

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2007

BUDGET ACTIVITY				PE NUMBER AND TITLE					PROJECT	
5 - System Development and Demonstration				0604201A - AIRCRAFT AVIONICS					C97	
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
C97 ACFT AVIONICS	9898	48554	57786	71880	78163	53246	68869	12417	Continuing	Continuing

A. Mission Description and Budget Item Justification: This Program Element (PE) funds the development of avionics systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army Aviation aircraft. Tasks in this PE support research, development and test efforts in the System Development and Demonstration (SDD) phases of these systems.

Aviation Tactical Communication Systems (ATCS) is an Army Aviation Program that requires RDT&E funds for the A-Kit (hardware and software) development, integration, test and certification of Alternative Communications (ARC-231 and ARC-201D) and the Joint Tactical Radio System (JTRS) radio hardware onto the Apache (AH-64D), Blackhawk (UH-60M) and Chinook (CH-47F) modernized aircraft. JTRS is the transformational system that will provide Army Aviation the required interoperability capability for Future Force and Joint Force operations.

Army Aviation originally planned to integrate the JTRS Cluster 1 radio onto all modernized platforms in this timeframe to meet a FY10 fielding. However, due to the JTRS program restructure, Army Aviation is now aligned with the Airborne Maritime Fixed (AMF) JTRS Program and plans to field JTRS AMF radios in FY14. This delay in the JTRS Cluster 1 program resulted in a lack of critical communications equipment to support modernized Army Aviation aircraft production line requirements and Alternative Communications (Alt Comms) was initiated to mitigate this issue. Alt Comms provides two ARC-231 and two ARC-201D radios with power amplifiers to meet the minimum interim JTRS requirements for Military Satellite Communications (MILSATCOM), Single Channel Ground and Airborne Radio System (SINCGARS), HAVEQUICK, Very High Frequency (VHF), Air Traffic Control (ATC), and Land Mobile Radio and funds the integration and test of the radios onto each platform to meet production line schedules. FY08 funds are required to continue A-Kit development, integration, and system testing for AH-64D, CH-47F, and UH-60M.

Alt Comms will be Army aviation's communication solution until FY14 when it will be supplemented by the JTRS AMF Small Airborne (SA) radio set. Increment 1 of the AMF SA will provide the Wideband Networking Waveform, Soldier Radio Waveform, and Link-16 required for interoperability with the Future Force. Increment 2 of the AMF SA, planned for FY20 will provide all legacy waveforms allowing aircraft to install a single hardware solution to meet all waveform requirements. FY08 funds are required to initiate JTRS integration onto aviation platforms. JTRS integration efforts planned for FY08 include defining standardized control and data interfaces and initiating development of reusable control software to be provided to JTRS integrators.

The Improved Data Modem (IDM) is the common solution for digitizing Army Aviation. It performs as an internet controller and gateway to Tactical Internet (TI) and Fire Support (FS) internet for Army aircraft. With interfaces supporting a six channel transmit/receive terminal, the IDM provides radio connectivity to the ARC-201D/210/220/231, ARC-186, ARC-164, and the Blue Force Tracker's (BFT) MT-2011 Transceiver. The IDM also provides 1553 and Ethernet portals for rapid data transfer. This hardware/software solution provides a flexible, software driven digital messaging system that is interoperable with existing Army and Joint forces battlefield operating systems. The IDM provides Situational Awareness and Variable Message Format messages capability to the cockpit. FY08 funds are required to continue development and integration effort for an Open Systems Architecture IDM solution compatible with the Common Avionics Architecture System (CAAS) cockpit for the CH-47F and HH/UH-60M helicopters. This effort provides the foundation for future open architecture solutions which will reduce space, weight, and power demands for the CAAS aircraft and also matures technology for the AH-64D Block III. Funds are also required to begin development and integration of the Future Combat Systems (FCS) database-to-database exchange interoperability

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standard.

