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

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2006
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207417F Airborne Warning and Control System (AWACS)

	Cost ($ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
	Total Program Element (PE) Cost	273.971	119.746	165.820	138.540	108.704	128.624	145.296	Continuing	TBD
411L	Airborne Warning & Control System (AWACS)	273.971	119.746	165.820	138.540	108.704	128.624	145.296	Continuing	TBD

(U) A. Mission Description and Budget Item Justification

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: (RDT&E, AF)

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.

A) DAMA SATCOM is a Chairman Joint Chiefs of Staff (CJCS)--mandated Ultra-High Frequency (UHF) satellite communications upgrade consisting of two new UHF DAMA terminals and new Radio Frequency (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 a FAA/International Civil Aviation Organization (ICAO)/EUROCONTROL--mandated ATC upgrade consisting of new Very High Frequency (VHF) radios with 8.33 kHz channel spacing, Traffic-alert Collision Avoidance System (TCAS)/Mode-S Identification Friend or Foe (IFF) transponder 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 has already resulted in airspace restrictions and denials, impacting AWACS's 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, 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.

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 help meet/exceed the MC rate standard of this critical C2 platform, therefore increasing 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 and control, computer, sensor systems and infrastructure improvements as well as providing solutions to diminishing manufacturing sources. Efforts will also focus on insertion of new technologies with the aim of reducing 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 as well as Aerospace Expeditionary Forces (AEF) 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 IFF interrogator/transponder and 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., Joint Combat Identification Evaluation Team (JCIET) and Joint Distributed Engineering Plant (JDEP)). Collaborative efforts with other sensor platforms through capabilities such as network-centric operations 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 re-playable mission data once the mission is complete, are quick reaction capabilities that can be developed & fielded to support the 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 decision tools. 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 the next C2ISR Platform. The AWACS program will coordinate with and participate in projects developing international standards (including NATO standards) to ensure joint, allied, and coalition interoperability. The E-3 will serve as the lead platform to support the development of the Mark XXIIA Mode 5 IFF capability carried out in PE 63742F, Combat ID Technology.

4) 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/analysis, and trainer/simulator integration and concurrency. The Radar Systems Integration Lab/Software Development Facility 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 support equipment technologies and test strategies to ensure concurrent capability to sustain current, modified and upgraded E-3 equipment. Trainer/simulator concurrency analysis and definition is required to ensure trainers and simulators are kept current with the AWACS baseline. Associate contractor agreements are used to establish concurrency between prime integrators and training service providers.

5) Test System 3/Integration Labs: The E-3 AWACS testbed aircraft, Test System 3 (TS-3, tail number 73-1674) and the Avionics Integration Laboratory (AIL) are Government owned/contractor managed, maintained and operated assets. These test-ready assets support AWACS modernization, including advanced projects and sustainment projects, and allow AWACS to participate in live-fly (e.g., Joint Expeditionary Force Experiment) and ground-based interoperability testing through the Joint Distributed Engineering Plant (JDEP) configured AIL. They also support multiple international Airborne Early Warning and Control (AEW&C) projects on a fee basis, including French, RSAF, UK, Japan, and NATO.

6) NAVWAR (Navigation Warfare) is mandated by CJCSI 6140.01A (31 Mar 04) 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 (Coarse Acquisition (C/A code)) and incorporate new technology into the navigation sensor.

7) AMP (Avionics Modernization Program) completes the FAA/International Civil Aviation Organization (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 that will impact AWACS ability to

support worldwide responses to situations requiring immediate on-scene command and control (C2 battle management). The AMP modifications to the flight deck include the addition of data link communications, upgrade or replacement of emergency locating technologies, 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.

8) Re-engining will replace the existing, original engines with new engines. New engines will ensure long-term viability of the platform and increase fuel-efficiency, improve reliability, and increase power quantity and quality available to on-board mission systems. Development will pursue synergies and leverage the efforts of other U.S. 707-based airframes as well as the International AWACS partners that operate the 707 AWACS (United Kingdom, France, and Saudi Arabia). Further refinement of the acquisition strategy is required to fully integrate the program into the AWACS modernization plan in FY11 and beyond.

9) Communication projects provide the AWACS system with an effective method for electronically transmitting and receiving critical mission information such as the Air Tasking Order (ATO). Comm projects will focus on engineering and retrofitting the entire fleet.

This program is in Budget Activity 7, Operational Systems Development, due to efforts supporting a fielded, post Milestone III operational weapon system.

(U) B. Program Change Summary ($ in Millions)

		FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	285.737	121.565	94.498
(U)	Current PBR/President's Budget	273.971	119.746	165.820
(U)	Total Adjustments	-11.766	-1.819	
(U)	Congressional Program Reductions		-0.087	
	Congressional Rescissions	-0.318	-1.732	
	Congressional Increases			
	Reprogrammings	-4.067		
	SBIR/STTR Transfer	-7.381		

(U) Significant Program Changes:

Funds were reprogrammed from FY07 APAF to RDT&E to properly align Block 40/45 non-recurring engineering tasks into the System Development and Demonstration phase of the program. The realigned program slips the Block 40/45 IOC 32 months to 2013.

