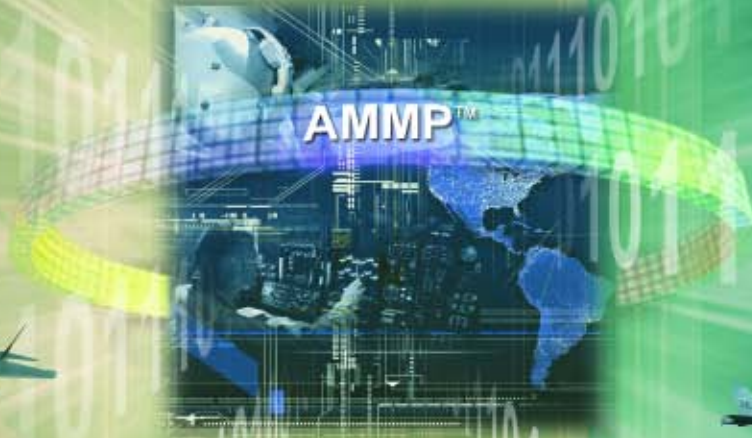


AEW & EW Systems

Airborne Electronic Attack Solutions

Providing Assured Battlespace Access in the 21st Century



Integrated Systems, Integrated Capabilities, Integrated Warfare

NORTHROP GRUMMAN

The Threat Dictates AEA Collaboration



AEA Mission Management Processing (AMMP™) Leading the Way in Battle Management Technologies

Airborne Electronic Attack (AEA) degrades, disrupts, compromises, or denies the enemy's use of the electromagnetic spectrum while enhancing the friendly force's use of it. The best way to increase electronic warfare capabilities is by capitalizing on a collaborative system using today's platforms, and Northrop Grumman has the answer. We design, produce, and deliver best value AEA system solutions, products, services, and life-cycle support. The effectiveness of our systems is enhanced by combining them to create a larger system-of-systems capability. Expanding tomorrow's capability by leveraging connectivity—that's transformation. That's AMMP™—AEA Mission Management Process ... the bridge between legacy platforms and 5th generation weapon systems.

Today's Threat Environment

Modern adversaries use the electromagnetic spectrum to observe, identify, inform, adapt, and attack everything from aircraft to individual soldiers. They plan and execute with the internet and wireless cell phones; they increase their lethality with such common and prolific commercial technologies as garage door openers. Mobility and hiding amongst commercial signals is now the name of the game. But regardless of size or function, if an electronic system aids the enemy, it's a target. Independent AEA systems represent only a fraction of the capability possible to defeat this asymmetric threat. AMMP™ harnesses their collective power.

How AEA works

Individual threat emissions must be detected and identified amid a background of thousands of non-threatening signals resident in today's dense electromagnetic environment.

Once identified, they must be accurately located. Now, how to attack that threat? What response is appropriate to the fight at hand? Jamming? Directed energy? Firing a kinetic weapon? Listen and exploit? The accuracy and speed at which these responses are performed will dictate the effectiveness of an AEA operation. AEA is far more compressed in time than other forms of combat. The complete process may take only a fraction of a second. Today, AEA systems perform these operations individually. Tomorrow, all AEA systems will act in concert, orchestrated and coordinated by AMMP™.

State-of-the-art AEA

Performing the art and science of AEA requires one of the most complex electronic systems in the military. A sophisticated receiving system must be tightly integrated with the attack system and connectivity elements, all being controlled by a mission system application that is unlike any other. Northrop Grumman's latest version, Improved Capability III (ICAP III), operational in Iraq, Afghanistan, and Korea in the EA-6B Prowler, continues to receive rave reviews from its operators. Its speed and accuracy significantly improve response effectiveness with rapid and precise emitter identification and location. Through its Multifunctional Information Distribution System (MIDS), Prowler shares data and coordinates responses via Link 16.

This same technology is the basis for the EA-18G Growler, the U.S. Navy's next generation AEA system, and is suitable for a wide range of airborne platforms, from long range stand-off to close-in unmanned and remotely piloted vehicles.