The Joint Precision Approach and Landing System (JPALS) is a precision approach and landing system providing joint operational capability for U.S. forces assigned to conventional and special operations missions including those operating from fixed base, ship, tactical, and special mission environments. This effort evaluates technical approaches for incorporating JPALS into Army aircraft while considering aircraft environment, electrical power, system space, weight, antenna placement, and electromagnetic compatibility without nullifying low observable capability requirements. This effort also develops fixed base and man pack ground stations for the Army. The Army's involvement in JPALS prior to MS B is to: ensure Army requirements are addressed in the joint program; participate in program management and provide systems engineering and acquisition documentation for the joint program; and monitor technology readiness to ensure it is sufficiently mature to meet the Army's technical requirements/solution. Army Aviation's technical solution is to include JPALS capability within the Embedded GPS/Inertial Navigation System (EGI).

<u>Accomplishments/Planned Program:</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Continue A-Kit Development, Integration and System Testing for AH-64D, CH-47F, and UH-60M (ATCS)	2837	29795	42776	45814
Continue System Engineering, Antenna Support and Logistics Effort (ATCS)	924	3000	3257	3000
Program Management Support for A-Kit Development (ATCS)			2435	2713
Continue Test and Evaluation Support (ATCS)	677	2662	1002	2500
Continue development and integration of an open systems architecture IDM solution and Future Combat System (FCS) database-to-database exchange (IDM)	3898	9748	2485	3420
Program Management Support (IDM)	84	151	131	180
Continue to provide; system engineering; product support; and programmatic, cost, test, and technical documentation for JPALS land and sea based development efforts. (JPALS)	1399	1764	3698	4000
Begin JPALS SDD with Milestone B in FY08. Continue execution of joint and Army effort to develop a JPALS-capable Embedded GPS Inertial (EGI) receiver. (JPALS)			700	7895
Begin JPALS Test and Evaluation planning. (JPALS)			1000	1600
Program Management Support (JPALS)	79	96	302	758
Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR) reductions.		1338		
Total	9898	48554	57786	71880

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<u>B. Program Change Summary</u>	FY 2006	FY 2007	FY 2008	FY 2009		
Previous President's Budget (FY 2007)	13259	61946	71307	85450		
Current BES/President's Budget (FY 2008/2009)	9898	48554	57786	71880		
Total Adjustments	-3361	-13392	-13521	-13570		
Congressional Program Reductions		-15185				
Congressional Recissions	-551					
Congressional Increases		2150				
Reprogrammings	-2472	-357				
SBIR/STTR Transfer	-338					
Adjustments to Budget Years			-13521	-13570		
FY08: Funding realigned (\$13.521 million) to higher priority requirements						
FY09: Funding realigned (\$13.570 million) to higher priority requirements						

<u>C. Other Program Funding Summary</u>	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
Airborne Avionics SSN AA0700	88471	155824	179565	176475	259254	287331	359098	318238	Continuing	Continuing

Comment:

D. Acquisition Strategy This project is comprised of multiple systems:

1) ATCS - Alt Comms is required to meet minimum acceptable near-term communications requirements as defined by the U.S. Army Aviation Warfighting Center (USAAWC) to mitigate production line communications equipment gaps for modernized Army aircraft (UH-60M, CH-47F, and AH-64D). The Alt Comms acquisition strategy is to use currently available communications equipment to fill these gaps. However, this equipment must be incorporated onto the modernized aviation platforms through A-Kit development, platform hardware and software development/integration, and platform testing of the Alt Comms suite. These efforts will be accomplished using host platform development contracts, integration labs, and Airworthiness testing and certification.

2) IDM - The non-recurring engineering and software development is used to integrate the IDM into open systems architecture. The initial effort is to develop a data exchange capability with the CAAS processors. The software will be ported into the CAAS by providing the IDM capability on a card that can be included in the platform's onboard systems to eliminate the need for a stand-alone IDM box. This development effort will be accomplished by a sole source cost-plus-fixed fee contract with ICI, McLean, VA.

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3) JPALS - Currently the Air Force is the lead service for this joint program. However, the Navy will assume this lead service role when the CDD is approved (scheduled for February 2007). The overall JPALS program acquisition strategy is to complete the current risk reduction effort and TD phase and enter into the SDD phase, currently scheduled for Milestone B in the second quarter of FY08. The TD phase led to the development of combined specifications for land, sea, and avionics. Using this specification, the JPALS prototype ground-based increment was tested in both benign and jamming environments in November 2006, with positive results for operating successfully in a jamming environment.

