

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

February 2002

<b>BUDGET ACTIVITY</b> <b>5 - Engineering and manufacturing development</b>		<b>PE NUMBER AND TITLE</b> <b>0604201A - AIRCRAFT AVIONICS</b>					<b>PROJECT</b> <b>C97</b>			
COST (In Thousands)		FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
C97	ACFT AVIONICS	40527	50838	40308	59535	31645	30893	6327	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. Tasks in this PE support research efforts in the engineering and manufacturing development phases of these systems. All of these systems support the Legacy-to-Objective transition path of the Transformation Campaign Plan.

The Army Airborne Command and Control System (A2C2S) is the Army's only airborne Command & Control (C2) system supporting corps, division and brigade commanders. This system is critical to enhance the Battle Command Group's ability to effectively perform combat unit operations and serve as a force multiplier in Army XXI. It provides the capability to access the tactical internet to manipulate, store, manage, and analyze situational awareness information, intelligence data, mission plans, and mission progress data to support the command and control decision making process. The A2C2S will provide situational awareness and command & control hosting Army Battle Command System (ABCS) such as Maneuver Control Systems (MCS), All Source Analysis System (ASAS), Advanced Field Artillery Tactical Data System (AFATDS), and Force XXI Battle Command Brigade and Below (FBCB2). The A2C2S provides communication capability that supports deep operations with non-line-of-sight communications such as High Frequency (HF) and Demand Assigned Multiple Access (DAMA), and Satellite Communications System Satellite Command (SATCOM). In addition, the system has the potential to improve the ability of state, local, and federal agencies to communicate and coordinate in a crisis environment such as hurricanes, forest fires, or terrorist incidents using weapons of mass destruction.

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 Tactical Radio System (JTRS) aircraft installation lays the foundation for achieving network connectivity across the radio frequency (RF) spectrum and provides the means for digital information exchanges, both vertically and horizontally, between joint warfighting elements, while enabling connectivity to civil and national authorities. The JTRS will provide affordable, high-capacity, tactical radios to meet the interoperability requirements with all DOD services. The JTRS will provide an internal capability through an open systems architecture approach in compliance with the joint technical architecture which improves system performance at minimal cost and effort. These RDT&E funds are required to design, develop, integrate, and qualify the aircraft installation kits (A Kits) to accommodate the JTRS in Army rotary wing aircraft.

**ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)****February 2002**

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

**5 - Engineering and manufacturing development****0604201A - AIRCRAFT AVIONICS****C97**

Installed A Kits and JTRS will provide the AH-64D, CH-47F, and UH/HH-60M the capability to transmit, receive, bridge and gateway between similar and diverse waveforms over multiple communications media & networks.

The Airborne Separation Video System(ASVS) will provide the AH-64D the capability to transmit and store digital video on the aircraft. ASVS will enhance battlefield awareness and give aircraft commanders the capability to perform a peacetime surveillance role.

**FY 2001 Accomplishments:**

- 3618 Continued System Development and Evaluation BLK I (A2C2S)
- 6535 Developed, Fabricated, & Deployed Prototype Systems 1&2, Initiate System 3 (A2C2S)
- 3843 Continued Systems Engineering, Logistics, and Software Integration (A2C2S)
- 212 ABCS System Engineering and Integration Efforts (A2C2S)
- 1087 Initiated Test Planning, Developmental Testing, and Prepare for DCX II (A2C2S)
- 434 Deployed System 1 to 4ID (A2C2S)
- 4600 Initiated effort to integrate IDM/EBC software into the UH/HH-60M (IDM)
- 10621 Continued CH-47F Test Plans, Software Development, and B-Kit Integration Support (IDM)
- 701 Initiated Information Assurance Efforts (IDM)
- 1000 Initiated software development for the RAH-66 (IDM)
- 891 Continued Program Management Support (IDM)
- 2045 Initiated design analysis of JTRS A-Kit integration efforts for AH-64D, CH-47F, and UH/HH-60M/ (JTRS)
- 2039 Initiated Systems Engineering and Logistics efforts (JTRS)
- 363 Initiated Program Management support (JTRS)
- 1000 Initiated Integrated Communications, Navigation, and Identification Avionics (ICNIA) compliance for JTRS requirements/architecture (JTRS)
- 175 Initiated IDE Development (JTRS)
- 1363 Initiated contractual effort to support AH-64D, CH-47F, and UH/HH-60M/ (JTRS)

