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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**

	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
	Total Program Element (PE) Cost	97654	145169	201566	132729	111275	82227	8947	Continuing	Continuing
028	GUARDRAIL COMMON SENS/AERIAL COMMON SENS (TIARA)	13162	14531	49748	78305	87806	74501	8947	Continuing	Continuing
179	CH-47D PRODUCT IMPRV	0	503	3101	0	0	0	0	0	3604
430	IMPR CARGO HELICOPTER	38711	18449	3482	0	0	0	0	0	111607
504	BLACK HAWK RECAPITALIZATION/MODERNIZATION	28760	71837	99061	54424	23469	7726	0	0	294824
508	APACHE 2ND GENERATION FLIR	17021	39849	46174	0	0	0	0	40000	174852

A. Mission Description and Budget Item Justification: This PE provides for development of modifications and improvements for the Guardrail Common Sensor/Aerial Common Sensor, the Improved Cargo Helicopter (ICH), the UH-60A/L Black Hawk Recapitalization/Modernization, and the Apache 2nd Generation Forward Looking Infrared(FLIR).

B. Program Change Summary	FY 2001	FY 2002	FY 2003
Previous President's Budget (FY2002 PB)	106831	143631	95678
Appropriated Value	107829	146431	0
Adjustments to Appropriated Value	0	0	0
a. Congressional General Reductions	0	-1262	0
b. SBIR / STTR	-1176	0	0
c. Omnibus or Other Above Threshold Reductions	-9613	0	0
d. Below Threshold Reprogramming	1603	0	0
e. Rescissions	-989	0	0
Adjustments to Budget Years Since FY2002 PB	0	0	105888
Current Budget Submit (FY 2003 PB)	97654	145169	201566

FY03 Breakdown of 105,888 increase is as follows:
028 increase 1044 supports Guardrail Common Sensor/Aerial Common Sensor
179 increase 3101 Supports CH-47 Product Improvement.
430 increase 3385 Supports CH-47, Improved Cargo Helicopter.
504 increase 60667 Supports UH-60M upgrade program
508 increase 37691 Supports Apache Second Generation FLIR Development

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**028**

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
028	GUARDRAIL COMMON SENS/AERIAL COMMON SENS (TIARA)	13162	14531	49748	78305	87806	74501	8947	Continuing	Continuing

A. Mission Description and Budget Item Justification: The Aerial Common Sensor (ACS) and the Guardrail Common Sensor (GRCS) are airborne intelligence collection systems required to provide critical support to U.S.-based early entry, forward deployed forces, and to support the Army's seamless intelligence architecture. ACS is the objective force system that will satisfy the Army's critical need for a responsive worldwide, self-deployable, airborne reconnaissance, intelligence, surveillance and target acquisition (RISTA) capability that can immediately begin operations when arriving in theatre. The ACS will merge the current Airborne Reconnaissance Low (ARL) and Guardrail Common Sensor (GRCS) capabilities into a single airborne system capable of providing a rapid response information dominance capability dedicated to the Land Component Commander's need for precision real-time geolocation of the enemy on the objective force battlefield. ACS will be composed of a family of modular sensors mounted on an airborne platform that is capable of operating independently or remotely via SATCOM or line-of-sight datalinks from a ground processor. ACS will be Joint Airborne SIGINT Architecture (JASA)and Unified Cryptologic Architecture (UCA) compliant and be interoperable within the open Network centric C4ISR architecture in order to support all combat and combat support functions through the emerging DOD "global infosphere". The primary mission will be standoff Signals Intelligence (SIGINT) collection, with a secondary mission of overflight Imagery Intelligence (IMINT). ACS ground functionality will be an element of the Distributed Common Ground Station-ARMY(DCGS-A). ACS is primarily targeted against threat maneuver forces, logistic areas, rocket and artillery forces, air defense artillery, and command control communications and intelligence nodes (C3I). ACS will satisfy unique Army/Land Force Commander Intelligence, Surveillance and Reconnaissance (ISR) and targeting requirements, and those of the Land Force Component of Joint and Combined Task Forces (JTF and CTF) across the spectrum of Operations.

This project is assessing Horizontal Technology Integration (HTI) candidates. A key consideration is the affordability of these subsystems. The National Security Agency's Defense Cryptologic Program (DCP) provides funding to support enhanced SIGINT capabilities.

