically request the UAS crew to provide information, such as onboard sensor capabilities, communications modes or capabilities, full-motion video downlink support specifics, and (if applicable) weapons payloads.

IE is most dynamic during the execution phase of a UAS mission. At the beginning of this phase, updates are passed between parties, such as the status of the mission and their own capabilities and requirements. Standardizing this coordination improves the accuracy and completeness of the exchange. As the mission progresses, mission information is clarified and expedited by using commonly understood brevity terms. The potential for improved management of the sensor by the ground team is made possible through the ability to see the full-motion video feed via video downlink receiving remote video transceiver downlink terminals or internet protocol connectivity. These best practices for sensor management have been captured and developed in the JUDIE UAS IE TTP.

Available network connectivity will affect the efficiency of information

exchange. For instance, chat software is often seen as a best practice for coordination during UAS mission execution because the information is immediate, enduring, and available to all participants of the mission to include command and control entities, and processing, exploitation, and dissemination teams. Without network connectivity to support chat, time sensitive IEs must fall back on voice communications that are not enduring or universally available to all mission participants. Furthermore, e-mail and information portal capabilities enable the transmission of large files and graphical products between the parties, such as updated gridded reference graphics and concepts of operations, and electronic versions of standardized coordination checklists. Finally, automated data-feeds and the ability to display these data-feeds on the tactical picture, common tactical picture, or common operational picture digital tools enable greater SA of the battlefield, which is important for a UAS asset given the narrow field-of-view provided by its imagery sensor.

UAS crews have stated that the post-mission, wrap-up phase of a UAS mission is often the most neglected. Service and theater instructions direct warfighters to complete after action and aircraft mission reports. However, there are few, if any, instructions that direct that these products are to be passed between the SUs and SIUs. UAS crews have emphasized that constructive feedback following UAS missions enables the continued improvement of their internal procedures.

To facilitate understanding and usage of the comprehensive IE TTP, JUDIE created a quick reference guide (QRG) as a field and reference tool. Written primarily for special operations and conventional forces organized in brigade and below echelon

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Army SPC Tyler Brewer, unmanned aircraft systems repair and technical inspector, UAS Platoon, Bravo Company, 1st Special Troops Battalion, 1st Brigade Combat Team, 101st Airborne Division, performs a pre-flight inspection on an RQ-7B Shadow at a forward operating base, May 2, 2013. RQ-7s played a large role in the Joint Unmanned Aerial System Digital Information Exchange final field test. (Photo by SPC Margaret Taylor, USA)

equivalents, the UAS IE TTP, and subsequently the QRG, has universal applicability for improving UAS support to operations taking advantage of each unit's current technological capabilities, network access, and experience levels. Recommendations are given throughout the UAS IE TTP and QRG on the best communications medium to be used for each IE. These recommendations are based on established best practices combined with common communications systems availability. Realizing not all systems will be available to all warfighters, the recommendations are given in a good/better/best format. This allows warfighters to choose the best IE method based on their available communications architecture. The UAS IE TTP does not address the asset requesting and tasking process. Instead, it focuses on enhancing UAS support to units with assets already tasked or allocated to specific operations.

JUDIE introduced the UAS IE TTP to various Joint and Service training centers and received positive feedback. The US Army Training and Doctrine Command has incorporated the TTP into their mobile training team curriculum that is taught at home station and combat training centers. The Army Intelligence Center of Excellence has agreed to introduce the UAS IE TTP to all intelligence professionals during their formal training deployments at Fort Huachuca, AZ. The Marine Aviation and Weapons Tactics Squadron One has agreed to evaluate the UAS IE TTP during its Weapons and Tactics Instructor course and have endorsed introducing the UAS IE TTP to the Navy TTP 3 22.3, Marine Unmanned Aerial Vehicle Squadron, re-write conference for possible inclusion in this tactics document. Army ground liaison officers and reconnaissance liaison officers have accepted the IE TTP for daily use during joint mission planning, execution, and reporting support the US Air Force MQ-1 and MQ-9 communities.

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As the JUDIE JT continues to evolve and refine the IE TTP and QRG, updates are sent to each of these organizations to keep them up to date on incorporated changes. Once the JUDIE JT closes down, the Joint Staff J7 will incorporate the final JUDIE documents in the Joint Lessons Learned Information System and other information repositories.

Current and past UAS missions have succeeded largely due to the ingenuity and experience of supporting UAS crews and supported ground teams. However, to ensure this "corporate knowledge" is not lost in the coming years, the best practices employed by these warfighters must be captured. JUDIE JT's tasks are a step in the right direction, but this effort needs support from the joint warfighting community. If you would like to assist with JUDIE JT's mission, e-mail **JTU-N@us.af.mil**.

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NKO: A TACTICIAN'S PERSPECTIVE

This April 2013 photograph depicts Capt Neece's home unit, the 561st Joint Tactics Squadron, Nellis Air Force Base, Nevada, which is responsible for preparing and honing the tactical readiness, lethality, and knowledge of Air Expeditionary Forces for combatant commanders by ensuring they have the most current combat tactics, techniques, and procedures. (Photo by A1C Jason Couillard, USAF)

By Capt Stacey Ihilani Neece, USAF

Isn't it amazing how our love affair with technology has empowered individuals to instantly share their status with hundreds of networked family and friends? Modern society has fueled the train of ingenuity well enough to send us careening into cyberspace by posting messages, pictures, instagrams, and tweets using computers, televisions, cell phones, gaming systems, and tablets. Technological advances have ensured we maximize our opportunities to upload, download, extract, research, send, or receive data faster, longer, and more securely. Even redundancy has become a necessity, just in case the wireless fidelity (WIFI) fails, we have cellular networks providing access to Facebook, Twitter, Pinterest, or iCloud. Whatever your technological, wireless, internet, cable, cellular, or cyber needs may be, there are multiple solutions currently residing at a help desk, waiting to be applied by the right subject matter expert. However, if you're a warfighter trying to implement the best non-kinetic course of action to meet an objective of a combatant commander, you may find yourself without a team of experts or even the phone number to an appropriate help desk. Non-kinetic operations (NKO), encompassing similar previously mentioned networks, are not nearly as robust as civil applications.

When it comes to military operations within the electromagnetic spectrum (EMS), there are few simple solutions, many levels of approval, numerous lines of command and control (C2), and fragmented views within joint doctrine. As we press forward into an era in which we can share gigabytes of information at the speed of light, it is vital to identify the disparity between our capabilities as a joint military force and the average civilian with an iPhone. The fact of the matter is, the world has been empowered and enabled with non-kinetic means of communication, navigation, and even electronic warfare. The police radar jamming systems ready to be added on a new sports car, or the global positioning system jammers advertised online for less than fifty dollars, prove the world is pressing forward

... it is vital to identify the disparity between our capabilities as a joint military force and the average civilian with an iPhone.

with new and improved developments for manipulating electrons through the atmosphere. The problem is further compounded when we consider the links between computer-based systems within billions of miles of coaxial and fiber networks. Electromagnetic manipulation takes on many other forms with respect to cyber operations.

