Integrated Joint All-Domain Operations (JADO) Collaboration Strategy
Full Spectrum Operations

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Executive Summary

Joint All-Domain Operations (JADO) is evolving warfighting by synchronizing major weapons systems and crucial data sources with revolutionary simplicity. JADO allows commanders to quickly predict adversaries' next moves and disrupt and overwhelm them with a new level of precision. Lockheed Martin is driving this change by building JADO-enabling systems that are ready for operational use today.

Revolutionary Simplicity

The next-generation battlespace requires interoperable solutions that speed joint and coalition decision-making in a range of contested environments.

Lockheed Martin is building a foundational Integrated Joint All-Domain Operations (JADO) architecture using assured communications in a Highly Contested Environment (HCE) for Joint All-Domain Command and Control (JADC2) and intelligence, surveillance and reconnaissance (ISR) previously demonstrated in an anechoic chamber. Our JADO capability will provide a combined physical and electromagnetic common operational picture. It will also utilize cognitive applications and artificial intelligence (AI) to identify War Reserve Mode (WARM) emissions, optimize ISR sensor collection, and autonomously update aircraft routes based on threats.

Lockheed Martin's Integrated JADO Collaboration Strategy provides a JADO architectural framework for future combat operations in a joint and coalition environment. Our approach is an open architecture solution designed to incorporate existing systems and new technologies. Spectrum dominance capabilities provide undetectable communications in the HCE as well as a fused common operating picture.

The sum of these capabilities can provide the foundation for the United States Air Force (USAF) Advanced Battle Management System (ABMS) by connecting sensors, battle management and effectors in a survivable, distributed system of systems. Lockheed Martin's JADO Full Spectrum Operations is key to operating and defeating an adversary in the HCE and we are ready to proto-flight this capability in collaboration with the USAF.

Behind our JADO Collaboration Strategy

The JADO Collaboration Strategy is underpinned by a DevSecOps testbed. This environment is a distributed simulation/software-in-the-loop framework enabling interoperability of digital simulations, advanced algorithms, planning tools and software with gateways to enable data exchange between dissimilar systems operating on unique standards.

To share these capabilities and gain valuable feedback from government, industry and academia, Lockheed Martin has conducted a series of tabletop exercises and flight tests to prove and mature JADO concepts and enabling technologies. A DevSecOps environment and supporting agile development and integration process provides management framework for technical delivery of JADO solutions, with reduced schedule and cost.

Right Decisions, Faster

Lockheed Martin is developing fully distributed Situational Awareness (SA) of all emitters in the battlespace passively targeting signals above and below the noise floor including their key characteristics: location, identification, and measurement parameters.

Our strengths include a broad understanding of electromagnetic (EM) technologies and environmental conditions, an understanding of systems and behavior across the battlespace, the means to integrate assets and capabilities to reliability sustain SA across the distributed battlespace, and real-time engagement and adaptation of the EM exploitation plans and strategies.

Increased processing "horsepower" at the forward edge improves near real-time performance, increases the number of covert targets identified and tracked simultaneously, improves cognitive performance, and improves the capabilities of big data analytics (decoy identification, signal associations, de-convolving co-aligned signals, etc.) Scalability is essential to successful application of JADO methods to large software-intensive complex system of systems.

Lockheed Martin is examining a balance of high-performance computing and advanced software and hardware (including embedded processing techniques) to most efficiently scale to hundreds and even thousands of nodes. In addition, the use of advanced Field Programmable Gate Arrays (FPGAs) and Adaptive Compute Acceleration Platforms (ACAPs) will be investigated for the most efficient implementation and scalability of AI and machine learning (ML) techniques.

The Lockheed Martin Difference

Lockheed Martin is developing and demonstrating JADO-enabling systems ready for operational use today. We're committed to putting the best capabilities into our warfighter's hands with the reliability, speed and dedication that Lockheed Martin is known for. We understand the next generation of battlespace because we're already building the tools for winning it.