

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2007

BUDGET ACTIVITY		PE NUMBER AND TITLE								
<b>5 - System Development and Demonstration</b>		<b>0604741A - Air Defense Command, Control and Intel - Eng</b>								
COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	49264	21516	21513	22552	23426	23938	23000	23000	Continuing	Continuing
126 FAAD C2 ED	36663	10349	1340	2995	2895	3000	3000	3000	Continuing	Continuing
146 AIR & MSL DEFENSE PLANNING CONTROL SYS (AMC PCS)	12601	11167	10250	9575	10531	10938	10000	10000		85062
149 COUNTER-ROCKETS, ARTILLERY & MORTAR (C-RAM) DVPMT			9923	9982	10000	10000	10000	10000	Continuing	Continuing

**A. Mission Description and Budget Item Justification:** The Air and Missile Defense Planning and Control System (AMDPCS) is an Army Objective Force System with Homeland Defense capabilities that allows for the integration of Air and Missile Defense (AMD) operations for Air Defense Artillery (ADA) Brigades at Corps and Echelons above Corps (EAC), the Army Air and Missile Defense Command (AAMDC) Headquarters, at Army, Joint, or Coalition level forces.

The Forward Area Air Defense Command, Control, and Intelligence (FAAD C2I) System provides continuously tailored situational awareness and situational understanding of the battlespace (including data on threat aircraft, cruise missiles and unmanned aerial vehicles (UAVs) to support the planning and decision process at various levels of command. The mission is to collect, digitally process and disseminate real time target cueing and tracking information, common tactical air picture, and C2I information to all Short Range Air Defense (SHORAD) weapons (Avenger, Bradley Linebacker, Manportable Air Defense System (MANPADS), joint and combined arms). Unique FAAD C2 software will provide this mission capability by integrating FAAD C2 engagement operations software with the Joint Digital Radio (JDR), Single Channel Ground and Airborne Radio System (SINCGARS), Enhanced Position Location Reporting System (EPLRS), Global Positioning System (GPS), Airborne Warning and Control System (AWACS), Sentinel and the Army Battle Command System (ABCS) architecture. Provides joint C2 interoperability and horizontal integration with PATRIOT, THAAD, MEADS, JLENS and SHORAD weapon systems by fusing sensor data to create a scalable and filterable single integrated air picture (SIAP) and common operating picture (COP) at Army divisions and below. System software will provide target data and engagement commands/status to the Surface Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM) air defense system. A small portion of RDTE funding is dedicated to SLAMRAAM C2 threshold requirements. FAAD C2 is the first system to digitize for Army Transformation in the First Digitized Division (FDD), III (Digitized) Corps, the Joint Contingency Force (JCF) and the STRYKER Brigade Combat Teams (SBCTs). The FAAD C2 netted and distributed system architecture has been briefed as the basis for a potential BM/C4I Future Combat Ssystem (FCS).

AMDPCS is the backbone of Army Air Defense, operating through the Battle Management/Command, Control, Communications, Computers, and Intelligence (BM/C4I), and the common tactical and operational air picture, (2) Air Defense System Integrator (ADSI), a communications data link processor and display system, provides real time joint airspace situational awareness and fire direction Command and Control (C2) for AMD, and (3) shelter configurations using computer hardware and tactical communications equipment (e.g., JTIDS 2M Terminals, Commanders Tactical Terminal). The AMDPCS enables Active, Passive and Attack Operations coordination and a correlated Single Integrated Air Picture (SIAP) to Army AMD and Joint Forces. The AMDPCS provides the Army Battle Command System (ABCS) architecture and the Army AMD Task Forces (AMDTF) with Joint BM/C4I capability and the Army component of interoperable Joint Theater Air and Missile Defense (JTAMD) BM/C4I.

In addition, the Air Missile Defense Work Station (AMDWS) supports the Surface Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM) air defense system by

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providing an automated defense planning capability for deployed units.

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<b>5 - System Development and Demonstration</b>	<b>0604741A - Air Defense Command, Control and Intel - Eng</b>			
<b><u>B. Program Change Summary</u></b>	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	41512	21757	21371	20648
Current BES/President's Budget (FY 2008/2009)	49264	21516	21513	22552
Total Adjustments	7752	-241	142	1904
Congressional Program Reductions		-151		
Congressional Rescissions				
Congressional Increases				
Reprogrammings	7752	-90		
SBIR/STTR Transfer				
Adjustments to Budget Years			142	1904
Change Summary Explanation:				
None				



# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

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<b>BUDGET ACTIVITY</b> <b>5 - System Development and Demonstration</b>				<b>PE NUMBER AND TITLE</b> <b>0604741A - Air Defense Command, Control and Intel - Eng</b>					<b>PROJECT</b> <b>126</b>	
COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
126 FAAD C2 ED	36663	10349	1340	2995	2895	3000	3000	3000	Continuing	Continuing