So, how do we begin to plan against a tactical problem physically spanning the range of landlines, atmosphere, networks, and space systems? How can we handle a technical problem that continues to advance with ever-flowing human inventiveness; a tortuous problem evolving every second as our networks, links, and nodes are altered each time someone will send or receive digital information?

There is no joint publication (JP) to bring the sister Services together in any kind of NKO.

There is no joint publication (JP) to bring the sister Services together in any kind of NKO. Although JP 3-12, Cyberspace Operations; JP 3-13, Information Operations; JP 3-13.1, Electronic Warfare; and JP 3-14, Space Operations, explain evolved doctrinal military theory for cyberspace, information operations, electronic warfare (EW), and space operations, they do not offer a multi-Service approach to integrated NKO. Why, then, do our leaders emphasize non-kinetic integration in exercises and publications? How would tacticians even begin to organize operations without strategic guidance? To help planners across all combatant commands, tacticians from the United States Air Force (USAF) Weapons School and the 561st Joint Tactics Squadron created tactical guidance in the form of the NKO Coordination Cell Tactics Bulletin in 2011. It describes NKO as:

"...the integrated actions used by specific delivery mechanisms (e.g., offensive space control, defensive space control, offensive cyber operations, defensive cyber operations, and electronic warfare (EW) elements) to deny, degrade, disrupt, deceive/manipulate, and destroy enemy use of the electromagnetic spectrum (EMS) while protecting friendly use of the EMS. The integrated actions encompassed by a non-kinetic operation may range from kinetic to non-kinetic or lethal to non-lethal."

In the most recent USAF Red Flag exercise, RF 13-3, coalition planners and aircrew were instructed to create and execute integrated operations, to include NKO. At the operational and tactical levels of war, planners utilized planning tools, such as the "RF 13-3 NKO Playbook," a "NKO Synch Matrix," as well as a non-kinetic "effects tracker." Most of these tools have been used in other USAF training events, including the USAF Weapons School Mission Employment. In the US Pacific Command theater of operations, NKO are a subset of the information operations (IO) Team, while US Central Command takes a more traditional approach with NKO happening parallel to EW operations. Across theaters, services, and domains, many tacticians are orchestrating masterful changes in concept of operations, C2, planning cells, operational products, and tactics, techniques, and procedures (TTP) with respect to NKO. While all of these developments are aligned with commander's intent and theater objectives, they are all unique without a joint non-kinetic strategy to guide operational and tactical directives. When teams attack the problem with different TTP, they lack unity of effort which results in uncoordinated operations at best, and counterproductive operations at worst.

The first step in integrating effectively as a joint force is to standardize language across Services, bases, and operations centers. Lessons learned regarding better communication resonate in just about any operation or exercise. Non-kinetics is no different with multiple lines of C2, across multiple theaters and time zones, with multiple means of communication. The non-kinetic community of cyber, space, EW, and IO professionals can, at the very least, standardize terminology across the services in multi-Service TTP. Once the community can agree on standard terminology, other TTP related to chat programs, se-

cure voice lines, or tactical communication should be explored.

The second step is to treat doctrine as doctrine, not direction. Just as joint doctrine has evolved through decades' worth of lessons learned gathered from various levels of warfare, technological advancements must drive changes in operations in the EMS. Joint and service doctrine documents were designed to apply lessons learned and provide recommendations for the future warfighter based on vetted procedures and strong historical evidence. NKO do not fit into any doctrinal mold because they encompass recent advancements in technology. JP 3-13 informs us that EW is employed to "influence, disrupt, corrupt or usurp adversarial human and automated decision making while protecting our own." Information operations may rely on NKO like EW; but to glean from doctrine alone that IO and EW should be planned in the same fashion, is flawed logic. After all, IO are contingent on many other core capabilities and functions that do not involve manipulation of the EMS (e.g., public affairs, military deception, special operations, operations security, joint fires, etc.).

While IO are related to NKO, IO cannot fill the void of NKO strategic guidance. IO professionals may understand the physical, cognitive, and informational dimensions of an adversary, but cannot be held responsible for the operational planning of integrating effects coordinated by cyber, space, or EW operators. NKO are executed by tacticians versed in manipulating the EMS and should, therefore, be planned by tacticians equally as knowledgeable. While there will always be a time and place for tailoring effects between IO and NKO, one is a tool for the joint force commander (JFC) to use for understanding adversary beliefs, while the other is a tool for the JFC to use to dominate the EMS across all domains. Planners within NKO and IO cells should always integrate when needed, but keep the functions separate. There are occasions when tacticians simply need to de-conflict times of emission and collection of electronic signatures. During these times, NKO tacticians are responsible assessing emission and collecting electronic signatures, irrespective of IO objectives. Whether the mission involved sending packets of information (cyber), radiating a satellite (space), or jamming an enemy threat (EW), these effects must be understood throughout a non-kinetic operation before dissemination or denial of messages can be planned.

Across all combatant commands, domains, operations centers, and Services, non-kinetic integration needs improvement.

Across all combatant commands, domains, operations centers, and Services, non-kinetic integration needs improvement. Military operations can share gigabytes of information at the speed of light, navigate networks and applications just as the average civilian with an iPhone, and evolve alongside the empowered and enabled civilian counterparts, worldwide. One solution is to standardize tactical-level integration by using a common language. Many other tacticians may find other solutions to collect lessons learned, identify the appropriate level of integration with IO, or even designate the appropriate operations center for C2 of joint NKO. However, to prepare the joint force for conflict within the EMS, the tactical community must press forward with current lessons learned and document doctrine to address the world's current capabilities. Furthermore, the tactical community must identify and abandon antiquated doctrine written for separate, once stove-piped, missions. Space, cyber, and EW operations cannot be commanded, or controlled, via any information operations cell or team. The best solutions may not reside in placing C2 authorities in any one operations center, but joint NKO must be codified for tomorrow's NKO planners, if nothing else, just to keep pace with current global domination of the EMS.

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OVER THE HORIZON, NOT THROUGH THE WOODS: METHODS TO LEVERAGE THE AIR FORCE ISRLO

Capt Haley poses outside the offices of Marine Command, Regional Command Southwest, Afghanistan, in 2011. Capt Haley spent half of his six-month deployment with Marine Corps units, down to the battalion level. Though intelligence, surveillance, and reconnaissance liaison officers doctrinally align with the Army, they integrate with all uniformed services and coalition partners during contingencies. (Photo courtesy of the USMC)

By Capt Jaylan Haley, USAF

... ISRLO lessons learned from counterinsurgency operations should translate into successful practices for the challenges of major combat operations ...