FY02 funding completes the Concept Exploration (CE) Phase that identifies airborne platform recommendations which best support the multi-mission role of ACS, sensor recommendations, cost performance analysis, performance specifications and development of modeling and simulations tools for evaluating performance and proposals. Funding also supports the decision review and entrance into the Component Advanced Development (CAD) Phase leading to a MS B decision in FY03. Efforts to maintain currency of the GRCS fielded systems with the modifications of current systems software and hardware baseline to handle new signals of interest are also supported. FY03 funding will be used to continue development and risk reduction efforts including Prime Mission Equipment (PME) advanced development and integration efforts. Funding continues CAD Phase, supports Milestone B, and supports entry into System Development and Demonstration (SDD) Phase. FY03 funding supports a Total Ownership Cost Reduction (TOCR) initiative to replace the current GRCS Airborne Data Links with the commercial based Tactical Airborne Data Link. FY03 funding also completes the development of Interface Control Documents (ICD)s and software modifications to allow GRCS systems to collect and exploit new, "non-traditional" signals. ACS supports the Objective transition path of the Transformation Campaign Plan.

FY 2001 Accomplishments:

- 3210 Continued initial phase of ACS concept exploration agreements.
- 3594 Completed initial operational performance and evaluation models for ACS.
- 2695 Awarded contract(s) for Guardrail Common Sensor (GRCS) fielded systems enhancements; upgrade data transport systems and modify system software to incorporate additional signals of interest. Developed implementation plan with an Interface Control Document (ICD) for system upgrades.
- 2000 Provided Tactical Information Broadcast Service (TIBS) capability in GRCS System 2.
- 1663 Modeling and Program Office support.

Total 13162

FY 2002 Planned Program

- 2400 Concept Exploration (CE) agreements/Component Advanced Development (CAD) bridge contract to support Milestone process.
- 360 Component Advanced Development (CAD) performance specification analysis and source selection.
- 8357 ACS CAD contract award(s) will transition virtual system concept and vet it into a system architecture and relevant integration environment.
- 1000 Complete the prototype efforts required to validate Data Transport Systems performance capabilities.
- 2414 Modeling, Program office, and Decision Review support for entry into CAD.

Total 14531

FY 2003 Planned Program

- 43899 Complete ACS CAD contract(s) and support MS B process.
- 420 System Integration (SI) Phase performance specification analysis and source selection.
- 1650 Continue contract(s) for fielded systems enhancements including efforts to productize Defense Cryptologic Program Technologies for GRCS.
- 1042 Develop an Airborne Tactical Common Data Link (TCDL) for GRCS under a Total Ownership Cost Reduction (TOCR) initiative.
- 2737 Program office and Milestone B Decision support for entry into System Integration (SI) of SDD Phase.

Total 49748

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**028**

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
Defense Cryptologic Program (DCP)	12304	22385	25590	24205	23055	21683	23735	Continuing	Continuing
Joint Airborne SIGINT family (from ASC/RAJ)	3250	0	0	0	0	0	0	0	4250
0305206/DK98 Tactical Reconnaissance	0	4903	4882	4832	5182	5473	5561	Continuing	Continuing
A02005 Aerial Common Sensor- Aircraft Procurement, Army	0	0	0	0	0	0	89289	Continuing	Continuing

FY02-FY07 DCP provides funding for the development of ACS technologies and technologies needed to maintain relevancy of GRCS and other legacy systems. Tactical Reconnaissance funds MASINT/IMINT technologies that will be integrated into ACS during SDD Phase.