**A. Mission Description and Budget Item Justification:** The Forward Area Air Defense Command and Control (FAAD C2) system collects, digitally processes, and disseminates real-time target cueing and tracking information; the common tactical air picture; and command, control, and intelligence information to all Maneuver Air and Missile Defense (MAMD) weapon systems (Avenger and Man-Portable Air Defense System (MANPADS)), and joint and combined arms systems. The FAAD C2 system provides alerting data to air defense gunners, air space battle management, and up linking of mission operations, thereby enhancing force protection against air and missile attack. Situational awareness and targeting data is provided on threat aircraft, cruise missiles, and unmanned aerial vehicles (UAVs). The FAAD C2 system provides this mission capability by integrating dynamic FAAD C2 engagement operations software with the Multifunctional Information Distribution System (MIDS), Joint Tactical Terminal (JTT), Single Channel Ground and Airborne Radio System (SINCGARS), Enhanced Position Location System (EPLRS), Global Positioning System (GPS), Airborne Warning and Control Systems (AWACS), Sentinel radar, and the Army Battle Command System (ABCS) architecture. In addition, FAAD C2 provides interoperability with Joint C2 systems and horizontal integration with PATRIOT, Theater High-Altitude Area Defense (THAAD), Medium Extended Air Defense System (MEADS), and the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor (JLENS) by fusing sensor data to create a scalable and filterable Single Integrated Air Picture (SIAP) and common tactical picture. The system software is a key component of the Air Defense and Airspace Management (ADAM) Cell that is being fielded to Stryker Brigade Combat Teams (SBCTs), Brigade Combat Teams (BCTs), and Division Headquarters as part of the Army's modularity concept. The FAAD C2 software has been fielded to ADAM Cells in the 3rd Infantry Division, 101st Air Assault Division, 4th Infantry Division, 1st Cavalry Division, 25th Infantry Division, 10th Mountain Division and to the SBCTs. System software is able to provide target data and engagement commands/status to MAMD Battalions. FAAD C2 is also a principal air defense system within the Homeland Security Program. Soldiers from activated ARNG MAMD battalions operate the FAAD C2 systems in the National Capital Region and other locations.

In support of the Global War on Terrorism (GWOT), FAAD C2 systems are in MAMD units and ADAM Cells deployed to Iraq and Afghanistan. These FAAD systems are critical in providing the local air picture to supported units and higher headquarters. FAAD C2 is also the integrating software that provides target track data and weapon system control for the initial Counter-Rocket, Artillery and Mortar (C-RAM) capability being deployed to Iraq. The primary mission of the C-RAM program is to develop, procure, field and maintain a system that can detect rocket, artillery or mortar launches; warn the defended area with sufficient time for personnel to take cover; intercept rounds in flight, thus preventing damage to ground forces or facilities; and enhance response to and defeat of enemy forces. C-RAM utilizes a system of systems (SoS) approach, and is comprised of a combination of multi-service fielded and non-developmental item (NDI) sensors, C2 systems and a modified U.S. Navy intercept system, with a low cost commercial off-the-shelf (COTS) warning system and wireless local area network. The system will be fielded to various echelons, fixed or semi-fixed-site, providing them correlated air and ground pictures and linking them to the ABCS and the Joint Defense Network (JDN), via various forms of communications, to provide situational awareness and exchange of timely and accurate information to synchronize and optimize automated Shape, Sense, Warn, Intercept, Respond and Protect decisions.

The C-RAM Program Office has fielded equipment to nine (9) Forward Operating Bases (FOBs) (Sense, Warn and Intercept to one (1) FOB; Sense and Warn to eight (8) additional FOBs). The C-RAM SoS approach was validated by a Proof of Principle demonstration in December 2004 and Army Test and Evaluation Command (ATEC) tests in Feb 05, Apr 05, Nov-Dec 05, and Sep 06. C-RAM will be managed as an ACAT I program upon formal designation as a program of record.

FY08 and FY09 will fund the efforts listed in Accomplishments/Planned Program below.