Total 40527

**ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)****February 2002**

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

**5 - Engineering and manufacturing development****0604201A - AIRCRAFT AVIONICS****C97****FY 2002 Planned Program**

- 4332 Continue System Development and Evaluation BLK I (A2C2S)
- 12983 Initiate Integration of Prototype Systems 3 to 7 (A2C2S)
- 1778 Develop and Integrate Training Demonstrator System (A2C2S)
- 6421 Continue Systems Engineering, Logistics, and Software Integration (A2C2S)
- 1715 Initiate and Complete System Software Development (A2C2S)
- 280 ABCS System Engineering and Integration Efforts (A2C2S)
- 6336 Continue Developmental Testing, participate in DCX II, and prepare for LUT (A2C2S)
- 739 Continue Support for System 1 and Deploy System 2 (A2C2S)
- 2224 Continue effort to integrate IDM/EBC software into the CH-47F (IDM)
- 117 Continue Program Management Support (IDM)
- 6548 Complete design analysis and initiate design/development of JTRS A-Kit for the AH-64D, CH-47F, and UH/HH60-M (JTRS)
- 2803 Continue Systems Engineering and Logistics efforts (JTRS)
- 640 Continue program management support for the A-Kit development (JTRS)
- 2000 Continue ICNIA compliance to JTRS requirements/architecture (JTRS)
- 822 Continue contractual effort to support AH-64D, CH-47F, and UH/HH-60M (JTRS)
- 1100 Initiate software development for embedding PTAC for IDM and MDP into the AH-64D (ASVS)

Total 50838

**FY 2003 Planned Program**

- 1616 Continue effort to integrate IDM/EBC software into the CH-47F (IDM)
- 4328 Continue effort to integrate IDM/EBC software into the UH/HH-60M (IDM)
- 218 Continue Program Management Support (IDM)
- 23718 Continue development of JTRS A-Kit for AH-64D, CH-47F, and UH/HH-60M to include platform control software (JTRS)

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

February 2002

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

**5 - Engineering and manufacturing development**

**0604201A - AIRCRAFT AVIONICS**

**C97**

**FY 2003 Planned Program (Continued)**

- 3089 Continue Systems Engineering and Logistics efforts (JTRS)
- 1517 Continue Program Management support for the JTRS A-Kit development (JTRS)
- 5000 Continue ICNIA compliance to JTRS requirements/architecture (JTRS)
- 822 Continue contractual effort to support AH-64D, CH-47F, and UH/HH-60M (JTRS)

Total 40308

<b><u>B. Program Change Summary</u></b>	FY 2001	FY 2002	FY 2003
Previous President's Budget (FY2002/03 PB)	41893	57474	52666
Appropriated Value	42280	51274	0
Adjustments to Appropriated Value	0	0	0
a. Congressional General Reductions	0	-436	0
b. SBIR / STTR	-1245	0	0
c. Omnibus or Other Above Threshold Reductions	0	0	0
d. Below Threshold Reprogramming	-120	0	0
e. Rescissions	-388	0	0
Adjustments to Budget Years Since FY2002/03 PB	0	0	-12358
Current Budget Submit (FY 2003 PB)	40527	50838	40308

Beginning in FY03, funding in PE 64201 for A2C2S was transferred to PE 64818.

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

February 2002

BUDGET ACTIVITY <b>5 - Engineering and manufacturing development</b>	PE NUMBER AND TITLE <b>0604201A - AIRCRAFT AVIONICS</b>	PROJECT <b>C97</b>
---	--	-----------------------

<u>C. Other Program Funding Summary</u>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
Airborne Command and Control SSN AA0710 (A2C2S)	0	0	27738	42281	51816	55664	0	Continue	Continue
Airborne Command and Control PE 64818, Project C3A (A2C2S)	0	0	16002	6998	6127	4541	0	0	33668
Aircraft Avionics SSN AA0700 (IDM)	32750	42605	59368	35760	30029	29894	33242	Continue	Continue
Joint Tactical Radio System SSN AA0702 (JTRS)	0	0	0	1941	2155	21604	131329	Continue	Continue
JTRS Ground Domain Integration PE 64805/D615 (JTRS)	27447	93238	40651	61136	46335	28797	4882	0	302486
Army Data Distribution System (Data Radio) SSN BU1400 (JTRS)	80831	63839	74835	95270	117812	119562	120017	Continue	Continue

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

- 1)A2C2S - Two A2C2S Demonstrators are being integrated by the Government. A prime contract was awarded in 4th Qtr FY01 for Prototype Development and Evaluation.
- 2)IDM - The IDM/EBC nonrecurring engineering and software development will be performed by Rockwell/Boeing for CH-47F and by Sikorsky for UH/HH-60M. The B-kits will be procured and installed during CH-47F and UH/HH-60M production.
- 3)JTRS - Initial JTRS A-Kit hardware development, installation and integration will be procured via host platform vendor. It is planned that full production contracts will be competitively awarded.
- 4)ASVS - The software development will be performed by Photo-T, Boeing and ICI.