ARMY RDT&E COST ANALYSIS (R3)

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BUDGET ACTIVITY			PE NUMBER AND TITLE									PROJECT		
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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
Integration, development and system testing for AH-64D, CH-47F, UH-60M (ATCS)	Various	Boeing, AZ, PA, & CA; Rockwell Collins, Cedar Rapids, IA; Sikorsky, Stratford, CT; Raytheon, IN	104129	2837	3-4Q	29795	1-3Q	42776	1-3Q	45814	1-3Q	Cont.	Cont.	Cont.
Integr and Dev of an Open Sys Architecture IDM solution and FCS database-to-database exchange (IDM)	SS/CPFF	ICI, McLean, VA	1916	3898	3Q	9748	2Q	2485	2Q	3420	2Q		21467	
JPALS Development (JPALS)	Various	Various						700	2-3Q	7895	2-3Q	Cont.	Cont.	Cont.
Subtotal:			106045	6735		39543		45961		57129		Cont.	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
System Engineering, Antenna Integration Support and Logistics Efforts (ATCS)	Various	Westar, Quantum, Teclote, AL; ARINC, CSC, NJ	3946	924	1-3Q	3000	1-3Q	3257	1-3Q	3000	1-3Q	Cont.	Cont.	Cont.
System Engineering, Logistics, and Technical Support (JPALS)	Various	Various	1774	1399	1-3Q	1764	1-3Q	3698	1-3Q	4000	1-3Q	Cont.	Cont.	Cont.
Subtotal:			5720	2323		4764		6955		7000		Cont.	Cont.	Cont.
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
Test and Evaluation (ATCS)	MIPR	Various	2201	677	1-3Q	2662	1-3Q	1002	1-3Q	2500	1-3Q	Cont.	Cont.	Cont.
Test and Evaluation (JPALS)	MIPR	Various						1000	1-3Q	1600	1-3Q	Cont.	Cont.	Cont.

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Subtotal:				2201	677		2662		2002		4100		Cont.	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	
PM Spt (ATCS)	In-House	AMCOM, Redstone Arsenal, AL/PM AME	6170					2435	1-4Q	2713	1-4Q	Cont.	Cont.	Cont.	
PM Spt (IDM)	In-House	AMCOM, Redstone Arsenal, AL/PM AME	1245	84	1-4Q	151	1-4Q	131	1-4Q	180	1-4Q		1791		
PM Spt (JPALS)	In-House	AMCOM, Restone Arsenal, AL/PM AME	39	79	1-4Q	96	1-4Q	302	1-4Q	758	1-4Q	Cont.	Cont.	Cont.	
SBIR/STTR						1338							1338		
Subtotal:				7454	163		1585		2868		3651		Cont.	Cont.	Cont.
Project Total Cost:				121420	9898		48554		57786		71880		Cont.	Cont.	Cont.

Schedule Profile (R4 Exhibit)

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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				
Continue Sys Engr, Log, Antenna, Test and Evaluation, and PM Spt (ATCS)	[Redacted]																																			
A-Kit Dev, Integration, Sys Testing for AH-64D, CH-47F, UH-60M (ATCS)	[Redacted]																																			
Continue Dev/Integration of Open Sys Arch (IDM)	[Redacted]								[Redacted]																											
(1) JPALS Milestone B	[Redacted]								▲				[Redacted]																							
System Design and Development (JPALS)	[Redacted]								[Redacted]																											
Provide Sys Engr, Log, & Tech Spt (JPALS)	[Redacted]																																			

Schedule Detail (R4a Exhibit)

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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>
Continue Sys Engr, Log, Antenna, Test and Evaluation, and PM Spt (ATCS)	1Q - 4Q							
A-Kit Dev, Integration, Sys Testing for AH-64D, CH-47F, UH-60M (ATCS)	1Q - 4Q							
Continue Dev/Integration of Open Sys Arch (IDM)	2Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q				
JPALS Milestone B			2Q					
System Design and Development (JPALS)			2Q - 4Q	1Q - 4Q				
Provide Sys Engr, Log, & Tech Spt (JPALS)	1Q - 4Q							