ICAP III provides full-spectrum electronic attack to counter enemy air defenses and communication networks, and represents a significantly reduced risk approach over other unproven platforms and systems. Already in the heat of battle, it is combat proven and tested. ICAP III supports a joint environment and is network enabled and linked. Imagine multiple ICAP III systems working in unison and with other intelligence, surveillance and reconnaissance (ISR) systems; powerful, and networked. AMMP™ is the enabler: The Next Generation of Electronic Warfare.



Next Generation Electronic Warfare

The challenge in transforming military systems lies in fielding an affordable capability within limited budgets. How better to achieve this than to create this capability within the current and planned force structure? A realistic system-of-systems approach that:

- Enhances low-density high-demand (LDHD) electronic attack assets
- Enables collaborative operations among a diverse mix of electronic attack (EA) and ISR assets
- Simultaneously orchestrates air, land, maritime, space, and special operations.
- Optimizes high bandwidth data links.

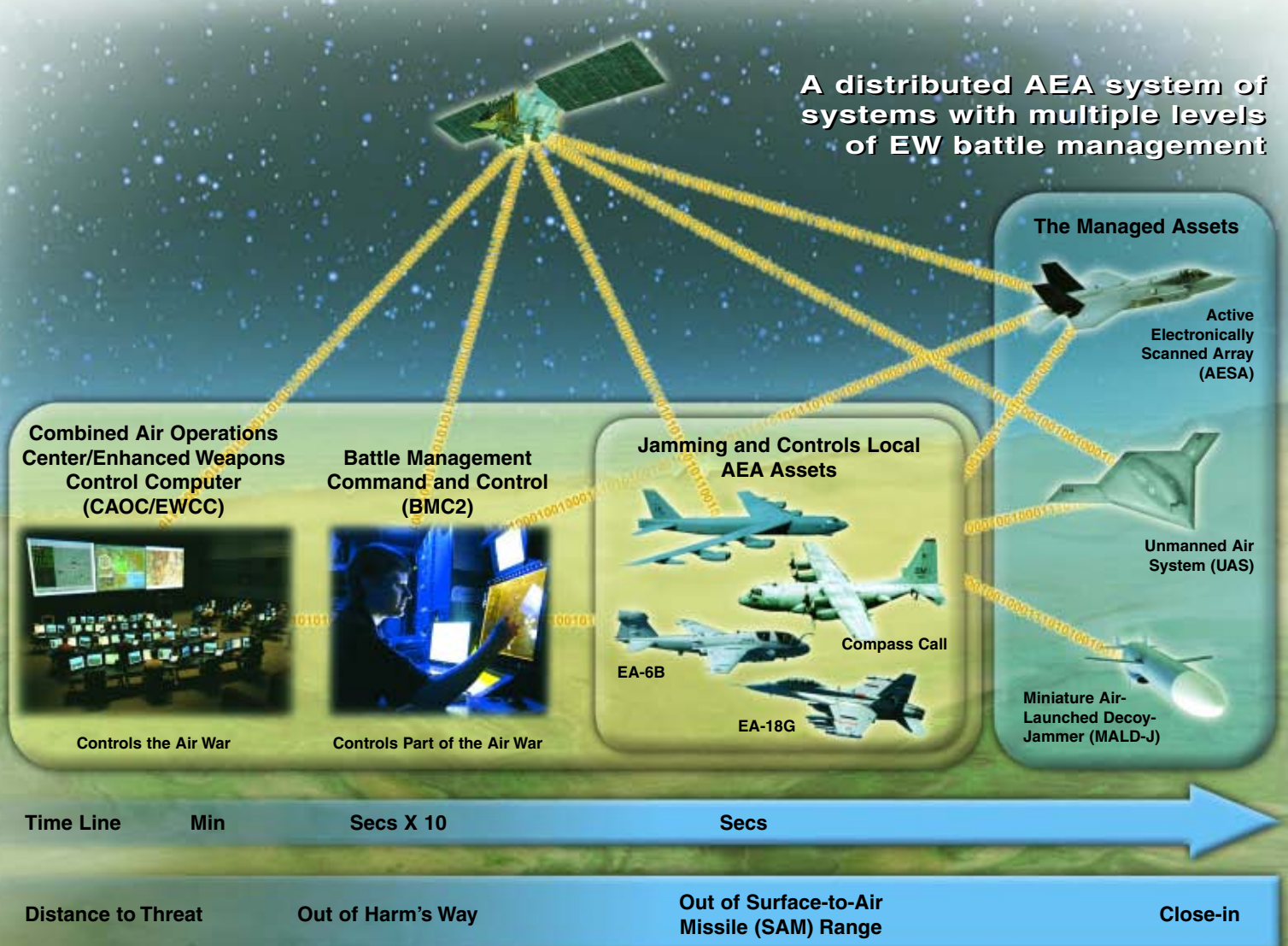
Northrop Grumman's AMMP™ is ready to meet this challenge today.

