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Empowering ISR Assets Throughout INDOPACOM

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Abstract

Future warfare against near-peer adversaries will require advanced communication capabilities amongst joint and allied partners. The conceptual framework of the Air Force's Advanced Battle Management System (ABMS) has been developed and appears to provide monumental contributions to the Department of Defense's (DOD) Joint All Domain Command and Control (JADC2) system. Based on recent publications from the DOD National Defense Strategy, China remains as our largest competitor when providing stability to the international system. Under the presumption that intelligence, surveillance, and reconnaissance (ISR) advancements will dictate the shape of future battlefields and essentially empowers ABMS, the ability of the United States to retain its status as a global hegemon will be largely dependent on mitigating Chinese interference against ISR assets. Based on the *Next Generation ISR Dominance Flight Plan*, executing this task requires the acceleration of ISR Targeting (ISRT) force transformation to deliver precise intelligence for decision advantage. This paper seeks to expand upon countering China's attempts to thwart US capabilities by out-maneuvering growing threats to ISR within the South China Sea. Based on the present development of ABMS and its reliance on existing ISR assets, it is not certain if present strategies can hold up to the demands of future conflicts.

Introduction

The future of warfare shall incorporate advanced communication capabilities that expand coordination amongst Department of Defense (DOD) assets and its joint partners and allies. This will inevitably lead to near-peer adversaries attempting to thwart the cooperative efforts of the United States. As a result, it will become exceedingly important that the United States mitigates these counter-efforts and employs strategies that outmaneuver adversarial planning.

Advanced Battle Management System

The Advanced Battle Management System (ABMS) seeks to seamlessly share data among Air Force and Space Force systems to disaggregate sensors and C2 systems from one another.¹ This extends to incorporate the necessity of normalizing ISR forces to various joint users.² Under the intent of maintaining international order, inferences can be developed regarding the empowerment of ABMS throughout INDOPACOM with ISR assets and whether this solution can adequately compete within an evolving battlefield. Primarily, measures must be developed to prevent the distortion of ABMS reliability by overcoming any nefarious attacks instigated militarily by the People's Republic of China (PRC).

National Defense Strategy

The publication of the *2022 National Defense Strategy* largely involves utilizing DOD assets to provide security against potential threats stemming from the Indo-Pacific region of the world.³ We can infer such posturing is predicated on sustaining a realist stance towards regional solidity under the basis of the hegemonic stability theory. As the United States progresses through the 21st century, it has become relatively dependent on utilizing hundreds of Intelligence, Surveillance, and Reconnaissance (ISR) assets to objectively impede on the PRC's sphere of influence throughout the Indo-Pacific Command (INDOPACOM) area of responsibility (AOR).⁴ This becomes exceedingly clear within the *Next Generation ISR Dominance Flight Plan*.

¹ Deptula, David A. "A New Battle Command Architecture For Joint All-Domain Operations." Æther: A Journal of Strategic Airpower & Spacepower 1, no. 1 (2022): 52.

² Ibid. 53.

³ Department of Defense. Summary of the 2022 National Defense Strategy of the United States of America. Washington, DC: Department of Defense, (2022). https://media.defense.gov/2022/Mar/28/2002964702/-1/-1/1/NDS-FACT-SHEET.PDF

⁴ Jalil, Ghazala Yasmin. "China's Rise: Offensive or Defensive Realism." Strategic Studies 39, no. 1 (2019): 56.

ISRT and C2 data shall fuse to provide decision advantage amongst warfighters.⁵ The role of ISR is largely associated by combatant commanders as a means of shaping the battlespace in which operations are being conducted.⁶ Within the scope of the DOD's Joint All Domain Command and Control (JADC2), the Air Force has described Advanced Battle Management System (ABMS) as its latest contribution.⁷

Mitigating Threats

The PRC's militarization of territories throughout the South China Sea may prove to be a difficult obstacle to traverse with the future employment of ABMS. Various outposts on the Spratly Islands and other nearby territories have been outfitted with jamming equipment. The People's Liberation Army (PLA) have greatly expanded jamming operations by increasing their electronic weapons, equipment, and performance capabilities.⁸ It is critical that future Concept of Operations (CONOPS) planning incorporates China's militaristic expansions and how this may thwart ISR assets and ABMS employment.

