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Modernizing the DOD's Airborne ISR

INTRODUCTION

The ability to observe an enemy from the air has long been a valuable asset for the military. From hot air balloons in the late 18th century to the SR-71 Blackbird during the Cold War era, aerial surveillance has proven to be a vital asset for gathering intelligence. Today, the world's most advanced militaries use airborne intelligence, surveillance, and reconnaissance (A-ISR) — aircraft equipped with advanced sensors and communication systems that collect, analyze, and distribute intelligence — to gain a tactical advantage on the battlefield.

A-ISR provides real-time intelligence, enhancing situational awareness and enabling informed decision-making across all levels of operations. By providing a comprehensive view of a battlespace from the air, A-ISR platforms improve threat detection, precision targeting, and coordination between joint forces. Moreover, the flexibility, speed, and endurance of A-ISR systems make them indispensable for rapid threat response. Beyond combat, A-ISR also aids in disaster relief efforts, search-and-rescue operations, and counter-narcotics missions. Whether tracking enemy movements, guiding precision strikes, or aiding humanitarian efforts, A-ISR is a force multiplier that underpins the Department of Defense's (DOD) ability to project power, maintain readiness, and safeguard national security.

Modernizing A-ISR

THE NEED FOR AN UPGRADE

Much of the DOD's existing A-ISR fleet are remnants of the Cold War and have limited range.[1] This makes them reliant on access to allied military installations to conduct global operations. Aircraft like the U-2 Dragon Lady, RC-12 Guardrail, and RC-135 Rivet Joint have been in service for decades, relying on legacy technologies that struggle to keep pace with modern threats.

Courtesy Photo | dvidshub.net

To bring its A-ISR capabilities into the 21st century, the DOD requires a new platform with extensive range and endurance to conduct its mission. In addition, the DOD needs a platform that is adaptable to various environments and can be modified for mission success regardless of the theater of operation. Perhaps most importantly, the DOD seeks to enhance its deep-sensing capabilities to support long-range fires. As defined by the U.S. Army, deep-sensing is the employment of capabilities beyond the division coordinated firing line to collect data and information that supports targeting, situational understanding, or decision-making.[2] More simply, deep-sensing allows the DOD to surveil and strike opponents from farther distances and with greater precision. Far more than just an eye in the sky, deep-sensing combines multiple types of data—like heat signatures and radio signals—to get a clearer, more detailed picture.[3] Further emphasizing its importance, Col. Joe S. Minor, Project Manager for Army Fixed-wing Aircraft, called deep-sensing "the Army's number-one operational imperative for the Army of 2030."[4]

CHOOSING BUSINESS JETS

Photo by Lt. Shawn Eklund n | dvidshub.net

Demand created by globalization and the needs of business travelers resulted in the development of long-range business jets that fly at near supersonic speed and at high altitudes above normal air traffic (above 41,000 feet). In researching ways to improve A-ISR capabilities, the DOD quickly learned the value of these attributes and how they can facilitate persistent surveillance and a wider sensor field of view, ultimately enabling operators to collect more data with every mission. Flying at higher altitudes also improves signals intelligence (SIGINT) collection, as radio and electronic emissions are more detectable from above.[5] Further, the speed at which business-class jets fly is significantly faster than turboprop aircraft, meaning they can reposition to higher priority areas quicker and provide rapid response to emergent needs. In addition, the larger fuselages of business-class jets provide more space for advanced sensors, electronic warfare suites, and processing systems than smaller aircraft.[6] Lastly, modern business-class jets can be delivered much faster and at a lower up-front cost compared to designing and developing new A-ISR platforms.[7]

AERIAL TECHNOLOGY DEMONSTRATORS

To bridge the gap between decommissioning the old A-ISR fleet and commissioning a new fleet, the DOD has used Aerial Technology Demonstrators (ATDs)—aircraft contracted to test and evaluate a combination of airframes and sensors to determine which will work best for the mission requirements. The airborne reconnaissance and target exploitation multi-mission system (ARTEMIS), an ATD based on Bombardier's Challenger 650 aircraft, was first tested in 2020.[8] In testing the ARTEMIS, the Army's ISR Task Force observed a significant increase in performance and capability over the existing turboprops, which were limited in range, capacity, and performance. Furthermore, ARTEMIS had a faster deployment capability, flew higher and faster, and could travel anywhere in the world within 24 hours. In 2022, another ATD, the Airborne Reconnaissance and Electronic Warfare System (ARES), was deployed to the Indo-Pacific region to support real-time intelligence collection and processing, exploitation, and dissemination (PED) operations.[9] Both ARES and ARTEMIS introduced capabilities that have made intelligence gathering more accurate and have proven themselves in active military operations. These systems served as a precursor to the next evolution in A-ISR capabilities, the HADES spy plane.