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<u><b>Accomplishments/Planned Program:</b></u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Continue FAAD C2 Blk III software development/engineering, including external Beyond Line of Sight/Non-Line of Sight, SINCGARS Data Looping, Sentinel Identification Friend or Foe Mode 5/S development, and Single Integrated Air Picture Blk 0 & 1 implementation. Software is being fielded to active and reserve component Maneuver Air and Missile Defense Battalions, to units in support of Homeland Defense, and to ADAM Cells deployed in support modularity and Operation Iraqi Freedom/Operation Enduring Freedom.	14423	6152		
Support FAAD C2 software development for new Air and Missile Defense Composite Battalions, including unique software enhancements in support of Homeland Defense and security accreditation upgrades. As a complementary Future Combat System (FCS), continue FAAD C2 integration and interoperability with FCS Mission Applications. Consistent with DA and DoD guidance, migrate FAAD C2 Engagement Operations software modules to the Joint Command and Control Mission Capability Packages. Integrate Sentinel radar Enhanced Target, Range and Classification (ETRAC). Implement software modifications necessary for Internet Protocol version 6 (IPv6), continue integration of interfaces for the Joint Tactical Terminal (JTT), and design Joint Tactical Radio System (JTRS) interfaces. Incorporate IFF modes 1,2 and 3 (active decode) capabilities.	8840	980	1340	2995
Develop, test and integrate FAAD C2 software with new hardware versions of FBCB2 and FACT that are fielded. FAAD C2 software cohost/rehost includes the development, test and integration of FAAD C2 software on newer versions of CHS hardware.		1262		
Implement IFF Mode 5/S in order to enhance positive friendly identification and provide an associated robust civil aviation identification capability.		1677		
Development of C-RAM/FAAD C2 improvements/enhancements (lower cost interceptor capability and enhancement of Shape and Respond options by integrating existing stovepipe systems).	13400			
Small Business Innovative Research/Small Business Technology Transfer Programs		278		
<b>Total</b>	<b>36663</b>	<b>10349</b>	<b>1340</b>	<b>2995</b>

<u><b>B. Other Program Funding Summary</b></u>	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
OPA 2, AD5050 - FAAD C2	228564	21010	9000	7500	9000	3800	5000	5000	Continuing	Continuing
Spares (BS9702) - FAAD C2	876	842							Continuing	Continuing

Comment:

**C. Acquisition Strategy** The FAAD C2 acquisition strategy relies on evolutionary software development to rapidly meet the demands of air defense battle management/command, control, communications, computers, and intelligence (BM/C4I) requirements, and to keep pace with automated information technologies. The concept of evolutionary software development is being followed and will be accomplished in Blocks I, II, and III. Blocks I and II have been completed. FAAD C2 Block III is currently being developed for both the Army's Active and Reserve components.

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The C-RAM program is primarily an NDI integration effort, comprised of a combination of multi-service sensors, C2 systems, a modified U.S. Navy intercept system and two low-cost commercial systems - a warning system and a wireless LAN. All COTS hardware and software are purchased through the installation contractor. All other hardware and software are purchased from the applicable PM or other Government organization. FAAD C2 forms the backbone of C-RAM C2 and continued development is expected to support this new mission.

# ARMY RDT&E COST ANALYSIS (R3)

February 2007

BUDGET ACTIVITY			PE NUMBER AND TITLE									PROJECT		
5 - System Development and Demonstration			0604741A - Air Defense Command, Control and Intel - Eng									126		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Northrop Grumman/TRW, BLK I	C/CPIF	Carson, CA	176461										176461	
Northrop Grumman/TRW, BLK II	SS/CPIF	Carson, CA	32206										32206	
Northrop Grumman/TRW, BLK III	SS/CPIF	Carson, CA	90510	7399	1Q	1052	1Q					Cont.	98961	
Northrop Grumman/TRW	SS/T&M	Carson, CA	7838	2508	1Q	713	1Q	92	1Q	205	1Q	Cont.	Cont.	
Northrop Grumman						978	1Q	262	1Q	601	1Q	Cont.	Cont.	
Program Management Administration	MIPR	Various	29520	3782	2Q	1075	2Q	139	2Q	310	2Q	Cont.	Cont.	
Sentinel GBS	MIPR	Huntsville, AL	3791										3791	
JTIDS	MIPR	Ft. Monmouth, NJ	6000									Cont.	6000	
ABCS SE&I	MIPR	Ft Monmouth, NJ	346										346	
Software Engineering	Various	Various	15093	2521	1-4Q	717	1-4Q	93	1-4Q	206	1-4Q	Cont.	Cont.	
C-RAM Sense, Warn & Intercept	Various	Various	45753	14735	1-4Q	4189	1-4Q	543	1-4Q	1206	1-4Q	Cont.	Cont.	
Subtotal:			407518	30945		8724		1129		2528		Cont.	Cont.	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:														
III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
ADATD	MIPR	Ft Bliss, TX	10257	1017	1-4Q	289	1-4Q	37	1-4Q	83	1-4Q	Cont.	Cont.	
RTTC	MIPR	WSMR, NM	2906	18	1-4Q	5	1-4Q					Cont.	Cont.	

