Jul - Sep 2025

THE AIR LAND SEA SPACE APPLICATION (ALSSA) CENTER NEWSLETTER 25-03

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- Airspace Control #3 (Virtual): 22 October
- Electromagnetic Spectrum Operations (EMSO) #2.1 (Virtual): 12 November
- EMSO #2.2 (Virtual): 12 December

**All dates are subject to change*

ALSSA EVENTS

- SDD Council (Virtual/JB Langley-Eustis): 19 November

ALSSA OUTREACH & ENGAGEMENTS**

- USMC WTI 1-26: 29 September – 2 October
- TECOM Outreach: 8 October
- Army AUSA Exposition: 13 – 15 October
- Joint CAS Curriculum Review: 21– 23 October
- Navy Doctrine Workshop: 28 – 29 October
- USSF Weptac: 3 – 7 November
- Joint Doctrine Planning Conference: 5 November
- Resolute Hunter: 10 – 14 November
- GEOINT AI Summit: 20 – 21 November

***ALSSA is not the lead POC but is attending.*

Joint Force Command and Control (C2) Redesign:

USMC Setting the Pace, Pushing the USAF

The U.S. Marine Corps (USMC) and U.S. Air Force (USAF) are actively redesigning their command and control (C2) capabilities to prepare for future warfare, contributing to the broader Joint All-Domain Command and Control (JADC2) effort. Their distinct modernization paths, though shaped by different operational needs, offer valuable opportunities for Joint collaboration. As adversaries seek to exploit seams in U.S. and allied operations, the USMC and USAF can push and pace one another to close those gaps, improving resilience and accelerating integration. This article highlights how employment techniques, equipment-agnostic design, and blended exercises can translate service-specific advances into joint operational advantage.

USMC C2 Redesign Efforts

The USMC's modernization effort is anchored by the Multifunction Air Operations Center (MAOC) and the Common Aviation Command and Control System Small Form Factor (CAC2S SFF). The

MAOC is intended to replace legacy Cold War-era structures with a scalable, all-domain C2 capability that integrates aviation, ground C2, fires, and intelligence to achieve decision superiority and fused targeting. Scalable and expeditionary by design, the MAOC supports Force Design 2030, Distributed Maritime Operations (DMO), and Expeditionary Advanced Base Operations (EABO), using radars, datalinks, and fires integration to maintain custody of targets and enable joint engagement. The CAC2S SFF complements MAOC with a highly mobile, modular, austere-capable C2 engine built for internal MV-22 carriage and dismounted operation, emphasizing plug-and-play modules, wearable/tablet end-user devices, and operation without tents or environmental control.

USAF C2 Redesign Efforts

The USAF's C2 modernization centers on the Tactical Operations Center-Light (TOC-L) and Cloud-Based Command and Control (CBC2), elements of the Advanced Battle Management System (ABMS), and the DAF Battle Network. TOC-L prototypes fuse hundreds of sensor and datalink feeds to produce an integrated air picture for battle managers, while CBC2 aggregates radar feeds to speed course-of-action selection. Field tests and phased procurements emphasize portability, survivability, and reduced size/weight/power to support distributed operations and Agile Combat Employment (ACE). Together, TOC-L and CBC2 move the Air Force from conceptual designs toward fielded nodes that can interoperate across the Joint Force if deliberately integrated with other services' C2 constructs.

How the USAF can learn: Employment Techniques

The first lesson lies in employment techniques: the USMC's doctrine for rapid emplacement, displacement, and decentralized execution underpins how CAC2S SFF and MAOC elements are used tactically. CAC2S teams are organized into mobile Control Teams, Mobile Liaison Teams, Remote Retrans Teams, and sensor nodes embedded with ground elements to shorten sensor-to-shooter timelines and sustain fires synchronization under mobility. For USAF TOC-L employment, adopting similar modular task organizations—small, mission-tailored detachments that can disaggregate and reconstitute quickly—would permit TOC-L nodes to provide continuous localized C2 while enabling distributed aggregation for joint effects. Institutionalizing these employment techniques would also create predictable touchpoints for joint procedures and handoffs during contested mobility operations.

Equipment-Agnostic Design (Trucks, Sensors, Support)

Beyond doctrine, a second lesson is equipment-agnostic engineering: CAC2S SFF is specified to operate without traditional sheltering and to be internally transportable by MV-22, which forces designers to solve thermal, power, and ergonomics problems within the module rather than relying on external trucks or tents. This approach produces a C2 engine that can run on diverse host platforms and reduces logistic and signature burdens. For the USAF, designing TOC-L packaging and interfaces to be agnostic of specific commercial trucks, shelters, or sensor vendors—focusing instead on standardized mounting, power, data bus, and cooling interfaces—would enable rapid mating to C-130/ULCV/ground vehicles and local sensor suites. The result is reduced integration time, improved cross-platform interoperability, and easier sustainment in contested lines of communication.

Joint Exercises and Blended C2 Constructs

Third, joint exercises provide the crucible to validate blended C2 constructs: embedding TOC-L elements within MAOC-organized scenarios or collocating CAC2S SFF nodes with TOC-L prototypes during Project Convergence-style events will reveal procedural, data-translation, and human-machine friction points. Exercises should purposefully mix control authorities and simulate split operations, e.g., a disaggregated MAOC fires cell using TOC-L fused tracks to prosecute time-sensitive targets under shared rules of engagement. Iterative experimentation with blended constructs will accelerate the development of joint tactics, techniques, and procedures (TTPs), reveal necessary middleware or gateway services, and create a shared vocabulary for decision authority and attribution across services. Measured, repeatable experiments will also inform acquisition priorities and identify low-cost modifications yielding outsized joint benefit.

Proposed Course of Action for Joint Collaboration

To exploit these lessons, the services should execute a three-part collaboration plan: workshops focused on employment doctrine and platform-

agnostic interfaces; joint field experiments validating blended C2 in austere, contested scenarios; and cross-service personnel exchanges to cultivate operators fluent in both MAOC and TOC-L constructs. First, technical workshops should produce interface standards for power, mounting, datalinks, and human-machine ergonomics to enable rapid hardware mating. Second, integrated field experiments, embedded into Project Convergence or similar events, should stress-test displacement, reconstitution, and joint sensor-to-shooter chains with mixed authority constructs. Third, rotating billets and shared training will produce the human capital to operate blended nodes under pressure and accelerate the institutionalization of joint TTPs.

Conclusion:

USMC and USAF C2 modernization paths are complementary: the Marines bring austere, platform-linked employment concepts and modular, equipment-agnostic packaging, while the Air Force brings advanced data fusion and cloud-enabled battle management. By centering collaboration on employment techniques, equipment-agnostic interfaces, and joint blended exercises, the Joint Force can accelerate convergence toward resilient, distributable C2 that denies adversaries' leverage. Intentional pacing, where services deliberately stress-test each other's innovations, will turn service-specific advances into joint operational advantage, ensuring JADC2 matures through practice as well as design.

Jonathan Daniel, Lt Col, USAF
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