Department of the Air Force Operational Imperative (DAF OI)

PUBLICLY RELEASABLE – NARRATIVE APPROVED FOR EXTERNAL MESSAGING

DAF OI-1. Defining Resilient and Effective Space Order of Battle and Architectures

Short-hand reference: Resilient Space Order of Battle

Situation: ***Resilient space order of battle and architectures, both defensive and offensive, are critical to providing essential operational services to the Joint Force, denying adversaries access to similar services, and protecting the Joint Force from the operational use of space by adversaries.*** This imperative must include a full range of resilient operational needs for support from space and the means to defeat adversary space systems, especially those that target the Joint Force. To accomplish this, the DAF must define the most cost-effective set of investments that will deliver acceptable mission resilience, operational performance, and warfighting capabilities to enable the Joint Force and allied and partner lethality and effectiveness.

Challenge: All or our space systems are subject to attack by potential adversaries employing a full spectrum of threats. The DAF must defend its space capabilities, protect the services provided from space to the Joint Force and allies, and mitigate adversary space capabilities. The U.S. relies on space for surveillance, intelligence, communications, and early warning, in addition to positioning, navigation, and timing services. Potential adversaries have operationalized space to counter U.S. space and space-dependent operations, and to deny joint and combined forces the space services on which they depend. These same potential adversaries continue to expand their own space capabilities, placing the Joint Force and allies and partners at risk.

Approach: The DAF must contribute to keeping space accessible, stable, and secure. To enable Joint Force operations, the DAF must develop a resilient space order of battle and architectures, both defensive and offensive, while denying adversary first-mover advantage and bolstering integrated deterrence.

- Develop resilient space-based capabilities that can be protected, survive attack, degrade gracefully under attack, and be reconstituted in a reasonable time when required.
- Provide new low-latency and highly resilient capabilities to joint and allied tactical warfighters directly from space, including resilient space data transport, missile warning and tracking, other tactical sensing, and position, navigation, and timing (PNT).
- Prioritize DAF investments to organize, train, and equip Guardians to defeat an adversary's space-based ability to attack terrestrial assets, especially high-value power projection assets.
- Capitalize on the growing number of allied and partner military space organizations and commercial space systems and the opportunities they present to increase defense resiliency, collaboration, and cooperation.

Original author: Lt Col Tom Gabriele/USSF/S8/703-693-9539/tpg/12Sep2022

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DAF OI-2. Achieving Operationally Optimized Advanced Battle Management System (ABMS) / DAF Joint All-Domain Command & Control (JADC2)

Short-hand reference: ABMS / JADC2

Situation: ***The DAF must modernize its operational Command, Control, Communications, and Battle Management (C3BM) systems to replace obsolete legacy systems and harness emerging information and communications technology and artificial intelligence technologies to provide targeting and decision support with the speed, adaptability, and resilience needed to fight in a highly contested environment.*** ABMS will provide the communications connectivity, decision support software, and tactically deployable hardware needed to Battle Manage DAF assets and contribute to the joint fight in a highly contested dynamic time compressed environment at scale. ABMS is the DAF contribution to Joint All-Domain Command and Control (JADC2).

Challenge: The high-end fight against today's peer adversary will be much more complex and stressing than any undertaking the DAF has had to manage to date. The current, highly centralized Air Operations Center (AOC) construct is not designed to manage the complexity of a future high-end fight, and it is a brittle, single point of failure vulnerable to non-kinetic and kinetic disruption. Legacy forward tactical C3BM platforms, such as E-3 and E-8, are not adequately survivable against emerging threats. Furthermore, the current C3BM construct is not optimal for true Joint and coalition operations. A redesign of the DAF C3BM network that exploits current technology and meets peer competitor driven requirements in a JADC2 context is required.

Approach: The DAF must develop and migrate to a C3BM architecture that includes resilient, distributed battle management and the operational ability to disaggregate C3BM and execution when the threat requires it. A new C3BM architecture will provide the data connectivity and communications, decision support software tools, and computational platforms to operate through a hierarchy of distributed airborne and/or surface based battle management nodes in locations and at operational levels as dictated by the operational situation.

