Information Warfare and Joint All-Domain Operations

A Primer for Integrating and Prioritizing Data Requirements

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## Introduction

The US Air Force (USAF) is at risk of losing the next conflict if we do not change, as noted by Gen Charles Q. Brown, the 22nd USAF chief of staff, within weeks of taking the reins via his "Accelerate Change or Lose" charge. This risk is at least mainly because there is currently no effective, integrated flow of information warfare (IW) data products and services into command and control (C2) systems to enable enhanced tactical and operational war-fighter and decision-maker situational awareness. The USAF and joint services remain constrained to legacy, industrial era, and static databases for all the data, intelligence products, and services that the various tenets of IW provide—if the services even possess any consolidation of such data at all. These datasets and databases must become available to the Advanced Battle Management System (ABMS) in near real-time to enable our USAF, joint, and allied force success in conducting joint all-domain operations (JADO) in future peacetime competition and combat actions across the global commons. We would not allow our friends to go into a cage fight blindfolded, so why would the IW component of the USAF enable our service, sister services, and allied partners to enter any nation versus nation competition or conflict blind? We must work promptly to ensure the integration of IW into ABMS to integrate our ability to operate from that mosaic of information down to the tactical level and enable "uncomfortable delegation" of C2 to that 8-ship flight lead over the South China Sea. Victory is not assured in all conflict and competition, but we can certainly increase our chances of future victory by planning and organizing proactively.

The *National Defense Strategy* of 2018 prominently noted: "inter-state strategic competition, not terrorism, is now the primary concern in US national security."[1] Much has changed since that strategy document's release, including the defense secretaries and the paradigms under which we as officers, noncommissioned officers, and civilians acting as leaders, planners, and staffers operate to organize,

train, and equip the USAF. That change has been immensely sufficient in enabling the USAF to adapt to "the increasingly complex security environment. . . defined by rapid technological changes [and] challenges from adversaries in every operating domain," such that we prioritize that it is "most important to field a lethal, resilient, and rapidly adapting Joint Force."[2] To that end, the USAF now finds itself, along with the joint services, wrestling with how to adapt to an era where freedom of maneuver and the ability to mass forces is again fundamentally at risk, in a way that it has fundamentally not been since the Fulda Gap scenarios of the 1980s Cold War competition with the Soviet Union.

The Pacing Threat of Peer Adversaries
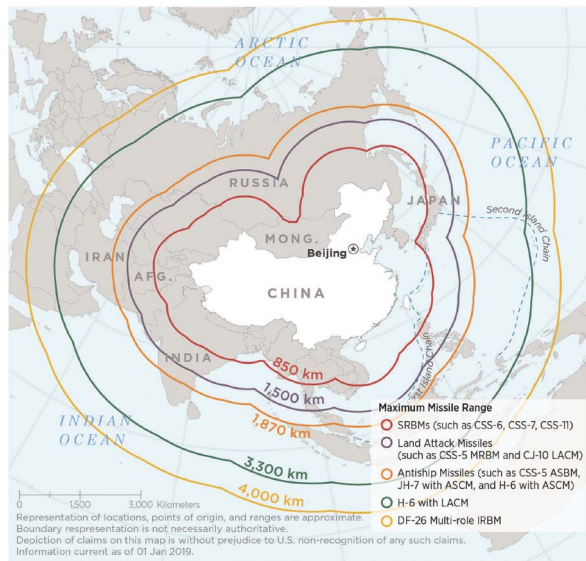
Figure 1. Chinese Conventional Strike Capabilities
Source: *OSD Annual Report to Congress: Military and Security Developments Involving the People's Republic of China*, 45

The reason for this struggle, of course, stems from the efforts of our peer adversaries, described in clear detail within the *National Defense Strategy* of 2018 as including the People's Republic of China and the Russian Federation to develop, field, and proliferate technologically advanced anti-access/area-denial weapons systems. They have done this to limit any third party's, in essence the United States', ability to intervene in their national objectives relative to nation-state engagements.[3] These advanced systems and their C2 enterprise collectively present joint and allied forces with a significantly contested and degraded operations space. It is well characterized that both China and Russia have developed double-digit surface-to-air missile systems and advanced fifth-generation fighters that they placed along borders, key C2 hubs, and the littoral to prohibit air interdic-

