

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2004

BUDGET ACTIVITY 5 - System Development and Demonstration		PE NUMBER AND TITLE 0604201A - AIRCRAFT AVIONICS					PROJECT C97			
COST (In Thousands)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost	
C97 ACFT AVIONICS	35971	47155	68857	59571	38651	54234	55684	0	449649	

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. Tasks in this PE support research efforts in the engineering and manufacturing development phases of these systems.

The Joint Tactical Radio System (JTRS) aircraft installation is the transformational system that will provide Army Aviation the required interoperability capability for Future Force and Joint Force operations. The JTRS is a DoD directed replacement for all legacy radio systems. The JTRS provides the foundation for achieving network centric warfare operations across the radio frequency spectrum providing digital information exchange for situational awareness, both vertically and horizontally, between Joint Warfighting elements, while enabling connectivity to civil and national authorities in support of Homeland Defense. The JTRS will provide an internal capability through an open systems architecture approach in compliance with the Joint Technical Architecture which improves system performance and provides a growth capability for technology insertion at a minimal cost and effort. These RDT&E funds are required to design, develop, integrate, and qualify (Air Worthiness Release) the aircraft installation kits (A Kits) to use the JTRS in Army rotary wing aircraft. The installed JTRS will provide the AH-64D, CH-47F, UH/HH-60M, and Special Operations Aircraft (SOA) with the critically needed interoperability capability to support the War fighter.

The Improved Data Modem (IDM) is the key link to joining Army Aviation with the digital battlefield and provides digital communication interoperability and flexibility on a fluid battlefield. Developed as an open system architecture, the IDM takes advantage of commercially available software and hardware solutions to enforce common communications protocols and the Joint Variable Message Format (JVMF). The IDM provides a flexible, software-driven digital messaging system interoperable with existing Battlefield Operating Systems and the Joint Forces. IDM improves Army Aviation's lethality and operational tempo through the exchange of fast and accurate data-burst communications through the Army's Fire Support and Tactical Internet (TI), providing seamless communications across the digital battlefield. These RDT&E funds are required to develop and integrate IDM hardware and software interfaces for the CH-47F and UH/HH-60M.

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 austere 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; also procures fixed base and tactical Local Differential Global Positioning System (LDGPS) ground stations. JPALS supports research efforts in the Architecture and Requirements Definition phase of the modified acquisition life cycle approved by the Defense Acquisition Executive in September of 1998.

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All of these systems support the Current-to-Future transition path of the Transformation Campaign Plan (TCP).

Beginning in FY05 funds from PE 0305114A (711) - JPALS have been combined with this PE.

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Complete effort to integrate IDM/FBCB2-Air software into the UH/HH-60M (IDM)	2685	0	0
Complete Program Management Support (IDM)	126	0	0
Complete Common Cockpit effort. (IDM)	215	0	0
Continue development of JTRS A-Kit and begin system testing for AH-64D, CH-47F, and UH-60M/Q (JTRS)	14761	32660	47587
Continue Systems Engineering and Logistics efforts (JTRS)	4908	5377	6900
Continue Program Management support for the JTRS A-Kit development (JTRS)	1368	2364	2301
Continue Integrated Communication, Navigation, and Identification Avionics (ICNIA) compliance to JTRS requirements (JTRS)	10500	1100	4000
Continue antenna effort (JTRS).	225	3215	3000
Continue Test and Evaluation Support(JTRS)	133	1068	3176
Develop Airborne Separation Video System (ASVS)	1050	0	0
Provide system engineering, logistics, programmatic, and technical documentation for JPALS development effort and execute joint Army/Navy/Air Force effort to develop a JPALS capable Embedded GPS Inertial (EGI) receiver. (JPALS)	0	0	1798
Program Management Support (JPALS)	0	0	95
Small Business Innovative Research/Small Business Technology Transfer Programs	0	1371	0
Totals	35971	47155	68857

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<u>B. Program Change Summary</u>	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2004)	39559	64650	44685
Current Budget (FY 2005 PB)	35971	47155	68857
Total Adjustments	-3588	-17495	24172
Congressional program reductions		-17448	
Congressional rescissions	-454		
Congressional increases	1050		
Reprogrammings	-3066	-47	
SBIR/STTR Transfer	-1118		
Adjustments to Budget Years			24172

Program Change Summary Explanation:
 FY05 funds for JPALS have been combined with this PE (\$1,903); and funds realigned for JTRS from procurement to RDTE(+\$22,269).