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AATD	MIPR	Ft Eustis, VA		160	1-4Q	45	1-4Q	7	1-4Q	13	1-4Q	Cont.	Cont.	
ATEC	MIPR	Alexandria, VA		978	1-4Q	278	1-4Q	36	1-4Q	81	1-4Q	Cont.	Cont.	
Yuma Proving Ground	MIPR	Yuma, AZ		3545	1-4Q	1008	1-4Q	131	1-4Q	290	1-4Q	Cont.	Cont.	
Subtotal:				13163	5718		1625		211		467		Cont.	Cont.
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:														
Remarks: Not Applicable														
<b>Project Total Cost:</b>				<b>420681</b>	<b>36663</b>		<b>10349</b>		<b>1340</b>		<b>2995</b>		<b>Cont.</b>	<b>Cont.</b>

# Schedule Profile (R4 Exhibit)

February 2007

BUDGET ACTIVITY  
**5 - System Development and Demonstration**

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Event Name	FY 06				FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
(1) V5.2 Materiel Release, (2) V5.4 Materiel Release				▲ 1 V5.2 Materiel Release					▲ 2 V5.4 Materiel Release																								
(3) Block III Software Deliveries, (4) SW Delivery							▲ 3 V5.4b SW Initial Drop	▲ 4 V5.4b SW Final Drop																									
Block III Test																																	
(5) V5.4a Thread Test	▲ 5 V5.4a Thread Test																																
V5.4b Test																																	
(6) V5.4b Test Readiness Review																																	
(7) V5.4b System Certification Test																																	
(8) Block III Initial Operational Capability (IOC)																																	
V5.4 Upgrades																																	
CHS Upgrades																																	
FAAD C2 DAMPL Fieldings																																	
(9) 2-174 OH ARNG, (10) 1-265 FL ARNG, (11) 1-174 OH ARNG, (12) C-RAM Contract Award																																	
C-RAM/FAAD C2 Development																																	

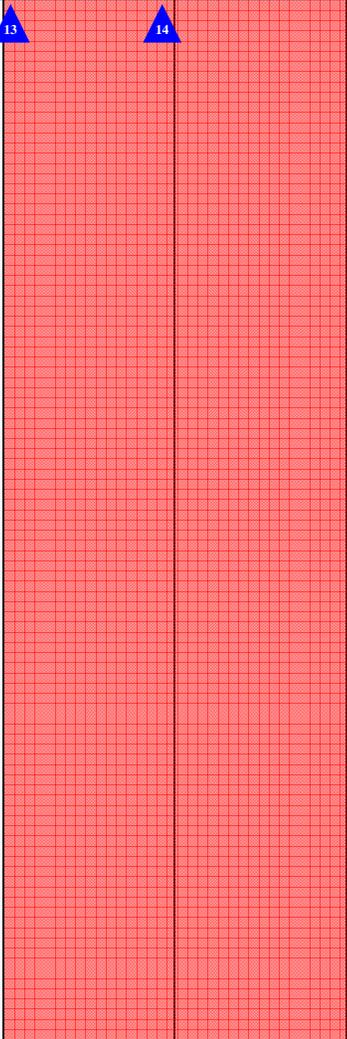
# Schedule Profile (R4 Exhibit)

February 2007

BUDGET ACTIVITY  
**5 - System Development and Demonstration**

PE NUMBER AND TITLE  
**0604741A - Air Defense Command, Control and Intel - Eng**

PROJECT  
**126**

Event Name	FY 06				FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13																															
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4																												
(13) C-RAM Tests /Demonstrations, (14) , (15) , (16)																																																												
(17) , (18)																																																												
(19) C-RAM/FAAD C2 SW Materiel Release																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												
																																																												

# Schedule Detail (R4a Exhibit)

February 2007

BUDGET ACTIVITY  
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PE NUMBER AND TITLE  
**0604741A - Air Defense Command, Control and Intel - Eng**

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<u>Schedule Detail</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>
Materiel Release								
V5.2 Materiel Release	4Q							
V5.4 Materiel Release			2Q					
Block III Software Deliveries		2Q						
SW Delivery		3Q						
Block III Test								
V5.4a Thread Test	1Q							
V5.4b Test		3Q - 4Q						
V5.4b Test Readiness Review		4Q						
V5.4b System Certification Test		4Q						
Block III Initial Operational Capability (IOC)		4Q						
V5.4 Upgrades			2Q - 4Q	1Q - 2Q				
CHS Upgrades	3Q - 4Q	1Q - 4Q						
FAAD C2 DAMPL Fieldings								
2-174 OH ARNG	3Q							
1-265 FL ARNG		3Q						
1-174 OH ARNG			3Q					
C-RAM Contract Award		2Q						
C-RAM/FAAD C2 Development		3Q - 4Q	1Q - 4Q					
C-RAM Tests /Demonstrations	1Q							
	4Q							
			1Q					
				4Q				
					2Q			
						1Q		

