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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604201A Aircraft Avionics	PROJECT DC97
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COST (<i>In Thousands</i>)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
DC97 Aircraft Avionics	32504	14780	6372	2990	9254	9247	8941	32810	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. The Army Airborne Command and Control System (A2C2S) functions as a highly mobile command post. When mounted in the UH-60 helicopter with auxiliary equipment, it provides tactical voice, data, and imagery digitized battlefield communications both in secure and nonsecure modes for corps, division, and brigade commanders. The system provides battle commanders access to critical situational awareness and off-board national asset intelligence information via satellite communications. It also provides digitized battlefield communications links with Army combined arms team members, joint service and combined force elements, and intercommunications facilities for up to five operators, and joint interoperability as well as maritime and air traffic control communications. The A2C2S is in response to real world needs of combat maneuver commanders to perform highly mobile and responsive digital, voice, and imagery command and control (C2) functions in the UH-60 helicopter. The A2C2S system will enable the commander and staff to remain highly mobile with the capability to interject critical C2 across the designated battle area without sacrificing access to information products or jeopardizing continuity of operations due to command post relocation. Interoperability is enhanced with this system by providing the capability to communicate digitally with Navy or Air Force close air support as well as relaying target information. The A2C2S is used to provide C2 for disaster relief, peacekeeping, drug interdiction, and both low and high intensity conflict missions. The A2C2S will play a major role in eliminating costly fratricide incidents via the capability to closely monitor and control operations. Satellite communications provide access to tactical communication systems and enable communication with the force and command structure from Joint Chiefs of Staff (JCS) down to battalion when required. RDTE funds are also required to develop Improved Data Modem (IDM) hardware and software interfaces for the Improved Cargo Helicopter to incorporate Embedded Battle Command (EBC) software for processing Joint Variable Message Formatting (JVMF) messages that will allow for battlefield interoperability. The Improved Data Modem (IDM) program provides Aviation assets with a flexible, software-driven digital messaging capability that facilitates Aviation interoperability with existing Combined Arms teams and the US Air Force. This capability provides digital interoperability with emerging Tactical Internet and joint information exchange models. RDTE is required to develop a common, multi-function, upgradeable software driven communication module that integrates or replaces existing discrete information exchange and information processing applications or devices. This open architecture design yields a multifaceted, highly reliable product that will reduce avionics space, weight and power requirements, resulting in lower overall life-cycle costs.

FY 1998 Accomplishments:

- 3600 Accelerated development of enhanced communications terminal, workstation consoles and other A2C2S prime mission equipment
- 1200 Accelerated development of A2C2S Antenna Interface Module (AIM)
- 1300 Accelerated development of A2C2S Workstation Software
- 2598 Accelerated test and integration procedures for A2C2S Engineering Development Model (EDM)
- 1600 Accelerated system engineering, logistics, and technical documentation for A2C2S
- 13705 Continued development of enhanced communications terminal, workstation consoles and other A2C2S prime mission equipment
- 2600 Completed development of A2C2S Antenna Interface Module (AIM)

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FY 1998 Accomplishments: (continued)		
•	3538	Continued development of A2C2S Workstation Software
•	663	Continued test and integration procedures for A2C2S Engineering Development Model (EDM)
•	550	Continued system engineering, logistics, and technical documentation for A2C2S
•	1150	Continued program management support for the A2C2S
Total	32504	
FY 1999 Planned Program:		
•	5030	Continue development of enhanced communications terminal, workstation consoles and other A2C2S prime mission equipment
•	1103	Continue development of A2C2S Workstation Software
•	4002	Continue test and integration procedures for A2C2S Engineering Development Model (EDM)
•	2630	Continue system engineering, logistics, and technical documentation for A2C2S
•	305	Continue program management support for the A2C2S development
•	309	Initiate IDM interface nonrecurring engineering to incorporate EBC for processing of JVMF messages into the Improved Cargo Helicopter (ICH)
•	1010	Initiate IDM/ICH platform interface software development
•	391	Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) programs.
Total	14780	
FY 2000 Planned Program:		
•	1818	Continue development of enhanced communications terminal, workstation consoles and other A2C2S prime mission equipment
•	370	Continue development of A2C2S Workstation Software
•	1218	Continue test and integration procedures for A2C2S Engineering Development Model (EDM)
•	675	Continue system engineering, logistics, and technical documentation for A2C2S
•	345	Continue program management support for the A2C2S development
•	500	Complete IDM interface nonrecurring engineering for ICH
•	500	Continue IDM/ICH platform interface software development
•	946	Initiate system level and interoperability testing for ICH with EBC
Total	6372	
FY 2001 Planned Program:		
•	751	Complete IDM/platform interface software development
•	1174	Complete testing of EBC in the ICH
•	1065	Initiate development of common digitization communication module
Total	2990	
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	31660	7878	1828	2800
Appropriated Value	32669	14878		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1009	-98		
b. SBIR / STTR	-794			
c. Omnibus or Other Above Threshold Reductions	-262			
d. Below Threshold Reprogramming	+1900			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+4544	+190
Current Budget Submit (FY 2000 / 2001 PB)	32504	14780	6372	2990

Change Summary Explanation. Funding – The FY 98 reprogramming of \$1.9M was required to initiate development of software changes in accordance with requirements of the First Digitized Division (FDD).
 The FY 00 increase of \$4.5M was reprogrammed from APA for the engineering and manufacturing development changes to A2C2S components and software required to maintain interoperability with First Digitized Division.

