RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE: February 2003

BUDGET ACTIVITY: 07 - Operational System Development

PE NUMBER AND TITLE: 0207417F Airborne Warning and Control System (AWACS)

PROJECT: 411L

COST ($ in Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
411L	Airborne Warning & Control System (AWACS)	36,732	169,649	270,397	289,544	131,666	85,754	83,295	74,334	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The funding set forth in this document investigates, develops, and integrates system improvements to enable the E-3 AWACS to remain an effective Battle Management airborne surveillance system for command and control of combat forces and for strategic defense of the U.S. This PE funds the following efforts:

Modernization Programs: (3600)

1) The Integrated DAMA (Demand Assigned Multiple Access)/GATM (Global Air Traffic Management) Program seeks to make communications and navigation improvements required to meet current mandated DAMA SATCOM (Satellite Communication) and Air Traffic Control (ATC) requirements. This mod consolidates Mod # T8135 - SATCOM DAMA and Mod # 3404 - ATC Compliance, in order to reduce modification schedule and cost.

A) DAMA SATCOM is a CJCS mandated Ultra-High Frequency (UHF) satellite communications upgrade consisting of two new UHF DAMA terminals and new RF components, to mitigate co-site interference, replacing the two non-DAMA UHF SATCOM radios on each aircraft. The DAMA enhancements will expand user availability of severely limited DoD UHF SATCOM channels, improving the interoperability and efficiency of DoD UHF SATCOM systems.

B) GATM is an FAA/International Civil Aviation Organization (ICAO)/EUROCONTROL mandated ATC upgrade consisting of new VHF radios with 8.33 kHz channel spacing, Aircraft Collision Avoidance System (ACAS)/Mode-S IFF and Reduced Vertical Separation Minimum (RVSM) capability. The ATC enhancements will permit more aircraft to fly closer together in congested airspace worldwide, particularly in European airspace. Non-compliance already results in airspace restrictions and denials, impacting AWACS' ability to support worldwide response in situations requiring immediate on-scene command and control (C2) battle management.

2) Block 40/45 is replacing AWACS 1970's vintage mission systems that are experiencing Diminishing Manufacturing Sources (DMS) issues, are difficult and expensive to upgrade, and limit overall AWACS system performance. The Block 40/45 upgrade will improve quality and timeliness of sensor data to the shooter,

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(U) A. Mission Description Continued

improve Combat Identification (CID), provide sensor fusion capability in support of the Single Integrated Air Picture (SIAP) via multi-sensor integration (MSI), improve AWACS contribution to Time Critical Targeting via Data Link Infrastructure, resolve radar electronics DMS, and enable more effective, faster upgrades via an open systems architecture. The Block 40/45 risk reduction effort continues in FY03 to drive down the risk of utilizing new technology to meet the AWACS Block 40/45 Operational Requirements Document (ORD). Some of the risk reduction efforts include modeling and simulation, requirements analysis, rapid protoyping, architecture trades, and designing a Commercial Off the Shelf (COTS) insertion process. Block 40/45 transitions from risk reduction to System Development and Demonstration (SD&D) during FY03.

3) Command & Control, Intelligence, Surveillance and Reconnaissance (C2ISR): C2ISR System Architecture Improvements provide timely enhancements to improve critical areas of the AWACS mission system, primarily in three areas:

A) Mission Capable (MC) rate improvement : Reliability, Maintainability, & Availability (RM&A) analysis and development projects provide system improvements that boost the below-standard MC rate of this critical C2 platform and increase airframe longevity in order to support its flight commitment to end of operational life. Such efforts focus on increasing reliability of the air vehicle, command, control, computer, sensor systems and infrastructure improvements as well as providing solutions to diminishing manufacturing sources. Efforts will also focus on reduction of maintenance man-hours along with periodic depot maintenance improvements to increase aircraft availability. Programs will focus on risk reduction, development, and fielding.

B) C2ISR enhancement and integration: AWACS seeks to fulfill the requirements of Joint Vision 2020, Real Time Defense Information Infrastructure Common Operating Environment (DII COE), as well as Expeditionary Air Force (EAF) and other Task Force Concept of Operations to meet the needs of the operator. AWACS seeks to enhance network-centric warfare capabilities with other C2ISR systems by horizontally integrating machine-to-machine interfaces into AWACS in order to digitize the kill chain. Sensor and communications improvements, such as the ability to send, receive and fuse the air (and ground) picture via data link to fighter aircraft, will be developed through rapid prototyping, modeling, simulation, and participation in live and simulated Joint exercises (e.g., JCIET, Joint Distributed Engineering Plant (JDEP)). Collaborative efforts with other sensor platforms through capabilities such as Network Centric Collaborative Targeting (NCCT) will also enhance horizontal integration efforts. Certain near-term efforts, required by the operator to improve the timeliness and accuracy of information passed to/from fighter aircraft in the engagement zone and to provide consistent and replayable mission data once the mission is complete, are quick reaction capabilities that can be developed & fielded to support the next air war. The program includes concept exploration, technology development and demonstration efforts that support continuous improvements to C2ISR capabilities of manned & unmanned platforms, space, data links and advanced Battle Management Command, Control and Communications concepts. C2ISR continues to support and develop self-protection capabilities to enable current and future threat deterrence. Fielding strategies will provide for immediate field retrofit when able, otherwise fielding will occur in subsequent modernization programs. All programs are designed to integrate with & transition into

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(U) A. Mission Description Continued

the next C2ISR platform.