Defining Advanced Battle Management System

The Advanced Battle Management System proposes to utilize "cloud environments" and "new communication methods" to share data through artificial intelligence to "enable fast decision-making."⁹ This becomes tangible by executing Command, Control, Communication and Battle Management (C3BM), especially in a contested environment. The impact of a contested environment as discussed during the *2018 National Defense Strategy* led to an entirely restructured program.¹⁰ General David Allvin loosely described ABMS in 2021 as a term that encompassed software, hardware, infrastructure, and policy.¹¹ Under this description, assets under the ISR enterprise must contain compatibility with applicable "software, hardware,

⁵ HAF/A2. "Next Generation ISR Dominance Flight Plan." Headquarters Air Force. Directorate of Intelligence, (2018).

⁶ Albon, Courtney. "Enterprise Revamping ISR Requirements Process: Air Force Leveraging Space, Cyber Assets To Support ISR Demand." Inside the Air Force 25, no. 47 (2014): 2.

⁷ Hoehn, John R. "Advanced Battle Management System (ABMS)." Congressional Research Service. (2022): 1-3. <https://sgp.fas.org/crs/weapons/IF11866.pdf>

⁸ Neuman, S. & Kuhn, A. "Beijing reportedly installs communications jamming equipment in South China Sea." NPR. (2018). https://www.npr.org/sections/thetwo-way/2018/04/10/601075294/beijing-reportedly-installs-communications-jamming-equipment-in-south-china-sea

⁹ Hoehn, John R. "Advanced Battle Management System (ABMS)." Congressional Research Service. (2022): 1-3. <https://sgp.fas.org/crs/weapons/IF11866.pdf>

¹⁰ Ibid.

¹¹ Ibid.

infrastructure, and policy" to solidify integration. As ABMS is portrayed to hold underlying value by advancing command and control techniques for airborne forces, its integration and execution throughout INDOPACOM may suffer from unforeseen obstacles.

Determining the initial effectiveness of ABMS can presently be restricted to test exercises conducted within the confines of Valiant Shield and other annual Air Force exercises. Various tests include utilizing the KC-46 equipped with a communication pod as a C2 system in either a primary or backup role during a depicted fight.¹² Other tests integrate joint partners from other nations into combined air operations. Although these tests may be successful within the confines of an uncontested environment, can the same results become replicated if executed throughout contested airspace; specifically, throughout the South China Sea against adversary jamming?

ISR Strategy within the Indo-Pacific

Developing ISR strategy for implementation throughout the Indo-Pacific shall receive the greatest outcome by dissecting the region with a layered approach starting with the development of Commander's Intent. There are a number of limiting factors that may impede the conceptual framework of an ISR strategy prior to execution. Theoretically, the advancement of ABMS and its incorporation into such framework may prove to overcome conventional limitations that historically obstructs strategy development.

Basic ISR Strategy Overview

Initial ISR strategy can be broken down into three components. This includes, "framing the problem, setting mission expectations, and outlining objectives" in a methodical manner that brings together to various efforts towards a common purpose.¹³

A "framed problem" is a fluid concept that will vary depending on the latest National Defense Strategy. With respect to ABMS and ISR assets, we can establish China's military technologies and assets throughout the South China Sea and Spratly Islands as a likely problem. Since ABMS is largely conceptual, we cannot fully depict the ramifications of China's jamming technology and its concurrent employment. If

¹² Ibid.

¹³ Brown, Jason M. "Developing the Commander's Intent for ISR." Strategy for Intelligence, Surveillance, and Reconnaissance. Air University Press, (2014). 6.

ABMS can be jammed or degraded, the "framed problem" can evolve depending on how the system is impacted.

Mission expectations will likely be correlated to effective data sharing and communications amongst allied assets and joint partners with minimized downtime. If ISR assets can empower ABMS to operate effectively, any other developed mission expectations should be successful. Mission expectations might also change depending on unknown limiting factors that affect utilized assets.

