PE NUMBER: 0603601F
PE TITLE: Conventional Weapons Technology

Exhibit R-2, RDT&E Budget Item Justification

DATE: February 2006

BUDGET ACTIVITY: 03 Advanced Technology Development (ATD)

PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology

	Cost ($ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
	Total Program Element (PE) Cost	24.680	30.519	19.658	19.993	21.504	21.876	22.037	Continuing	TBD
670A	Conventional Weapons Development	12.436	30.519	19.658	19.993	21.504	21.876	22.037	Continuing	TBD
670B	Guidance Technology	12.244	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	TBD

Note: In FY 2006, the efforts covered under Project 670B were moved to Project 670A.

(U) A. Mission Description and Budget Item Justification

This program develops, demonstrates, and integrates ordnance and advanced guidance technologies for air-launched conventional weapons. The program includes development of conventional ordnance technologies including warheads, fuzes, and explosives; and development of advanced guidance technologies including seekers, navigation and control, and guidance. Note: In FY 2006, Congress added $1.3 million for Air Force Special Operations (AF/SO) Miniature Infrared Camera, $1.7 million for Body Armor and Fragmentation Protection, $1.7 million for Clandestine Electric Reconnaissance Vehicle, $1.0 million for Fuze Air-to-Surface Technlogy, $2.9 million for High Speed Strike Weapon, $1.0 million for Internet Protocol (IP) Targeting Extension System, $1.7 million for Micro-Sized Air Launched Atmospheric Visibility Sonde, and $1.0 million for Plug and Play Capability for Air-Launched Munitions. This program is in the Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for existing system upgrades and/or new system developments that have military utility and address warfighter needs.

(U) B. Program Change Summary ($ in Millions)

		FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	27.255	18.660	19.094
(U)	Current PBR/President's Budget	24.680	30.519	19.658
(U)	Total Adjustments	-2.575	11.859	
(U)	Congressional Program Reductions			
	Congressional Rescissions	-0.021	-0.441	
	Congressional Increases		12.300	
	Reprogrammings	-2.034		
	SBIR/STTR Transfer	-0.520		
(U)	Significant Program Changes:			

Not Applicable.

C. Performance Metrics

(U) Under Development.

Exhibit R-2a, RDT&E Project Justification			DATE: February 2006
BUDGET ACTIVITY: 03 Advanced Technology Development (ATD)	PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology	PROJECT NUMBER AND TITLE: 670A Conventional Weapons Development	

Cost ($ in Millions)		FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
670A	Conventional Weapons Development	12.436	30.519	19.658	19.993	21.504	21.876	22.037	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

This project develops, demonstrates, and integrates ordnance and affordable, autonomous, and adverse weather resistant guidance technologies for enhancing the effectiveness of air-launched conventional weapons delivered from manned and unmanned aerospace vehicles. The project develops conventional ordnance including warheads, fuzes, explosives, carriage and release, munition integration technologies, terminal seekers, midcourse navigation sensors for stand off delivery weapons, and target detection and identification processing algorithms for reducing target location error to improve target kill probability. This project improves the capability for conventional munitions supporting an Air Expeditionary Force.

(U) B. Accomplishments/Planned Program ($ in Millions)	FY 2005	FY 2006	FY 2007
(U) MAJOR THRUST: Develop and demonstrate advanced air-delivered munitions fuze and mass-focusing warhead technologies to improve munition effectiveness, allowing for smaller warheads and munition airframes, thereby improving sortie effectiveness and increasing strike aircraft load-outs. Develop a fuzing capability that will transmit function data from penetrating weapons through various hard target mediums. Note: In FY 2007, funding will be reduced as fuze efforts go to a single demonstration.	3.436	3.789	3.768
(U) In FY 2005: Designed a fuze using Microwave Monolithic Integrated Circuit technologies that will give burst accuracy of 0.5 meter for weapons that have closure rates up to 2,500 meters per second. Conducted research studies for designing a hard target influence fuze capable of denying hard and deeply buried facilities access.			
(U) In FY 2006: Continue designing a hard target influence fuze capable of denying hard and deeply buried facilities access. Begin developing fuzes that can transmit bomb damage information to an aircraft platform.			
(U) In FY 2007: Continue designing a hard target influence fuze capable of denying hard and deeply buried facilities access. Complete developing fuzes that can transmit bomb damage information to an aircraft platform.			
(U)			
(U) MAJOR THRUST: Develop and demonstrate conventional munition subsystem and platform integration technologies to include innovative air-delivered munition carriage and release equipment, miniature weapon release concepts, and reduced airframe size providing the capability to safely carry, launch, and communicate with the aerospace vehicle and other multiple miniature weapons. These integration technologies will increase weapon load-outs and improve sortie effectiveness for current and future strike aircraft, while reducing munition airlift requirements.	1.202	1.875	0.241
(U) In FY 2005: Conducted analysis studies on a weapon that can neutralize hardened chemical and biological warfare facilities. Completed an initial effort to develop a multi-mode ordnance package effective against a broad range of			

Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY 03 Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603601F Conventional Weapons Technology	PROJECT NUMBER AND TITLE 670A Conventional Weapons Development

	B. Accomplishments/Planned Program ($ in Millions)	FY 2005	FY 2006	FY 2007
	unhardened ground targets.			
(U)	In FY 2006: Integrate a miniaturized datalink into a weapon system to perform retargeting in-flight. Begin planning a datalink flight demonstration. Begin planning a low-cost miniature cruise missile demonstration. Begin planning a miniature persistent munition demonstration that will provide area dominance with a multiple-shot capability.			
(U)	In FY 2007: Complete planning a miniaturized datalink flight demonstration. Enhance plans and begin design of a low-cost miniature cruise missile. Mature plans and begin design of a miniature persistent munition that will provide area dominance with a multiple-shot capability. Note: Datalink flight test will be conducted in the navigation and control technologies activity in this project.			
(U)				
(U)	MAJOR THRUST: Develop and demonstrate advanced conventional armament warhead technologies, including heavy metal liners, dense metal cases, and insensitive explosives with increased energy release performance attributes. The goal of these efforts is to destroy hardened targets by more effectively penetrating protective surfaces and by enhancing kill mechanisms against softer surface targets.	2.843	6.982	6.751
(U)	In FY 2005: Tested on high speed sled track a weapon capable of high-speed penetration of extremely hard targets by integrating new warhead case technology, insensitive explosive, and a multiple-event fuze. Improved insensitive explosive warhead fills thru analysis and testing with an end goal to significantly reduce the fill volume completing the intended ordnance mission.			
(U)	In FY 2006: Continue to improve insensitive explosive warhead fills with a goal to significantly reduce the fill volume completing the intended ordnance mission. Commence developing an ordnance package that will significantly improve counter-air lethality against cruise missiles and manned aircraft. Initiate design of a multi-mode warhead package designed for precision-guided submunitions. Begin developing a weapon system capable of dispensing payloads within a target for counterforce applications.			
(U)	In FY 2007: Complete insensitive explosive warhead fills that significantly reduce fill volume requirements. Continue developing an ordnance package that will significantly improve counter air lethality against cruise missiles and manned aircraft. Continue developing a multi-mode warhead package designed for precision-guided submunitions. Continue developing a weapon system capable of dispensing payloads within a target for counterforce applications.			
(U)				
(U)	MAJOR THRUST: Develop and demonstrate advanced conventional armament seeker technologies for miniature munitions applications. These seeker technologies will autonomously detect, acquire, and guide to targets of interest in adverse weather and battlefield conditions. Also, the seeker technologies will increase the probability of kill and minimize collateral damage, while providing increased weapons load-out and improved sortie effectiveness. Note:	0.000	0.000	7.839

Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY **03 Advanced Technology Development (ATD)**	PE NUMBER AND TITLE **0603601F Conventional Weapons Technology**	PROJECT NUMBER AND TITLE **670A Conventional Weapons Development**

