

# ARCHIVED REPORT

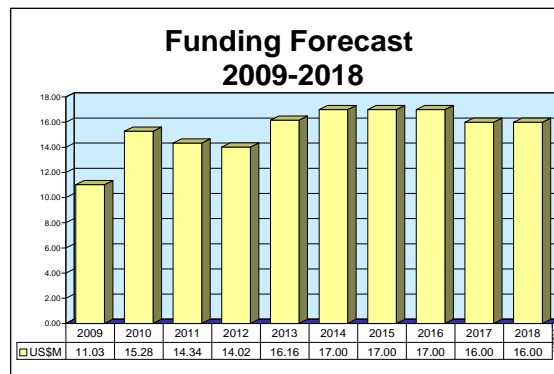
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## Aerospace Information Dominance – Archived 3/2010

### Outlook

- Forecast International estimates that the U.S. Air Force will spend almost \$154 million over the next decade on its Aerospace Information Dominance project
- In FY09, look for Subproject One to initiate the development of capabilities to allow seamless information sharing for enhanced situational awareness and understanding by the decision-maker



### Orientation

**Description.** The U.S. Air Force's Aerospace Information Dominance project is an R&D effort that develops and demonstrates technologies that enable the warfighter to plan, assess, execute, monitor, and replan both combat and non-combat operations.

#### Sponsor

U.S. Air Force  
U.S. Air Force Research Laboratory  
Rome Research Site  
Griffiss AFB, NY

**Status.** Ongoing research and development.

**Application.** Command, Control, Computers, Communications, Intelligence, Surveillance, and Reconnaissance (C<sup>4</sup>ISR).

### Contractors

Contractor(s) not disclosed.

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to [www.forecastinternational.com](http://www.forecastinternational.com) (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; [rich.pettibone@forecast1.com](mailto:rich.pettibone@forecast1.com)

### Technical Data

## Aerospace Information Dominance

The Aerospace Information Dominance project is part of Program Element #0603789F (C<sup>3</sup>I Advanced Development). The Aerospace Information Dominance project consists of the following subprojects:

**Subproject One.** Subproject One develops and demonstrates distributed information technologies that are scalable and reconfigurable. These technologies provide commanders and staff in mobile, dynamic command and control (C<sup>2</sup>) centers with seamless access to tailored multimedia, multispectral data.

**Subproject Two.** Subproject Two demonstrates the integration of planning tools and information-based intelligent agents with aerospace C<sup>2</sup> systems.

**Subproject Three.** Subproject Three develops and demonstrates an effects-based approach for the next generation of planning and assessment techniques. This approach will enable aerospace commanders to

determine the desired operational effects at the right place and the right time.

**Subproject Four.** Subproject Four develops and demonstrates high-performance computing for size, weight, and power-limited applications.

**Subproject Five.** Subproject Five demonstrates how a “publish, subscribe, and query” information management paradigm can enable horizontal integration of U.S. Air Force C<sup>4</sup>I systems. The project also develops advanced prototypes of a Community of Interest (COI) infosphere that supports the information management requirements of various U.S. Air Force net-centric communities. Finally, Subproject Five demonstrates how such an infosphere can interact with and enhance the current U.S. net-centric infrastructure.

## Program Review

The following is a discussion of recent activity in the five subprojects of the Aerospace Information Dominance project.

**Subproject One.** In FY05, Subproject One demonstrated a core set of functionalities of and supporting infrastructure for an advanced-technology Air Operations Center (AOC) weapon system. This system would enable the ability to plan, direct, coordinate, and control air forces and operations across security boundaries. The project also developed an automatic options generation capability for correcting failures and degradation within the command and control (C<sup>2</sup>) system of the AOC weapon system.

In FY06, Subproject One was to develop business processes and tools to support information exchange between the AOC and other C<sup>2</sup> centers in the “Theater Air Control Structure.” The project also worked toward joint U.S. military service planning of mission packages, complete with customizable and exportable information reports/briefings on air space management and de-confliction.

In FY07, work on the above-mentioned efforts continued. In addition, development of polymorphic computing technology began for persistent surveillance systems using faster processing and greatly reduced size, weight, and power.

In FY08, Subproject One completed the development of capabilities that allow a network-enabled operations center to plan, direct, and coordinate air force assets across security boundaries in a coalition environment. In FY09, this subproject will initiate the development of

capabilities to allow seamless information sharing for enhanced situational awareness and understanding by the decision-maker.

**Subproject Two.** In FY05, Subproject Two began developing the tools and technologies required to enable the swift and effective response to global demands across all spectrums of operations, from humanitarian relief to a major military conflict. More specifically, the project sought to develop the capability to quickly synchronize theater information between combat and mobility forces to support the seamless interoperability of the air traffic control systems of U.S. DoD, civil, and coalition units.

In FY06, Subproject Two continued development continued of “common mobility ontology” toward improved automation of decision support tools. These improved tools would, among other benefits, increase situational awareness. The subproject also worked toward the automated machine-to-machine exchange of selected information between Combat Air Force (CAF) aircraft and Mobility Air Force (MAF) aircraft and their respective C<sup>2</sup> elements, and civil Air Traffic Management (ATM) agencies. The latter effort was completed in FY08.

In FY07, Subproject Two demonstrated the capability to support collaborative C<sup>2</sup>, including dynamic and intermittent participation of players, possibly in a coalition setting, in addition to developing “virtual staff” members to maintain a vision of C<sup>2</sup> processes during human absences, providing 24/7 coverage.

## Aerospace Information Dominance

In FY08, Subproject Two completed development of improved synchronization among Global Strike and Global Mobility Force participants within multiple theaters and global civil ATM agencies.