<u>E. Schedule Profile</u>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Deploy System 1 to 4ID (A2C2S)	3Q						
Deploy System 2 to 101st ABN (A2C2S)		1Q					
Continued Developmental Testing (A2C2S)	2-4Q	1-4Q					

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

February 2002

BUDGET ACTIVITY <b>5 - Engineering and manufacturing development</b>	PE NUMBER AND TITLE <b>0604201A - AIRCRAFT AVIONICS</b>	PROJECT <b>C97</b>
---	--	-----------------------

<b>E. Schedule Profile (continued)</b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
DCX II (A2C2S)		1Q					
Prepare for LUT (A2C2S)							
Initiate/Continue effort to Integrate IDM/EBC software into the UH/HH-60M (IDM)	2-4Q		1-2Q				
Continue CH-47F test plans, software development, and B-Kits Integration in support of IDM (IDM)	1-4Q	1-4Q	1-2Q				
Initiated RAH-66 Software Development (IDM)	3Q						
Initiate/Continue Program Management support for IDM (IDM)	1-4Q	1-4Q	1-4Q				
Initiated Information Assurance Certification effort for IDM (IDM)	4Q						
Received JTRS MDAP decision (JTRS)	4Q						
Initiate/continue design analysis of JTRS A-Kit for AH-64D, CH-47F, and UH/HH-60M (JTRS)	4Q	1-3Q					
Initiate/Continue development of JTRS A-Kit for AH-64D, CH-47F, and UH/HH-60M (JTRS)		3-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Initiated/Continue Systems Eng/Log Efforts for JTRS (JTRS)	1-4Q						
Initiated/Continue Prog Mgmt Support for JTRS A-Kit (JTRS)	1-4Q						
Initiate system level testing for AH-64D, CH-47F, UH/HH-60M (JTRS)				1-2Q	2Q	2Q	
Initiate/Continue ICNIA Efforts for JTRS (JTRS)	4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	
Initiated Integrated Digital Environment (IDE) for JTRS (JTRS)	2Q						
Initiated/Continue contractual effort to support AH-64D, CH-47F & UH/HH-60M (JTRS)	1-4Q						
Initiate software development (ASVS)		3-4Q					

## ARMY RDT&E COST ANALYSIS(R-3)

**February 2002**

**BUDGET ACTIVITY**  
**5 - Engineering and manufacturing development**

**PE NUMBER AND TITLE**  
**0604201A - AIRCRAFT AVIONICS**

**PROJECT**  
**C97**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . System Dev and Eval (BLK I )) (A2C2S)	Various	Various	43133	3618	1Q	4232	1Q	0		0	50983	0
b . Prototype and TDS Integration (Sys 1-7)) (A2C2S)	MIPR/CPIF	Army Aviation TD Ft. Eustis, VA/Raytheon, AL	7732	6535	1Q	13860	1Q	0		0	28127	0
c . Systems Engineering (A2C2S)	Various	Various	20387	1686	1Q	2997	1Q	0		0	25070	0
d . GFE (A2C2S)	MIPR	Naval Research Lab, Wash, D.C.	578	0		0		0		0	578	0
e . Integrated Development of IDM into CH47-F SIL (IDM)	MIPR	AMCOM, AL	644	0		0		0		0	644	0
f . Initiated development of CH-47F wiring design (IDM)	MIPR	AMCOM, AL	1126	0		0		0		0	1126	0
g . UH/HH-60M Integration of B-Kit (IDM)	MIPR	AMCOM,AL	0	4600	3Q	0		4328	2Q	0	8928	0
h . CH-47F Test Plans, software development and B-Kit Integration in support of the IDM	MIPR	Various	0	10621	1-2Q	2224	1-4Q	1616	1-2Q	0	14461	0

