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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604201A Aircraft Avionics				PROJECT DC97		
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost	
DC97 Aircraft Avionics	15027	6324	42280	33411	36349	25538	9859	Continuing	Continuing	
<p><b>A. Mission Description and Budget Item Justification:</b> 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.</p> <p>The Army Airborne Command and Control System (A2C2S) is the Army's <u>only</u> airborne C2 system supporting corps, division, &amp; 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 &amp; control hosting Army Battle Command System (ABCS) systems such as Maneuver Control System (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 communications capability that supports deep operations and Stability Augmentation and Support Operations (SASO) with non-line-of site communications such as High Frequency (HF) and Demand Assigned Multiple Access (DAMA) Satellite Communications System Satellite Command (SATCOM). In addition, the system provides digitized battlefield communication links with joint service interoperability and enhanced fire control management with artillery, Longbow Apache, Comanche, and Joint Surveillance Target Attack Radar System (J-STARS).</p> <p>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). 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&amp;E funds are required to develop and integrate IDM hardware and software interfaces for the CH-47F, embodying the Embedded Battlefield Command (EBC) software. The IDM provides a flexible, software-driven digital messaging system interoperable with existing Battlefield Operating Systems and the Joint Forces.</p> <p>This PE also provides funds to design, develop, integrate, and install Army Aviation Joint Tactical Radio System (JTRS) A-Kits for the AH-64D, SOA, CH-47F, and UH-60Q/L+ aircraft platforms. The JTRS will provide affordable, high-capacity, tactical radios to meet interoperability requirements with all DOD services. The JTRS will provide an internal growth capability through an open systems architecture approach in compliance with the joint technical architecture which improves system performance at minimal cost and effort. The JTRS will provide the much needed wideband waveform capability to facilitate full tactical internet (TI) connectivity. In addition, it will decrease the size, weight, and power requirements associated with discrete legacy radios which already exceed the capability of current aircraft architectures. RDT&amp;E funding is required for systems engineering to develop the system specification and interface control documents for aviation domain JTRS.</p>										
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604201A Aircraft Avionics</b>	PROJECT <b>DC97</b>
<b>FY 1999 Accomplishments:</b>		
<ul style="list-style-type: none"> <li>• A2C2S</li> <li>• 4607 Continued significant development efforts of A2C2S Communications Subsystem</li> <li>• 3054 Continued significant development of A2C2S Maneuver Commander's Environment</li> <li>• 4708 Continued A2C2S Prototype Fabrication and Platform Integration</li> <li>• 2296 Continued System Engineering and Logistics for A2C2S</li> <li>• 147 Continued Program Management Support for the A2C2S Development</li> <li>• 215 Initiated/completed Digitization Efforts for Aviation Interface Requirements</li> </ul>		
Total	15027	
<b>FY 2000 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• A2C2S</li> <li>• 2080 Continue Limited Development of A2C2S Communications Subsystem</li> <li>• 1168 Continue Limited A2C2S Prototype Fabrication and Platform Integration</li> <li>• 818 Continue Limited System Engineering and Logistics for A2C2S</li> <li>• 221 Continue Program Management Support for the A2C2S Development</li> <li>• IDM</li> <li>• 644 Initiate Development of CH-47F Systems Integration Lab in Support of IDM Integration</li> <li>• 1126 Initiate Development of CH-47F Detail Design Data for Wiring in Support of IDM Integration</li> <li>• 96 Initiate Program Management Support for the IDM-CH-47F Integration Effort</li> <li>• 171 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)</li> </ul>		
Total	6324	
<b>FY 2001 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• A2C2S</li> <li>• 5675 Continue Development of A2C2S Communications Subsystem</li> <li>• 889 Continue Development of A2C2S Maneuver Commander's Environment</li> <li>• 3169 Continue A2C2S Prototype Fabrication and Platform Integration</li> <li>• 5806 Continue System Engineering, Logistics, and Initiate Test Planning for A2C2S</li> <li>• 823 Continue Program Management Support for the A2C2S Development</li> <li>• IDM</li> <li>• 4609 Continue Integration and Coding of CH-47F Interface Software in Support of IDM</li> <li>• 2188 Continue CH-47F Test Plans in Support of IDM Integration</li> </ul>		
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**FY 2001 Planned Program: (continued)**