C. Acquisition Strategy: The Aerial Common Sensor Concept Exploration Agreements were awarded on a competitive basis using Other Transaction Agreements and shared contractor investment. Requirements are to analyze/recommend an architecture to include an airframe that integrates Signals Intelligence (SIGINT) and non-SIGINT suites, e.g. Moving Target Indicator (MTI)/Synthetic Aperture Radar (SAR), Electro Optic/Infrared (EO/IR), etc. The contractors will be required to provide the integration analysis, modeling and simulation packages and a proposed airframe for a total system recommendation. Following evaluation of the recommendations, new limited competitive contract(s) will be awarded in FY2002 to begin risk reduction efforts. The contractor(s) will be required to support the program through a milestone approval of the aircraft and sensor suites. The SIGINT payload for ACS could be comprised of scaled SIGINT subsystems being developed by the ASC/RAJ under separate action with additional enhancements being funded under the ACS DCP program. The acquisition strategy for the GRCS upgrades will be through task orders against omnibus contracts that team multiple contractors. The Data Link upgrade for GRCS will be awarded through USAF.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
ACS Concept Exploration Agreements	1-4Q	1-2Q					
GRCS upgrade contracts (to include FY 03 TOCR initiative)	3-4Q	1-4Q	1-4Q				
Decision Review for ACS Component Advanced Development (CAD)		1Q					
ACS CAD Contract(s)		2-4Q	1-4Q				
Field TIBS capability		2-4Q					

D. Schedule Profile (continued)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
ACS Milestone B Decision			3Q				
ACS SI Contract				1-4Q	1-4Q	1-2Q	
Field software modifications			2-4Q				
Flight test upgrades			3-4Q				
Conduct ACS SI Demonstration						1Q	
ACS System Demonstration (SD) Phase Decision Review						3Q	
ACS SD Contract						3-4Q	1-4Q
ACS SD DT&E							4Q

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
028

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 . Concept Evaluation Agreement	C-FP	Raytheon; Greenville, TX	875	1110	2Q	800	1Q	0		0	2785	2785
b . Concept Evaluation Agreement	C-FP	Lockheed Martin; Palmdale, CA	1535	1100	1-2Q	800	1Q	0		0	3435	3435
c . Concept Evaluation Agrement	C-FP	Northrup Grumman, Baltimore, MD	1400	1000	1Q	800	1Q	0		0	3200	3200
d . Data Transport Contract (Includes FY03 TOCR initiative)	SS-CPFF	L3Comm, Salt Lake City, Utah	0	2000	3Q	1000	2Q	1042	1Q	0	4042	4042
e . Omnibus contract	SS-FP	TRW, Sunnyvale, CA.	0	695	4Q	0		1650	1Q	0	2345	2345
f . TIBS Installation	C-CPFF	Mutiple	0	2000	2Q	0		0		0	2000	2000
g . ACS CAD Contract(s)	C-CPXF	TBD	0	0		8357	2Q	42499	1Q	0	50856	50856
Subtotal:			3810	7905		11757		45191		0	68663	68663

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
028

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 . ACS Operational Performance Model	SS-CPFF	Raytheon System Dev. Marlborough, MA	1500	2520	1Q	0		0		0	4020	4020
b . Model Evalution Support		Multiple	325	1074	1Q	450	1Q	0		0	1849	1849
c . ASARC Support	C-CPFF	CSC, Falls Church, VA	50	160	1Q	60	1Q	100	1Q	Continue	Continue	Continue
Subtotal:			1875	3754		510		100		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 . Engineering Support	C-CPFF	CACI Technologies; Chantilly, VA	600	400	2Q	0		0		0	1000	1000
b . Engineering Support	C-CPFF	Multiple	0	300	2Q	460	1Q	920	1Q	Continue	Continue	Continue
c . AEC Support	C-CPFF	Multiple	0	80	2Q	180	1Q	200	1Q	Continue	Continue	Continue
d . Analysis and Evaluation of CAD Products	TBD	TBD	0	0		0		1200	1Q	0	1200	1200

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
028

III. Test and Evaluation (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
Subtotal:			600	780		640		2320		Continue	Continue	Continue

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	MIPR	PM, Signals Warfare	171	368	2Q	690	1Q	722	1Q	Continue	Continue	Continue
b . Matrix Support	MIPR	HQ, CECOM	648	355	1-2Q	934	1-2Q	1415	1-2Q	Continue	Continue	Continue
Subtotal:			819	723		1624		2137		Continue	Continue	Continue
Project Total Cost:			7104	13162		14531		49748		Continue	Continue	Continue

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**179**

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
179 CH-47D PRODUCT IMPRV	0	503	3101	0	0	0	0	0	3604

A. Mission Description and Budget Item Justification: The CH-47 is a tandem rotor helicopter. This is a joint project with the United Kindgom which utilizes alpha contracting to develop, test, and qualify a Low Maintenance Rotor Hub (LMRH). Successful implementation will reduce the life cycle cost associated with acquiring and operating a rotor system. LMRH will reduce spare parts consumption, increase rotor hub reliability, and will result in a reduction of major parts. This system supports the Legacy-to-Objective transition path of the Transformation Campaign Plan (TCP).