As battle-tested members of the total force tactical air control party (TACP), intelligence, surveillance, and reconnaissance liaison officers (ISRLOs) advise, assist and educate supported units (normally United States (US) Army (USA) divisions and brigades) on integrating aerospace intelligence, surveillance, and reconnaissance (ISR) assets into the overall scheme of maneuver. Originally requested by the USA in 2006 as division educators, the ISRLO—pronounced I-S-R-lo—is a proven contributor to the tactical operations center in recent contingencies by optimally integrating aerospace intelligence and operations. As the defense establishment considers models like the Air Sea Battle Concept, ISRLO lessons learned from counterinsurgency (COIN) operations should translate into successful practices for the challenges of major combat operations (MCO) and other contingencies. However, successful transition hinges on (1) warfighter awareness and (2) codification into joint and Service doctrine of their unique placement, skills, and authorities.

ISRLOs deployed first in support of Multi-National Corps-Iraq (MNC-I) during Operation IRAQI FREEDOM (OIF). As the intelligence picture at brigade and battalion levels became increasingly important due to

requirements by the rules of engagement, commanders allocated ISRLOs to brigades for Operation ENDURING FREEDOM (OEF). At the brigade level, ISRLOs could most optimally effect development of the intelligence picture and any dynamic targeting requirements. They developed tactics, techniques and procedures (TTP) to support aligned units through detailed ISR sensor integration with operations.

In 2008, the US Air Force (USAF) made an initial investment to align ISRLOs at in-garrison USA divisions, though, with little formal guidance. In April 2012, General Mike Hostage, Commander, Air Combat Command, Langley Air Force Base, Virginia integrated ISRLOs as permanent members of the TACP in the Air Support Operations Squadron through the *Intelligence Operations Enabling Concept*. The document cemented the USAF's investment in air-ground integration of operations and intelligence, culminating the initial investment with formal guidance. Since then, draft Air Force instructions (AFIs) that codify organizational, training, and equipment requirements and a discussion of tactical Air Force TTP (AFTTP) emerged to capture lessons learned from OEF and OIF for untold future contingencies. But, ISRLO integration for any contingency cannot rest solely on AFIs and AFTTP.

Future US contingencies are likely to be as joint, combined, and as varied as they have been in the years since 9/11; vis-à-vis COIN like OEF, humanitarian assistance/disaster relief operations such as Operation UNIFIED RESPONSE, and MCO like Operation ODYSSEY DAWN. As a result, joint and service doctrine should reflect proper use of ISRLOs who must be well placed, well-skilled, and given proper authorities to execute aerospace ISR missions across the spectrum of conflict.

ISRLOs need to be in the right place at the right time. The 2004 USA restructure into brigade combat teams (BCTs) followed by employment of ISRLOs with BCTs in OEF warrant a reassessment of ISRLO alignment from division to the BCT in-garrison. Further, the intelligence personnel must continue to possess unique backgrounds in USAF ISR operations to enhance aligned S2 aerospace ISR planning and integration. Moreover, continued support of ISRLOs by joint, higher headquarters (HHQ) organizations like the air operations center (AOC), which provides direct liaison authority (DIRLAUTH), will remain key to their future employment. These and other qualities make ISRLOs potentially critical contributors to future US contingencies; but the most important of all is proximity to the fight.

Doctrinally, ISRLOs align with USA divisions but experience in COIN demonstrates their utility at the brigade level. GEN Raymond Odierno, former Commander of MNC-I, identified ISRLOs as key intelligence team members and force multipliers at the division level. "It would also be extremely helpful to have these experts at [the] BCT level to provide the CAOC [combined air operations center] and related organizations with insight into the operations they support,"[1] he said.

At the brigade level, ISRLOs became familiar with the area of operations, integral mission planners, and trusted partners. The BCT structure recognizes that battles are localized; each adversary's units fight differently and terrain is unique (i.e., geographic and human). ISRLOs assimilated these mission-specifics into sensor planning and airspace integration. Moreover, their presence during the planning process has built trust with commanders and other operators for asset capabilities that are not always understood or releasable to frontline warfighters. Placement at BCT allowed ISRLOs to understand and communicate relevant operations information and feedback to supporting ISR units. Other important components to ISRLO applicability are the unique skills brought to the joint and combined fights.

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ISRLOs enhance the supported unit's ability to bring overwhelming firepower to the battlefield or leverage intelligence for non-kinetic effects using tradecraft acquired at previous assignments and training. The USAF's goal is to fill ISRLO billets with experienced operators from backgrounds in multiple intelligence disciplines. When this is not possible, inexperienced ISRLOs receive intensive ISR training. These air-minded ISR integrators are valuable allies to BCT S2/S3 staffs who may come from a variety of backgrounds. Though some S2 staffs possess airborne ISR exposure via tactical unmanned aerial vehicle platoons, they lack crew experience with the complexities of larger, armed, and networked theater assets. ISRLOs help them adeptly apply these sensors over the next hill, against dynamic targets, and to build the intelligence picture.

... ISRLOs bring unique skills that make them invaluable in protracted and time-sensitive scenarios.

ISRLOs helped field TTP in COIN, such as ISR mission-type orders (MTOs), that layer and fuse multiple platforms against various objectives, allowing commanders to effectively apply firepower and manpower.[2] Using their experience and training, ISRLOs anticipated the needs of overhead ISR operators to ensure their effective use once on-station and helped dynamically re-task sensors to emerging priorities. Moreover, ISRLOs understand the myriad of authorities dealing with intelligence tasking and collection that are different between and within theaters, and make sensor tasking more efficient. Simply, ISRLOs bring unique skills that make them invaluable in protracted and time-sensitive scenarios.

Lack of empowerment can thwart the advantage of proximity and knowledge. Tactical value of ISRLOs appears during later operations in OIF and major operations in OEF like MOSHTARAK and HAMKARI. In these operations lower echelon units requested delegation of sensor tasking authority (STA) to ISRLOs from HHQ during

US Army Soldiers engage enemy forces during Operation MOSHTARAK in Badula Qulp, Afghanistan, on February 19, 2010. The International Security Assistance Force operation was an offensive mission conducted in areas of Afghanistan prevalent in drug-trafficking and Taliban insurgency.(Photo by TSgt Efren Lopez, USAF)

MTOs to exploit the unique placement and skills of the ISR professionals. Commanders empowered ISRLOs with STA to leverage aerospace ISR against the right targets, at the right time, for the right intelligence.

OIF and OEF teach that HHQ STA delegation, including that from the AOC, is effective when provided to ISRLOs during major operations with multiple ISR assets, for limited time periods and when ISRLOs are intimately involved with planning. Commanders enhanced STA when they granted ISRLOs DIRLAUTH to network with personnel up, down, and across the chain of command. With STA and DIRLAUTH, ISRLOs helped HHQ allocate scarce resources against critical targets and integrated aerospace ISR platforms into the overall scheme of maneuver. Doctrine should encapsulate the hard-learned lessons of the last several years at war in COIN with ISRLOs: when well-placed, well-skilled, and duly empowered, ISRLOs can be a critical link in the chain that binds intelligence and operations.

