ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE
5 - System Development and Demonstration	**0604664A - FCS Unattended Ground Sensors**

COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
FC5 FCS UNATTENDED GROUND SENSORS	22007	17011	26919	Continuing	Continuing

A. Mission Description and Budget Item Justification: The FCS BCT Unattended Ground Sensors (UGS) program is divided into two major configurations of sensing systems: URBAN-UGS (U-UGS), also known as Urban Military Operations in Urban Terrain (MOUT) Advanced Sensor System (UMASS); and TACTICAL-UGS (T-UGS), which includes Intelligence, Surveillance and Reconnaissance (ISR)-UGS and Chemical, Biological, Radiological and Nuclear (CBRN)-UGS. U-UGS - Will provide a low cost, network-enabled reporting system for Situational Awareness (SA) and force protection in an urban setting, as well as residual protection for cleared areas of urban MOUT environments. The U-UGS system can support BCT operations by monitoring urban choke points such as rooms, halls, attics, basements, sewers, culverts, tunnels, caves, and alleyways. They can be hand-emplaced by Soldiers or robotic vehicles either inside or outside buildings and structures. When a platoon or squad clears a building, U-UGS are left behind to perform surveillance that would otherwise require dedicated soldiers.

The U-UGS system provides a self-organizing wireless network that consists of three configuration items; personnel detect sensors, imaging sensors, and gateways:

1. Personnel Detect Sensors provide dual mode, passive infrared and RF microwave motion sensing for "trip-wire" detection of intruders.
2. Imaging Sensors provide electro-optical visual imaging with a near-infrared illuminator for operation in full darkness.
3. Gateways organize and manage the sensor network, and communicate sensor data to FCS C2 Joint Tactical Radio System (JTRS) systems and to the local dismounts.

T-UGS - Tactical-UGS (T-UGS) includes Intelligence, Surveillance and Reconnaissance (ISR)-UGS and Chemical, Biological, Radiological and Nuclear (CBRN)-UGS. The UGS (T-UGS) are designed for remote tactical operations in open spaces, at road choke points, avenues of approach, etc, and are designed to be emplaced by hand or by remote deployment methods. T-UGS provides ISR and CBRN awareness to the FCS (BCT) areas not covered by manned/unmanned ground/air vehicles. Packaging the common form factor enables simplified scalability and upgrade paths for future technology insertion, while the distributed sensing capability enhances mission flexibility and system versatility. The T-UGS system consists of five configuration items (nodes), each containing a unique set of sensing capabilities, and sharing a common hardware form factor.
1. The T-UGS ISR sensor node provides for vehicle and personnel detection capabilities via seismic, acoustic and magnetic sensors. Seismic sensors are the primary means of personnel detection. The principal means of vehicle detection and tracking are the acoustic bearing sensors. The ISR-UGS will be modular and composed of tailorable sensor groups using multiple ground-sensing technologies. Multiple sensors support precision location and simultaneous tracking of multiple targets.
2. When confirmed as a valid target of interest, Electro Optical/Infrared (EO/IR) sensor nodes will autonomously capture multiple images of the target.
3. The CBRN node provides for chemical, biological, radiological, and nuclear sensing and reporting capabilities.
4. The Hazard/Clear Lane Marker (H/CLM) nodes are deployed to mark hazardous keep-out zones, or to define cleared lanes though hazardous areas such as minefields.
5. The final component of the T-UGS system is the Long-Haul gateway node that provides radio communications and integration into the FCS network.

T-UGS and U-UGS are both included in the E-IBCT and T-IBCT.

The UGS program has been changed due to restructuring of the MGV portion of the FCS program and the refocusing of the FCS program to spin out FCS technologies faster to the IBCT. The accomplishments, funding, and schedule reflected in this justification are based on preliminary analysis of the new direction and reduced program budget. Upon

further resolution and detailed planning, adjustments may occur which could potentially change planned accomplishments, funding requirements, and program schedule. The budget justification program schedule reflects the current FCS program. The funding and accomplishments are a top-level attempt to incorporate the recofused FCS program.