FY 2002 Planned Program

- 503 Conduct Flight Test & Evaluation.

Total 503

FY 2003 Planned Program

- 3101 Conduct Fatigue Life Substantiation Testing.

Total 3101

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**179**

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
APA, SSN AA0252, LMRH	0	0	3745	12342	9571	12955	11410	12597	62620

FY03 includes tooling and production preparation.

C. Acquisition Strategy: The Low Maintenance Rotor Hub (LMRH) for the CH-47F will be procured for five fiscal years, beginning fiscal year 2004 through fiscal year 2008. Conversion of the CH-47D to LMRH will be accomplished as modernization through spares.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Critical Design Review (CDR)		1Q					
Testing		2-4Q	1-4Q				
Production Contract Award				2Q	2Q	2Q	2Q

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
179

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
Subtotal:			0	0		0		0		0	0	0

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
Subtotal:			0	0		0		0		0	0	0

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 Testing - Flt Test	Reimbursable	Various Government	0	0		503	3Q	0		0	503	0
b . Developmental Testing - Fatigue Test	CPFF	Various	0	0		0		3101	2Q	0	3101	0
Subtotal:			0	0		503		3101		0	3604	0

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
179

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
Subtotal:			0	0		0		0		0	0	0
Project Total Cost:			0	0		503		3101		0	3604	0

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**430**

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
430 IMPR CARGO HELICOPTER	38711	18449	3482	0	0	0	0	0	111607

A. Mission Description and Budget Item Justification: The Improved Cargo Helicopter (ICH) is a recapitalization program to extend the useful life of the CH-47D Cargo helicopter. This funding will assure heavy lift capability into the 21st century. This program awarded a contract for Engineering Manufacturing Development (EMD) which includes decreasing operation and support costs through vibration reduction/airframe stiffening, incorporating a new electronics/architecture system for compatibility with the digital battlefield and structural modifications as necessary to extend the life of the airframe. This program is the basis for establishing remanufacture, modernization, and upgrade program to meet the readiness needs of the future for heavy lift capability. The ICH Program includes testing of the two engineering development models plus component testing for Live Fire. This system supports the Legacy-to-Objective transition path of the Transformation Campaign Plan (TCP).

FY 2001 Accomplishments:

- 29930 Continue Engineering Manufacture Development (EMD).
- 1506 Continue in-house and program management administration.
- 5675 Continue Government Test & Evaluation; 2 EMD Models delivered for testing.
- 1600 Total Operating Cost Reduction (TOCR) Initiative.

Total 38711

FY 2002 Planned Program

- 14227 Continue Engineering Manufacture Development (EMD).
- 326 Continue in-house and program management administration.
- 3896 Continue Government Test & Evaluation.

Total 18449

FY 2003 Planned Program

- 3385 Continue Government Test & Evaluation
- 97 Continue Contract Live Fire Test & Evaluation

Total 3482

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
APA, SSN AA0252/AA0254, CH-47 CARGO HELICOPTER MODS (MYP) (Including Adv Proc)	82261	112727	199553	307123	335076	374052	376219	4095746	5882757

Increase in FY04-07 for recapitalization

C. Acquisition Strategy: The ICH will recapitalize an aging fleet and bridge the gap until the development of a follow-on aircraft. This will be achieved in a cost effective manner as the ICH program will be based on a four-pronged approach which will include rebuilding the airframe, recapitalizing dynamic components, improving mission capability, and reducing vibrations to provide for long term O&S cost reductions. There will be two Low Rate Initial Production (LRIP) lots to ramp up full rate production.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
EMD Contract & Funding Increments	2Q	1Q					
Initial Production Facilitization (IPF)	3Q						
LL Award For LRIP I		1Q					
Initial Oper Test & Eval (IOTE)		2Q					
LRIP I Award			1Q				
LL Award For LRIP 2			1Q				
LRIP 2 Award				2Q			
MS 3					2Q		