## ARMY RDT&E COST ANALYSIS(R-3)

**February 2002**

**BUDGET ACTIVITY**  
**5 - Engineering and manufacturing development**

**PE NUMBER AND TITLE**  
**0604201A - AIRCRAFT AVIONICS**

**PROJECT**  
**C97**

I. Product Development (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
i . RAH-66 Software Development (IDM)	MIPR	Naval Research Lab, Wash, D.C.	0	1000	3Q	0		0		0	1000	0
j . A-Kit AH-64D , CH-47F, and UH/HH-60M/Q R&D Contracts (JTRS) (Design Analysis & SDD)	CPFF	Boeing, Mesa, AZ, Boeing, Philadelphia, PA and Sikorsky, Stratford, CT	0	2045	4Q	6548	3-4Q	23718	1-4Q	Continue	32311	Continue
k . Systems Engineering, Logistics Efforts (JTRS)	MIPR	Various	0	2039	1-4Q	2803	1-4Q	3089	1-4Q	Continue	Continue	Continue
l . Contractual efforts to support platforms (JTRS)	MIPR	Various	0	1363	1-4Q	822	1-4Q	822	1-4Q	Continue	Continue	Continue
m . Initiate software development (ASVS)	CPFF	Boeing, Mesa, AZ Photo-T, San Antonio Tx , ICI, Mclean Va.	0	0		1100	3-4Q	0		0	1100	0
Subtotal:			73600	33507		34586		33573		Continue	Continue	Continue

## ARMY RDT&E COST ANALYSIS(R-3)

**February 2002**

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

**5 - Engineering and manufacturing development**

**0604201A - AIRCRAFT AVIONICS**

**C97**

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Software Integration (A2C2S)	CPFF	TBD	0	413	1Q	1432	1Q	0		0	1845	1030
b . Systems Logistics Support (ILS,NET,Tech) (A2C2S)	Various	Various	1219	573	1Q	1143	1Q	0		0	2935	0
c . System 1 & 2 Deployment to 4ID & 101st (A2C2S)	Various	Various	0	434	3Q	739		0		0	1173	0
d . ABCS System Eng & Int Efforts (A2C2S)	MIPR	Various	0	212	1Q	280	1Q	0		0	492	0
e . Software Development (A2C2S)	MIPR/CPIF	Naval Research Labs, Wash, D.C., Raytheon, AL	18209	0		1715	1Q	0		0	19924	0
f . Training Development (A2C2S)	CPFF, CPIF	CAS, AL, Raytheon, AL	90	0		70	1Q	0		0	160	0
g . Configuration Management/Technical Data (A2C2S)	MIPR/CPIF	Naval Research Lab Wash, D.C.,Raytheon, AL	1449	0		444	1Q	0		0	1893	0
h . Technical Data (A2C2S)	CPFF/SS, CPIF	Dynamics Research Corp, Andover, MA, NRL, Wash D.C., Raytheon, AL	772	0		47	1Q	0		0	819	0
i . ICNIA compliance to JTRS requirements (JTRS)	MIPR	TRW, CA	0	1000	1-4Q	2000	1-4Q	5000	1-4Q	Continue	Continue	Continue

## ARMY RDT&E COST ANALYSIS(R-3)

**February 2002**

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

**5 - Engineering and manufacturing development**

**0604201A - AIRCRAFT AVIONICS**

**C97**

II. Support Cost (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
j . Integrated Digital Environment for JTRS	CPFF	ARINC, NJ	0	175	2Q	0		0		0	175	0
Subtotal:			21739	2807		7870		5000		Continue	Continue	Continue

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Developmental Test & Evaluation (A2C2S)	MIPR/CPIF	ATEC/RTTC/AATD/ AED/Raytheon, AL	0	1087	1Q	6336	1Q	0		0	7423	0
b . Operational Test & Evaluation (A2C2S)	MIPR	TEXCOM FT. Hood, TX	250	0		0		0		0	250	0
c . IA Certification (IDM)	MIPR	AMCOM,CECOM	0	701	4Q	0		0		0	701	0
Subtotal:			250	1788		6336		0		0	8374	0

## ARMY RDT&E COST ANALYSIS(R-3)

**February 2002**

**BUDGET ACTIVITY**  
**5 - Engineering and manufacturing development**

**PE NUMBER AND TITLE**  
**0604201A - AIRCRAFT AVIONICS**

**PROJECT**  
**C97**

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Program Management Operations (A2C2S)	Various	Various	5503	1171	1Q	1289	1Q	0		0	7963	0
b . Government Engineering Support (A2C2S)	MIPR	AMCOM, AL	742	0		0		0		0	742	0
c . PM Spt (Digitization)	CPFF/C MIPR	AMCOM PATS, AL	215	0		0		0		0	215	0
d . PM Spt (IDM)	MIPR	AMCOM, AL	96	891	1-4Q	117	1-4Q	218	1-4Q	Continue	Continue	Continue
e . PM Spt (JTRS)	MIPR	AMCOM, AL	0	363	1-4Q	640	1-4Q	1517	1-4Q	Continue	Continue	Continue
Subtotal:			6556	2425		2046		1735		Continue	Continue	Continue
Project Total Cost:			102145	40527		50838		40308		Continue	Continue	Continue