

**UNCLASSIFIED**

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army

DATE: February 2011

**APPROPRIATION/BUDGET ACTIVITY**  
 2040: Research, Development, Test & Evaluation, Army  
 BA 3: Advanced Technology Development (ATD)

**R-1 ITEM NOMENCLATURE**  
 PE 0603003A: AVIATION ADVANCED TECHNOLOGY

COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
Total Program Element	104.229	57.454	62.193	-	62.193	66.660	73.039	76.774	78.762	Continuing	Continuing
313: ADV ROTARYWING VEH TECH	37.993	42.149	44.939	-	44.939	46.777	50.279	56.515	58.170	Continuing	Continuing
435: AIRCRAFT WEAPONS	2.615	2.608	-	-	-	-	-	-	-	Continuing	Continuing
436: ROTARYWING MEP INTEG	-	1.754	7.619	-	7.619	10.070	12.762	10.092	10.252	Continuing	Continuing
447: ACFT DEMO ENGINES	17.264	10.943	9.635	-	9.635	9.813	9.998	10.167	10.340	Continuing	Continuing
BA7: AVIATION ADVANCED TECHNOLOGY INITIATIVES (CA)	46.357	-	-	-	-	-	-	-	-	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This program element (PE) matures and demonstrates manned and unmanned rotary wing vehicle (RWV) technologies to enable Army transformation. Within this PE, aviation technologies are developed and integrated into realistic and robust demonstrations. The PE supports enabling component and subsystems for rotorcraft in the following areas: rotors, drive trains, structures and survivability (project 313), weapons integration (project 435), mission equipment packages to enable control of unmanned systems (project 436) and affordable and efficient engines (project 447). Projects BA7 and BA8 fund congressional special interest items.

Work in this PE is related to and fully coordinated with PE 0602211A (Aviation Technology), PE 0603313A (Missile and Rocket Advanced Technology) and PE 0603270A (Electronic Warfare Technology). Efforts under this PE transition to programs supported by PE 0603801A (Aviation - Advanced Development), PE 0604801A (Aviation - Engineering Development), and PE 0604270A (Electronic Warfare Development).

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this PE is performed by the Aviation and Missile Research, Development, and Engineering Center (AMRDEC) with facilities located at Redstone Arsenal, AL; Fort Eustis, VA; and Moffett Field, CA.

**UNCLASSIFIED**

**Exhibit R-2A. RD&E Project Justification:** PB 2012 Army

**DATE:** February 2011

APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE				PROJECT					
2040: Research, Development, Test & Evaluation, Army		PE 0603003A: AVIATION ADVANCED TECHNOLOGY				BAT: AVIATION ADVANCED TECHNOLOGY INITIATIVES (CA)					
BA 3: Advanced Technology Development (ATD)		TECHNOLOGY				INITIATIVES (CA)					
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
BAT: AVIATION ADVANCED TECHNOLOGY INITIATIVES (CA)	46.357	-	-	-	-	-	-	-	-	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Congressional Interest Item funding for Aviation advanced technology development.

**B. Accomplishments/Planned Programs (\$ in Millions)**

**Title:** UAV-Resupply (BURRO)

**Description:** This is a Congressional Interest Item.

**FY 2010 Accomplishments:**

Supported the development of an unmanned aerial logistics resupply system designed to overcome effects of threat, weather, elevation and chem-bio-radiation; Effort focused on unmanned aerial system concept to increase reliability, reduce susceptibility and reduce vulnerability.

**Title:** Universal Control Full Authority Digital Engine Control (FADEC)

**Description:** This is a Congressional Interest Item.

**FY 2010 Accomplishments:**

Developed a universal control architecture that incorporates model-based schemes to improve operational performance and reduce ownership cost for turboshaft engine control systems; Effort was re-scoped for future ITEP 3000hp engine application.

**Title:** Drive System Composite Structural Component Risk - Reduction Program

**Description:** This is a Congressional Interest Item.

**FY 2010 Accomplishments:**

Evaluated the results of the earlier material testing and implemented necessary changes; Other materials were also evaluated and tested; A final geometry and material system was down-selected for advancement.

**Title:** Autonomous Cargo Acquisition for Rotorcraft Unmanned Aerial Vehicles

**Description:** This is a Congressional Interest Item.

**FY 2010 Accomplishments:**

	FY 2010	FY 2011	FY 2012
BAT: AVIATION ADVANCED TECHNOLOGY INITIATIVES (CA)	3.184	-	-
Universal Control Full Authority Digital Engine Control (FADEC)	7.162	-	-
Drive System Composite Structural Component Risk - Reduction Program	2.387	-	-
Autonomous Cargo Acquisition for Rotorcraft Unmanned Aerial Vehicles	1.273	-	-

**UNCLASSIFIED**

**UNCLASSIFIED**

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army

DATE: February 2011

**APPROPRIATION/BUDGET ACTIVITY**  
 2040: Research, Development, Test & Evaluation, Army  
 BA 3: Advanced Technology Development (ATD)