	B. Accomplishments/Planned Program ($ in Millions)	FY 2005	FY 2006	FY 2007
	Prior to FY 2006, these efforts were covered under Project 670B in this Program Element. In FY 2007, the Miniature Navigator Demonstration (in another thrust in this project) will be completed allowing seekers for two different munition concepts to be initiated.			
(U)	In FY 2005: Not Applicable.			
(U)	In FY 2006: Continue design and fabrication of low-cost laser detection and ranging seeker that will increase data rate and reduce moving parts compared to earlier generation laser seeker technologies. Initiate planning for a small, multiple-mode radar demonstration for air-to-surface weapon applications.			
(U)	In FY 2007: Continue design and fabrication, and commence ground and flight test a low-cost laser detection and ranging seeker that reduces moving parts compared to earlier generation seekers. Mature plans and begin designing a small multiple-mode radar for an air to surface weapon demonstration.			
(U)				
(U)	MAJOR THRUST: Develop and demonstrate advanced conventional armament navigation and control technologies to increase armament navigation accuracy, improve stand off range, and enhance weapons control and operation in electronic jamming environments. Note: Prior to FY 2006, these efforts were covered under Project 670B in this Program Element. In FY 2007, the Miniature Navigator Demonstration will be completed allowing seekers for two different munition concepts to be initiated (in another thrust in this project).	0.000	5.748	1.059
(U)	In FY 2005: Not Applicable.			
(U)	In FY 2006: Finish developing and demonstrate a munition navigation system that provides accurate (less than a meter), miniature (less than 25 cubic inch), and affordable (less than $6000 per unit) global positioning management system. Develop a capability for weapons to datalink information to a communications grid.			
(U)	In FY 2007: Complete design and fabrication of a weapon datalink and integrate datalink into a guided munition for commencement of flight testing.			
(U)				
(U)	CONGRESSIONAL ADD: High Speed Strike Weapon.	0.971	2.858	0.000
(U)	In FY 2005: Conducted preliminary design study of a high-speed weapon to provide a quick strike capability against time-critical targets.			
(U)	In FY 2006: Refine the design and development high-speed flight test vehicle for a quick strike capability for time-critical targets			
(U)	In FY 2007: Not Applicable.			
(U)				
(U)	CONGRESSIONAL ADD: BLU-109 Bunker Buster - Heavy.	2.915	0.000	0.000
(U)	In FY 2005: Improved penetration performance on BLU-109 (with a tungsten metal ballast in the warhead and a			

Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY 03 Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603601F Conventional Weapons Technology	PROJECT NUMBER AND TITLE 670A Conventional Weapons Development

	B. Accomplishments/Planned Program ($ in Millions)	FY 2005	FY 2006	FY 2007
	Joint Direct Attack Munition (JDAM) tailkit) seeking performance similar to BLU-113.			
(U)	In FY 2006: Not Applicable.			
(U)	In FY 2007: Not Applicable.			
(U)				
(U)	CONGRESSIONAL ADD: Fuze Air-to-Surface Technology (FAST).	1.069	0.986	0.000
(U)	In FY 2005: Developed and demonstrated, in breadboard fashion, a cost-effective integrated height-of-burst fuze, Global Position Satellite/Inertial Navigation System (GPS/INS) altitude error correction, and in-flight retargeting receiver capability for precision air delivered munitions.			
(U)	In FY 2006: Perform trade studies to validate FAST flexible manufacturing approach for low-cost, high performance radars.			
(U)	In FY 2007: Not Applicable.			
(U)				
(U)	CONGRESSIONAL ADD: Air Force Special Operations (SO) and Miniature Infrared Camera.	0.000	1.281	0.000
(U)	In FY 2005: Not Applicable.			
(U)	In FY 2006: Develop a miniature infrared camera top be used on small unmanned vehicles.			
(U)	In FY 2007: Not Applicable.			
(U)				
(U)	CONGRESSIONAL ADD: Body Armor and Fragmentation Protection.	0.000	1.676	0.000
(U)	In FY 2005: Not Applicable.			
(U)	In FY 2006: Develop armor systems to protect the upper body of a vehicle inhabitant against fragmentation as rifle threats. Systems will also be developed and improved to protect lower extremities of vehicle inhabitants from Improvised Explosive Devices (IEDs).			
(U)	In FY 2007: Not Applicable.			
(U)				
(U)	CONGRESSIONAL ADD: Clandestine Electric Reconnaissance Vehicle.	0.000	1.676	0.000
(U)	In FY 2005: Not Applicable.			
(U)	In FY 2006: The Clandestine Electric Reconnaissance Vehicle (CERV) program will adapt world-class racing technology for tactical military applications. The CERV program will build two 1,200 pound, electric demonstration vehicles.			
(U)	In FY 2007: Not Applicable.			
(U)				
(U)	CONGRESSIONAL ADD: Internet Protocol (IP) Targeting Extension System.	0.000	0.986	0.000

Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY 03 Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603601F Conventional Weapons Technology	PROJECT NUMBER AND TITLE 670A Conventional Weapons Development

	B. Accomplishments/Planned Program ($ in Millions)	FY 2005	FY 2006	FY 2007
(U)	In FY 2005: Not Applicable.			
(U)	In FY 2006: Development and implementation of the prototype IP-based weapons data link system that includes a handheld wireless IP-based device such as Air Force Special Operations Command Special Operations Forces Tactical Network (SOFTNET) system.			
(U)	In FY 2007: Not Applicable.			
(U)				
(U)	CONGRESSIONAL ADD: Micro-Sized Air-Launched Atmospheric Sonde.	0.000	1.676	0.000
(U)	In FY 2005: Not Applicable.			
(U)	In FY 2006: Develop a small Sonde that senses atmospheric visibility and weather data during descent as well as reporting on other deployed remote sensors with seismic and acoustic data.			
(U)	FY 2007: Not Applicable.			
(U)				
(U)	CONGRESSIONAL ADD: Plug and Play Capability for Air-Launched Weapons.	0.000	0.986	0.000
(U)	In FY 2005: Not Applicable.			
(U)	In FY 2006: Develop and demonstrate the integration of Universal Armament Interface (UAI) weapon or UAI weapn emulator within a service-based architect that is compatible with netweork centric operations.			
(U)	In FY 2007: Not Applicable.			
(U)	Total Cost	12.436	30.519	19.658