Program Spotlight

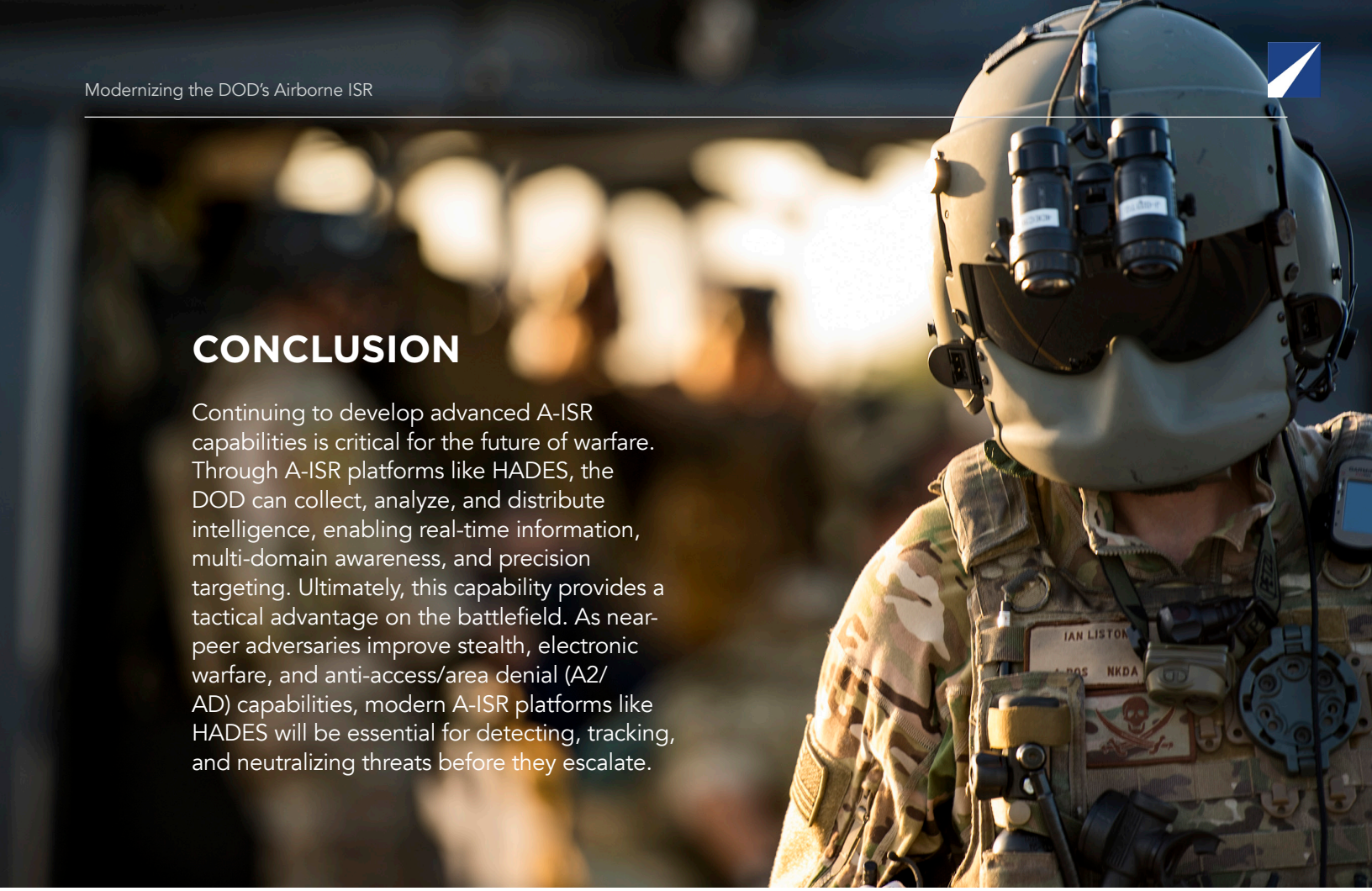
HADES: A GAME CHANGER FOR A-ISR

Photo by David Hylton | dvidshub.net

The High Accuracy Detection and Exploitation System (HADES) is the latest step in the advancement of the DOD's A-ISR capabilities. Designed to replace the RC-12 Guardrail, HADES is a modernized fixed-wing ISR platform that will greatly exceed the performance parameters of the legacy systems it replaces.[10] According to the U.S. Army, HADES will possess the speed, endurance-at-range, and altitude needed for deep sensing, all culminatingin its ability to overcome the physical challenges encountered by legacy A-ISR aircraft, without sacrificing the unique quality and capability of collection.[11] HADES will be globally deployable, theater agnostic, and provide a multi-faceted sensing capability for the Army, which aims to field the systems in the 2027/2028 timeframe.[12]

The HADES program could prove particularly vital for operations in the Indo-Pacific region, where long-range A-ISR capabilities are needed to counter China's growing military presence. With its ability to detect, track, and analyze threats across vast distances, HADES can surveil expansive areas, covering the South China Sea and Taiwan Strait. Moreover, by integrating with Joint All-Domain Command and Control (JADC2), HADES strengthens multi-domain operations, ensuring the U.S. maintains a strategic advantage in this highly dynamic and heavily contested region.

HADES uses Bombardier's Global 6500 aircraft, leveraging the platform's range, speed, reliability, endurance, and payload capacity to deliver timely, relevant, and flexible capabilities for the full spectrum of Army and Joint collection requirements. The baseline Global 6500 aircraft provides several advantages, such as a maximum endurance of up to 18 hours and up to 750 flight hours between maintenance intervals.[13] This aircraft is also part of Bombardier's Global family of aircraft, which has a dispatch reliability greater than 99.8%.[14]



CONCLUSION

Continuing to develop advanced A-ISR capabilities is critical for the future of warfare. Through A-ISR platforms like HADES, the DOD can collect, analyze, and distribute intelligence, enabling real-time information, multi-domain awareness, and precision targeting. Ultimately, this capability provides a tactical advantage on the battlefield. As near-peer adversaries improve stealth, electronic warfare, and anti-access/area denial (A2/AD) capabilities, modern A-ISR platforms like HADES will be essential for detecting, tracking, and neutralizing threats before they escalate.

Photo by Staff Sgt. Ryan Callaghan | dvidshub.net

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NATO members and like-minded allied countries have multiple specialized Bombardier jets active across the world, performing critical missions vital for national and international security. Bombardier Defense will continue to offer products that are reliable, trusted, and customizable for special missions.

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SOURCES

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