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B. Program Change Summary	FY 2008	FY 2009	FY 2010
Previous President's Budget (FY 2009)	10929	12967	18968
Current BES/President's Budget (FY 2010)	22007	17011	26919
Total Adjustments	11078	4044	7951
Congressional Program Reductions		-56	
Congressional Recissions			
Congressional Increases		4100	
Reprogrammings	11377		
SBIR/STTR Transfer	-306		
Adjustments to Budget Years	7		7951

Change Summary Explanation: Funding - Increase in FY10 budget due to incorporation of new T-UGS, U-UGS production cost saving design.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604664A - FCS Unattended Ground Sensors**	**FC5**

COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
FC5 FCS UNATTENDED GROUND SENSORS	22007	17011	26919	Continuing	Continuing

A. Mission Description and Budget Item Justification: Please see Exhibit R-2.

Accomplishments/Planned Program:	FY 2008	FY 2009	FY 2010
UGS System Engineering & Program Mgt. FY08 - Completed and released Thresholds PIDS. Provided technical support to Technical Field Test (TFT) & LUT test at Joint Expeditionary Force Experiment (JEFX) 08. Updated Future UGS Low Rate Initial Production (LRIP) Design by changing Mobile Subscriber Radio Terminal (MSRT) radio into a JTRS Handheld Manpack & Small form fit (HMS). Conducted affordability initiatives to attempt to lower production costs. Also redesigning deck shape and material to lower production costs and make emplacement easier. Defined and Captured U-UGS Requirements; Preliminary Design Base CI; Preliminary Design Fixed Camera; Preliminary Design Radio Enclosure & Antenna; Prelimary Spike Design; Preliminary U-UGS Short Haul (SH) Module Design.	14049		
UGS System Engineering & Program Mgt. FY09 - Design of New Form Factor T-UGS, consist of more producible configuration (Less Production Costs). New Radio, New Seismic Spike. Integrate New Form Factor into Battle Command Network.		14750	
UGS System Engineering & Program Mgt. FY10 - Oversee delivery of prototypes Test and Analysis of New Form Factor UGS (to include radio, spike, acoustic sensor, etc.) and U-UGS gateway. Overseeing all test for T-UGS. Begin planning efforts to support T-IBCT.			25814
UGS Test FY08 - Preliminary Design Base Configuration Item; Long Haul Radio Risk Reduction Tests; Engineering Short Haul Radio Performance System Test Plan; UGS Short Haul Module Engineering Design, Build, and Test.	5993		
UGS Test FY09 - Procurement for Base Engineering Build; Base Configuration Item Engineering Tests; Electro Optical Combat Intelligence Engineering Tests; Engineering Radio Configuration Item Engineering Test; Seismic Engineering Tests; Engineering Short Haul Radio Performance System Test; Engineering Long Haul Radio Performance System Test; Hardware/Software Lab Integration Test; T-UGS Endurance Test; Engineering Performance Test-Developmental Performance (DP1); Engineering Long Haul/Short Haul Radio Performance Test; Operations Qualifications Test; T-UGS System Environmental Quality Tests.		1635	
UGS Test FY10 - U-UGS SW Quality Test; U-UGS System Environmental Quality Test; U-UGS System Performance Quality Test; T-UGS System Environmental Quality Test; T-UGS System Performance Quality DP3; T-UGS Operations Qualification Tests.			645
UGS Prototypes FY08-Delivered 10 T-UGS and 16 U-UGS for Spin Out Testing. (These prototypes will be used in the Core Program, thus charged to Core Program.)	1965		
UGS Prototypes FY09-FY10: Improvement to T-UGS and U-UGS, based on E-IBCT Testing. Refurbishment of the current E-IBCT assets in order to support the Army's Operational Assessment OA.		150	460
Small Business Innovative Research/Small Business Technology Transfer Programs		476	
Total	22007	17011	26919