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**430**

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 . EMD	CPIF	Various	73569	29930	2Q	14227	1Q	0		0	117726	117098
b . TOCR	CPIF	Various	0	1600	3Q	0		0		0	1600	1600
Subtotal:			73569	31530		14227		0		0	119326	118698

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 . PMO/OGA	Reimbursable	Various government	9982	1506	3Q	326	2-3Q	0		0	11814	0
Subtotal:			9982	1506		326		0		0	11814	0

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
430

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 . DT/OT	Reimbursable	Various government	3784	2875	3Q	2621	1-3Q	3385	1Q	0	12665	0
b . Live Fire Test & Eval	Reimbursable	Contract/Govt	2243	2750	2-3Q	1275	1-3Q	97	1Q	0	6365	0
c . Live Fire Test & Eval	Contract		0	50	2Q	0		0		0	50	0
Subtotal:			6027	5675		3896		3482		0	19080	0

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 . CAMBER/Westar	SS/FP	Huntsville, AL	3901	0		0		0		0	3901	3901
Subtotal:			3901	0		0		0		0	3901	3901

Project Total Cost:			93479	38711		18449		3482		0	154121	122599

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**504**

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
504	BLACK HAWK RECAPITALIZATION/MODERNIZATION	28760	71837	99061	54424	23469	7726	0	0	294824

A. Mission Description and Budget Item Justification: The UH-60 Black Hawk will serve as the Army's utility helicopter in the Objective Force. It is used for air assault, general support, aeromedical evacuation (MEDEVAC), and command and control in active and reserve component theater, corps, division, and table of distribution and allowances units. The UH-60A entered service in fiscal year 1978 (FY78), and the newer model UH-60L in FY89. The Army continues to procure UH-60L helicopters today. The Army has established a recapitalization goal for its systems of maintaining the fleet's average age at the design half-life or less. The UH-60 was designed for a 20 year service life. The oldest UH-60As are now over 23 years old, and the average age of the UH-60A fleet is 18 years old. The increased operational tempo, coupled with the technological age of the basic airframe, components, and systems, is having an adverse impact on the operational readiness (OR) and operating and support (O&S) costs of the over 1500 aircraft UH-60 fleet. In addition, the UH-60A/L helicopters lack the necessary digital avionics architecture to meet current and future Army and Joint Service interoperability communication requirements. The Army has determined that a recapitalization/upgrade program is required to address these issues. An Operational Requirements Document (ORD) for recapitalization of the Black Hawk fleet was approved by the Joint Requirements Oversight Council in March, 2001. The ORD describes an evolutionary, block approach to transform the utility helicopter force to one that is more deployable, responsive, and less expensive to operate. Block 1 recapitalizes the oldest UH-60A Black Hawks to the UH-60M configuration. The UH-60M selected upgrade includes airframe service life extension, structural improvements, upgrade of the propulsion system (UH-60A T700-GE-700 engine and drive train to UH-60L T700-GE-701C engine and drive train), and a digital cockpit. The UH-60M provides a common platform for the modernized air ambulance MEDEVAC medical mission equipment package (MEP). RDTE funds are required to develop, integrate, test and qualify the UH-60M configuration. This effort supports the Legacy-to-Objective transition path of the Transformation Campaign Plan.

Currently the UH-60 cannot meet Force XXI and Army 2010 and Beyond requirements for operations and support (O&S). Costs must be reduced while reliability and maintainability are improved. The Army entered into a Commercial Operational Support Sharing Initiative (COSSI) Program with the Navy and Goodrich to explore the Integrated Mechanical Diagnostic (IMD) Health Usage Monitoring System (HUMS) concept from the Navy's SH-60 and for the Army's UH-60A. The demonstration will include data collection and analysis to determine which features of an IMD-HUMS/Cockpit Voice/Flight Data Recorder is beneficial to the Army. Based on this analysis the Army will have sufficient data to select the most cost effective subsystem that will then be installed on the UH-60 fleet through the Recapitalization Programs as well as a potential retrofit.