- Develop and deploy tactical airborne communications hardware and network management tools to connect DAF and Joint Force airborne tactical data links, space data transport, and terrestrial communications for seamless data flow across the Joint Force and with allies and partners. Ensure redundant, resilient, low-latency communication pathways to connect sensors to decision makers to shooters in a communications-limited environment.
- Develop and provision an initial configuration of battle management node infrastructure to PACAF. This will include edge computational hardware, communications connectivity, and a software architecture to accommodate a range of decision support software tools. These nodes are scalable and configurable to mission need — from rapidly deployable light tactical elements, to medium nodes suitable for deployment in small forward ground centers or on aircraft such as E-7, to heavy nodes that are equivalent to resilient AOCs.
- Develop and integrate C3BM decision support software tools for target development and prioritization, target-weapon task assignment, and other planning functions, and establish a pipeline for continuous tool development, modification, and integration, including tools for C3BM across the Joint Force.
- Develop concepts of operations (CONOPS) and tactics for distributed battle management, supported by an ABMS battle lab modeling and simulation environment. Develop model-based system engineering tools to map operational plans to corresponding technical architectures.

Original author: Col CJ Johnson/ABMS CFT/831-224-0871/ctj/12Sep2022

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Department of the Air Force Operational Imperative (DAF OI)

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DAF OI-3. Achieving Moving Target Engagement at Scale in a Highly Contested Environment

Short-hand reference: Air, Ground, and Sea Surface Moving Target Engagement

Situation: ***Moving target engagement at scale must provide identification, tracking, and engagement support of numerous moving or mobile targets simultaneously in a highly contested time compressed multi-domain Joint environment.*** To accomplish this, a mix of air and space-based capabilities will be necessary to provide the resilient ability to conduct long-range, beyond line-of-sight sensing, and support integrated beyond line-of-sight fires against moving air, land and sea surface targets in a Joint and combined environment.

Challenge: The DAF must be prepared to efficiently engage air, land, and sea surface moving targets in the numbers or on the time scale it would face during any potential conflict with a well-resourced peer- or near-peer adversary attempting an act of aggression. The DAF must be capable of engaging those threats simultaneously, in high volumes, and on a compressed timeline where a few hours are likely to decide the outcome of the conflict. Traditional airborne moving target intelligence, surveillance, and reconnaissance (ISR) sensors currently employed by the DAF will be inadequate for such a scenario due to deficiencies in survivability, speed, range, or sensor performance.

Approach: Considering these current capability gaps, the DAF must provide the Joint Force and coalition forces with next-generation sensors, weapons, and decision support. Space-based solutions are highly desirable, but a mix of space and airborne sensors may be required technically and would provide needed redundancy and resilience against advanced threats. The DAF must improve its capability to sense and prosecute a number of targets that in a previous era would be considered overwhelming, all while prioritizing those threats consistent with operational needs.

- Develop a family of wide-area target indication (GMTI/AMTI) sensors to detect and track surface, ground, and air moving targets. This family of sensors will leverage multiple sensing modalities and include airborne and especially space-based sensors.
- Develop a suite of sense-making software tools to fuse data from multiple sources, including this OI's GMTI and AMTI sensors, to maintain target custody and manage sensor tasking and data collection. (While defined under this OI, these tools will ultimately be fielded as elements of ABMS (see OI-2)).
- Develop the communications infrastructure to connect sensors to shooters within target engagement timelines.
- Develop weapons in sufficient quantity with the range and other features necessary to engage moving targets beyond line-of-sight.
- Ensure newly developed capabilities consider potential exportability to allies and partners to enable combat-credible coalition response options.

