

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

BUDGET ACTIVITY 5 - System Development and Demonstration		PE NUMBER AND TITLE 0604662A - FCS Reconnaissance (UAV) Platforms						PROJECT FC3	
COST (In Thousands)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
FC3 FCS RECONNAISSANCE (UAV) PLATFORMS		43388	34379	14296	9235	4556	1336	Continuing	Continuing

A. Mission Description and Budget Item Justification: The Class I UAV provides the dismounted soldier Reconnaissance, Surveillance, and Target Acquisition (RSTA) and has the ability to hover and stare at military operations on rural and urban terrain. Class I senses and provides imaging to recognize personnel, day and night. Provides targeting information to the FCS network during day and night operations and in adverse weather from 1000 feet above ground level. Weighing less than 41 pounds, the air vehicle operates in complex urban and rural terrains with a vertical take-off and landing capability. The Class I system is carried in two custom MOLLEs and is air droppable with soldier.

The Class IV UAV has a range and endurance appropriate for the brigade mission. Class IV supports the BCT Commander with communications relay, long endurance persistent stare, and wide area surveillance over 75km radius. Unique missions include dedicated manned and unmanned teaming (MUM) with manned aviation; Emitter Mapping; Wide Band Communications Relay across 150-175 km; and standoff Chemical Biological Radiological, Nuclear, and Energy (CBRNE) detection with on-board processing. Additionally, Class IV has the payloads to enhance the RSTA capability by cross-cueing multiple sensors. It operates at survivable altitudes at standoff range day and night and during adverse weather. The Class IV Firescout is a joint effort with the Navy program and is enhanced with FCS capability in a two phase assembly process. Phase I corresponds to approximately 90% of the complete assembly, includes major components airframe, engine, and wiring harness. Phase II assembly adds the unique avionics and payloads completing the FCS Class IV UAV.

<u>Accomplishments/Planned Program:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
IAW Section 214 of the FY2006 National Defense Authorization Act, this Program Element was established commencing with FY2008 President's Budget request. This Program Element replaced the previous Project F57 under the Armored System Modernization Program Element 0604645A. The major FY2007 program accomplishments for that project are described below to show continuity of the development efforts.			
UAV CLASS I FY08. Execute Experiment 2.1 and document the operation of the Class I surrogate (MAV system) utilizing a JTRS surrogate (SLICE) radio link and the SRW waveform. Participate in Joint Expeditionary Force Experiment (JEFX)/Experiment 2.1 to determine value of manned/unmanned teaming with Apache AH-64 D and UAV Class IV Surrogate, disseminating stream videos over future networks. Begin Early Air Vehicle Integration in the Class I System Integration Lab (SIL) to support software development for EO/IR/LD/LRF sensor control, air vehicle flight controls, heavy fuel engine integration, executing mission sets, and development of risk reduction testing procedures. Field the design of the larger improved Class I UAV that has the capability to carry the laser designator sensor. Continue to improve the reliability of the components that go into the Class I UAV and continue to improve research and test efforts for 25 MAV Unmanned Systems located at the 25th Infantry Division.		19073	
UAV CLASS I FY09. Conduct Class I PDR beginning 1st qtr FY09. Procure Engines and Airframes for Early Developmental Assets (EDAs). Initial Class I risk reduction testing: Tethered Flight (Airframe & Heavy Fuel Engine) during 4th qtr FY09. Begin Class I System Integration in the Class I SIL to support software development for EO/IR/LD/LRF sensor control, air vehicle flight controls,			14259