A Google search of the term ISRLO demonstrates the dearth of credible knowledge about the intelligence professionals, and their absence from joint and service doctrine. Even though ISRLOs have served with US Navy, Marine Corps and coalition partners during the past seven years, no documents formally cement best practices within these organizations. Thus training uninitiated S2 and N2 staff members and ground commanders on the very existence and utility of ISRLOs, is difficult at best.

Joint and service doctrine should capture the benefits of well-placed, well-skilled, and duly empowered ISRLOs to augment USAF efforts. Specifically, ISRLOs should be reflected in joint publication (JP) 3-0, Joint Operations; JP 3-09, Joint Fire Support; and JP 3-09.3, Close Air Support; and subordinate service doctrine to delineate placement and planning functions for ISRLOs during operations. JP 2-0, Joint Intelligence, should include ISRLOs as tactical ISR representatives of the joint forces air component commander (JFACC) that can be delegated STA when designated by the JFACC's AOC and ground commanders. JP 2-0, and subordinate Service doctrine, also should cement the necessity of ISRLO DIRLAUTH across all operational chains. These lessons learned from previous contingencies can help detail action for future contingencies, such as those mentioned in the Air Sea Battle Concept.

When employed properly, ISRLOs can serve as critical bridges between intelligence and operations. The lessons of OIF and OEF demonstrate that well-placed, skilled, and empowered ISRLOs can help bring success to COIN. However, lessons learned in COIN can be translated to success in future contingencies if doctrine helps the joint community avoid re-learning past lessons. The facts emanating from OIF and OEF are in: the USAF has made the investment in ISRLOs and the prospects for ISRLO success in future contingencies are enormous.

END NOTES

[1] Nichoel Brooks, Francesco Mastracchio and Raymond Odierno. "ISR Evolution in the Iraqi Theater." Joint Forces Quarterly, Issue 50, (3rd Quarter 2008): 51 - 55.

[2] Jaylan Haley. "An Evolution in Intelligence Doctrine: The Intelligence, Surveillance and Reconnaissance Mission Type Order." Air and Space Power Journal 26, No. 5 (Sept – Oct 2012): 33 – 48.

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Joint and service doctrine should capture the benefits of well-placed, well-skilled, and duly empowered ISRLOs to augment USAF efforts.

ACHIEVING SPECTRUM DOMINANCE IN THE CAB

CW2 Steven Quast prepares electronic warfare equipment with the proper load set prior to leaving a forward operating base during Operation ENDURING FREEDOM, March 2012. (Photo by SGT Brandon Bednarek, USA)

By CW4 Brian S. Filibeck, USA and CW4 Corey M. Swetz, USA

Over the last few years, commanders have received Army electronic warfare (EW) professionals into their ranks without a full understanding of how they can contribute to the unit's mission. In 2013, combat aviation brigades (CAB) will see an influx of EW technicians (EWTs) into units. (This is military occupational specialty 290A.) It is imperative CAB leadership understand the how to leverage the expertise of these professionals to enhance the effectiveness of future operations. Up to this point, CAB relied heavily on the aviation mission survivability officer (previously referred to as tactical ops (TACOPS) officer) for planned aircraft survivability, to include EW. Almost all operations today affect the electromagnetic spectrum (EMS) and need a team of EW professionals that include aviators and EWTs coupled with intelligence and signal Soldiers to set the conditions for success. With the addition of an EWT, the aviation mission survivability officer (AMSO) now has a colleague who can focus on preventing spectrum fratricide by ensuring friendly and enemy EW systems produce only minimal effects on aircraft EW equipment.

It is imperative CAB leadership understand the how to leverage the expertise of these professionals to enhance the effectiveness of future operations.

EW, in the Army, represents the military use of the EMS and directed energy. It has been a rapidly developing and expanding career field across the Army since 2008. Through radio frequency (RF) attacking and sensing, EWTs bring options

to the commander (within the EMS) which ensure friendly systems remain effective while degrading or denying the enemy's ability to use the EMS. As a force multiplier and a mission enabler, EW is not limited to just RF, but includes optical, acoustical, and infrared emissions as well. Although complex in nature, EW must be fully integrated and synchronized within aviation operations. This is accomplished through the coordinated effort of the AMSO, EW, S2, and S6 sections to achieve its full potential in contributing to mission success.

For clarity purposes and to view areas of convergence and divergence, a fundamental understanding of each area of expertise is required. The following are duties and responsibilities of the EWT and AMSO. EWTs and warrant officers in the AMSO position perform the following duties.

1. EWTs analyze, plan, organize, integrate, monitor, and assess EW operations, the threat environment, and EW technical requirements. EWTs focus the efforts of EW systems, both air and ground, against adversary personnel, facilities, or equipment with the intent of denying, degrading, neutralizing, defeating, or destroying enemy capabilities. They enhance operations through active coordination, integration, and de-confliction of EW during mission preparation and execution. EWTs integrate EW into the targeting and planning process and assist in developing the enemy EW order of battle, EW target information and products, intelligence, and target selection standards. The following are roles and responsibilities of the EWT. They:

- •Advise commanders on capabilities and employing EW assets.
- •Monitor EMS for indications and warnings enabling immediate threat recognition and targeting.
- •Coordinate external support for EW mission requirements and integrate EW into planning/targeting processes to include EW combat assessment.
- •Reprogram EW ground equipment.
- •Ensure quality assurance, quality control, and prioritize EW requests from subordinate units.
- •Assist in training unit, staff (leadership), and subordinate units in all facets of EW.

2. The AMSO is the commander's primary advisor on aviation mission survivability (AMS). AMSOs conduct combat survivability analysis, inspect aircraft survivability equipment (ASE), and manage the personnel recovery (PR) program. The AMSO performs Army aviation EW operational planning and aviation mission planning system (AMPS) administration. The AMSO provides support to the intelligence section's threat analysis to identify enemy threat capabilities and limitations which affect the commander's ability to conduct aviation missions in the assigned area of responsibility. AMSOs are responsible for administrating the

Although complex in nature, EW must be fully integrated and synchronized within aviation operations.

CW2 Marlon Atherton conducts electronic warfare synchronization over the radio with Aviation headquarters in Afghanistan during combat operations in Operation ENDURING FREEDOM, May 2012. (Photo by MSG Thomas Allen, USA)

commander's AMS program and training all AMS requirements within the assigned unit. The following are roles and responsibilities of the AMSO. They:

- Advise commanders on aviation mission survivability.
- Perform combat survivability and enemy threat system analyses.
- Reprogram ASE and recommend ASE configuration.
- Integrate joint assets.
- Develop aviation tactics, techniques, and procedures.
- Serve as the unit PR officer within aviation units.
- Facilitate administration of AMPS.
- Assist in training members of ground maneuver brigade aviation elements and subordinate unit AMS officers.