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Department of the Air Force Operational Imperative (DAF OI)

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DAF OI-4. Defining the Next Generation Air Dominance (NGAD) Family of Systems

Short-hand reference: NGAD Family of Systems

Situation: ***NGAD must provide a family of innovative platforms and systems that allows the Air Force to control the air.*** To accomplish this, NGAD is more than simply a new crewed fighter aircraft—the NGAD family of systems will also include un-crewed tactical aircraft teaming with the crewed platform, the connectivity between those platforms, sensors, other mission systems, a suite of weapons, supporting external systems. The NGAD family of systems will replace the F-22, and, in conjunction with other fighter aircraft in the Air Force inventory like the F-35, ensure the USAF's continuing ability to achieve air superiority.

Challenge: Controlling the air domain is an absolute precondition for the Joint Force's freedom of maneuver against a peer adversary. Acknowledging this tenet of modern warfare, the U.S.'s most challenging competitors have invested in sophisticated airborne surveillance aircraft, advanced tactical aircraft, cutting edge air-to-air weapons, electronic warfare systems, air defenses, and other capabilities to contest American air superiority. The Air Force must move to the next generation of air superiority. Uncrewed combat aircraft, controlled by pilots and battle managers will be part of that transformation. Uncrewed combat aircraft will provide an affordable and cost-effective game changing capability. Current USAF fighter aircraft, either planned or in production, are also not affordable in the numbers required to counter the threat posed by China and Russia. In addition to exploiting the new operational possibilities provided by attritable uncrewed aircraft, the lower cost of these aircraft can address the DAF affordability challenge.

Approach: A 'family of systems' approach acknowledges the complexity of modern air dominance and emphasizes the most efficient and effective means of attaining next generation air dominance as identified in the DARPA led Air Dominance Study. The DAF approach also recognizes that the advances demonstrated by programs such as the Air Force Skyborg Project, Australia's Loyal Wingman Program, the DARPA ACE project, and other technology programs have demonstrated the potential for autonomy in combat applications. Fully achieving this operational imperative also requires a blend of platforms, sensors, software, and increased advanced weapons capacity to address stressing operational scenarios.

- Develop and field program of record collaborative combat aircraft (CCA) operating as a formation controlled by a single, modern, crewed aircraft—principally the NGAD crewed platform and potentially the F-35. The pilot of the crewed aircraft will 'call plays' and employ multiple un-crewed combat aircraft as wingmen to execute tactical tasks.
- Develop and integrate tactical aircraft autonomy across the DAF. Concept development will explore the precise mix of crewed and un-crewed teaming, the mission of those un-crewed combat aircraft, and the degree of autonomy the un-crewed aircraft will exercise in execution.
- Develop and implement necessary civil-military information technology, test, and training infrastructure to support the integration of crewed and un-crewed platforms.

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DAF OI-5. Defining Optimized Resilient Forward Basing, Sustainment, and Communications in a Contested Environment

Short-hand reference: Resilient Forward Basing

Situation: ***Fixed forward Airbases are targetable and vulnerable to attack. China, the pacing challenge for the United States, has invested heavily in long range precision munitions designed to attack USAF forward air bases and other high value targets.*** To achieve resilient basing the DAF has developed a concept, Agile Combat Employment or ACE, that uses a hub and spoke system of alternative basing. This concept is sound, but a cost effective mix of investments is necessary to make ACE effective. The DAF must acquire a mix of enablers that include pre-positioned essential supplies, improved expeditionary communications, and both active and passive defenses of distributed operating bases. Additionally, the DAF must expand the number of bases from which it can operate and provide a mix of defenses, concealment, and hardening, as well as the ability to maintain logistics support from multiple locations.

Challenge: The DAF currently relies on a limited number of isolated, forward air bases in the Western Pacific and a handful of fixed bases in Eastern Europe. These bases are increasingly threatened by advances in adversary long-range precision strike capability. Additionally, adversaries continue to challenge U.S. efforts to gain allied and partner access, basing, and overflight (ABO). The DAF must define and acquire a cost effective mix of responses to these threats that will enable resilient forward basing.