Objectives are defined by joint doctrine as, "a clearly defined, decisive, and attainable goal toward which every operation is directed."¹⁴ Referencing the research from Col Jason Brown, ISR objectives can be developed from "goals, IPS, roles and missions, and the 4Cs as a foundation."¹⁵ Although any theorizing about applying ABMS to an INDOPACOM conflict is still completely hypothetical, we can narrow down the focus of applying these planning strategies. Conversely, the empowerment of ABMS through the use of ISR assets may constitute the solidity of mission objectives and their execution.

Adversarial Threats

In 2019, the DOD released an annual report to Congress regarding the military developments of the PRC. It was determined that potential electronic warfare (EW) targets included, "adversary systems operating in radio, radar, microwave, infrared and optical frequency ranges, as well as adversary computer and information systems."¹⁶ Further reports include routine training to perform jamming and anti-jamming against, "multiple communication and radar systems and Global Positioning System (GPS) satellite systems" throughout "force-on-force" exercises.¹⁷

Specific emphasis on counter-ISR has resulted with the PRC developing a slew of technological advancements such as "maneuverable reentry vehicles, multiple independently targetable reentry vehicles,

¹⁴ Joint Chiefs of Staff. "Department of Defense Dictionary of Military and Associated Terms." JP 1-02. Washington, DC: Joint Chiefs of Staff, (2016). < https://irp.fas.org/doddir/dod/jp1_02.pdf >

¹⁵ Brown, Jason M. "Developing the Commander's Intent for ISR." Strategy for Intelligence, Surveillance, and Reconnaissance. Air University Press, (2014). 10.

¹⁶ Secretary of Defense. "Military and Security Developments Involving the People's Republic of China." Office of the Secretary of Defense. (2020). https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF

¹⁷ Ibid.

decoys, chaff, jamming, thermal shielding, and hypersonic glide vehicles." Aside from kinetic weapons, China maintains assets that can be utilized through non-kinetic capabilities.

The PLA Navy operates an aircraft known as the Y-8X as its first "long-range" maritime patrol aircraft. Utilizing the Y-8 aircraft as a basis, it has received extensive modifications that have led to it containing "forward-looking infrared (FLIR) turrets, jamming antennas, and possibly a synthetic aperture radar (SAR)." More recently, the PLA Air Force announced its Y-9 communications jamming/electronic countermeasures aircraft.¹⁸ The Y-9 (also known as a GX-11) is utilized to distort battlespace awareness at longer ranges.¹⁹ Another asset with non-kinetic capabilities include the CH-91. The CH-91 is a small unmanned aerial vehicle (UAV) that has been used for "artillery directing, tactical reconnaissance, and communications jamming."²⁰

It is likely that denial of an ISR presence will inevitably result with severely degraded ABMS capabilities throughout the South China Sea. Aside from the Y-8X and CH-91, it should be anticipated that China has other non-kinetic based jammers that have the potential to disrupt ISR assets along with ABMS. Future development of ABMS must account for these types of threats if it is expected to function in a contested environment.

Various Chinese military publications regard information warfare as a domain in which a highaltitude electromagnetic pulse (HEMP) weapon shall lead to prevailing in a wartime scenario.²¹ The use of a nuclear HEMP attack in conjunction with cyber-attacks comprise "Total Information Warfare" as defined by Chinese military doctrine.²² An electromagnetic pulse (EMP) test attack from the 1960's revealed the damaging results that occur from damage sustained to radars, communication and control systems, and computers.²³ China's arsenal of missiles can be equipped with nuclear weapons (or a non-nuclear EMP

¹⁸ Ibid.

¹⁹ Ibid.

²⁰Wood, P. & Cliff, R. "Chinese Airborne C4ISR." China Aerospace Studies Institute. Air University Press, (2018). 16.

²¹ Pry, P. "China: EMP Threat." EMP Task Force on National and Homeland Security. (2020). <https://apps.dtic.mil/sti/pdfs/AD1102202.pdf>

²² Ibid.