The S2 and S6, as it relates to EW, will be considered together. Although they are not focal points in this article, the S2 and S6 are key members of the team.

It is sometimes unclear who is best suited to conduct important tasks based on training and experience alone.

CW2 George Warner and SSG Sean Adkins work with additional soldiers to initialize the Universal Test Set to ensure electronic warfare equipment is operating at the proper frequencies in Operation ENDURING FREEDOM, October 2012. (Photo by SFC Phillip Isbill, USA)

The S2 focuses on the collecting intelligence and the S6 wants to ensure all forms of friendly communications operate effectively and are protected. These relate directly to the EW support (ES) and electronic protect (EP) sub-categories of EW. Electronic attack (EA), conducted by the AMSO and EWT, has the potential to cause problems with signal intelligence or collection, and communications. ES should go hand-in-hand with EA so proper cueing can be conducted. If proper coordination and synchronization are not conducted, lack of confidence in executing ES and EP is sure to yield degradation of both. Losses of intelligence and communication fratricide are of no benefit to any unit.

It is sometimes unclear who is best suited to conduct important tasks based on training and experience alone. This, coupled with units trying to conduct complex missions in unfamiliar territory, can lead to varying degrees of success. EW is a point of contention in aviation due to its complexity and effect within the EMS, mainly on aircraft communications and system interoperability. The more the EWT knows about ASE and the AMSO knows about other spectrum activity, the better chance problems can be quickly identified and alleviated. With a greater understanding of how the team (i.e., AMSO, EWT, S2, and S6) ties together and the need for overlap, excellence in execution should prevail.

To efficiently conduct operations in a very dynamic, traffic jammed superhighway known as the EMS, it is imperative that the EWT and the AMSO work together along with the S2 and S6. All members of the team need a basic understanding of how ASE works. The AMSO warrant officer is the lead with the EWT focusing efforts on the effects EW has in the EMS with respect to ASE and other equipment. A concerted effort will maximize ASE effectiveness to protect the aircrew. The following are key cross-over duties that span several layers of expertise:

• ASE interoperability/synchronization (AMSO/EWT/S2).

• ASE/EW ground equipment reprogramming (AMSO/EWT).

• Electronic order of battle/electromagnetic operational environment analysis and its effects on aviation operations (S2/ AMSO/EWT).

• Joint restricted frequency list (JRFL) coordination/deconfliction to include team internal frequencies (i.e., to prevent communications fratricide) (S6, EWT, AMSO).

• Forward arming and refueling points (FARPs)/forward operating base EW security support, to include equipment and personnel (e.g., counter radio-controlled improvised explosive device electronic warfare (CREW), Gator, Duke EA, etc.) (EWT/AMSO/S2).

• Logistic resupply to the FARPs ES (i.e., CREW equipment and planning) (EWT/AMSO/S2/S6).

• Pathfinder operations security (EWT/S2).

• PR ES (AMSO/EWT/S2/S6).

• Key/critical Intelligence/EA cueing loss prevention (AMSO/EWT/S2).

For EW to become effective in the CAB, commanders and their staffs need to make a conscious effort to integrate junior grade EWT warrant officers into their team. Warrant officers 1s are arriving at most CAB units to fill captains and chief warrant officer slots without much assistance. They need the mentorship of the senior AMSO warrant officer to fulfill the role designated to them and assist them in learning their duties and responsibilities. It is crucial the EWT works closely with the AMSO to ensure the CAB's EMS footprint is properly coordinated with the JRFL, ground units, and higher headquarters to mitigate frequency fratricide. The EWT needs to be trained on all ASE equipment and have a firm understanding of how it supports the mission to best serve the commander. This would give them the needed exposure to the EW systems installed on CAB aircraft and a better understanding of aviation operations. Also, it would enhance the working relationship between the EW and AMSO warrants officers. By forming this team of AMSO, EW, S2, and S6 personnel, the CAB will be postured to seize and exploit the initiative to gain and maintain spectrum dominance while achieving the commander's intent.

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CW4 Corey M. Swetz is currently serving as the Senior Instructor for the Electronic Warfare Technician Warrant Officer Advanced course at Fort Sill, Oklahoma. He has three deployments to Operation IRAQI FREEDOM. Previous assignments include Electronic Warfare Technician at the 75th FiB and as a TACOPS Warrant Officer and an AH-64D Maintenance Test Pilot in Germany and at Fort Hood, Texas.

For EW to become effective in the CAB, commanders and their staffs need to make a conscious effort to integrate junior grade EWT warrant officers into their team.