							4Q	
C-RAM/FAAD C2 SW Materiel Release					2Q			

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COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
146 AIR & MSL DEFENSE PLANNING CONTROL SYS (AMC PCS)	12601	11167	10250	9575	10531	10938	10000	10000		85062

**A. Mission Description and Budget Item Justification:** The Air and Missile Defense Planning and Control System (AMDPCS) is an Army Objective Force System that provides integration of Air and Missile Defense (AMD) operations at all echelons. AMDPCS systems are deployed with Air Defense Artillery (ADA) brigades, Army Air and Missile Defense Commands (AAMDCs), and Air Defense and Airspace Management (ADAM) Cells at the Brigade Combat Teams (BCT's), Fires Brigades and Divisions. AMDPCS systems also provide air defense capabilities to Homeland Defense systems.

The development of ADAM Cells is essential in fulfilling the Army's Modularity requirement. ADAM Cells provide the Commander at BCTs, Brigades and Divisions with air defense situational awareness and airspace management capabilities. They also provide the interoperability link with Joint, multinational and coalition forces. AMDPCS components are vital in the transformation of ADA units and the activation of the Maneuver Air & Missile Defense (MAMD) Composite Battalions. AMDPCS has three major components:

- (1) The Air and Missile Defense Workstation (AMDWS) is an automated defense and staff planning tool that displays the common tactical and operational air picture. AMDWS provides the Battle Command (BC) capabilities embedded within the Warfighter Mission area. AMDWS is also the Net-centric interface to BC for all components of the AMD force. AMDWS provides an interoperability link to multinational air defense forces IAW Annex C to a Joint US/NATO Air Defense Agreement;
- (2) The Air Defense System Integrator (ADSI) is a communications data link processor and display system that provides near-real time joint airspace situational awareness and fire direction command and control for Air and Missile Defense forces;
- (3) The Army Air Defense shelter configurations use automated data processing equipment, tactical communications, Common Hardware Systems, standard vehicles and tactical power to provide AMD unit commanders and staffs with the capabilities to plan missions, direct forces, and control the airspace.

In support of the Global War on Terrorism (GWOT), AMDWS and ADSIs are vital components of the AMDPCS shelter systems fielded to ADA units, the AAMDC and ADAM Cells that have deployed to Iraq and Afghanistan. In addition, these components have also been integrated into non-ADA higher headquarters such as the Coalition Forces Land Component Command (CFLCC). AMDWS is a critical component in the integration and fielding of a Counter-Rocket, Artillery and Mortar (C-RAM) capability to Operating Bases in Iraq and elsewhere. In support of Homeland Defense missions, the AMDWS has been integrated as the Force Operations component into the Joint Service/Air Force architecture. These AMDPCS systems provide the common tactical air picture, a major component of the Common Operating Picture (COP), and are critical to the development and planning of offensive and defensive operations.

FY08 and FY09 funds the development, software engineering and testing of the AMDWS, ADSI, and sheltered subsystem software as described below.

<b><u>Accomplishments/Planned Program:</u></b>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Continue AMDWS development and support of Software Blocking and Battle Command. Complete AMDWS software engineering and development consistent with Software Block 2, 2+ and 3 requirements, evolving the air and missile defense planning and control requirements to a net-centric environment, and fulfilling the air defense force operations capabilities identified in the AMD TRADOC	7294	6775	5802	5674

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capabilities requirement list. Continue AMDWS software development and rehost onto emerging light/laptop common hardware systems. Complete integration of the PATRIOT Air Defense system Tactical Planner (PTP) and the Theater Battle Management Core Systems (TBMCS). Initiate development of the SLAMRAAM, JLENS, MEADS and Theater Battle Operations Net-Centric Environment (T-BONE) interfaces. Continue supporting the Air Force Joint Tactical Air and Missile Defense (JTAMD), and support the evolving development of the Force Operations portion of the Integrated Air and Missile Defense (IAMD) System of Systems. As a complimentary Future Combat System (FCS), initiate AMDWS integration and interoperability with FCS command and control system development. Begin migration of AMDWS software modules to the Net Enabled Command and Control Mission Capability Packages (MCPS).									
Continue ADSI software engineering and development in software version 12 upgrades and versions 14, 14.1, and 14.2 including development of capabilities for TAC View Situational Awareness, full TADIL-J, Joint Range Extension Application Protocols (JREAP) for link 16 messages, MIDS TADIL-J connectivity, and Windows XP Pro and LINUX Realtime.									
Continue engineering, development, test and evaluation of the AMDPCS shelter subsystem Objective configurations; continue evaluation and definitization of the AMDPCS tactical communications, data processing and vehicle/shelter/power generation/environmental system block upgrade program for fielded systems.									
Continue software system certification testing, accreditation, and approval of Authority-to-Operate for the various software systems; continue Army and Joint integration and interoperability assessments.									
SBIR/STTR									
Total									
				12601	11167	10250	9575		