Exhibit R-2a, RDT&E Project Justification			DATE February 2006
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207417F Airborne Warning and Control System (AWACS)	PROJECT NUMBER AND TITLE 411L Airborne Warning & Control System (AWACS)	

Cost ($ in Millions)		FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
411L	Airborne Warning & Control System (AWACS)	273.971	119.746	165.820	138.540	108.704	128.624	145.296	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

A. Mission Description

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Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY **07 Operational System Development**	PE NUMBER AND TITLE **0207417F Airborne Warning and Control System (AWACS)**	PROJECT NUMBER AND TITLE **411L Airborne Warning & Control System (AWACS)**

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Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207417F Airborne Warning and Control System (AWACS)	PROJECT NUMBER AND TITLE 411L Airborne Warning & Control System (AWACS)

include the addition of data link communications, upgrade or replacement of emergency locating technologies, 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.

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This program is in Budget Activity 7, Operational Systems Development, due to efforts supporting a fielded, post Milestone III operational weapon system.

(U)	**B. Accomplishments/Planned Program ($ in Millions)**	FY 2005	FY 2006	FY 2007
(U)	Accomplishments/Planned Programs			
(U)	Continuing Test System-3/AITS support and Program Sustaining efforts	9.931	12.948	13.095
(U)	Continuing Trainers, Simulators and Infrastructure (TSI) efforts (previously included under Test System-3/AITS support and Program Sustaining efforts)	4.592	2.206	3.199
(U)	Continuing Block 40/45 SD&D effort	247.739	93.826	143.774
(U)	Continuing C2ISR System Architecture Improvements, Advanced Projects, MC Rate Improvements	4.908	5.999	5.752
(U)	Continuing Navigational Warfare (NAVWAR) SD&D	6.801	4.767	0.000
(U)	Total Cost	273.971	119.746	165.820

(U) C. Other Program Funding Summary ($ in Millions)

		FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
(U)	AF RDT&E									
(U)	Other APPN									
(U)	Aircraft Procurement, AF, E-3 Mods	46.548	49.591	64.547	192.838	313.828	436.693	462.750	Continuing	TBD
(U)	E-3 Initial Spares, AF	8.726	7.002	7.427	7.693	7.982	10.971	18.751	Continuing	TBD
(U)	Replacement Supt Equip	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

(U) D. Acquisition Strategy

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

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2006**

BUDGET ACTIVITY: **07 Operational System Development**

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

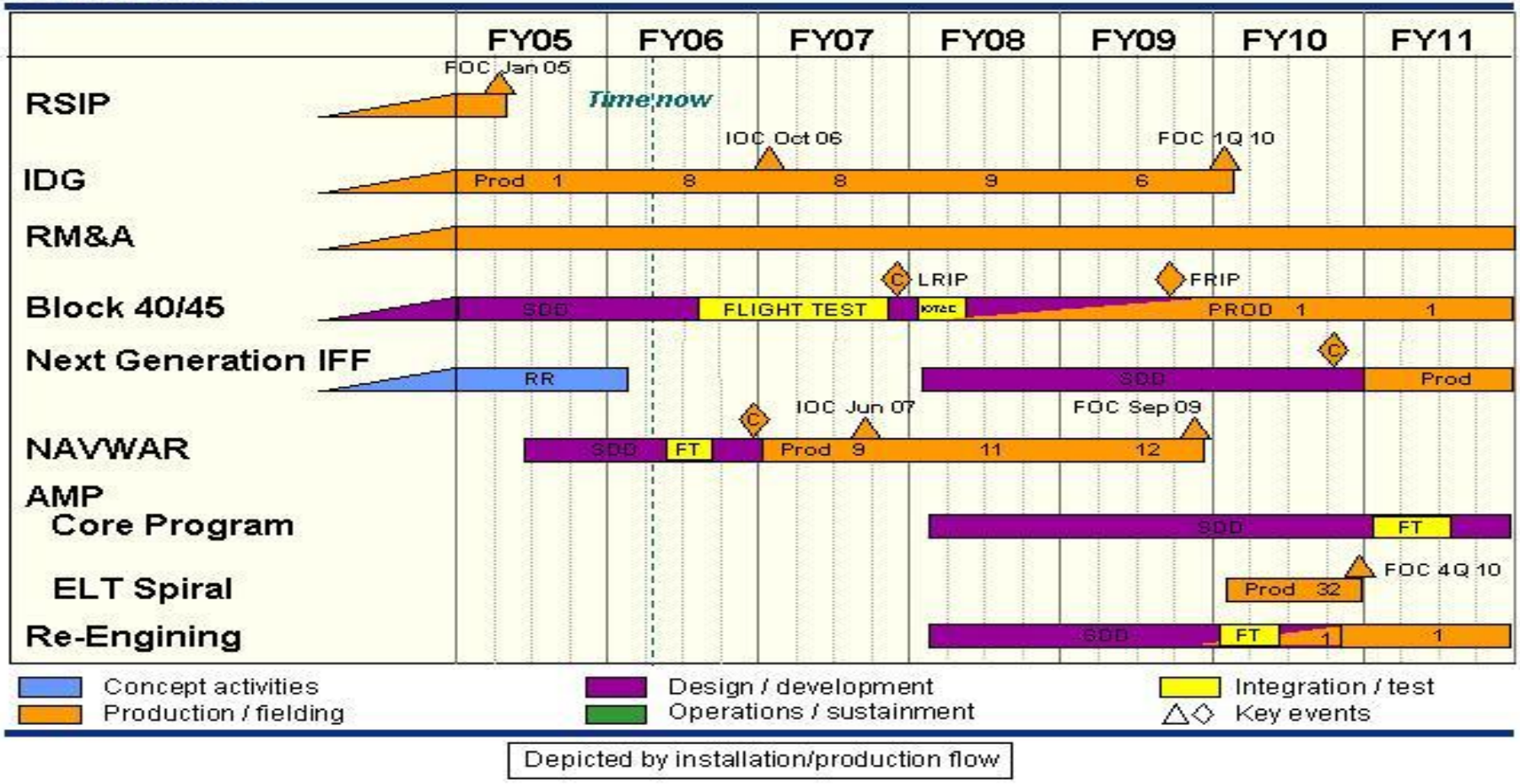
PROJECT NUMBER AND TITLE: **411L Airborne Warning & Control System (AWACS)**