C. Other Program Funding Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
Aircraft Procurement, Army (APA):									<u>Compl</u>	<u>Cost</u>
Airborne Command and Control Console AA0710 BLIN 901029	0	0	0	17252	35464	77247	78331	65539	Continue	Continue
Aircraft Avionics SSN AA0700, BLIN 901021	41697	56173	43690	43336	71248	56307	71020	53769	Continue	Continue

D. Acquisition Strategy: This project is comprised of multiple systems. The A2C2S is being developed by the Naval Research Laboratory (NRL). The initial limited production will be accomplished by the developer. The follow on full production contract will be competitively awarded starting in FY 01. The A kits and B kits will be installed by depot level contractors. Rockwell/Boeing will perform the nonrecurring engineering and software development required to incorporate the IDM EBC functionality into the ICH. This development will be completed in FY 01. The B kits will be procured and installed during ICH production.

E. Schedule Profile	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Continue/Complete Design and Development of A2C2S Workstation Consoles	4Qtr	4Qtr	4Qtr	4Qtr	4Qtr					
Continue/Complete Technical Documentation - A2C2S Test and Integration Procedures	4Qtr	4Qtr	4Qtr	4Qtr	4Qtr					

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E. Schedule Profile	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Continue/Complete Development of A2C2S Antenna Interface Module (AIM)	4Qtr	4Qtr	4Qtr							
Continue/Complete A2C2S Systems Engineering, Logistics Processes	4Qtr	4Qtr	4Qtr	4Qtr	4Qtr					
Continue/Complete Development of Enhanced Communications terminal, Work Station Consoles and other Prime Mission Equipment	4Qtr	4Qtr	4Qtr	4Qtr	4Qtr					
Continue/Complete Development of A2C2S Workstation Software	4Qtr	4Qtr	4Qtr	4Qtr	4Qtr					
Initiate IDM interface nonrecurring engineering to incorporate EBC				4Qtr						
Initiate IDM/ICH platform interface software development				4Qtr						
Complete IDM interface nonrecurring engineering for ICH					4Qtr					
Initiate system level and interoperability testing for ICH with EBC					4Qtr					
Continue IDM/ICH platform interface software development					4Qtr					
Complete IDM/platform interface software development						4Qtr				
Complete testing of EBC in the ICH						4Qtr				
Initiate development of common digitization communication module						4Qtr				

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	MIPR	Naval Research Lab Washington, DC	30148	6790	Oct 98	2090	Oct 99	384	Oct 00		39412	Cont
Ancillary Hardware Development	MIPR	Army Aviation Tech Dir. Ft. Eutis, VA	6591	400	Jan 99						6991	6591
Systems Engineering	MIPR	Naval Research Lab Washington, DC	16871	2325	Oct 98/ Jan 99	440	Oct 99				19636	19636
GFE	MIPR	Naval Research Lab Washington, DC	578								578	578
Subtotal Product Development:			54188	9515		2530		384			66617	

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Software Development	MIPR	Naval Research Lab Washington, DC Boeing, Philadelphia	14402	1807	Oct 98	370	Oct 99	266	Oct 00		16845	16845
Software Development	CPFF/SS	Naval Research Lab Washington, DC Boeing, Philadelphia		1369	Jul 99	1946	Aug 00	1925	Jul 01		5240	5240
Training Development	CPFF/C/	CAS, Huntsville, AL	90								90	90
Integrated Logistics Support	MIPR	1 Naval Research Lab Washington, DC 2 AMCOM, AL 3 ARL	1041	196	Jan 99	135	Oct 99				1372	1372
Configuration Management	MIPR	Naval Research Lab Washington, DC	1449								1449	1449
Technical Data	CPFF/SS	Dynamics Research Corp, Andover, MA Naval Research Lab Washington, DC	253								253	253

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II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Technical Data	MIPR	Dynamics Research Corp, Andover, MA Naval Research Lab Washington, DC		750	Jan 99	100	Oct 99				850	850
Subtotal Support Costs:			17235	4122		2551		2191			26099	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	MIPR	TECOM FT. Huachuca, AZ	351	350	Jan 99	350	Oct 99				1051	1051
Operational Test & Evaluation	MIPR	TEXCOM FT. Hood, TX	250	0		148	Oct 99	415	Oct 00		813	813
Subtotal Test and Evaluation:			601	350		498		415			1864	
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	MIPR	AMCOM, AL	402	358	Jan 99	358	Oct 99				1118	1118
Program Management Support	CPFF/C MIPR	AMCOM PATS, MATRIX , AL	4095	345	Jan 99	345	Oct 99				4785	4785
Travel	Allot	AMCOM, AL	240	90		90					420	420
Overhead	MIPR	Naval Research Lab Washington, DC AMCOM, AL	655								655	655
Subtotal Management Services:			5392	793		793					6978	
Project Total Cost:			77416	14780		6372		2990			101558	