B. Other Program Funding Summary	FY 2008	FY 2009	FY 2010	To Compl	Total Cost
0604660A FCS Manned Grd Vehicles & Common Grd Vehicle Components	635846	782664	368557	Continuing	Continuing
0604661A FCS System of Systems Engr & Program Management	1292514	1414756	1067191	Continuing	Continuing
0604662A FCS Reconnaissance (UAV) Platforms	42772	57190	68701	Continuing	Continuing
0604663A FCS Unmanned Ground Vehicles	78826	102976	125616	Continuing	Continuing
0604665A FCS Network Hardware & Software	724397	556301	749182	Continuing	Continuing
0604646A Non Line of Sight - Launch System	246071	208009	88660	Continuing	Continuing
0604647A Non Line of Sight - Cannon	133139	89545	58216	Continuing	Continuing
0604666A FCS Spin Outs	84111	111032		Continuing	Continuing
0603639A FCS MRM	43068	40731		Continuing	Continuing
WTCV G86100 FCS Core Program	78932	154127		Continuing	Continuing
WTCV G86200 FCS Spin Out Program	1370	67268	327921	Continuing	Continuing
0605625A - Manned Ground Vehicles			100000	Continuing	Continuing

Comment: Comp Programs: ASTAMIDS, WIN-T, JTRS-HMS, JTRS-GMR, STARLite SAR/GMTI, GSTAMIDS, JAVELIN, JCADS, JSLSCAD, DCGS-A, STRS-AMF, FBCB2, OneTESS, OneSAF

C. Acquisition Strategy The original FCS Contract was awarded to the Boeing Company 30 May 2003 and definitized 10 Dec 2003. Boeing has contracted with its One Team Partner, Textron Systems, Wilmington, (MA) producing the Urban Unattended Ground Sensors (U-UGS) and Tactical Unattended Ground Sensor (T-UGS). T/U UGS prototypes were delivered to the Army Evaluation Task Force (AETF) and will be included in the initial increment to the E-IBCT. As the program transitions to an incremental development approach, the above will continue to be provided by Boeing to the E-IBCT and T-IBCT.

ARMY RDT&E COST ANALYSIS (R3)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604664A - FCS Unattended Ground Sensors**	**FC5**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Unattended Ground Sensors (UGS)	FAR	The Boeing Company - St Louis, MO See Remark 1		22000	1-3Q	16535	1-3Q	26919	1-3Q	Cont.	Cont.	
Subtotal:				22000		16535		26919		Cont.	Cont.	

Remarks: Remarks 1: Subcontractor: Textron Systems, Intelligent Battlefield System Division - Willington, MA

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR	Direct	OSD				476	1-2Q			Cont.	Cont.	
Adjustment to Budget Years	Direct	ABO		7	1-2Q					Cont.	Cont.	
Subtotal:				7		476				Cont.	Cont.	

III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												

Remarks: All Test and Evaluation costs for this project are included in 0604661 FCS SoS Engineering and Program Management project.

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												

Remarks: All Management Services costs for this project are included in 0604661 FCS SoS Engineering and Program Management project.

ARMY RDT&E COST ANALYSIS (R3)									May 2009		
BUDGET ACTIVITY **5 - System Development and Demonstration**		PE NUMBER AND TITLE **0604664A - FCS Unattended Ground Sensors**								PROJECT **FC5**	
Project Total Cost:		**22007**		**17011**		**26919**		**Cont.**	**Cont.**		