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heavy fuel engine integration, executing mission sets, and to support risk reduction testing of Engineering Design Assets in order to meet threshold requirements. Begin design effort required to support the Class I Critical Design Review (CDR) scheduled for 2nd qtr FY10.			
UAV CLASS IV FY08. Continue Integration Phase 2 activities to include Engineering Iteration 2, Integration and verification -- Phase 2, and Operational Flight Software Build 2. Support System of System logistics and training. Accept delivery of Army/Navy common airframes A6-A8. Complete Phase 1 of air vehicle assembly at Moss Point, MS for Air Vehicles #A3-A5, less FCS-unique avionics/payloads. Rotor Hub Fatigue Test will be completed. Vendor level component and subsystem delta testing for Electromagnetic Environmental Effects and Temperature will conclude. Delivery of Class IV Simulation Build to SoSIL. Begin planning for FY09 PDR. There will be approximately 96 drawings completed for PDR. A total of 46 are completed to date. Continue initial build software development.		22372	
UAV CLASS IV - FY09. Conduct Class IV UAVS PDR beginning 1st qtr FY09. Complete Phase 1 of air vehicle assembly at Moss Point, MS for Air Vehicles #A6-A8, less FCS-unique avionics/payloads. Accept delivery of emulator and brass board Air Platform Communications Systems (APCS) Hardware for initial integration into several FCS SILs. Begin integration of Build 2 Final (B2F) Engineering Release SW into NGC SIL for Integrated Qualification Test (IQT). Begin planning for Class IV CDR scheduled to begin 1st qtr FY10.			20120
GFX- Develop the mission kit for the Class IV Surrogate and install in UH-1 flight test to achieve Air Worthiness approval. The Class IV Surrogate capabilities include a day camera providing Intelligence, Surveillance and Reconnaissance (ISR) to Highband Networking Waveform (HNW) and Tactical Common Data Link (TCDL) transport layers allowing the opportunity to experiment with Manned/Unmanned Teams. Also provides Airborne network thickening via comms relay for HNW, Wideband Networking Waveforms (WNW), and Soldier Radio Waveforms (SRW). Completion of the Apache participation in the Joint Expeditionary Force Experiment (JEFX) 2.1 which integrates Soldier Radio Waveform (SRW) and the H264 video card onto an AH-64D. Some additional JEFX 2.1 Capabilities: Video processing capability to translate high bandwidth video sources (i.e. raw ISR data) down to more bandwidth efficient video streams suitable for transmission over SRW and WNW. Data archival and retrieval. Receipt of Apache video on TC DL network. TC DL crossbanding into HNW allows for the Apache to join the FCS HNW network. Early demonstration of TIER 1 Aviation interoperability through WIN-T.		729	
Small Business Innovative Research/Small Business Technology Transfer Programs		1214	
Total		43388	34379

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<u>B. Program Change Summary</u>	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008/2009)		41164	34220
Current BES/President's Budget (FY 2009)		43388	34379
Total Adjustments		2224	159
Congressional Program Reductions		-276	
Congressional Recissions			
Congressional Increases		2500	
Reprogrammings			
SBIR/STTR Transfer			
Adjustments to Budget Years			159

<u>C. Other Program Funding Summary</u>	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
0604660A FCS Manned Grd Vehicles & Common Grd Vehicle Components		592254	774257	785575	358641	214207	103230	Continuing	Continuing
0604661A FCS System of Systems Engr & Program Management		1497321	1413945	1874987	1916207	1290308	1027816	Continuing	Continuing
0604662A FCS Reconnaissance (UAV) Platforms		43388	34379	14296	9235	4556	1336	Continuing	Continuing
0604663A FCS Unmanned Ground Vehicles		90091	96918	64744	43601	26855	3580	Continuing	Continuing
0604664A FCS Unattended Ground Sensors		10929	12967	18968	16754			Continuing	Continuing
0604665A FCS Network Hardware & Software		647649	539145	334085	365287	290790	169526	Continuing	Continuing
0604646A Non Line of Sight - Launch System	313981	253075	200099	40043	5957			Continuing	Continuing
0604647A Non Line of Sight - Cannon	108649	136929	89841	71396	43222	28775		Continuing	Continuing
0604666A FCS Spin Outs	27900	64385	64900	67021	51026	56287	14637	Continuing	Continuing
0603639A FCS MRM		44294	45866	71451	56296	106353	50757	Continuing	Continuing
0604715A STRICOM/NAWCTSD Support		378	388	398	406	415	426	Continuing	Continuing
WTCV G86100 FCS Core Program		80932	154583	148028	677820	2175327	5744649	Continuing	Continuing
WTCV G86200 FCS Spin Out Program		19978	176667	367962	550821	766274	944999	Continuing	Continuing

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AMMO E88103					24634	47624	61762	Continuing	Continuing
0604645 F52 UAV Recon & Sensors	26360							Continuing	Continuing
0604645 F53 UGV	106516							Continuing	Continuing
0604645 F54 UGS	10612							Continuing	Continuing
0604645 F55 SUSTAINMENT	106517							Continuing	Continuing
0604645 F57 MANNED GROUND VEHICLES	563946							Continuing	Continuing
0604645 F61 SoS Engineering and Program Management	2142970							Continuing	Continuing

Comment:

D. Acquisition Strategy The Original FCS Contract was awarded to the Lead Systems Integrator 30 May 2003 and definitized 10 Dec 2003, to Boeing. The LSI contracted with its One Team Partners, Honeywell (NM) and Northrop Grumman (CA). A series of prototypes were developed in FY2008 and will continue into FY2009. In FY09 the Class I UAV will be accelerated to the Army Evaluation Task Force (AETF) to conduct initial testing as well as to develop Tactics, Techniques and Procedures and concepts of the operation in the FCS BCT construct.