(U) C. Other Program Funding Summary ($ in Millions)

	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
(U) Related Activities:									
(U) PE 0602602F, Conventional Munitions.									
(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.									

(U) D. Acquisition Strategy

Not Applicable.

Exhibit R-2a, RDT&E Project Justification			DATE: February 2006
BUDGET ACTIVITY: 03 Advanced Technology Development (ATD)	PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology	PROJECT NUMBER AND TITLE: 670B Guidance Technology	

Cost ($ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
670B Guidance Technology	12.244	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

Note: After FY 2005, these efforts will be covered under Project 670A in this Program Element.

(U) A. Mission Description and Budget Item Justification

This project develops, demonstrates, and integrates affordable, autonomous, and adverse weather advanced guidance technologies for conventional armaments delivered from manned and unmanned aerospace vehicles. This project includes development of conventional weapon guidance systems including terminal seekers, midcourse navigation sensors for stand off delivery weapons, and target detection and identification processing algorithms for reducing target location error to improve target kill probability.

(U) B. Accomplishments/Planned Program ($ in Millions)	FY 2005	FY 2006	FY 2007
(U) MAJOR THRUST: Develop and demonstrate advanced conventional armament seeker technologies for miniature munitions applications. These seeker technologies will autonomously detect, acquire, and guide to targets of interest in adverse weather and battlefield conditions. Also, the seeker technologies will increase the probability of kill and minimize collateral damage, while providing increased weapons load-out and improved sortie effectiveness. Note: In FY 2006, these efforts will be moved to Project 670A in this Program Element.	0.824	0.000	0.000
(U) In FY 2005: Conducted preliminary design and fabrication of a low-cost, laser detection and ranging seeker to increase data rate and reduce moving parts of earlier generation laser seeker technologies.			
(U) In FY 2006: Not Applicable.			
(U) In FY 2007: Not Applicable.			
(U)			
(U) MAJOR THRUST: Develop and demonstrate advanced conventional armament navigation and control technologies to increase armament navigation accuracy, improve stand off range, and enhance weapons control and operation in electronic jamming environments. Note: In FY 2006, these efforts will be moved to Project 670A in this Program Element.	3.324	0.000	0.000
(U) In FY 2005: Conducted test and analysis to support the development a munitions navigation system using micro-electromechanical system technology to provide an accurate (less than one meter), miniature (less than 25 cubic inches), and affordable (less than $6,000 per unit) Global Positioning System/Inertial Measurement Unit navigation system.			
(U) In FY 2006: Not Applicable.			
(U) In FY 2007: Not Applicable.			
(U)			

Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY **03 Advanced Technology Development (ATD)**	PE NUMBER AND TITLE **0603601F Conventional Weapons Technology**	PROJECT NUMBER AND TITLE **670B Guidance Technology**

(U) B. Accomplishments/Planned Program ($ in Millions)

	FY 2005	FY 2006	FY 2007
(U) MAJOR THRUST: Integrate advanced conventional guidance technologies including seekers, processors, controls, datalinks, and algorithms to provide improved adverse weather performance, faster processing of target information, higher probability of target detection, an operationally acceptable target false alarm rate, and enhance the effectiveness of miniature munitions against both mobile and fixed ground targets. Note: In FY 2006, this effort will be completed. Further guidance integration efforts will be executed under Project 670A in this Program Element.	8.096	0.000	0.000
(U) In FY 2005: Developed and tested Low-Cost Autonomous Attack System (LOCAAS) datalink for flight test that will provide the capability to re-target in-flight after munition has separated from launch aircraft.			
(U) In FY 2006: Not Applicable.			
(U) In FY 2007: Not Applicable.			
(U) Total Cost	12.244	0.000	0.000

(U) C. Other Program Funding Summary ($ in Millions)

	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
(U) Related Activities:									
(U) PE 0602602F, Conventional Munitions									
(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.									

(U) D. Acquisition Strategy

Not Applicable.