<b><u>B. Other Program Funding Summary</u></b>	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
OPA, AD 5070 - AMDPCS	103622	69289	12654	33106	75504	9874	25000	24410	Continuing	Continuing

Comment:

**C. Acquisition Strategy** The acquisition strategy relies on non-development items (NDI) and evolutionary software development to rapidly meet the demands of air defense battle management command, control, communications, computers, and intelligence (BM/C4I) requirements and to keep pace with automated information technologies. The concept of evolutionary software development will be accomplished in a series of AMDWS and ADSI Block releases and upgrades. AMDPCS is being developed for both the Army's Active and Reserve components.

# ARMY RDT&E COST ANALYSIS (R3)

February 2007

BUDGET ACTIVITY			PE NUMBER AND TITLE									PROJECT		
5 - System Development and Demonstration			0604741A - Air Defense Command, Control and Intel - Eng									146		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Northrop Grumman/TRW	SS/CPIF	Huntsville, AL	34269	7100	1Q	6612	1Q	5624		5251		Cont.	Cont.	
ULTRA Electronics, ADSI	SS/CPIF	Austin, TX	5005	361	1Q	158	1Q	159		148		Cont.	Cont.	
Program Management Administration	Various	Various	18833	3599	2Q	3556	2Q	3609		3443		Cont.	Cont.	
ABCS SE&I	MIPR	Ft Monmouth, NJ	619										619	
Software Engineering	Various	Various	4574	1284	2-3Q	779	2-3Q	793		675		Cont.	Cont.	
Subtotal:			63300	12344		11105		10185		9517		Cont.	Cont.	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:														
III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Certification	MIPR	JITC, Ft Huachuca, AZ	517	81	1Q	39	3Q	40		37		Cont.	Cont.	
Interoperability Assessment	MIPR	CTSF, Ft. Hood, TX	796	176	1Q	23	3Q	25		21		Cont.	Cont.	
Subtotal:			1313	257		62		65		58		Cont.	Cont.	
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract

# ARMY RDT&E COST ANALYSIS (R3)

February 2007

BUDGET ACTIVITY <b>5 - System Development and Demonstration</b>				PE NUMBER AND TITLE <b>0604741A - Air Defense Command, Control and Intel - Eng</b>					PROJECT <b>146</b>				
Subtotal:													
Remarks: Not Applicable													
<b>Project Total Cost:</b>				<b>64613</b>	<b>12601</b>		<b>11167</b>		<b>10250</b>		<b>9575</b>	<b>Cont.</b>	<b>Cont.</b>

# Schedule Profile (R4 Exhibit)

February 2007

BUDGET ACTIVITY  
**5 - System Development and Demonstration**

PE NUMBER AND TITLE  
**0604741A - Air Defense Command, Control and Intel - Eng**

PROJECT  
**146**

Event Name	FY 06				FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
(1) AMDWS Contract Awards	Blk III																																			
(2) ADAM CELL UMR, (3) ADAM CELL UMR	4ID																																			
(4) AMDWS CMR V6.4	4ID, 101st ABN, 10th MTN																																			
(5) ADAM FRP	FRP																																			
AMDWS/ADSI SW Development	AMDWS/ADSI SW Development																																			
(6) AMDWS SW Deliveries, (7), (8)	SWB 2																SWB 2+				SWB 3															
(9) ADSI SW DELIVERIES, (10), (11), (12)	v12.3.1																v14.0				v14.2				v14.3											
AMDWS Migration to NECC & FCS																	NECC & FCS																			
(13) ADSI JIT/SLT, (14), (15), (16)	v12.3																v14.0				v14.2				v14.3											
(17) AMDPCS LOG DEMO																	Log Demo																			
(18) JRF/RS, (19) JRF/RS																	JRF/RS				JRF/RS															
(20) C-RAM DEMO	C-RAM DEMO																																			
(21) Ulchi Focus Lens, (22), (23), (24)																	UFL				UFL				UFL				UFL							
(25) IPOW, (26) IPOW, (27) UFL, (28) UFL																					IPOW				UFL				IPOW				UFL			

# Schedule Profile (R4 Exhibit)

February 2007

BUDGET ACTIVITY  
**5 - System Development and Demonstration**

PE NUMBER AND TITLE  
**0604741A - Air Defense Command, Control and Intel - Eng**

PROJECT  
**146**

Event Name	FY 06				FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AMDWS IAIC. .																																
AMDWS TFT. .																																