AMMP™

AMMP™ is a set of algorithms and decision aids that enable dynamic control of EA assets; a bridge between legacy platforms and 5th generation weapon systems. AMMP™ enables electronic warfare (EW) to be more than just an enabler; it allows EW

to buy back battlespace, either in the air, on land, or at sea. Buying back battlespace equals freedom to maneuver. AMMP™ is based on Northrop Grumman's next generation AEA mission management processing architecture. It is a scalable, portable, and missionized battle management component, independent of host platform software that:

- Integrates AEA assets to provide a common operating picture and coordinated EA
- Cues and/or controls manned/unmanned assets
- Provides decision aids to achieve desired effects across the electromagnetic spectrum
- Disseminates data and decision quality information
- Solves geographical location of radio frequency (RF) emitters
- Provides tactical reactive suppression of enemy air defense (SEAD) response in seconds
- Supports time-critical strike assignments in single digit minutes.



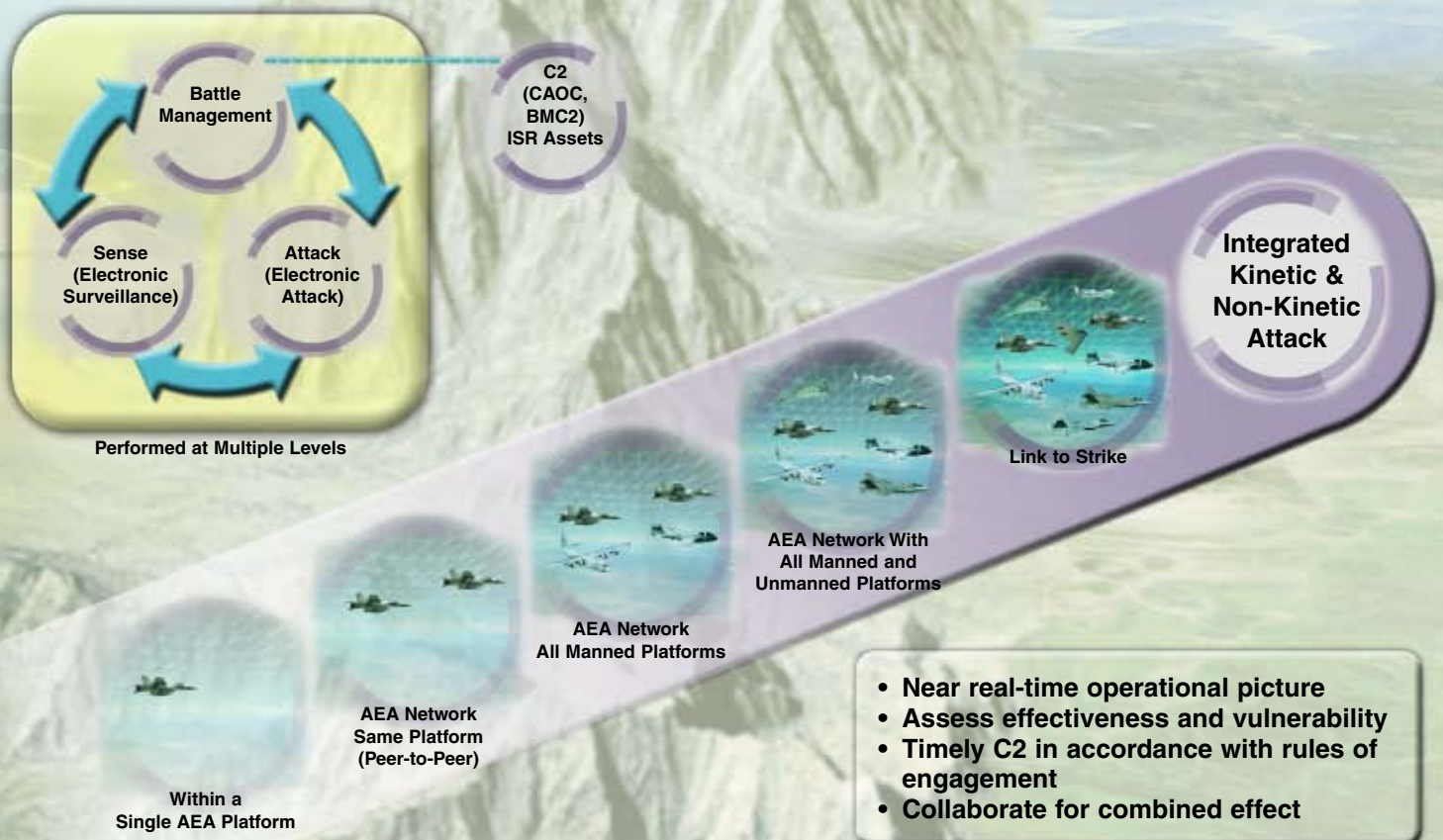
Jointly distributed AEA with AMMP™

The threat is diverse, mobile, and asymmetrical. This dictates a distributed EA architecture, as predicted by the Department of Defense (DOD) AEA analysis of alternatives. To address this distributed architecture, the Marine Corps will move into the future with its all Short Takeoff Vertical Landing (STOVL) aviation capability; they will approach the electronic battlefield differently than in the past. Their concept of a netted, distributed, synergistic Marine Air-Ground Task Force (MAGTF) EW capability will incorporate ground and aviation elements, manned and unmanned, able to act cooperatively or collaboratively with EW battle management functions ranging from centralized directions to oversight. Northrop Grumman will be there with the systems solution, AMMP™. The U.S. Navy is adding Multifunctional Information Distribution System (MIDS)