²³ Ibid.

warhead). These weapons would likely result with significant damage and degradation to the functions of ABMS or JADC2.

Joint Endeavors

Overcoming adversary jammers while employing ABMS will require both offensive and defensive measures that rely on allied and joint partners for successful execution. Relevant Joint Doctrine concepts expand upon the empowerment of ISR assets through ABMS, "The art and science of decision-making to rapidly translate decisions into action, leveraging capabilities across all-domains and with mission partners to achieve operational and information advantage in both competition and conflict."²⁴

Strategies of Mitigation

There are two basic approaches that can be taken towards out-maneuvering adversary tactics intended to "deceive, degrade, deny, disrupt, or destroy"²⁵ assets that can empower ISR capabilities. Either approach includes developing courses of action against either known or unknown enemy weaponry. As mentioned, known jamming aircraft include the Y-8X, Y-9 (GX-11), and the CH-91. Although the existence of EMP weaponry has been confirmed, it is difficult to determine whether such a weapon would be employed within the vicinity of the PRC (presuming ISR assets would be operating within the AOR). Under the expectation that EMP weapons can severely harm friendly ISR assets, it is unknown how the PLA would use such weaponry in proximity to its own assets.

Joint Partners

Sustaining sortie operations throughout a contested environment, presumably in INDOPACOM, would require reliance on joint and allied partners to maintain an adequate presence. This can be broken down into data sharing and decentralized execution if a component of JADC2 or ABMS becomes compromised.

²⁴ Marler, Timothy, Carra S. Sims, Ajay K. Kochhar, Christine Kistler LaCoste, Caitlin Lee, Matt Strawn, and Mark Toukan, "What Is JADC2, and How Does It Relate to Training? An Air Force Perspective on Joint All Domain Command and Control." Santa Monica, CA: RAND Corporation. (2022). <https://www.rand.org/pubs/perspectives/PEA985-1.html>

²⁵ Reed, John. "The Five Deadly DS of the Air Force's Cyber Arsenal." Foreign Policy. (2013). https://foreignpolicy.com/2013/04/12/the-five-deadly-ds-of-the-air-forces-cyber-arsenal/

Under ABMS, we can assume that data will be shared and received from Air Force, Space Force, joint, intelligence community, and coalition sensor assets. Once this data is processed through ABMS and JADC2 systems, it creates a layered sensing grid²⁶ to meet expected challenges imposed by adversaries throughout INDOPACOM. Operations should be expected to continue even with EW-based threats observed within a contested environment.

It is also imperative that decentralized execution based on collaboration with joint partners assists with ABMS data transmissions. It would require a degree of flexibility among joint partners to facilitate the continued operation of ABMS if various components of the system become degraded. Ideally, JADC2 should contain options to operate independently of ABMS when transmitting data between joint partners along with finding other avenues of sharing non-standardized data. Combining a layered sensing grid with decentralized data transmission amongst allied assets allows ABMS and JADC2 to become "connected, persistent, and survivable"²⁷; which ultimately withstands the obstacles observed throughout an INDOPACOM battlefield.

Conclusion

ABMS may serve as a viable key towards suppressing Chinese expansion throughout the South China Sea while solidifying the United States as a continued global hegemon. At a minimum, it should be expected that ABMS empowering ISR assets shall serve as a cornerstone of communication efforts within the future of joint operations upon the completion of its upcoming development. If we can assume that ABMS and JADC2 are the keys to sustaining our status as a global hegemony, it is of the utmost importance to devise strategies that enable the empowerment of ISR operations when faced with through stemming from jamming and degradation. Localizing communication nodes to operate independently if assets become degraded may serve as a feasible alternative. Nonetheless, the role of developed communication contingencies shall be paramount prior to the next near-peer conflict.

²⁶ HAF/A2. "Next Generation ISR Dominance Flight Plan." Headquarters Air Force. Directorate of Intelligence, (2018).

²⁷ DIA. "DODIIS Day Three: The value of partnership." DIA Public Affairs, (2021). <https://www.dia.mil/News-Features/Articles/Article-View/Article/2870683/dodiis-day-three-the-value-of-partnership/>

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