FY 2001 Accomplishments:

- 8159 Initiate assessment and design activities required for recapitalization/upgrade of UH-60M airframe, avionics and power plant.
- 3663 Initiate Producibility Engineering and Planning (PEP) to validate production processes and methods.
- 2319 Initiate design and production of tooling required for UH-60M unique processes.
- 2484 Initiate test article induction, preparation/teardown and fabrication (4 test articles: UH-60A to UH-60M, L to M, A to MEDEVAC, new production UH-60M) to include Airframe and System Requirements Review and Airframe Preliminary Design Review.
- 6636 Test planning and execution - Initiate plans; prepare and conduct Early User Demonstration #1; begin software integration at Systems Integration Lab (SIL); Qualification of component/subsystems; live fire planning & begin component live fire test.
- 221 Begin implementation of Continuous Acquisition and Life-Cycle Support (CALS)/Contractor Integrated Technical Information System (CITIS) and delivery of technical drawings and Interface Control Documents (ICDs).
- 140 Deliver initial Depot Partnership Study Report.
- 5138 Continue software (SW) development - update software requirements specifications and multiplex interface control documents and prepare software design descriptions.

Total 28760

FY 2002 Planned Program

- 15684 Continue design of airframe, avionics and powerplant to include completion of airframe Critical Design Review.
- 7555 Continue software (SW) development to include failure modes and effects criticality analysis and preliminary software design descriptions. Continue development and qualification testing of mission critical computer resources.
- 12764 Continue build and delivery of four test articles to support Development Testing.
- 2086 Preparation of training documentation for Logistics Demonstration Familarization Course, Government Test Pilot Familiarization Course and Test Data Collection Training Course.
- 12572 Initiate Development Testing; complete component live fire phase 1.
- 462 Deliver CALS/CITIS technical drawings and interface control documentation updates to the allocated baseline specifications.
- 408 Continue Depot Partnership Study data collection for midyear update to reflect input from test article build.
- 6306 Continue Producibility Engineering and Planning (PEP) as well as manufacturing planning and control.

FY 2002 Planned Program (Continued)

- 1026 Complete the COSSI for IMD HUMS on the UH-60A
- 12974 Initiate and complete delta design and testing of the IMD HUMS for the UH-60L. Installations of IMD HUMS on 8 demonstrator air craft as well as data collection for 8 air craft over 2 year period.

Total 71837

FY 2003 Planned Program

- 24221 Continue and deliver ICDs, product drawings and detailed specifications for hardware/software.
- 6025 Continue software (SW) development - update software requirements specifications and multiplex interface control documents and prepare software design descriptions.
- 7778 Continue Producibility Engineering and Planning (PEP) as well as manufacturing planning and control.
- 28219 Continue build and delivery of four test articles to support Development Testing.
- 3434 Continue training course preparation and conduct Development Test Pilot Course.
- 581 Prepare update and final report for Depot Partnership Study.
- 571 Maintain CALS/CITIS and delivery of ICDs.
- 28232 Test planning and execution - continue plans, contractor ground tests and instrumentation for flight test; Initiate software qualification, air vehicle ground and flight tests and contractor support to government testing.

Total 99061

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**504**

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
AA0492 UH-60 MODS	25405	68010	41863	179953	239569	461293	436722	Continuing	Continuing

C. Acquisition Strategy: The UH-60 Black Hawk will serve as the Army's utility helicopter in the Objective Force. The recapitalization/upgrade of the legacy UH-60 fleet for the interim/objective force will be accomplished using an evolutionary, block approach to transform the system. The Block 1 program will selectively upgrade the UH-60A/L fleet to the UH-60M configuration. This includes airframe structural improvements, a propulsion upgrade, and a digital cockpit that will meet lift, range, survivability, and interoperability requirements while decreasing O&S costs. This will extend the useful life of these aircraft another 20 years, or through the FY25 time frame. These improvements will be accomplished through integration of existing technologies, by upgrading the UH-60A propulsion system to that currently in the UH-60L, and by adding the UH-60Q advanced MEDEVAC medical equipment package (MEP) to the air ambulance fleet. This program addresses current UH-60 fleet aging problems such as decreasing operational readiness (OR) and increasing O&S costs, including all top-ten cost drivers, and provides a common, modernized platform for the UH-60 utility and MEDEVAC fleet of the future. The program will be executed over four phases: pre-System Development/Demonstration Phase (FY00-01), System Development/Demonstration Phase (FY01-06), Production/Readiness Phase (FY04-27), and Operations and Sustainment Phase (FY05-FY48).