terminals to the EA-6B with the first building block of AMMP™ in line for ICAP III Block 3 upgrade. In the near future, all EA-6Bs and EA-18Gs will be able to communicate and attack collectively, enabled by AMMP™. AMMP™ not only ties like systems together, but also creates a large AEA system of systems with disparate elements, co-joined and interdependent.

Defining the Future

Northrop Grumman is applying its extensive experience and expertise to define and develop advanced operational and system concepts for the AEA mission. We are also using our extensive high fidelity modeling, simulation, and analysis capabilities along with our Cyber Warfare Integration Network (CWIN) to validate system requirements and examine operational considerations and effectiveness for both traditional and network-centric constructs.



Experience Counts



With over 40 years of experience in Electronic Warfare systems integration, Northrop Grumman Integrated Systems represents a strategic thread connecting DOD's past, present, and future Electronic Attack capabilities.

Integrated Systems is fully committed to finding the solutions and fielding the capabilities

that meet the requirements of today's war-fighters and anticipate their needs in the future.

Our mission is to play an enabling role as a technology and information integrator for a vision of future military operations that is knowledge-based and near-instantly effective in the application of precise power.

NORTHROP GRUMMAN

DEFINING THE FUTURE

Copyright ©2006 Northrop Grumman Corporation • Airborne Early Warning and Electronic Warfare Systems
703-875-8455 • www.northropgrumman.com

Design and Production by AEW & EW Systems Media Services, Bethpage, NY • 4019-06 (09/06) • Approved for Public Information Under Control Number SPR-109-06