(U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2005 Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost to Complete	Total Cost	Target Value of Contract
(U) Product Development												
(U) Block 40/45 SD&D	SS/CPAF	Boeing - Seattle, WA	206.855	232.325	Oct-04	75.952	Oct-05	132.368	Oct-06	Continuing	TBD	TBD
(U) C2ISR Sys Arch Imp	SS/FPIF & CPAF	Boeing - Seattle, WA	40.568	3.062	Nov-04	3.530	Oct-05	0.641	Oct-06	Continuing	TBD	TBD
(U) NAVWAR/AMP	SS/Muliple	Boeing - Seattle, WA	0.000	6.331	Nov-04	4.170	Oct-05	0.000	N/A	Continuing	TBD	TBD
Subtotal Product Development			247.423	241.718		83.652		133.009		Continuing	TBD	TBD
Remarks: Note: Total Program does not include NATO funds.												
(U) Support												
(U)Support/ITSP MITRE, travel, other	Competitive Multiple	AWACS Program Office - Hanscom AFB, MA	613.810	19.184	N/A	21.431	N/A	17.888	N/A	Continuing	TBD	TBD
Subtotal Support			613.810	19.184		21.431		17.888		Continuing	TBD	TBD
Remarks:												
(U) Test & Evaluation												
(U) Test System-3 ADAPT Contract/AITS Contract / Other test activities	SS/Multiple	Boeing - Seattle, WA	415.216	8.477	N/A	12.454	N/A	11.695	N/A	Continuing	TBD	TBD
(U) Trainers, Simulators & Infrastructure (TSI)	SS/Multiple	Boeing - Seattle, WA		4.592	Jan-05	2.209	Jan-06	3.228	Jan-07	Continuing	TBD	TBD
Subtotal Test & Evaluation			415.216	13.069		14.663		14.923		Continuing	TBD	TBD
Remarks:												
(U) Management											0.000	0.000
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) Total Cost			1,276.449	273.971		119.746		165.820		Continuing	TBD	TBD

Exhibit R-4, RDT&E Schedule Profile		DATE February 2006
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207417F Airborne Warning and Control System (AWACS)	PROJECT NUMBER AND TITLE 411L Airborne Warning & Control System (AWACS)

U.S. AIR FORCE

AWACS Schedule



Depicted by installation/production flow

Exhibit R-4a, RDT&E Schedule Detail		DATE February 2006
BUDGET ACTIVITY **07 Operational System Development**	PE NUMBER AND TITLE **0207417F Airborne Warning and Control System (AWACS)**	PROJECT NUMBER AND TITLE **411L Airborne Warning & Control System (AWACS)**

(U)	**Schedule Profile**	FY 2005	FY 2006	FY 2007
(U)	NAVWAR SD&D Contract Award	1Q		
(U)	RSIP Aircraft Modifications Complete	1Q		
(U)	40/45 Test Aircraft Modification Start	2Q		
(U)	NAVWAR Software Development Progress Review	3Q		
(U)	IDG Production Aircraft Modification Start	3Q		
(U)	IDG Delta Testing		1Q	
(U)	NAVWAR Flight Tests		2Q	
(U)	40/45 Airworthiness Testing		3Q	
(U)	IDG Follow-On Contract Award		3Q	
(U)	40/45 Install & Checkout Complete		4Q	
(U)	40/45 Ground/Flight Test Starts		4Q	
(U)	IDG IOC			1Q
(U)	NAVWAR IOC			3Q
(U)	40/45 Ground/Flight Test Complete			4Q
(U)	40/45 Milestone C - LRIP			4Q