tion. The Chinese People's Liberation Army Rocket Force has fielded advanced and mobile, terminally guided antiship ballistic missiles that force US Navy carrier strike groups to operate at extended ranges from their targets. Both the Democratic People's Republic of Korea and China field mobile and advanced intermediate-range ballistic missiles such as the DF-26, potentially armed with nuclear weapons that place key joint force marshaling locations and fixed bases such as Anderson AB, Yokosuka Naval Air Station, or the III MEF Headquarters on Okinawa at risk.[4] All of that says nothing of the nonkinetic concerns that a peer adversary such as the Russian Federation presents via the use of combined cyber and information operations to enable the advance of irregular forces to infiltrate and commandeer an allied nation via hybrid warfare. Everywhere, the threat to the USAF's freedom of maneuver is real and clear. Never has it been more accurate than now that our adversaries are strategically targeting our power projection centers of gravity and developing the means to defeat us through their dismemberment of *schwerpunkt* (assessed "critical focal points" in the form of static C2 centers at the operational- and theater-level of warfare).
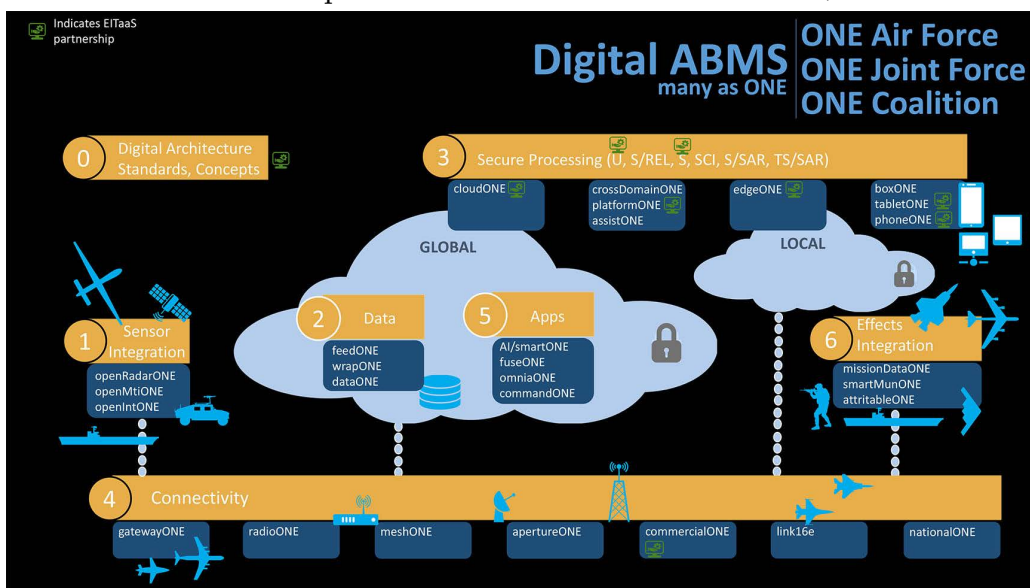
Figure 2. ABMS Overview
Source: CSAF—Wing Commanders Call, JADC2 & ABMS, 17 September 2020, 7.

Joint All-Domain Operations and Command and Control

As the post-COVID-19 world begins to recalibrate itself to the previously emerging great-power competition already well underway at the pandemic's outset, the USAF and its joint service peers will charge full speed ahead with imple-

menting doctrinal joint all-domain command and control (JADC2) to enable JADO. As articulated by USAF Gen Paul J. Selva, as vice chairman of the Joint Chiefs of Staff, JADC2 aims to secure resilient C2 and battlespace awareness sufficient to enable and integrate fires across the variety of disparate shooters and sensors operated across a joint or combined task force. It intends to reconceptualize the headquarters elements such as an air operations center or tactical operations center naturally dislocated from the forward edge action. JADC2 aims to empower tactical commanders immersed in high-intensity forward, tactical-edge combat with the same SA and empowered C2 decision-making that would previously have been reserved for what are now at-risk as *schwerpunkt*. This concept enables force management that is responsive to, even out in front of, enemy or adversary generated effects, decision-making, and maneuvering. JADC2 seeks to be executable even when networks are disconnected, reduced in bandwidth, or intermittent, as can and should be expected when fighting or competing in earnest with adversaries in the twenty-first century. The end goal of all this connectivity and pristine situational awareness will be friendly forces' ability to synchronize the prosecution of thousands of potential targets across a federated resource set of the combat arms inherent to the task force and across domains.[5]