In FY09, Subproject Two will develop dynamic workflow and workload management capabilities to manage the command and control “constellation of resources.”

**Subproject Three.** In FY05 and FY06, Subproject Three began the design of new concepts and technologies supporting effects-based planning, execution, and assessment. These efforts continued into FY08.

Also during this timeframe, evaluations were conducted of the various ways AOC personnel could assess, in near real-time, various courses of action based upon a U.S. commander’s intent and knowledge gained from predictive battlespace awareness tools and processes.

In FY07, Subproject Three developed technologies to capture, assess, and integrate cause-and-effect (first, second, and third order) relationships endemic to models of the “enemy as a system.” The subproject also worked on developing a streaming Air Tasking Order (ATO) prototype capability.

In FY08, Subproject Three completed the development of techniques that will allow continued assessment of the status of planned actions against adversary systems to determine whether predicted effects are actually achieved.

In FY09, Subproject Three will initiate development of predictive battlespace awareness tools with the ability to reason over models of the “enemy as a system.”

**Subproject Four.** In FY08, Subproject Four worked on developing high-performance computing for size, weight, and power-limited applications. Also, by addressing power, programmability, and radiation issues, this subproject was able to transition power-efficient processors to U.S. DoD users.

In FY09, look for Subproject Four to initiate the development of “reliably autonomic” small platforms for unmanned operations.

**Subproject Five.** In FY05, Subproject Five demonstrated techniques that could be used to manage thousands of bits of information from diverse sources within a C<sup>2</sup> environment. Also, work to integrate and then demonstrate information management services that allow information exchange among disparate systems was completed.

In FY06 and FY07, initial next-generation Community of Interest (COI) infosphere prototypes were developed to provide high levels of scalability to meet U.S. Air Force net-centric operational needs.

In FY08, Subproject Five worked on developing tactical and federated COI infospheres to manage information objects from diverse sources and data environments within and across the tactical edge. In other efforts, the subproject applied adaptor technology to allow existing Air Force systems to rapidly integrate with and utilize COI information sources.

In FY09, Subproject Five will initiate the study of discovery and filter technology to assess and evaluate unstructured information and convert it into structured information feeds.

## Funding

U.S. FUNDING								
	FY07 <u>QTY</u>	FY07 <u>AMT</u>	FY08 <u>QTY</u>	FY08 <u>AMT</u>	FY09 <u>QTY</u>	FY09 <u>AMT</u>	FY10 <u>QTY</u>	FY10 <u>AMT</u>
<b>RDT&amp;E (U.S. Air Force)</b>								
PE#0603789F, Project 4872	-	16.88	-	15.00	-	11.03	-	15.28
	FY11 <u>QTY</u>	FY11 <u>AMT</u>	FY12 <u>QTY</u>	FY12 <u>AMT</u>	FY13 <u>QTY</u>	FY13 <u>AMT</u>		
<b>RDT&amp;E (U.S. Air Force)</b>								
PE#0603789F, Project 4872	-	14.34	-	14.02	-	16.16		

All \$ are in millions.

Source: U.S. Department of the Air Force FY09 RDT&E Budget Document

## Contracts/Orders &amp; Options

No contract information regarding the Aerospace Information Dominance project has been made public.

## Aerospace Information Dominance

### Timetable

<b>Year</b>	<b>Major Development</b>
FY05	Subproject One develops an automatic options generation capability for correcting failures and degradation within the C <sup>2</sup> system of the advanced-technology AOC weapon system
FY06	Subproject Two works to develop "common mobility ontology" toward improved automation of decision support tools
FY07	Subproject Three develop a streaming Air Tasking Order prototype capability
FY08	Subproject Four develops high-performance computing for size, weight, and power-limited applications
FY09	Subproject Five to initiate the study of discovery and filter technology to assess and evaluate unstructured information and convert it into structured information feeds

### Worldwide Distribution/Inventories

The Aerospace Information Dominance project is an effort of the **U.S. Air Force**.

### Forecast Rationale

The U.S. Air Force's Aerospace Information Dominance project is an R&D effort that develops and demonstrates technologies that enable the warfighter to plan, assess, execute, monitor, and replan both combat and non-combat operations.

#### ***Aerospace Information Dominance Project Expected to Receive \$154 Million***

As indicated by the **Ten-Year Outlook** chart, Forecast International projects that the U.S. Air Force will spend almost \$154 million over the next decade on its Aerospace Information Dominance project. The U.S. Air Force's desire to develop tools that enhance the warfighter's decision-making capabilities is driving project funding.

To achieve information superiority, the U.S. Air Force must be able to plan, assess, monitor, and replan missions very quickly across the full range of operations (air, space, and cyberspace) at all levels of war (strategic, operational, and tactical) and during all phases of conflict (pre-conflict, conflict, and stability operations). To accomplish this goal, the USAF's Aerospace Information Dominance project is developing and demonstrating the technologies necessary for executing this dynamic process.

Pressure placed upon the Obama administration and the U.S. Congress to contain government spending could limit the amount of funding the U.S. Air Force receives for its Aerospace Information Dominance project.

### Ten-Year Outlook

ESTIMATED CALENDAR YEAR RDT&E FUNDING (in millions \$)												
Designation or Program		High Confidence				Good Confidence			Speculative			
	Thru 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
<b>MFR Varies</b>												
<b>AEROSPACE INFORMATION DOMINANCE Military &lt;&gt; United States &lt;&gt; Air Force</b>												
	52.63	11.03	15.28	14.34	14.02	16.16	17.00	17.00	17.00	16.00	16.00	153.83
<b>Total</b>	52.63	11.03	15.28	14.34	14.02	16.16	17.00	17.00	17.00	16.00	16.00	153.83