Approach: The DAF will complicate the adversary's plans to target its bases by distributing operations to dispersed locations and improving its ability sustain and conduct continuing operations—all while selectively hardening base infrastructure against attack and invoking a combination of concealment, deception, and defenses. This imperative will be accomplished through a mix of investments in resilient forward basing, sustainment, and communications to support strategic sensing and tactical operations. Active defenses should be provided by Joint Force partners. This OI furthers the Air Force's Agile Combat Employment (ACE), a scheme of maneuver that calls for using a network of dispersed operating locations that are resilient to attack.

- Expand prepositioned fuel, war reserve material (WRM), aircraft support, and other logistics at key locations. Improve the Joint Force's ability to generate sorties from distributed locations in combat conditions.
- Enhance infrastructure hardening, Joint Force-provided active defense, and proliferation, as well as the range of needed logistics, agile communications, and other improvements such as expeditionary training to develop multi-capable Airmen.
- Implement the most cost-effective combination of investments to mitigate the threat to forward tactical airbases.
- Engage with willing allies and partners to provide ABO and build partner nation capabilities to defend air and space bases.

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DAF OI-6. Defining the B-21 Long Range Strike Family of Systems

Short-hand reference: B-21 Family of Systems

Situation: ***The B-21 Family of Systems must employ an open architecture and advanced capabilities to deliver precision weapon effects en masse to numerous targets anywhere in the world.*** To accomplish this, the DAF must identify and develop the components of a B-21 Family of Systems, to include platforms, sensors, other mission systems, payloads, and weapons.

Challenge: The DAF must invest in long range strike capacity that is affordable and resilient against advanced threats with increasing range and sophistication. Adversary investment in anti-access/area-denial (A2/AD) designed to defeat U.S. power projection necessitates the development of this family of systems.

Approach:

- Many details of the B-21 family of systems are classified and cannot be discussed here.
- Leverage the B-21 open systems architecture to enable rapid integration of advanced capabilities.
- The B-21 will leverage of onboard and off-board sensors, payloads, and weapons depending on the operational requirement.

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Department of the Air Force Operational Imperative (DAF OI)

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DAF OI-7. Readiness of the Department of the Air Force to Transition to a Wartime Posture Against a Peer Competitor

Short-hand reference: Readiness to Mobilize, Deploy, and Fight

Situation: ***The DAF must be ready to mobilize, deploy and fight—which will require hardening the Joint Force's mobilization and support chain against cyber and non-cyber threats.*** To accomplish this, the DAF must identify, analyze, and defend against cyber, electronic warfare, and in some cases kinetic threats to all the dependencies that an adversary could reasonably be expected to attack. This OI has focused on cyber threats to date and will be continued to further address these threats and others.

Challenge: The DAF relies upon a wide range of supporting information systems and facilities in the continental U.S. and overseas, to mobilize, deploy and support Joint and coalition forces in a major conflict. All of these dependencies can be targeted by a wide variety of threats. In the event of a conflict with a peer adversary, any information system dependency or critical node may become a significant vulnerability.

Approach: The processes and systems required to deploy Airmen, Guardians, and the rest of the Joint Force is complex. Readiness includes mobilizing and moving DAF personnel and assets forward and supporting them once in place, along with all the systems necessary to sustain a force capable of fighting and winning. This imperative identifies priority gaps in the DAF's ability to transition to and support current and projected operational plans in a contested environment.

- Analyze and defend key mobilization, deployment, and sustainment functions on which the DAF depends for warfighting. Evaluate these systems against a stressing threat.
- Buy back the technical debt in today's information systems to harden them against cyberattack and reduce vulnerability.
- Invest in greater cybersecurity, to include both materiel systems and cyber-defenders.
- Improve understanding of DAF cyber terrain through increased sensors, data platforms, analytics and visualization to inform operational commanders.
- While initial studies have focused on cyber threats to our readiness, continued work will examine other capabilities needed to transition to large-scale conflict, including, but not limited to, the ability of our organic logistics systems, our industrial base and supplies chains to support wartime mobilization and sustainment needs.

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