CURRENT ALSA MTTP PUBLICATIONS

AIR BRANCH – POC alsaa@langley.af.mil

TITLE	DATE	PUB #	DESCRIPTION/STATUS
AIRSPACE CONTROL *Multi-Service Tactics, Techniques, and Procedures for Airspace Control* **Distribution Restricted**	22 MAY 09	FM 3-52.1 AFTTP 3-2.78	Description: This MTTP publication is a tactical-level document which synchronizes and integrates airspace C2 functions and serves as a single-source reference for planners and commanders at all levels. **Status: Revision**
ATCARS *Multi-Service Tactics, Techniques, and Procedures for the Airborne Target Coordination and Attack Radar Systems* **Distribution Restricted**	22 OCT 12	ATP 3-55.6 MCRP 2-24A NTTP 3-55.13 AFTTP 3-2.2	Description: This publication provides procedures for employing ATCARS in dedicated support to the JFC. It describes MTTP for consideration and use during ATCARS planning and employing. **Status: Current**
AVIATION URBAN OPERATIONS *Multi-Service Tactics, Techniques, and Procedures for Aviation Urban Operations* **Distribution Restricted**	19 APR 13	ATP 3-06.1 MCRP 3-35.3A NTTP 3-01.04 AFTTP 3-2.29	Description: This publication provides MTTP for tactical-level planning and execution of fixed- and rotary-wing aviation urban operations. **Status: Current**
DYNAMIC TARGETING *Multi-Service Tactics, Techniques, and Procedures for Dynamic Targeting* **Distribution Restricted**	7 MAY 2012	ATP 3-60.1 MCRP 3-16D NTTP 3-60.1 AFTTP 3-2.3	Description: This publication provides the JFC, operational staff, and components MTTP to coordinate, de-conflict, synchronize, and prosecute dynamic targets in any AOR. It includes lessons learned, and multinational and other government agency considerations. **Status: Current**
IADS *Multi-Service Tactics, Techniques, and Procedures for an Integrated Air Defense System* **Distribution Restricted**	1 MAY 09	FM 3-01.15 MCRP 3-25E NTTP 3-01.8 AFTTP 3-2.31	Description: This publication provides joint planners with a consolidated reference on Service air defense systems, processes, and structures to include integration procedures. **Status: Revision**
JFIRE *Multi-Service Procedures for the Joint Application of Firepower* **Distribution Restricted**	30 NOV 12	ATP 3-09.32 MCRP 3-16.6A NTTP 3-09.2 AFTTP 3-2.6	Description: This is a pocket sized guide of procedures for calls for fire, CAS, and naval gunfire. It provides tactics for joint operations between attack helicopters and fixed-wing aircraft performing integrated battlefield operations. **Status: Current**
JSEAD *Multi-Service Tactics, Techniques, and Procedures for the Suppression of Enemy Air Defenses in a Joint Environment* **Classified SECRET**	19 JUL 2013	FM 3-01.4 MCRP 3-22.2A NTTP 3-01.42 AFTTP 3-2.28	Description: This publication contributes to Service interoperability by providing the JTF and subordinate commanders, their staffs, and SEAD operators a single reference. **Status: Current**
KILL BOX *Multi-Service Tactics, Techniques, and Procedures for Kill Box Employment* **Distribution Restricted**	4 AUG 09	FM 3-09.34 MCRP 3-25H NTTP 3-09.2.1 AFTTP 3-2.59	Description: This MTTP publication outlines multi-Service kill box planning procedures, coordination requirements, employment methods, and C2 responsibilities. **Status: Revision**
SCAR *Multi-Service Tactics, Techniques, and Procedures for Strike Coordination and Reconnaissance* **Distribution Restricted**	26 NOV 08	FM 3-60.2 MCRP 3-23C NTTP 3-03.4.3 AFTTP 3-2.72	Description: This publication provides strike coordination and reconnaissance MTTP to the military Services for conducting air interdiction against targets of opportunity. **Status: Revision**
SURVIVAL, EVASION, AND RECOVERY *Multi-Service Procedures for Survival, Evasion, and Recovery* **Distribution Restricted**	11 SEP 12	ATP 3-50.3 MCRP 3-02H NTTP 3-50.3 AFTTP 3-2.26	Description: This is a weather-proof, pocket-sized, quick reference guide of basic information to assist Service members in a survival situation regardless of geographic location. **Status: Current**
TAGS *Multi-Service Tactics, Techniques, and Procedures for the Theater Air-Ground System* **Distribution Restricted**	10 APR 07	FM 3-52.2 NTTP 3-56.2 AFTTP 3-2.17	Description: This publication promotes Service awareness regarding the role of airpower in support of the JFC's campaign plan, increases understanding of the air-ground system, and provides planning considerations for conducting air-ground ops. **Status: Revision**
UAS *Multi-Service Tactics, Techniques, and Procedures for Tactical Employment of Unmanned Aircraft Systems* **Distribution Restricted**	21 SEP 11	ATTP 3-04.15 MCRP 3-42.1A NTTP 3-55.14 AFTTP 3-2.64	Description: This publication establishes MTTP for UAS by addressing tactical and operational considerations, system capabilities, payloads, mission planning, logistics, and multi-Service execution. **Status: Assessment**

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TITLE	DATE	PUB #	DESCRIPTION/STATUS
ADVISING *Multi-Service Tactics, Techniques, and Procedures for Advising Foreign Forces* **Distribution Restricted**	10 SEP 09	FM 3-07.10 MCRP 3-33.8A NTTP 3-07.5 AFTTP 3-2.76	Description: This publication discusses how advising fits into security assistance/security cooperation and provides definitions for specific terms as well as listing several examples to facilitate the advising process. **Status: Revision**
AIRFIELD OPENING *Multi-Service Tactics, Techniques, and Procedures for Airfield Opening* **Distribution Restricted**	15 MAY 07	FM 3-17.2 NTTP 3-02.18 AFTTP 3-2.68	Description: AThis publication provides guidance for operational commanders and staffs on opening and transferring an airfield. It contains information on service capabilities, planning considerations, airfield assessment, and establishing operations in all operational environments. **Status: Revision**
CF/SOF *Multi-Service Tactics, Techniques, and Procedures for Conventional Forces and Special Operations Forces Integration and Interoperability* **Distribution Restricted**	17 MAR 10	FM 6-03.05 MCWP 3-36.1 NTTP 3-05.19 AFTTP 3-2.73 USSOCOM Pub 3-33V.3	Description: This is a comprehensive reference for commanders and staffs at the operational and tactical levels with standardized techniques and procedures to assist in planning and executing operations requiring synchronization between CF and SOF occupying the same area of operation. **Status: Revision**
CORDON AND SEARCH *Multi-Service Tactics, Techniques, and Procedures for Cordon and Search Operations* **Distribution Restricted**	10 MAY 13	FM 3-06.20 MCRP 3-31.4B NTTP 3-05.8 AFTTP 3-2.62	Description: This is a comprehensive reference to assist ground commanders, subordinates, and aviation personnel in planning, training, and conducting tactical cordon and search operations. **Status: Current**
EOD *Multi-Service Tactics, Techniques, and Procedures for Explosive Ordnance Disposal in a Joint Environment* **Distribution Restricted**	20 SEP 11	FM 4-30.16 MCRP 3-17.2C NTTP 3-02.5 AFTTP 3-2.32	Description: This publication identifies standard MTTP for planning, integrating, and executing EOD operations in a joint environment. **Status: Revision**
IMSO *Multi-Service Tactics, Techniques, and Procedures for Integrated Money Shaping Operations* **Distribution Restricted**	26 APR 13	ATP 3-07.20 MCRP 3-33.1G NTTP 3-57.4 AFTTP 3-2.80	Description: IMSO describes how to integrate monetary resources with various types of aid within unified action to shape and influence outcomes throughout the range of military operations. **Status: Current**
MILITARY DECEPTION *Multi-Service Tactics, Techniques, and Procedures for Military Deception* **Classified SECRET**	12 APR 07	MCRP 3-40.4A NTTP 3-58.1 AFTTP 3-2.66	Description: This publication facilitates integrating, synchronizing, planning, and executing MILDEC operations. It is a one-stop reference for service MILDEC planners. **Status: Revision**
Military Diving Operations (MDO) *Multi-Service Service Tactics, Techniques, and Procedures for Military Diving Operations* **Distribution Restricted**	12 JAN 11	ATTP 3-34.84 MCRP 3-35.9A NTTP 3-07.7 AFTTP 3-2.80 CG COMDTINST 3-07.7	Description: This publication is a single source, descriptive reference guide to ensure effective planning and integration of multi-Service diving operations. It provides combatant command, joint force, joint task force, and operational staffs with a comprehensive resource for planning military diving operations, including considerations for each Service's capabilities, limitations, and employment. **Status: Revision**
NLW *Multi-Service Service Tactics, Techniques, and Procedures for the Tactical Employment of Nonlethal Weapons* **Distribution Restricted**	24 OCT 07	FM 3-22.40 MCWP 3-15.8 NTTP 3-07.3.2 AFTTP 3-2.45	Description: This publication provides a single-source, consolidated reference on employing nonlethal weapons. Its intent is to make commanders and subordinates aware of using nonlethal weapons in a range of scenarios including security, stability, crowd control, determination of intent, and situations requiring the use of force just short of lethal. **Status: Revision**
PEACE OPS *Multi-Service Tactics, Techniques, and Procedures for Conducting Peace Operations* **Approved for Public Release**	20 OCT 03 Change 1 incorporated 14 APR 09	FM 3-07.31 MCWP 3-33.8 AFTTP 3-2.40	Description: This publication offers a basic understanding of joint and multinational PO, an overview of the nature and fundamentals of PO, and detailed discussion of selected military tasks associated with PO. **Status: Revision**
TACTICAL CONVOY OPERATIONS *Multi-Service Tactics, Techniques, and Procedures for Tactical Convoy Operations* **Distribution Restricted**	13 JAN 09	FM 4-01.45 MCRP 4-11.3H NTTP 4-01.3 AFTTP 3-2.58	Description: This is a quick-reference guide for convoy commanders operating in support of units tasked with sustainment operations. It includes TTP for troop leading procedures, gun truck employment, IEDs, and battle drills. **Status: Revision**
TECHINT *Multi-Service Tactics, Techniques, and Procedures for Technical Intelligence Operations* **Approved for Public Release**	9 JUN 06	FM 2-22.401 NTTP 2-01.4 AFTTP 3-2.63	Description: This publication characterizes how threat forces maneuver in the operational environment. It presents guidance on evacuating captured material of intelligence value, and provides joint force staffs and other communities of interest with specific data concerning the mission requirements of TECHINT. **Status: Revision**
UXO *Multi-Service Tactics, Techniques, and Procedures for Unexploded Explosive Ordnance Operations* **Distribution Restricted**	20 SEP 11	FM 3-100.38 MCRP 3-17.2B NTTP 3-02.4.1 AFTTP 3-2.12	Description: This publication provides commanders and their units guidelines and strategies for operating with UXO threats while minimizing the impact of the threats on friendly operations. **Status: Revision**