<u>C. Other Program Funding Summary</u>	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Compl	Total Cost
Aircraft Avionics SSN AA0700	90876	74052	49091	59381	124493	145269	136268	Continue	Continue
Joint Tactical Radio System SSN AA0702 (JTRS)	0	1892	0	0	0	0	0	0	1892
JTRS Ground Domain Integration PE 654805/615 (JTRS)	60659	202148	101770	61578	41322	14616	2674	0	575440
Army Data Distribution System (Data Radio) SSN BU1400 (JTRS)	72811	52384	35611	33954	1706	10234	2325	Continue	Continue

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C. Other Program Funding Summary (continued)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009		
JPALS RDTE (FY 04 & Prior) PE 030511A	934	945	0	0	0	0	0	0	1879

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

- 1)JTRS - Initial JTRS A-Kit hardware/software development, installation and integration will be procured via host platform vendor. Full production contracts may be competitively awarded dependent on schedule.
- 2)IDM - The nonrecurring engineering and software development to integrate the IDM/FBCB2-Air into the CH-47F and UH/HH-60M will be performed by Boeing/Rockwell and Sikorsky/Rockwell. The B-kits will be procured and installed during production.
- 3)JPALS- The JPALS acquisition strategy is to complete the current risk reduction and Technology Development (TD) Phase followed by the development of a JPALS LDGPS specification. Using this specification, a JPALS prototype LDGPS ground station will be tested in both benign and jamming environments prior to MS B in Dec 04. JPALS functionality will be integrated on a GPS card which will be inserted into the Army's existing avionics. JPALS integration will be synchronized with the integration of M Code into Army platforms in the FY 2010 timeframe.

ARMY RDT&E COST ANALYSIS(R3)

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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Development of IDM into CH47-F SIL (IDM)	MIPR	Aviation & Missile Command (AMCOM), Redstone Arsenal, AL	644	0		0		0		0	644	644
b . CH-47F wiring design (IDM)	MIPR	AMCOM, AL	1126	0		0		0		0	1126	1126
c . UH/HH-60M Integration of B-Kit (IDM)	MIPR	AMCOM,AL	5500	2685	1-4Q	0		0		0	8185	8185
d . Common Cockpit effort. (IDM)	MIPR	AMCOM, AL	0	215	3Q	0		0		0	215	215
e . CH-47F Test Plans, software development and B-Kit Integration in support of the IDM	MIPR	Various	12732	0		0		0		0	12732	12732
f . RAH-66 Software Development (IDM)	MIPR	Naval Research Lab, Wash, D.C.	2000	0		0		0		0	2000	2000
g . A-Kit AH-64D , CH-47F, and UH/HH-60M/Q R&D Contracts (JTRS) (Design Analysis & SDD)	CPFF	Boeing, AZ, PA, & CA;Rockwell/Collins, IA;Sikorsky, CT;ARINC, MD;ICI, VA	6056	14761	1-3Q	34031	1-3Q	47587	1-3Q	Continue	102435	Continue

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I. Product Development (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
h . Systems Engineering, Logistics Efforts (JTRS)	MIPR	Various	2850	4908	1-3Q	5377	1-3Q	6900	1-3Q	Continue	Continue	Continue
i . ATC Software Development (IDM)	MIPR	AMCOM, AL	319	0		0		0		0	319	319
j . Airborne Separation Video System (ASVS)	MIPR	Naval Air Warfare Center, Pax River, MD	0	1050		0	2Q	0		0	1050	1050
Subtotal:			31227	23619		39408		54487		Continue	Continue	Continue