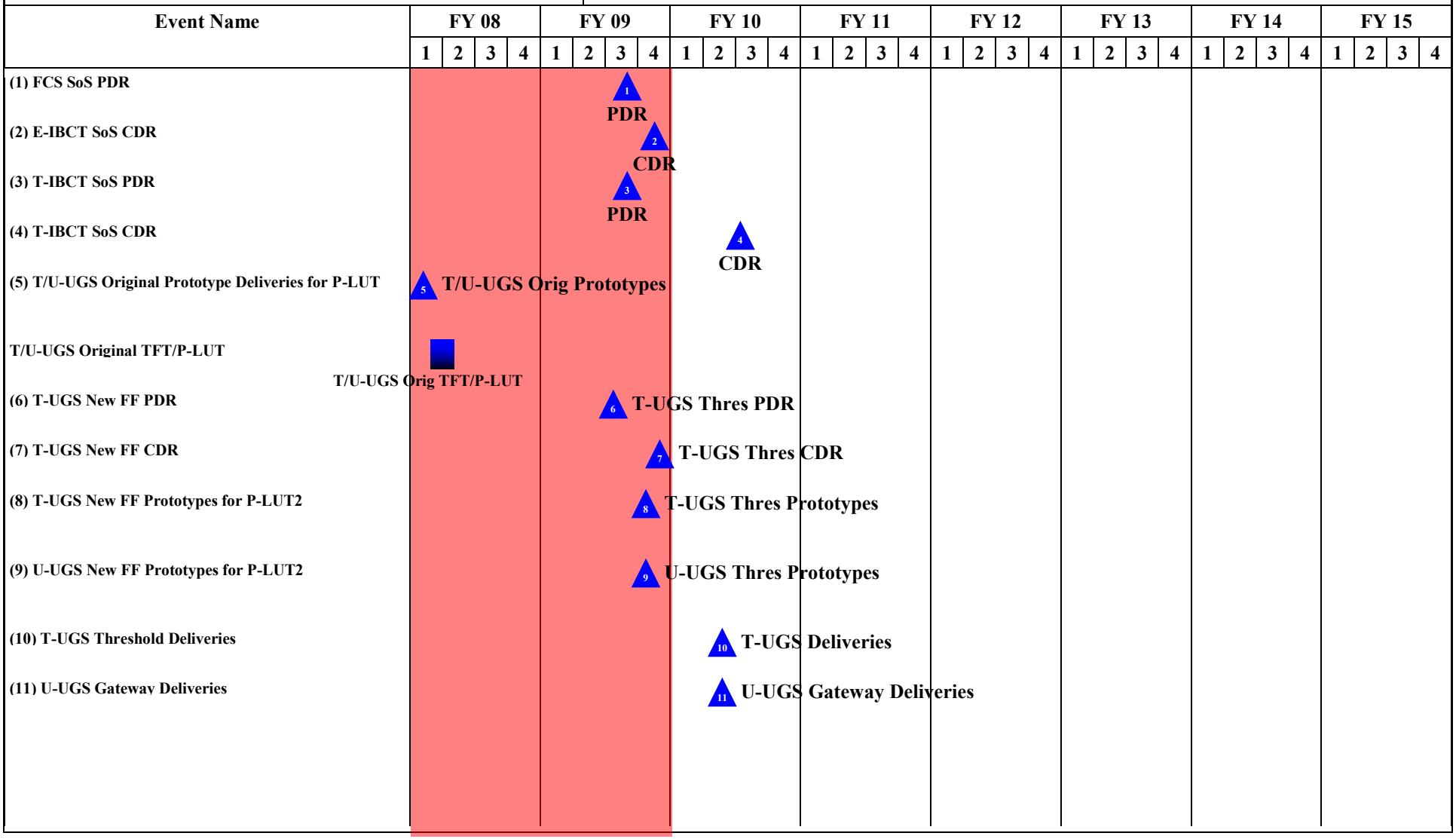
Schedule Profile (R4 Exhibit)

May 2009

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604664A - FCS Unattended Ground Sensors

PROJECT
FC5



Schedule Detail (R4a Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604664A - FCS Unattended Ground Sensors**	**FC5**

Schedule Detail	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
FCS SoS PDR		3Q						
E-IBCT SoS CDR		4Q						
T-IBCT SoS PDR		3Q						
T-IBCT SoS CDR			3Q					
T/U-UGS Original Prototype Deliveries for P-LUT	1Q - 2Q							
T/U-UGS Original TFT/P-LUT	1Q - 2Q							
T-UGS New FF PDR		3Q						
T-UGS New FF CDR		4Q						
T-UGS New FF Prototypes for P-LUT2		4Q						
U-UGS New FF Prototypes for P-LUT2		4Q						
T-UGS Threshold Deliveries			2Q					
U-UGS Gateway Deliveries			2Q					

The schedule reflected in this budget justification is based on preliminary analysis of the available budget.