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TITLE	DATE	PUB #	DESCRIPTION/STATUS
AOMSW *Multi-Service Tactics, Techniques, and Procedures for Air Operations in Maritime Surface Warfare* **Distribution Restricted**	17 NOV 08	NTTP 3-20.8 AFTTP 3-2.74	Description: This publication consolidates Service doctrine, TTP, and lessons-learned from current operations and exercises to maximize the effectiveness of air attacks on enemy surface vessels. **Status: Revision**
BREVITY *Multi-Service Brevity Codes* **Distribution Restricted**	20 SEP 12	ATP 1-02.1 MCRP 3-25B NTTP 6-02.1 AFTTP 3-2.5	Description: This publication defines multi-Service brevity which standardizes air-to-air, air-to-surface, surface-to-air, and surface-to-surface brevity code words in multi-Service operations. **Status: Revision**
COMCAM *Multi-Service Tactics, Techniques, and Procedures for Joint Combat Camera Operations* **Approved for Public Release**	19 APR 13	ATP 3-55.12 MCRP 3-33.7A NTTP 3-61.2 AFTTP 3-2.41	Description: This publication fills the combat camera doctrine void and assists JTF commanders in structuring and employing combat camera assets as effective operational planning tools. **Status: Current**
DEFENSE SUPPORT OF CIVIL AUTHORITIES (DSCA) *Multi-Service Tactics, Techniques, and Procedures for Civil Support Operations* **Distribution Restricted**	11 FEB 13	ATP3-28.1 MCWP 3-36.2 NTTP 3-57.2 AFTTP 3-2.67	Description: DSCA sets forth MTTP at the tactical level to assist the military planner, commander, and individual Service forces in the employment of military resources in response to domestic emergencies in accordance with US law. **Status: Current**
EW REPROGRAMMING *Multi-Service Tactics, Techniques, and Procedures for the Reprogramming of Electronic Warfare and Target Sensing Systems* **Distribution Restricted**	01 FEB 11	FM 3-13.10 (FM 3-51.1) NTTP 3-51.2 AFTTP 3-2.7	Description: This publication describes MTTP for EW reprogramming; the EW reprogramming process, requirements, and procedures for coordinating reprogramming during joint and multi-Service operations, Services' reprogramming processes, organizational points of contact, and reprogramming databases and tools. **Status: Revision**
HAVE QUICK *Multi-Service Tactics, Techniques, and Procedures for HAVE QUICK Radios* **Distribution Restricted**	7 MAY 04	FM 6-02.771 MCRP 3-40.3F NTTP 6-02.7 AFTTP 3-2.49	Description: This MTTP simplifies planning and coordination of HAVE QUICK radio procedures. It provides operators information on multi-Service HAVE QUICK communication systems while conducting home station training or preparing for interoperability training. **Status: Revision**
HF-ALE *Multi-Service Tactics, Techniques, and Procedures for the High Frequency-Automatic Link Establishment (HF-ALE) Radios* **Distribution Restricted**	20 NOV 07	FM 6-02.74 MCRP 3-40.3E NTTP 6-02.6 AFTTP 3-2.48	Description: This publication standardizes high- and low-power HF-ALE operations across the Services and enables joint forces to use HF radio as a supplement/alternative to overburdened SATCOM systems for over-the-horizon communications. **Status: Revision**
JATC *Multi-Service Procedures for Joint Air Traffic Control* **Distribution Restricted**	23 JUL 09	FM 3-52.3 MCRP 3-25A NTTP 3-56.3 AFTTP 3-2.23	Description: This is a single source, descriptive reference guide to ensure standard procedures, employment, and Service relationships are used during all phases of ATC operations. It also outlines how to synchronize and integrate JATC capabilities. **Status: Revision**
TACTICAL CHAT *Multi-Service Tactics, Techniques, and Procedures for Internet Tactical Chat in Support of Operations* **Distribution Restricted**	07 JUL 09	FM 6-02.73 MCRP 3-40.2B NTTP 6-02.8 AFTTP 3-2.77	Description: This publication provides commanders and their units guidelines to facilitate coordinating and integrating tactical chat when conducting multi-Service and joint force operations. **Status: Revision**
TACTICAL RADIOS *Multi-Service Communications Procedures for Tactical Radios in a Joint Environment* **Approved for Public Release**	14 JUN 02	FM 6-02.72 MCRP 3-40.3A NTTP 6-02.2 AFTTP 3-2.18	Description: This is a consolidated reference for TTP in employing, configuring, and creating radio nets for voice and data tactical radios. **Status: Revision**
UHF SATCOM *Multi-Service Tactics, Techniques, and Procedures Package for Ultra High Frequency Military Satellite Communications* **Distribution Restricted**	9 AUG 13	ATP 6-02.90 MCRP 3-40.3G NTTP 6-02.9 AFTTP 3-2.53	Description: Operations at the JTF level have demonstrated difficulties in managing a limited number of UHF SATCOM frequencies. This publication documents TTP that will improve efficiency at the planner and user levels. **Status: Current**

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The Air Land Sea Application (ALSA) Center develops multi-Service tactics, techniques, and procedures (MTTP) with the goal of meeting the immediate needs of the warfighter. In addition to developing MTTP, ALSA provides the ALSB forum to facilitate tactically and operationally relevant information exchanges among warfighters of all Services.