The objective of the Integrated Mechanical Diagnostic - Health Usage Monitoring System (IMD-HUMS) program is to design, develop, produce and demonstrate a IMD-HUMS with a Cockpit Voice/Flight Data Recorder that will aide in fulfilling the requirements as specified in Operational Requirements Document numbered 05028. The IMD-HUMS will provide the capability to simultaneously acquire, store, and process aircraft structural, engine, drive train, exceedances usage, electrical data and voice interchanges. The data collected by the IMD-HUMS will be used for crash investigations and scheduled and unscheduled maintenance. The strategy for acquiring this modification is a block effort. Block 1 is to design, install and demonstrate the IMD-HUMS on one UH-60L to prove out functionality. The Block 2 effort will be to retrofit 7 additional aircraft and begin a demonstration. Demonstration results will be used for a Milestone C decision.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Depot Partnership Study	1-4Q	1-4Q	1-4Q	1Q			
Milestone B	2Q						
Finish COSSI Effort		2Q					
Initiate and complete integration and demonstration of HUMS on UH-60L.		3-4Q					
Installation for demonstration of HUMS.		4Q	1Q				
Integration and Qualification Contract Award	3Q						

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**504**

D. Schedule Profile (continued)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
System Critical Design Review			3Q				
Test Article Delivery for Testing			4Q	1Q			
Depot Partnership Prove-out				3-4Q	1-4Q	1-4Q	1Q
Milestone C				2Q			
LRIP Lot I Contract Award				3Q			
LRIP Lot 2 Contract Award					1Q		
Full Rate Production IPR						2Q	
First Unit Equipped (FUE)						4Q	

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
504

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 . Design, Integration & Qualification Contract	SS/CPAF	Sikorsky Aircraft Co 30 Moffitt Street Stratford, CT 06601	8381	23375	3Q	50004	2Q	87867	2Q	56270	225897	0
b . Development Support - Organic	MIPR	UH PMO/matrix	872	1544	1-4Q	3911	1-4Q	3340	1-4Q	4419	14086	0
c . Development Support - Contractor	C/FP	O2K Contractors	0	1893	1-4Q	2081	1-3Q	451	1-3Q	2779	7204	0
d . Development Support - Organic	MIPR	Aviation Applied Tech Directorate (AATD) Matrix	0	0		1026	2Q	0		0	1026	0
e . Development Support - Contractor	CPAF	Goodrich, 100 Panton Road, Vergennes, Vermont 05491	0	0		12974	3Q	0		0	12974	0
Subtotal:			9253	26812		69996		91658		63468	261187	0

Remarks: Adjusted FY01 to actuals. Adjusted FY02 to reflect current plan.

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
504

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 . Cost Analysis Support	MIPR	AMCOM Matrix	160	210	1-4Q	80	1-4Q	0		0	450	0
Subtotal:			160	210		80		0		0	450	0

Remarks: Increased FY02 cost to reflect current plan.

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 . Test Planning, Test and Evaluation	MIPR	Various Activities	45	697	1-4Q	227	1-4Q	4406	1-4Q	6623	11998	0
Subtotal:			45	697		227		4406		6623	11998	0

Remarks: Increased FY01 cost to actuals.

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
504

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 . PM Support - Organic	MIPR	UH PMO/matrix	89	708	1-4Q	1315	1-4Q	2030	1-4Q	10567	14709	0
b . PM Support - Contract	C/FP	O2K Contractor	0	333	1-3Q	219	1-3Q	967	1-3Q	4961	6480	0
Subtotal:			89	1041		1534		2997		15528	21189	0

Remarks: Adjusted FY01 costs to actuals. Adjusted FY02 costs to current spending plan.

Project Total Cost:			9547	28760		71837		99061		85619	294824	0

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**508**

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
508	APACHE 2ND GENERATION FLIR	17021	39849	46174	0	0	0	0	40000	174852

