

UNCLASSIFIED

PE NUMBER: 0603601F

PE TITLE: Conventional Weapons Technology

Exhibit R-2, RDT&E Budget Item Justification

DATE

February 2005

BUDGET ACTIVITY

03 Advanced Technology Development (ATD)

PE NUMBER AND TITLE

0603601F Conventional Weapons Technology

Cost (\$ in Millions)	FY 2004 Actual	FY 2005 Estimate	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	35.441	27.255	18.660	19.094	19.922	21.294	21.485	21.584	Continuing	TBD
670A Conventional Weapons Development	20.275	18.759	18.660	19.094	19.922	21.294	21.485	21.584	Continuing	TBD
670B Guidance Technology	15.166	8.496	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	TBD

Note: In FY 2005, the funding was reduced as the Low-Cost Autonomous Attack System (LOCAAS) Advanced Technology Demonstration (ATD) transitioned from the initial powered flight test phase of the ATD to the second phase of the ATD. 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 2005, Congress added \$1.0 million for High Speed Strike Weapon; \$3.0 million for BLU-109 Bunker Buster - Heavy; and \$1.1 million for Fuze Air-to-Surface Technology. 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)**

	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) Previous President's Budget	37.198	22.398	22.594	23.024
(U) Current PBR/President's Budget	35.441	27.255	18.660	19.094
(U) Total Adjustments	-1.757	4.857		
(U) Congressional Program Reductions				
Congressional Rescissions		-0.243		
Congressional Increases		5.100		
Reprogrammings	-0.731			
SBIR/STTR Transfer	-1.026			

(U) **Significant Program Changes:**

Not Applicable.

C. Performance Metrics

(U) Under Development.

Exhibit R-2a, RDT&E Project Justification

DATE

February 2005

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 2004 Actual	FY 2005 Estimate	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	20.275	18.759	18.660	19.094	19.922	21.294	21.485	21.584	Continuing	TBD
Quantity of RDT&E Articles	0	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)**

	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(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.	7.108	5.350	4.062	2.119
(U) In FY 2004: Completed cooperative program with the United Kingdom to ground test an integrated fuze, an improved target detection device, and a directional warhead package. Enhanced design of a fuze using Microwave Monolithic Integrated Circuit technologies that will give a burst accuracy of 0.5 meters for weapons that have closure rates up to 2,500 meters per second. Began designing a hard target influence fuze capable of denying hard and deeply buried facilities access.				
(U) In FY 2005: Complete design of 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. Continue 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)				

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Exhibit R-2a, RDT&E Project Justification			DATE February 2005		
BUDGET ACTIVITY 03 Advanced Technology Development (ATD)		PE NUMBER AND TITLE 0603601F Conventional Weapons Technology		PROJECT NUMBER AND TITLE 670A Conventional Weapons Development	
(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.	2.349	3.301	3.000	2.000
(U)	In FY 2004: Completed initial design that integrated components and technologies for a weapon that can neutralize hardened chemical and biological warfare facilities. Developed an initial concept to demonstrate a multi-mode ordnance package effective against a broad range of unhardened ground targets.				
(U)	In FY 2005: Demonstrate 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 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. Note: In FY 2004, Air Force shifted ~\$6.0M to this thrust from other projects to accelerate the high penetrator demonstration.	10.818	5.053	5.257	6.375
(U)	In FY 2004: Improved the design and fabrication of a warhead capable of surviving high-speed penetration of extremely deep targets by integrating a new warhead case technology, insensitive explosives, and a multiple-event fuze. Demonstrated a Tantalum warhead to provide attack capability against armored targets employing 'Active Protection Systems'.				
(U)	In FY 2005: Demonstrate a weapon capable of high-speed penetration of extremely hard targets by integrating new warhead case technology, insensitive explosive, and a multiple-event fuze. Begin				
Project 670A		R-1 Shopping List - Item No. 29-3 of 29-9		Exhibit R-2a (PE 0603601F)	

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BUDGET ACTIVITY

03 Advanced Technology Development (ATD)

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Technology

PROJECT NUMBER AND TITLE

670A Conventional Weapons
Development

improving insensitive explosive warhead fills with a 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: 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.	0.000	0.000	0.905	7.600
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(U) In FY 2004: Not Applicable.