- 348 Continue Program Management Support for the IDM-CH-47F Integration Effort
  - JTRS
  - 4500 Initiate development of JTRS A-Kit for AH-64D
  - 4250 Initiate current technology transfer
  - 4000 Initiate development of JTRS A-Kit for UH-60Q/L+
  - 5078 Initiate and conduct systems engineering supporting JTRS A-Kit development
  - 945 Initiate program management support for JTRS A-Kit development
- Total 42280

<b>B. Program Change Summary</b>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget ( FY 2000/2001 PB)	14780	6372	2990
Appropriated Value	14878	6372	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-98		
b. SBIR / STTR	-391		
c. Omnibus or Other Above Threshold Reductions		-26	
d. Below Threshold Reprogramming	+696		
e. Rescissions	-58	-22	
Adjustments to Budget Years Since <u>FY 2000/2001</u> PB			+39290
Current Budget Submit ( <u>FY 2001</u> PB)	15027	6324	42280

Change Summary Explanation: Funding – FY 2001: Due to Army decision to defer development funding and unplanned changes in digitization initiatives, the Army increased the A2C2S program in FY 2001 by 16452. These funds will be used for the continuation of prototype hardware and software development, integration, and tests.

The IDM program received an FY 2001 increase of 4200 for platform interface software development for processing, displaying, and testing the Joint Variable Message Format messages in the CH-47F.

The FY 2001 addition of 18900 in the JTRS program was a DA plus-up to initiate design and development of the JTRS aircraft A-kits.

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<b>C. Other Program Funding Summary</b>	<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>	To <u>Compl</u>	Total <u>Cost</u>
Aircraft Procurement, Army (APA):									
Airborne Command and Control SSN AA0710 BLIN 901029 (A2C2S portion)	0	0	0	25932	53232	49276	58056	Continue	Continue
Joint Tactical Radio System (JTRS) SSN AA0702						1938	966	Continue	Continue
Aircraft Avionics SSN AA0700, BLIN 901021 (IDM portion)	27592	16452	32494	42647	53740	35711	46882	Continue	Continue

**D. Acquisition Strategy:** This project is comprised of multiple systems: The A2C2S is being developed by the Naval Research Laboratory (NRL). The full production contract will be competitively awarded. The IDM EBC nonrecurring engineering and software development for CH-47F will be performed by Rockwell/Boeing. The B kits will be procured and installed during CH-47F production. JTRS A-Kit hardware, installation, and integration support will be procured from host platform vendor or competitive contractors.

<b>E. Schedule Profile</b>	<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 Development of A2C2S Communications Subsystem	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr			
Continue/Complete Development of A2C2S Maneuver Commander's Environment	1-4Qtr		1-4Qtr	1-4Qtr			
Continue/Complete Development of A2C2S Antenna Interface Module (AIM)							
Continue/Complete A2C2S Prototype Fabrication and Platform Integration	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr			
Continue/Complete Engineering and Test Planning for A2C2S	1-4Qtr		1-4Qtr	1-4Qtr			
Initiate Digitization Efforts for Aviation Interface Requirements	3-4Qtr						
Initiate development of CH-47F Systems Integration Lab in support of IDM integration		1-4Qtr					
Initiate development of CH-47F detail design data for wiring in support of IDM integration		1-4Qtr					
Initiate integration and coding of CH-47F interface software in support of IDM			1-4Qtr				
Initiate CH-47F test plans in support of IDM integration			1-4Qtr				

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<b>E. Schedule Profile</b>	<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>
Initiate development of JTRS A-Kit			1-4 Qtr	1-4 Qtr	1-4 Qtr	1-4 Qtr	
Initiate and conduct JTRS A-Kit systems engineering			1-4 Qtr				
Continue/Complete development of JTRS A-Kit			1-4 Qtr	1-4 Qtr	1-4 Qtr	1-4 Qtr	