C) The Training, Support, and Infrastructure programs cover an array of cross cutting programs and activities in support of AWACS modification and enhancement programs. These programs include managing the AWACS developmental infrastructure, support equipment development, modernization planning and analysis, and trainer and simulator integration and concurrency. The Radar Systems Integration Lab/Software Development Facility (SIL/SDF) must be maintained, operated and supported by contract to provide customers with a functioning APY 1/2 radar configuration in support of AWACS radar development, production and sustainment programs. The SIL/SDF is funded within the Radar System Improvement Program (RSIP) through FY04. The supportability effort will analyze future diagnostic support equipment technologies and test strategies to ensure concurrent capability to sustain current, modified and upgraded E-3 equipment. Trainer and simulator concurrency analysis and definition is required to ensure trainers and simulators are kept current with the AWACS baseline. Associate contractor agreements are needed to establish engineering concurrency between prime integrators and training service providers.

4) Test System 3/Integration Labs: The E-3 AWACS testbed aircraft, Test System 3 (TS-3, tail number 73-1674), the Avionics Integration Laboratory (AIL), and the AWACS Development Laboratory (ADL) are Government owned/contractor managed, maintained and operated assets. These test-ready assets support AWACS modernization and sustainment programs, including advanced projects, and allow AWACS to participate in live-fly and ground-based simulation exercises such as JEFX and JDEP. They also support multiple international projects, including French, RSAF and NATO projects.

5) NAVWAR (Navigation Warfare) is mandated by CJCSI 6140.01 (15 Nov 98) and requires all DoD GPS users to incorporate NSA Selective Availability Anti-Spoofing Module (SAASM), make provisions for the transition to 'black keys', eliminate requirements to acquire GPS satellites using the civil signal (C/A) and incorporate new technology into the navigation sensor. AMP (Avionics Modernization Program) completes the FAA/ICAO/EUROCONTROL mandated air traffic control system upgrades and equips the E-3 fleet with flight deck and other avionics capabilities that will allow AWACS to comply with mandated global Required Navigation Performance (RNP) surveillance and communication standards. Non-compliance will result in airspace restrictions and denials which will impact AWACS' ability to support worldwide responses to situations requiring immediate on-scene C2 battle management. The AMP modifications to the flight deck include the addition of data link communications, voice and data link digital radios, improved visual displays and flight management system, as well as automatic position reporting via data link. Replacement of critical avionics subsystems, unsustainable beyond 2010, will be included in the AMP. The program will focus on risk reduction, development and fielding. This mod was previously Mod # 9709 - Global Air Traffic Management (GATM) Phase II.

In last year's budget documents, HF Messenger was listed as a Research and Development project. It was determined that it did not require RDT&E funding. The RDT&E funding was reallocated within the PE. HF Messenger is covered in Procurement Documentation Mod # 3403.

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(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands)

(U)	$0	Accomplishments/Planned Programs
(U)	$4,317	Continuing C2ISR System Architecture Improvements
(U)	$15,855	Continuing Test System-3/AITS support and program sustaining efforts
(U)	$8,862	Continuing Block 40/45 Risk Reduction effort
(U)	$7,698	Starting Integrated DAMA/GATM (IDG) SD&D (combination of ATC Compliance & SATCOM DAMA)
(U)	$36,732	Total

(U) FY 2003 ($ in Thousands)

(U)	$0	Accomplishments/Planned Programs
(U)	$5,208	Continuing C2ISR System Architecture Improvements
(U)	$24,960	Continuing Test System-3/AITS support and program sustaining efforts
(U)	$115,668	Completing Block 40/45 Risk Reduction effort, starting SD&D effort
(U)	$23,813	Continuing Integrated DAMA/GATM (IDG) SDD (combination of ATC Compliance & SATCOM DAMA)
(U)	$169,649	Total

(U) FY 2004 ($ in Thousands)

(U)	$0	Accomplishments/Planned Programs
(U)	$3,844	Continuing C2ISR System Architecture Improvements, Advanced Projects
(U)	$18,077	Continuing Test System-3/AITS support and program sustaining efforts
(U)	$221,404	Continuing Block 40/45 SD&D effort
(U)	$27,072	Continuing Integrated DAMA/GATM (IDG) SD&D, lab and flight testing
(U)	$270,397	Total

(U) B. Budget Activity Justification

Operational Systems Development, Budget Activity 7. AWACS is a fielded, operational system currently undergoing major modifications/block upgrades and continuing sustainment activities.