There is no better resource for information than the people doing the jobs. Personal experiences, studies, and individual research lead to inspirational and educational articles. Therefore, we invite our readers to share their experiences and possibly have them published in an upcoming ALSB.

We want to take your lessons learned from recent operations or any other multi-Service or multination missions in which you have been involved, and spread that knowledge to others. Get published by sharing your experiences and expertise.

The January 2014 ALSB topic is Pacific Rebalance: Tactical Implications. It focuses on the Department of Defense's recent efforts to rebalance forces to the Pacific theater and potential tactical-level effects.

This rebalance will, conceivably, impact all Services. The ALSB provides an excellent opportunity for you to share your insights and concerns regarding the tactical implications and impact of this rebalance. We want to know your perspective, so tell us what you think.

Please keep submissions unclassified and in accordance with the instructions in the box on this page.

Pacific Rebalance: Tactical Implications

Submissions must:

- Be 1,500 words or less
- Be publicly releasable
- Be double spaced
- Be in MS Word format
- Include the author's name, unit address, telephone numbers, and email address
- Include current, high-resolution, 300 dpi (minimum), original photographs and graphics. (Public affairs offices can be good sources for photographs or graphic support.)

Article submissions and photos are due no later than 1 October 2013 for publication in the January 2014 issue.

Early submissions are highly encouraged.

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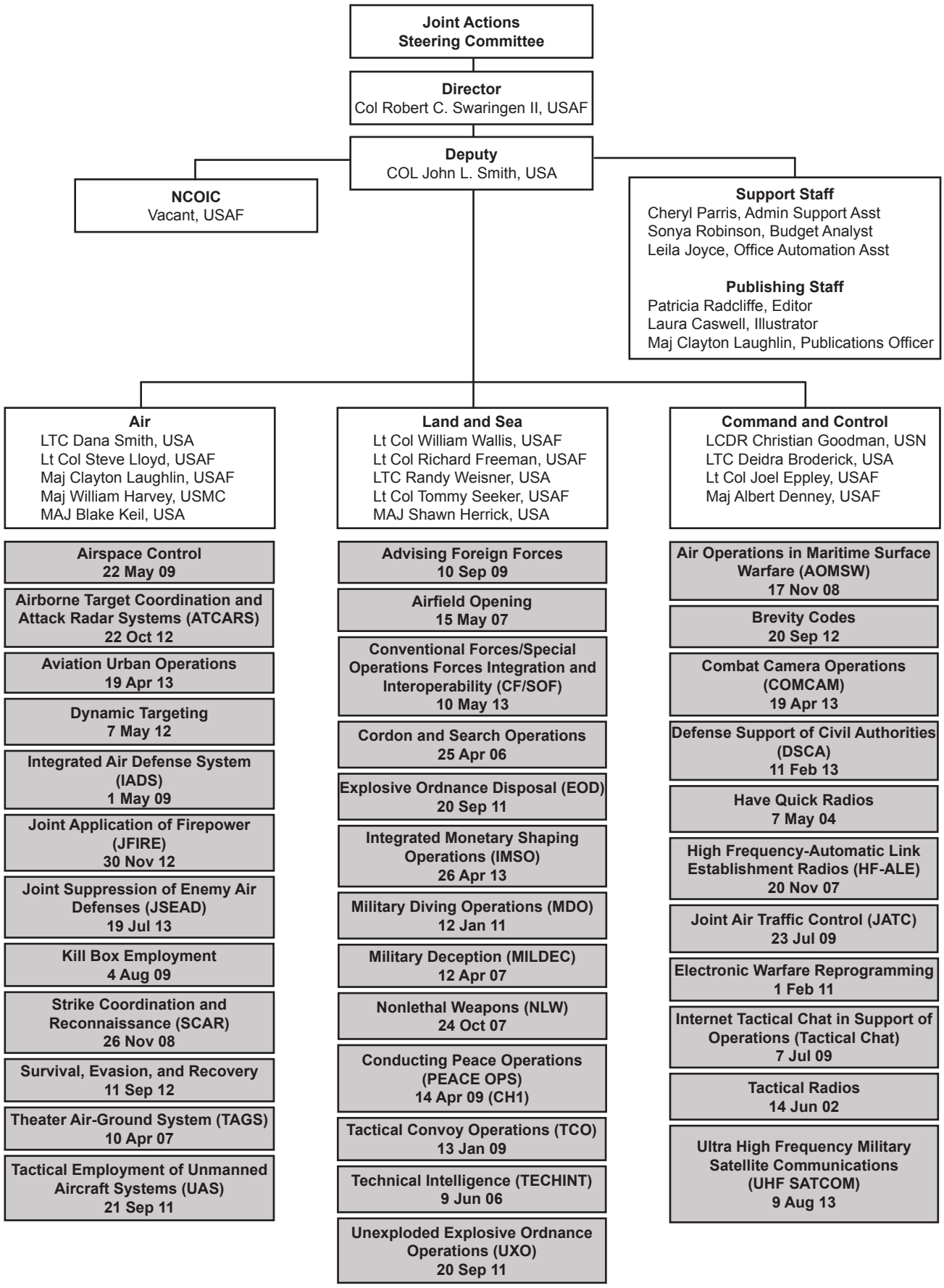

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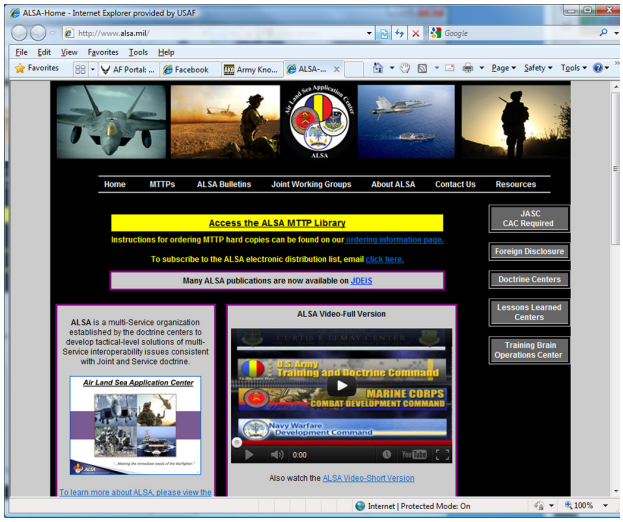

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