# Schedule Detail (R4a Exhibit)

February 2007

BUDGET ACTIVITY  
**5 - System Development and Demonstration**

PE NUMBER AND TITLE  
**0604741A - Air Defense Command, Control and Intel - Eng**

PROJECT  
**146**

<u>Schedule Detail</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>
AMDWS Contract Awards	1Q							
ADAM CELL UMR	1Q							
ADAM CELL UMR	2Q							
AMDWS CMR V6.4		4Q						
ADAM FRP		2Q						
AMDWS/ADSI SW Development	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q				
AMDWS SW Deliveries		1Q						
			1Q					
			1Q					
ADSI SW DELIVERIES	4Q							
		3Q						
			4Q					
				4Q	1Q			
AMDWS Migration to NECC & FCS			1Q - 4Q	1Q - 4Q				
ADSI JIT/SLT	1Q							
		2Q						
			2Q					
				2Q				
AMDPCS LOG DEMO		4Q						
JRF/RS		3Q						
JRF/RS				3Q				
C-RAM DEMO	4Q							
Ulchi Focus Lens	4Q							
		4Q						
			4Q					

					4Q			
JPOW			3Q					
JPOW					3Q			
UFL						4Q		
UFL				4Q				
AMDWS IAIC		3Q - 4Q						
			3Q - 4Q					
				2Q - 3Q				
AMDWS TFT	3Q - 4Q	1Q - 2Q						
			1Q - 2Q					
			4Q	1Q - 2Q				
ADAM Cell Urgent Materiel Release (1CD, 82ABN, 25ID, 10MTN)								
AMDWS Migration to JC2v2			1Q - 4Q					
AMDWS Migration to JC2v3				1Q - 4Q				
ADSI Migration to CDLIM		1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q			
AMDPCS Sheltered Systems Spiral Development		1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q			
ADAM Cell Spiral Evolution				1Q - 4Q	1Q - 4Q			
AMDWS SW Block 2 Operational Eval	3Q							

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

**February 2007**

<b>BUDGET ACTIVITY</b> <b>5 - System Development and Demonstration</b>		<b>PE NUMBER AND TITLE</b> <b>0604741A - Air Defense Command, Control and Intel - Eng</b>							<b>PROJECT</b> <b>149</b>	
COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
149 COUNTER-ROCKETS, ARTILLERY & MORTAR (C-RAM) DVPMT			9923	9982	10000	10000	10000	10000	Continuing	Continuing

**A. Mission Description and Budget Item Justification:** Counter-Rockets, Artillery and Mortar (C-RAM) is a spiral Initiative Non Developmental program initiated by the Army Chief of Staff in response to Iraqi theatre threat and twice validated theater ONS. The primary mission of the C-RAM program is to develop, procure, field and maintain a system that can detect rocket, artillery or mortar launches; warn the defended area with sufficient time for personnel to take cover; intercept rounds in flight, thus preventing damage to ground forces or facilities; and enhance response to and defeat of enemy forces. C-RAM utilizes a system of systems (SoS) approach, and is comprised of a combination of multi-service fielded and non-developmental item (NDI) sensors, command and control (C2) systems and a modified U.S. Navy intercept system, with a low cost commercial off-the-shelf (COTS) warning system and wireless local area network. The system will be fielded to various echelons, fixed or semi-fixed-site, providing them correlated air and ground pictures and linking them to the Army Battle Command System (ABCS) and the Joint Defense Network (JDN), via various forms of communications to provide situational awareness and exchange of timely and accurate information to synchronize and optimize automated Shape, Sense, Warn, Intercept, Respond and Protect decisions.

The fielding of the C-RAM SoS will be accomplished through an incremental fielding approach that is driven by an urgent operational need, theater priorities and emerging capability requirements to provide counter-RAM capability to fielded forces. Increment I (FY05-FY13) delivers a partial C-RAM SoS capability for sites in theater. Increment II (FY14-FY23) delivers a full C-RAM SoS capability for fixed and semi-fixed sites. It encompasses protection for joint critical assets using next generation C4, sensors and interceptors in a structured joint organization. Increment III (FY23 and beyond), the objective capability, provides full integration with Future Combat System (FCS) and Protection SoS. It includes network-enabled operations and protection of mobile assets using advanced technologies, leading to a joint integrated Defeat-Rockets, Artillery and Mortars (D-RAM) capability. Increments II and III depend on the readiness of future technologies, value to the operational concept, enemy threat, affordability and integration considerations at the element and SoS level.