This situation only happens via the stand-up and rollout of ABMS. ABMS represents a $3.3 billion investment through fiscal year 2025 by the USAF and intends to serve as a data-integrating, command-decision enabler that spurs the Find, Fix, Target, Track, Engage and Assess process. The intent is that ABMS will aid active battlespaces and within those murkier, harder-to-define scenarios and environments that we as a nation and the USAF will find ourselves increasingly operating (i.e., peacetime competition).[6] In places such as the Kuril Islands, the waters of the South China Sea, the airspace of the Black Sea, the outskirts of Kaliningrad, and all around the Baltic, America, and her allies will assuredly be forced to proactively confront the advances of our peer adversaries in ways short of war. With those adversaries' intentions laid bare more than ever before, the only way to effectively confront those ambitions now is via effectively interlaced joint and combined (read *allied*) force approaches.

Per reporting, ABMS will be driven by artificial intelligence and employ machine learning but, more importantly, will integrate into seven categories of actions or applications. These categories include digital architectures, standards and concept development; sensor integration; multidomain data management; multidomain secure processing; multidomain connectivity; multidomain applications; and effects integrations. These effect integrations include smart munitions, attritable aircraft, and the rapid reprogramming of electric warfare mission data files in near real-time.[7] What do all of these advertised elements of ABMS have in

common? A distinct reliance upon IW and data or intelligence derived from the same to function at peak performance to support JADO.

The Prioritization and Integration of Information Warfare

To achieve that peak performance, we need ABMS, and it will, in turn, require critical data provided via the tenets of IW. This requirement includes critical intelligence derived from observations of and operations within cyberspace, electronic warfare and the electromagnetic spectrum, and intelligence derived from information and intelligence, surveillance, and reconnaissance (ISR) operations. One subset of data that will be critical to interlink within ABMS—in which the Air Force Life Cycle Management Center is beginning to evaluate for integration—is intelligence mission data (IMD). All too often an afterthought in consideration, as was the case in the Technology Maturation and Risk Reduction phase of the F-35 Joint Strike Fighter program's acquisition, IMD represents a crucial component to both the ability of ABMS to function successfully and to provide situational awareness to operational commanders and tacticians executing their mission orders and taskings. IMD includes order of battle, characteristics and performance, geospatial intelligence, and electronic warfare integrated reprogramming data and signatures data. The requirements for IMD are documented early in a weapon system program's development and are captured within an associated Life-Cycle Mission Data Plan. When IMD is integrated, and accurate, joint and allied forces avoid fratricide and hone their battlespace awareness through combat ID. This integration enables those forces to seize the high ground, hold adversary targets at risk, and win the day. Compared with ABMS, IMD receives a USAF budget slice of barely $40M annually, representing an outsized potential to affect JADC2 positively.

IMD is certainly not alone in its criticality to fielding a functioning ABMS and enabling the joint and allied force to execute to JADO. Cyberspace operations, information operations, and the intelligence-derived from ISR operations must also be able to integrate within ABMS so as to update the JADC2 reality presented to tactical decision-makers. Each component of IW can contribute a myriad of datasets to the ABMS mosaic. Within IW, cyberspace operations provide the ability to defend the ABMS network itself and present a matrix of cyber vulnerabilities possessed by the adversary for exploitation and targeting. Information operations would enable commanders to safeguard joint task force feints from the real surprise dynamic force deployments intended to throw the adversary back on their heels, representing datasets that must be available to ABMS. ISR operations provide the ability to yield critical intelligence on mobile SAM and theater ballistic missiles repositioning to enable interdicting joint fires; this intelligence must quickly transition onto ABMS to enable shooter decisions. Across the board, IW has critical

data to offer, ensuring the mosaic is its most complete and accurate. However, that data must be integrated and early to enable ABMS to be successful.