ARMY RDT&E COST ANALYSIS (R3)

February 2008

BUDGET ACTIVITY			PE NUMBER AND TITLE							PROJECT		
5 - System Development and Demonstration			0604662A - FCS Reconnaissance (UAV) Platforms							FC3		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Class I	FAR	Boeing Co., St. Louis, MO See Remark 1				19073	1-3Q	14259	1-3Q		33332	
Class IV	FAR	Boeing Co., St. Louis, MO See Remark 2				19872	1-3Q	20120	1-3Q		39992	
GFX	MIPR	PM FCS (BCT), ST Louis,MO				729	1-3Q				729	
Congressional Earmark	Direct	TBD				2500	2-3Q				2500	
Subtotal:						42174		34379			76553	

Remarks: Remark 1: Subcontractor: Honeywell International, Inc - Albuquerque, New Mexico
 Remark 2: Subcontractor: Northrop Grumman Unmanned Systems - San Diego, CA

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR	Direct	OSD				1214	1-2Q				1214	
Subtotal:						1214					1214	

III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												

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Subtotal:									
Project Total Cost:				43388		34379		77767	

Schedule Profile (R4 Exhibit)

February 2008

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Event Name	FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13																											
	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) FCS SoS Critical Reviews, (2)																																																				
FCS SoS Integration / Verification Phase 1																																	IV1				PDR								CDR							
FCS SoS Test - Phase 1																																	LUT1 & IMT1																			
FCS SoS Integration / Verification Phase 2																																					IV2															
FCS SoS Test - Phase 2																																									IMT2 & LUT2											
FCS SoS Integration / Verification Phase 3																																													IV3							
FCS SoS Test - Phase 3																																																	IMT3 & LUT3			
FCS SoS Integration / Verification Phase 4																																																	IV4			
(3) Class I Critical Reviews - PDR																																					Class I PDR															
(4) Class I Critical Reviews - CDR																																									Class I CDR											
Class I UAV Prototype Deliveries (10)																					Class I UAV Prototypes																															
Class I UAV Testing																					Class I Test																															
(5) Class IV UAV Critical Reviews - PDR									Class IV PDR																																											
(6) Class IV UAV Critical Reviews - CDR													Class IV CDR																																							

Schedule Profile (R4 Exhibit)

February 2008

BUDGET ACTIVITY
5 - System Development and Demonstration

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0604662A - FCS Reconnaissance (UAV) Platforms

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Event Name	FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13							
	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				
Class IV UAV Prototvpe Deliveries (8)																									<div style="background-color: blue; color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> Class IV Prototypes							
Class IV UAV Testing																									<div style="background-color: blue; color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> Class IV Test							

Schedule Detail (R4a Exhibit)

February 2008

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<u>Schedule Detail</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	
FCS SoS Critical Reviews			3Q					
					3Q			
FCS SoS Integration / Verification Phase 1		1Q - 4Q	1Q - 2Q					
FCS SoS Test - Phase 1		2Q - 4Q						
FCS SoS Integration / Verification Phase 2			3Q - 4Q	1Q - 4Q	1Q - 2Q			
FCS SoS Test - Phase 2				3Q - 4Q				
FCS SoS Integration / Verification Phase 3					1Q - 4Q	1Q - 4Q	1Q - 3Q	
FCS SoS Test - Phase 3						3Q - 4Q	1Q	
FCS SoS Integration / Verification Phase 4							1Q - 4Q	
FCS SoS Test - Phase 4								
Class I Critical Reviews - PDR			1Q					
Class I Critical Reviews - CDR				2Q				
Class I UAV Prototype Deliveries (10)					4Q			
Class I UAV Testing					4Q	1Q - 3Q		
Class IV UAV Critical Reviews - PDR			1Q					
Class IV UAV Critical Reviews - CDR				1Q				
Class IV UAV Prototype Deliveries (8)					2Q - 4Q	1Q		
Class IV UAV Testing					2Q - 4Q	1Q - 3Q		