Current development efforts include the implementation of improvements and upgrades to C-RAM Increment I and the initial development of Increment II capabilities. C-RAM is transitioning from an IED Task Force Initiative to a Program of Record and is currently in the process of creating a formal acquisition strategy documentation support package. It will be managed as an ACAT I program upon formal designation as a program of record.

FY08 and FY09 will fund the efforts listed in Accomplishments/Planned Program below.

<b><u>Accomplishments/Planned Program:</u></b>	<b><u>FY 2006</u></b>	<b><u>FY 2007</u></b>	<b><u>FY 2008</u></b>	<b><u>FY 2009</u></b>
Develop advanced user interface/capabilities			4923	
Test/demonstration support for new C-RAM capabilities			5000	2000
Develop Threat Evaluation and Weapons Assignment (TEWA) capabilities				2782
Integrate with Rapid Digital "Clearance of Fires"				2000

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

**February 2007**

<b>BUDGET ACTIVITY</b> <b>5 - System Development and Demonstration</b>	<b>PE NUMBER AND TITLE</b> <b>0604741A - Air Defense Command, Control and Intel - Eng</b>	<b>PROJECT</b> <b>149</b>
Develop Advanced Defense Design System Exerciser		2000
Support Joint, Interagency and Multi-national (JIM) interoperability (Common Link Integration Processing (CLIP) integration, communications improvement)		1200
<b>Total</b>		<b>9923</b>

<b><u>B. Other Program Funding Summary</u></b>	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
OPA 2 BZ0526- COUNTER-ROCKETS, ARTILLERY& MORTAR (C-RAM)									Continuing	Continuing

Comment:

**C. Acquisition Strategy** The C-RAM program is following an evolutionary acquisition strategy for rapid acquisition of mature technology to the user. The approach will deliver capabilities in increments, recognizing up front the need for future improvements. The objective of the strategy is to balance needs and available capability with resources and put a robust capability to engage rockets, artillery, and mortars into the hands of the user quickly. Success will depend on continuous user feedback, consistent definition of capability needs, maturation of technology, and allocation of required resources. To achieve the evolutionary acquisition of C-RAM, the program director will collaborate and coordinate with the user, combat developer, tester, logistician, PEO C3T, and resource provider (e.g., G8). The program will follow the Spiral Development process (per DoDI 5000.2), where the desired capability is identified, but the end-state requirements are not fully known at program initiation. Those end-state C-RAM requirements will be refined through demonstration and risk management. Each fielded increment provides the user with the best possible capability over time. The requirements for future increments depend on feedback from users and technology maturation.

# ARMY RDT&E COST ANALYSIS (R3)

February 2007

BUDGET ACTIVITY			PE NUMBER AND TITLE									PROJECT		
5 - System Development and Demonstration			0604741A - Air Defense Command, Control and Intel - Eng									149		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Northrop Grumman	ID/IQ CPFF	Carson, CA			4Q			2125		2125		Cont.	Cont.	70500
Nortrop Grumman	CPFF	Carson, CA					2Q	6298		6357		Cont.	Cont.	40000
Program Management Administration	MIPR	Various						1500	2Q	1500	2Q	Cont.	Cont.	
Subtotal:								9923		9982		Cont.	Cont.	110500
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:														
III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:														
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:														
<b>Project Total Cost:</b>								<b>9923</b>		<b>9982</b>		<b>Cont.</b>	<b>Cont.</b>	<b>110500</b>

# Schedule Profile (R4 Exhibit)

February 2007

BUDGET ACTIVITY  
**5 - System Development and Demonstration**

PE NUMBER AND TITLE  
**0604741A - Air Defense Command, Control and Intel - Eng**

PROJECT  
**149**

Event Name	FY 06				FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
(1) C-RAM Tests/Demonstrations, (2) , (3) , (4) , (5) , (6)	▲1			▲2					▲3							▲4								▲5								▲6								
(7) Increment II CDD Complete								▲7																																
(8) Increment II CPD Complete																				▲8																				
Increment I R&D Effort					Incremental I R&D Effort																																			
Increment II R&D Effort													Incremental II R&D Effort																											

**Schedule Detail (R4a Exhibit)**

**February 2007**

**BUDGET ACTIVITY**  
**5 - System Development and Demonstration**

**PE NUMBER AND TITLE**  
**0604741A - Air Defense Command, Control and Intel - Eng**

**PROJECT**  
**149**

<u>Schedule Detail</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>
C-RAM Tests/Demonstrations	1Q - 2Q							
	4Q							
			1Q					
				4Q				
						1Q		
							4Q	
Increment II CDD Complete		4Q						
Increment II CPD Complete					3Q			
Increment I R&D Effort		1Q - 4Q	1Q - 4Q	1Q - 4Q				
Increment II R&D Effort				1Q - 4Q				