Recommendations
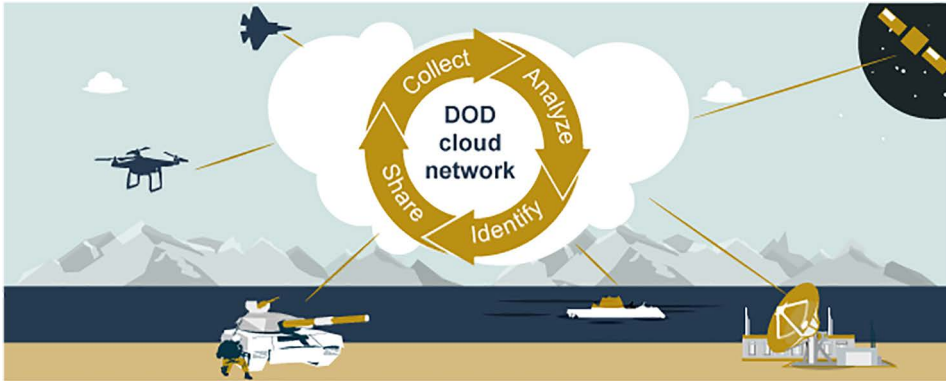
Figure 3. Government Accountability Office ABMS Analysis
Source: Action is Needed to Provide Clarity and Mitigate Risks of the Air Force's Planned Advanced Battle Management System, US Government Accountability Office (GAO-20-389), 16 April 2020.

In conclusion, we can delay modernization no longer. Our adversaries, like China, simply will not allow for it. The Defense Intelligence Agency has initiated an effort to transition static, foundational intelligence databases like the Modernized Integrated Database (MIDB) into a worldwide web-like application in the form of a machine-assisted rapid-repository system (MARS). This system represents an excellent first step in transforming the environment for foundational military intelligence and interactions with same.[8] However, such efforts are insufficient to actualize the integration of decision-enhancing IW-derived intelligence data in JADC2 constructs via mechanisms like ABMS. Neither do such efforts comprise threat warning, collection management, and targeting intelligence equities necessary to create the most robust picture for war fighters. What is called for is promulgation and federation of all IW-produced data and intelligence, through a cloud-based federation enabled by automation and machine learning algorithms, onto the ABMS cloud and into cockpits. This shared intelligence, tagged and integrated with tactical sensor data and multifunction displays, will enable true decision advantage for the USAF, joint services, and our allies, critically enabling them to reinvigorate intelligence databases with their combat mission's findings and observations. The following concrete measures can accomplish this:

- Establish clear requirements for all tenets of IW products and services in JADC2 "Concept Required Capabilities."
- Integrate existing intelligence and IW databases within the ABMS Cloud.

- Develop and implement security protocols and cross-domain solutions to enable IW and intelligence data transfers to and through ABMS, and for sensor and platform-derived data in the opposite direction and into intelligence databases.

- Assure appropriate data labeling and tagging to sources of data.

- Service-wide training to establish tactics, techniques, and procedures for IW, intelligence, and sensor data utilization and transfer.

Conclusion

Such a significant transformation affecting the IW enterprise, the role of the intelligence, and other provided data services for the joint war fighter will not occur overnight. It will require a significant paradigm shift in how producers, curators, and consumers of such data will conduct their relative operations and how the unit level integrates its combat mission results back into the intelligence community and IW enterprise. This task will not be easy and will require a joint approach, but American innovation must, can, and will win the day over Chinese reverse engineering—if senior leaders foster and guide that innovation into being. ✪

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Notes

1. Department of Defense (DOD), *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge* (Washington, DC: DOD, 2018), https://dod.defense.gov/.

2. DOD, *Summary of the 2019 National Defense Strategy*.

3. Office of the Secretary of Defense (OSD), "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China, 2019," 2 May 2019, https://media.defense.gov/.

4. OSD, "Annual Report to Congress."

5. Lt Col Aaron Gibney, "Joint All-Domain Command & Control (JADC2) Campaign Plan–Planning Conference 27–29 August 2019-Outbrief," August 2019: 3–4.

6. Rachel S. Cohen, "Air Force Bets on ABMS Success in Fiscal 2021," *Air Force Magazine*, 11 February 2020, https://www.airforcemag.com/.

7. Cohen, "Air Force Bets on ABMS Success."

8. Defense Intelligence Agency (DIA), *Strategic Approach: Committed to Excellence in Defense of the Nation* (Washington, DC: DIA, September 2018) https://www.dia.mil/.