(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	0.000	0.000	5.436	1.000
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Exhibit R-2a, RDT&E Project Justification			DATE		
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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE			
03 Advanced Technology Development (ATD)	0603601F Conventional Weapons Technology	670A Conventional Weapons Development			
Demonstration will be completed allowing seekers for two different munition concepts to be initiated (in another thrust in this project).					
(U) In FY 2004: Not Applicable.					
(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.		0.000	0.991	0.000	0.000
(U) In FY 2004: Not Applicable.					
(U) In FY 2005: Perform preliminary design of a high-speed weapon to provide a quick strike capability against time-critical targets.					
(U) In FY 2006: Not Applicable.					
(U) In FY 2007: Not Applicable.					
(U)					
(U) CONGRESSIONAL ADD: BLU-109 Bunker Buster - Heavy.		0.000	2.973	0.000	0.000
(U) In FY 2004: Not Applicable.					
(U) In FY 2005: Improve and test the penetration performance of a BLU-109 (with a tungsten metal ballast in the warhead and a 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.		0.000	1.091	0.000	0.000
(U) In FY 2004: Not Applicable.					
(U) In FY 2005: Develop and demonstrate, 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: Not Applicable.					
(U) In FY 2007: Not Applicable.					
(U) Total Cost		20.275	18.759	18.660	19.094
Project 670A		R-1 Shopping List - Item No. 29-5 of 29-9		Exhibit R-2a (PE 0603601F)	

Exhibit R-2a, RDT&E Project Justification

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BUDGET ACTIVITY

03 Advanced Technology Development (ATD)

PE NUMBER AND TITLE

0603601F Conventional Weapons
Technology

PROJECT NUMBER AND TITLE

670A Conventional Weapons
Development(U) **C. Other Program Funding Summary (\$ in Millions)**

	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	

(U) Related Activities:

(U) PE 0602602F, Conventional
Munitions.This project has been
coordinated through the(U) Reliance process to
harmonize efforts and
eliminate duplication.(U) **D. Acquisition Strategy**

Not Applicable.

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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 2004 Actual	FY 2005 Estimate	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	15.166	8.496	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	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)**

	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</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: In FY 2006, these efforts will be moved to Project 670A in this Program Element.	2.417	1.500	0.000	0.000
(U) In FY 2004: Evaluated a low-cost, laser detection and ranging seeker that will increase data rate and reduce moving parts of earlier generation laser seeker technologies.				
(U) In FY 2005: Commence design and fabrication of a low-cost, laser detection and ranging seeker that will 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.	2.175	3.792	0.000	0.000
(U) In FY 2004: Furthered development of a munition 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 2005: Continue developing a munition navigation system using micro-electromechanical system				

Project 670B

R-1 Shopping List - Item No. 29-7 of 29-9

Exhibit R-2a (PE 0603601F)

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			February 2005	
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE		
03 Advanced Technology Development (ATD)	0603601F Conventional Weapons Technology	670B Guidance Technology		
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)				
(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.	3.802	3.204	0.000	0.000
(U) In FY 2004: Designed a data link for Low Cost Autonomous Attack System (LOCAAS) to provide a capability to perform re-targeting in-flight after munition has separated from launch aircraft.				
(U) In FY 2005: Develop, fabricate, and flight test a datalink on the LOCAAS providing 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)				
(U) CONGRESSIONAL ADD: Develop technologies in support of the Low Cost Autonomous Attack System (LOCAAS) program.	0.968	0.000	0.000	0.000
(U) In FY 2004: Complemented the current LOCAAS development program by accelerating the fabrication, integration, and flight-testing of a datalink on the weapon.				
(U) In FY 2005: Not Applicable.				
(U) In FY 2006: Not Applicable.				
(U) In FY 2007: Not Applicable.				
(U)				
(U) CONGRESSIONAL ADD: Maverick Missile Upgrade Lock-On After Launch (LOAL) - Live Testing.	5.804	0.000	0.000	0.000
(U) In FY 2004: Conducted an operational utility evaluation of a Maverick Missile enhanced with a communication subsystem. Tested a Maverick missile with a data communication system proving it could be targeted/retargeted after launch.				
(U) In FY 2005: Not Applicable.				
(U) In FY 2006: Not Applicable.				
(U) In FY 2007: Not Applicable.				
Project 670B				
R-1 Shopping List - Item No. 29-8 of 29-9				
Exhibit R-2a (PE 0603601F)				

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Exhibit R-2a, RDT&E Project Justification							DATE February 2005			
BUDGET ACTIVITY 03 Advanced Technology Development (ATD)				PE NUMBER AND TITLE 0603601F Conventional Weapons Technology		PROJECT NUMBER AND TITLE 670B Guidance Technology				
(U)	Total Cost				15.166	8.496	0.000	0.000		
(U)	<u>C. Other Program Funding Summary (\$ in Millions)</u>									
	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	Related Activities:									
(U)	PE 0602602F, Conventional Munitions									
	This project has been coordinated through the									
(U)	Reliance process to harmonize efforts and eliminate duplication.									
(U)	<u>D. Acquisition Strategy</u>									
	Not Applicable.									