A. Mission Description and Budget Item Justification: Apache Second Generation Forward Looking Infrared (FLIR) is a U.S. Army program to develop, test, integrate and produce a Second Generation FLIR (SGF) for the Army's entire fleet of AH-64A and AH-64D aircraft. The FLIR system enables for pilotage of the aircraft and the engagement of targets during night operations and adverse weather conditions. The Apache SGF project will leverage technology already invested in electronics, sensors and optics to provide the best sensor available at the lowest cost. The SGF enhancements, over the present Apache FLIR, include increased range for detection, recognition and identification of targets; higher resolution and improved sensitivity for improved safety and pilotage performance, especially in adverse weather; increased capability to identify friend versus foe during hostilities; and increased reliability with a corresponding reduction in O&S costs. These enhancements will improve the overall warfighting capability of the Apache aircraft by: 1) significantly enhancing the pilot's visibility and safety while imp roving target designation and acquisition; 2) providing improved clarity and ability to fly and navigate using advanced FLIR imagery; 3) improving aircraft survivability with increased standoff ranges; and 4) reducing the risk of fratricide.
This system supports the Legacy ("L") transition path of the Transformation Campaign Plan (TCP).

FY 2001 Accomplishments:

- 9968 Continue Contract for 2nd Generation FLIR Development/PDR/CDR/First Prototype Delivery/T&E.
- 5000 Night Vision & Electronics Sensors Directorate (NVESD), Standard Advanced Dewar Assembly 1 (SADA1) Contract/Support
- 113 Test and Evaluation - Government.
- 1940 Continue In-house and Program Management Administration.

Total 17021

FY 2002 Planned Program

•	36800	Continue Contract for 2nd Generation FLIR Development/Prototype Deliveries/T&E.
•	700	NVESD SADAI Contract/Support
•	1153	Test and Evaluation - Government (Qualification Testing - Air Worthiness Release - Operational Testing - Simulation).
•	1196	Continue in-house and Program Management Administration.

Total 39849

FY 2003 Planned Program

•	25400	Complete Contract for 2nd Generation FLIR Development/Prototype Deliveries/T&E.
•	500	Complete NVESD SADAI Contract/Support
•	3300	Apache/Comanche HTI Helmet Contract.
•	15991	Complete Test and Evaluation - Government(Qualification Testing - Air Worthiness Release - Operational Testing - Simulation).
•	983	Continue In-house and Program Management Administration.

Total 46174

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0203744A - Aircraft Modifications/Product Improvement Program**	**508**

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
APA, BA 12,: AA6606, AA6607, AA6608; BA 13: AA0978	803664	950362	992872	881253	562289	627207	456277	2126883	8250146

C. Acquisition Strategy: A cost plus incentive fee (CPIF) type contract was awarded to Team Apache Systems (TAS) on 18 Oct 00. Six prototypes will be designed, developed and tested. The program will culminate with qualification flight testing on the Apache Attack Helicopter. The design will be compatible with both the A and D model Apache helicopters.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
SSEB							
Receive Proposals							
Contract Award	1Q						
PDR/CDR	2-4Q						
Prototype Deliveries		3-4Q					
Qual Testing		3-4Q	1-2Q				
Air Worthiness Release		4Q					
Flight Testing			1-2Q				
Follow-up Testing			2Q				

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
508

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 . Contract -- 2nd Gen FLIR (SGF)	C, CPIF	Team Apache Systems (TAS), Orlando, FL	24008	9968	1Q	36800	1Q	25400	1Q	0	96176	96176
b . SADA1 Contract/Spt	SS, CPIF	DRS Infrared Tech, L.D.; CECOM, N.J	4400	5000	3Q	700	1Q	500	1Q	0	10600	10600
c . Apache/Comanche HTI Helmet	CPIF	TAS, Orlando, FL	0	0		0		3300	1Q	0	3300	3300
d . M-TADS/PNVS P3I	TBD	TBD	0	0		0		0		40000	40000	40000
Subtotal:			28408	14968		37500		29200		40000	150076	150076

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 . NONE			0	0		0		0		0	0	0
Subtotal:			0	0		0		0		0	0	0

Remarks: None

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203744A - Aircraft Modifications/Product Improvement Program

PROJECT
508

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 . GOV'T Qual, Air Worth, Demo, Follow-On Testing	MIPR	ATTC	0	113		1153		15991		0	17257	17257
Subtotal:			0	113		1153		15991		0	17257	17257

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 . In-House Prog Mgt & Admin, SSEB	NA	PEO AVN REDSTONE ARSENAL, AL	3400	1940		1196		983		0	7519	7519
Subtotal:			3400	1940		1196		983		0	7519	7519
Project Total Cost:			31808	17021		39849		46174		40000	174852	174852