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . ICNIA compliance to JTRS requirements (JTRS)	CPFF	TRW, California	2866	10500	1-3Q	1100	1-3Q	4000	1-3Q	2400	20866	20866
b . Integrated Digital Environment for JTRS	CPFF	ARINC, New Jersey	175	0		0		0		0	175	175
c . Antenna Effort (JTRS)	CPFF	JVYS, Alabama; Lear Siegler Services, Inc., Maryland	0	225	1-3Q	3215	1-3Q	3000	1-3Q	3662	10102	10102

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II. Support Cost (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
d . System engineering, logistics, and technical support(JPALS)	MIPR	Various	0	0		0		1798	1-3Q	Continue	Continue	Continue
Subtotal:			3041	10725		4315		8798		Continue	Continue	Continue

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Information Assurance (IA) Certification (IDM)	MIPR	AMCOM,CECOM	701	0		0		0		0	701	701
b . Test and Evaluation (JTRS)	MIPR	Various	0	133	4Q	1068	1-3Q	3176	1-3Q	Continue	Continue	Continue
Subtotal:			701	133		1068		3176		Continue	Continue	Continue

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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . PM Spt (Digitization)	MIPR	AMCOM, AL	215	0		0		0		0	215	215
b . PM Spt (IDM)	MIPR/In-house	AMCOM, AL/PM AME, AL	1119	126	1-4Q	0		0		0	1245	1245
c . PM Spt (JTRS)	MIPR/In-house	AMCOM, AL/PM AME, AL	815	1368	1-4Q	2364	1-4Q	2301	1-4Q	Continue	Continue	Continue
d . PM Spt (JPALS)	MIPR/In-house	AMCOM, AL/PM AME, AL	0	0		0		95	1-4Q	Continue	Continue	Continue
Subtotal:			2149	1494		2364		2396		Continue	Continue	Continue
Project Total Cost:			37118	35971		47155		68857		Continue	Continue	Continue

Schedule Profile (R4 Exhibit)

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Event Name	FY 02				FY 03				FY 04				FY 05				FY 06				FY 07				FY 08				FY 09			
	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
Complete integration of IDMw/FBCB2-AIR into the UH/HH-60M (IDM)	UH/HH-60M Integration																															
Complete Common Cockpit effort (IDM)					CC																											
Provide PM Admin Spt (IDM)	IDM PM Spt																															
Continue A kit dev, begin sys testing for AH-64D, CH-47F, and UH-60M (JTRS)	JTRS A kit Dev & Sys Test																															
Spiral development begins (JTRS)																									1st Evolutionary Spiral							
Continue Sys Engr, Log, and PM admin spt (JTRS)	JTRS Sys Engr, Log, and PM admin																															
Continue Airborne Separation Video Sys dev (JTRS)									ASVS																							
Continue ICNIA compliance w/JTRS SCA (JTRS)													ICNIA Compliance w/JTRS SCA																			
CECOM antenna effort (JTRS)													Ant																			
Continue Test & Evaluation Support (JTRS)													JTRS T&E Support																			
(1) JPALS MS B System Design and Development (JPALS)													1 JPALS MS B																			
Provide PM, sys engr, log, & tech spt (JPALS)																					JPALS PM, Sys Engr, Log, Tech Spt											

Schedule Detail (R4a Exhibit)

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<u>Schedule Detail</u>	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Complete effort to Integrate IDM/FBCB2-Air software into the UH/HH-60M (IDM)	1-4Q						
Complete Common Cockpit Effort (IDM)	3Q						
Develop JTRS A-Kit and begin system testing for AH-64D, CH-47F, and UH-60M/Q (JTRS)	1-4Q						
Continue System Engineering and Logistics Efforts (JTRS)	1-4Q						
Airborne Separation Video System (ASVS)		2-4Q					
Continue ICNIA Compliance to JTRS Requirements	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q		
Continue Antenna Effort (JTRS)	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q		
Continue Test and Evaluation Support (JTRS)	4Q	1-4Q	1-4Q	1-4Q	1-4Q		
Complete Program Management support for IDM (IDM)	1-4Q						
Continue Program Management support for the JTRS A-Kit development (JTRS)	1-4Q						
PM Support (JPALS)			1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Continue system engineering, logistics and technical support (JPALS)			1-4Q	1-4Q	1-4Q	1-4Q	1-4Q