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<b>ARMY RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2000</b>
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<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>DC97</b>
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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 System Development (A2C2S)	MIPR	Naval Research Lab Washington, DC	30148	8030	Oct 98	2566	Nov 99- Jan 00	5204	Oct 00	300	46248	46248
Ancillary/Integration Kits Development (A2C2S)	MIPR	Army Aviation Tech Dir. Ft. Eutis, VA	6591	756	Jan-Apr 99	385	Nov 99 - Jan 00	605	Oct 00	555	8892	8892
Systems Engineering (A2C2S)	MIPR	Naval Research Lab Washington, DC	16788	2270	Oct 98- Jan 99	300	Nov 99 - Jan 00	2446	Oct 00	5012	26816	26816
Systems Engineering (A2C2S)	CPFF/C	AMCOM PATS/UH-Blackhawk Spt, AL	83	202	May 99	365	Jun 00- Sept 00	500	Oct 00 - Jun 00		1150	1150
GFE (A2C2S)	MIPR	Naval Research Lab Washington, DC	578								578	578
Primary A-Kit Hardware Development (JTRS)	MIPR	AMCOM, AL						12798	Oct 00	36105	48903	48903
A-Kit Prototype Manufacturing (JTRS)	MIPR	AMCOM, AL								3864	3864	3864
Systems Engineering (JTRS)	MIPR	AMCOM, AL						5030	Oct 00	3000	8030	8030
SBIR/STTR						171					171	
Subtotal Product Development:			54188	11258		3787		26583		48836	144652	144481

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 (A2C2S)	MIPR	Naval Research Lab Washington, DC	14402	2400	Oct 98	297	Nov 99 - Jan 00	3447	Oct 00	53	20599	20599
Training Development (A2C2S)	CPFF/C/	CAS, Huntsville, AL	90								90	90
Integrated Logistics Support (A2C2S)	MIPR	Naval Research Lab Washington, DC AMCOM, AL ARL, MD	889	178	Jan-Apr 99	41	Dec 99- Apr 00	2117	Oct 00	370	3595	3595

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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
Systems Engineering (A2C2S)	MIPR	SSEB, Prod Planing Army Aviation Tech Dir. Ft. Eutis, VA						300	Oct 00	700	1000	1000
Configuration Management/ Technical Data (A2C2S)	MIPR	Naval Research Lab Washington, DC	1449					270	Oct 00		1719	1719
System Logistics Support (A2C2S)	CPFF/C MIPR	AMCOM, AL	152			97	Jan 00				249	249
Technical Data (A2C2S)	CPFF/SS	Dynamics Research Corp, Andover, MA NRL, Washington DC	253	519	Oct 98						772	772
Software Integration & Testing (IDM)	CPFF/SS	Boeing, Philadelphia				1770	Mar 00	6797	Feb 01		8567	8567
Training Development (JTRS)	CPFF/C	AMCOM, AL								3081	3081	3081
Technical Data (JTRS)	CPFF/SS	AMCOM, AL								5892	5892	5892
Subtotal Support Costs:			17235	3097		2205		12931		10096	45564	45564
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 (A2C2S)	MIPR	TECOM FT. Huachuca, AZ	351			5	Jun 00	500	Oct 00	340	1196	1196
Operational Test & Evaluation (A2C2S)	MIPR	TEXCOM FT. Hood, TX	250							1300	1550	1550
Developmental Test & Evaluation (JTRS)	MIPR	TECOM								9149	9149	9149
Support Equipment (JTRS)	MIPR	TECOM								3600	3600	3600
Subtotal Test and Evaluation:			601			5		500		14389	15495	
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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 (A2C2S)	MIPR	AMCOM, AL	402	240	Feb-Apr 99	10	Jan 00	150	Oct 00	65	867	867
Program Management Support (A2C2S)	CPFF/C MIPR	AMCOM PATS, MATRIX, AL	4095	147	Jan-Jul 99	221	Jan 00	823	Oct 00	460	5746	5746
Travel (A2C2S)	Allot	AMCOM, AL	240	70							310	310
Overhead (A2C2S)	MIPR	Naval Research Lab Washington, DC AMCOM, AL	655								655	655
Program Management Support (Digitization)	CPFF/C MIPR	AMCOM PATS, AL		215	Jun 99						215	215
Program Management Support (IDM)	MIPR	AMCOM, AL				96	Jan 00	348	Jan 01		444	444
Program Management Support (JTRS)	CPFF/C MIPR	AMCOM PATS, MATRIX, AL						945	Oct 00	3433	4378	4378
Subtotal Management Services:			5392	672		327		2266		3958	12615	
Project Total Cost:			77416	15027		6324		42280		77279	218326	