**R-1 ITEM NOMENCLATURE**  
 PE 0603003A: AVIATION ADVANCED TECHNOLOGY

**PROJECT**  
 BAT: AVIATION ADVANCED TECHNOLOGY INITIATIVES (CA)

**B. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2010	FY 2011	FY 2012
Investigated rotorcraft unmanned aerial systems (UAS) to provide logistics supply and precise load emplacement and extraction.			
<b>Title:</b> Inter Turbine Burner for Turbo Shaft Engines	2.387	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Validated the final design selection of an inter turbine burner flame-holder and combustion chamber geometry.			
<b>Title:</b> Enhanced Rapid Tactical Integration and Fielding of Systems	3.104	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Supported development of systems that provide network-centric capabilities to the future force.			
<b>Title:</b> Parts-on-Demand for CONUS Operations	4.477	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Developed a process for Parts-on-Demand for CONUS Operations.			
<b>Title:</b> Next Generation Green, Economical and Automated Production of Composite Structures for Aerospace	0.995	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Developed tooling system processes to reduce labor costs, improve efficiency, and improve capabilities; Included semi-automated/automated processes: batching, mixing, forming, drying, and sealing for soluble tooling; Rapid prototyping methods were evaluated to make small production runs more cost effective for soluble and insoluble tooling.			
<b>Title:</b> UH-60 Transmission/Gearbox Galvanic Corrosion Reduction	1.492	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Researched ways to reduce corrosion and thus increase mission readiness.			
<b>Title:</b> Robust Composite Structural Core for Army Helicopters	1.592	-	-

**UNCLASSIFIED**

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification: PB 2012 Army</b>		<b>DATE:</b> February 2011	
<b>APPROPRIATION/BUDGET ACTIVITY</b>	<b>R-1 ITEM NOMENCLATURE</b>	<b>PROJECT</b>	
2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	PE 0603003A: AVIATION ADVANCED TECHNOLOGY	BAT: AVIATION ADVANCED TECHNOLOGY INITIATIVES (CA)	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>			
<b>Description:</b> This Congressional Interest Item matured a more robust structural core product through material characterization, product development and technology transition.	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012</b>
<b>FY 2010 Accomplishments:</b> In FY10, this Congressional Interest Item matured a more robust structural core product through material characterization, product development and technology transition.	1.592	-	-
<b>Title:</b> Crewmember Alert Display Development Program			
<b>Description:</b> This Congressional Interest Item developed and combined already installed crewmember displays to alert the door gunners with immediate and accurate detections of hostile fire from enemy weapon systems.			
<b>FY 2010 Accomplishments:</b> In FY10, this Congressional Interest Item developed and combined already installed crewmember displays to alert the door gunners with immediate and accurate detections of hostile fire from enemy weapon systems.	1.592	-	-
<b>Title:</b> Wireless HUMS for Condition Based Maintenance of Army Helicopters			
<b>Description:</b> This Congressional Interest Item evaluated ways to improve operational safety of Army helicopters in both training and combat operations, while concurrently supporting cost reduction through condition based maintenance.			
<b>FY 2010 Accomplishments:</b> In FY10, this Congressional Interest Item evaluated ways to improve operational safety of Army helicopters in both training and combat operations, while concurrently supporting cost reduction through condition based maintenance.			
<b>Title:</b> Heavy Fuel Engine Family for Unmanned Systems	3.183	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Developed and tested a fuel efficient heavy fuel engine to meet the DoD requirement that UAS engines operate on JP-8 fuel.			
<b>Title:</b> Transitioning Stretch Broken Carbon Fiber to Production Programs	3.183	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Researched methods to develop and qualify carbon fiber composite material forms for use on military aircraft.			
<b>Title:</b> Advanced Affordable Turbine Engine Program	3.979	-	-

**UNCLASSIFIED**

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification: PB 2012 Army**

**DATE:** February 2011

<b>APPROPRIATION/BUDGET ACTIVITY</b> 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	<b>R-1 ITEM NOMENCLATURE</b> PE 0603003A: AVIATION ADVANCED TECHNOLOGY	<b>PROJECT</b> BAT: AVIATION ADVANCED TECHNOLOGY INITIATIVES (CA)
---	---	--

**B. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2010	FY 2011	FY 2012
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Developed and tested components of the next generation engine for attack and utility helicopters in support of the Army Advanced Affordable Turbine Engine (AATE) program.			
<b>Title:</b> New Hi Temp Dom PES Foam Fab/Cert DoD Aerospace Applications	2.387	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Qualified a low density polyethersulphone (PES) foam for high performance core materials as an alternative source for defense and aerospace structural core applications.			
<b>Title:</b> Technologies for Military Equipment Replenishment	1.592	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Developed solutions to facilitate the return of equipment to service; Re-engineered essential parts to reduce costs and give equipment a longer useful life.			
<b>Title:</b> Foil Bearing Supported UAV Engine	0.796	-	-
<b>Description:</b> This is a Congressional Interest Item.			
<b>FY 2010 Accomplishments:</b> Developed proof-of-concept air cushion foil bearings that provide extended part life relative to conventional engine bearings.			
<b>Accomplishments/Planned Programs Subtotals</b>			46.357
<b>C. Other Program Funding Summary (\$ in Millions)</b>			
N/A			
<b>D. Acquisition Strategy</b>			
N/A			
<b>E. Performance Metrics</b>			
Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.			

**UNCLASSIFIED**