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(U) C. Program Change Summary ($ in Thousands)

		FY 2002	FY 2003	FY 2004	Total Cost
(U)	Previous President's Budget	38,972	173,956	294,100	TBD
(U)	Appropriated Value	39,787	173,956		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions	-815	-2,589		
	b. Small Business Innovative Research	-1,087			
	c. Omnibus or Other Above Threshold Reprogram		-1,718		
	d. Below Threshold Reprogram	-973			
	e. Rescissions	-180			
(U)	Adjustments to Budget Years Since FY 2003 PBR			-23,703	
(U)	Current Budget Submit/FY 2004 PBR	36,732	169,649	270,397	TBD

(U) Significant Program Changes:
Funds were reduced in FY04 from Block 40/45 System Development & Demonstration to support other Air Force efforts. Block 40/45 remains executable. Additionally, Tactical Data Link (TDL) funds were transferred to the TDL Program Element to help establish this PE. These TDL funds remain linked to AWACS.

(U) D. Other Program Funding Summary ($ in Thousands)

		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
(U)	AF RDT&E										
(U)	Other APPN										
(U)	Aircraft Procurement, AF, E-3 Mods	90,069	28,089	53,467	37,869	57,580	146,008	186,243	172,928		TBD
(U)	E-3 Initial Spares, AF	28,344	5,393	8,324	4,922	4,980	7,169	7,411	7,590		TBD
(U)	Replacement Supt Equip										

(U) E. Acquisition Strategy
Most major programs (IDG, Block 40/45, TS-3 and lab support) will be sole source to Boeing aircraft in Seattle, Wa.

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(U) F. Schedule Profile

		FY 2002				FY 2003				FY 2004			
		1	2	3	4	1	2	3	4	1	2	3	4
(U)	BLOCK 30/35 FOC	*											
(U)	BLOCK 40/45 Risk Reduction Start	*											
(U)	IDG SD&D Start			*									
(U)	BLOCK 40/45 MILESTONE B							X					
(U)	BLOCK 40/45 SD&D Start							X					
(U)	BLOCK 40/45 Risk Reduction Complete								X				
(U)	IDG AIL Integration & Testing Start									X			
(U)	IDG Test Aircraft Modification Start									X			
(U)	40/45 Initial Design & Manufacturing Review (IDMR)										X		
(U)	IDG Ground & Flight Testing											X	
(U)	IDG Production Decision												X
(U)	40/45 Final Design & Manufacturing Review (FDMR)												X

* Denotes completed events

X Denotes planned events

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

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(U) A. Project Cost Breakdown ($ in Thousands)

		FY 2002	FY 2003	FY 2004
(U)	Contracts	26,184	153,331	256,605
(U)	MITRE/ITSP	5,920	8,423	9,634
(U)	Travel	669	678	746
(U)	Other	3,959	7,217	3,412
(U)	Total	36,732	169,649	270,397

(U) B. Budget Acquisition History and Planning Information ($ in Thousands)

(U) Performing Organizations:

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 2002	Budget FY 2002	Budget FY 2003	Budget FY 2004	Budget to Complete	Total Program
Product Development Organizations										
(U) Boeing (Block 40/45 Risk Reduction)	CPAF	10/01	N/A	N/A	28,510	8,999	91,195		0	128,704
(U) Boeing (Block 40/45 SD&D)	CPAF	06/03	N/A	N/A	0	0	22,286	218,863	Continuing	TBD
(U) Boeing (PDMA)*	Multiple	N/A	N/A	N/A	58,149				Continuing	TBD
(U) Boeing (C2ISR Sys Arch Imp)	FPIF/CPAF	N/A	N/A	N/A	35,876	2,303	2,331	628	Continuing	TBD
(U) Boeing (IDG)	Multiple	04/02	N/A	N/A	0	6,467	19,963	25,695	0	52,125
(U) Boeing NAVWAR/AMP	Multiple	TBD	N/A	N/A	0	0	0	0	Continuing	TBD

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE: February 2003

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(U) Performing Organizations Continued:

* N/A based on Program Depot Maintenace Airframe (PDMA) Acquisition Strategy which includes multiple contracts with multiple organizations with overlapping and continuing performance periods.

Note: Total Program does not include NATO funds.

Support and Management Organizations										
(U)Support/ITSP MITRE, travel, other	Multiple contracts	N/A	N/A	N/A	573,037	10,101	21,349	11,753	Continuing	TBD
Test and Evaluation Organizations										
(U) Test System-3 ADAPT Contract/AITS Contract / Other test activities	Multiple	N/A	N/A	N/A	370,745	8,862	12,525	13,458	Continuing	TBD

(U) Government Furnished Property:

Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 2002	Budget FY 2002	Budget FY 2003	Budget FY 2004	Budget to Complete	Total Program
Product Development Property									
Support and Management Property									
Test and Evaluation Property									

Subtotals	Total Prior to FY 2002	Budget FY 2002	Budget FY 2003	Budget FY 2004	Budget to Complete	Total Program
Subtotal Product Development	122,535	17,769	135,775	245,186	TBD	TBD
Subtotal Support and Management	573,037	10,101	21,349	11,753	TBD	TBD
Subtotal Test and Evaluation	370,745	8,862	12,525	13,458	TBD	TBD
Total Project	1,066,317	36,732	169,649	270,397	TBD	TBD