

**UNCLASSIFIED**

PE NUMBER: 0603860F

PE TITLE: Joint Precision Approach and Landing Systems - Dem/Val

<b>Exhibit R-2, RDT&amp;E Budget Item Justification</b>								<b>DATE</b> <b>February 2008</b>	
<b>BUDGET ACTIVITY</b> <b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>				<b>PE NUMBER AND TITLE</b> <b>0603860F Joint Precision Approach and Landing Systems - Dem/Val</b>					
Cost (\$ in Millions)	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	9.524	7.451	7.479	7.872	2.324	2.093	1.941	Continuing	TBD
4652 Precision Landing Systems	9.524	7.451	7.479	7.872	2.324	2.093	1.941	Continuing	TBD

**(U) A. Mission Description and Budget Item Justification**

Joint Precision Approach and Landing System (JPALS) is a joint effort among the USAF, Navy/USMC, and Army. The USAF is responsible for developing the common system architecture for the Land-Based increments. The Joint Requirements Oversight Council (JROC) approved the Capability Development Document (CDD) in March 2007 and transferred lead service responsibilities to the Navy. JPALS will define the future precision approach and landing system for the Department of Defense (DOD) to provide a joint operational capability for U.S. forces to perform assigned missions within and from fixed-base, tactical, shipboard, and special operations environments under a wide range of meteorological conditions. Also, JPALS will enhance DOD's ability to obtain civil interoperability with the Federal Aviation Administration's (FAA) projected Local Area Augmentation System (LAAS). This program will participate in the development, testing, and implementation of international standards (to include North American Treaty Organization (NATO) standardization agreements) to ensure joint, allied, and coalition interoperability. When complete, this effort will replace aging shipboard and ground-based precision landing systems (Instrument Landing System, Precision Approach Radar, Microwave Landing System, and Automated Carrier Landing Systems). JPALS will facilitate DOD missions and training by enabling US forces to land on any JPALS-equipped airfield worldwide (land and sea) under peacetime and hostile conditions. Furthermore, JPALS will provide a precision landing capability where none currently exists: interoperability for naval aircraft landing at shore-based airfields operated by other services; interoperability for Navy/USMC and Army aircraft landing at civil airports, and for the Civil Reserve Air Fleet landing at DOD airfields. The 2005 JPALS Analysis of Alternatives (AoA) Update identified a family of systems (FoS) based on GPS technology solutions for fixed base, tactical and sea-based environments and Enhanced Vision Systems (EVS) for the special operations environment as the best choice for mitigating the capability gaps and meeting user needs. Development activities are initially focused on reducing technical risks. First, JPALS will provide needed guidance quality in the presence of Global Positioning System (GPS) jamming. Second, its architecture will be developed to integrate and synchronize with related Communication, Navigation and Surveillance/Air Traffic Management (CNS/ATM), GPS modernization initiatives, and net-centricity operations. Third, JPALS will develop and integrate encrypted data links and antenna sets. Finally, because a cornerstone of the JPALS implementation strategy is world wide military and civil interoperability, JPALS will harmonize with US and international civil satellite navigation and ground navigation systems development to support development of an international implementation timeline and strategy. JPALS will result in avionics modifications to over 13,000 DOD aircraft. EVS technologies will also be monitored and evaluated, because they are a planned future JPALS increment and have the potential to provide an autonomous near zero visibility landing capability for special operations and Air Mobility Command first-in aircraft.

This program is in budget activity 4, Advanced Component Development and Prototypes Research Category 6.4B, because supportability and manufacturing process design considerations must be identified and integrated into the precision landing architecture.

Exhibit R-2, RDT&E Budget Item Justification

DATE

February 2008

BUDGET ACTIVITY

04 Advanced Component Development and Prototypes (ACD&P)

PE NUMBER AND TITLE

0603860F Joint Precision Approach and Landing Systems - Dem/Val

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

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Previous President's Budget	9.908	7.544	8.656
(U) Current PBR/President's Budget	9.524	7.451	7.479
(U) Total Adjustments	-0.384		
(U) Congressional Program Reductions	-0.111	-0.093	
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer	-0.273		
(U) <u>Significant Program Changes:</u>			

## Exhibit R-2a, RDT&amp;E Project Justification

DATE

February 2008

BUDGET ACTIVITY				PE NUMBER AND TITLE			PROJECT NUMBER AND TITLE			
<b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>				<b>0603860F Joint Precision Approach and Landing Systems - Dem/Val</b>			<b>4652 Precision Landing Systems</b>			
Cost (\$ in Millions)	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total	
4652 Precision Landing Systems	9.524	7.451	7.479	7.872	2.324	2.093	1.941	Continuing	TBD	
Quantity of RDT&E Articles	0	0	0	0	0	0	0			

(U) **A. Mission Description and Budget Item Justification**

Joint Precision Approach and Landing System (JPALS) is a joint effort among the USAF, Navy/USMC, and Army. The USAF is responsible for developing the common system architecture for the Land-Based increments. The Joint Requirements Oversight Council (JROC) approved the Capability Development Document (CDD) in March 2007 and transferred lead service responsibilities to the Navy. JPALS will define the future precision approach and landing system for the Department of Defense (DOD) to provide a joint operational capability for U.S. forces to perform assigned missions within and from fixed-base, tactical, shipboard, and special operations environments under a wide range of meteorological conditions. Also, JPALS will enhance DOD's ability to obtain civil interoperability with the Federal Aviation Administration's (FAA) projected Local Area Augmentation System (LAAS). This program will participate in the development, testing, and implementation of international standards (to include North American Treaty Organization (NATO) standardization agreements) to ensure joint, allied, and coalition interoperability. When complete, this effort will replace aging shipboard and ground-based precision landing systems (Instrument Landing System, Precision Approach Radar, Microwave Landing System, and Automated Carrier Landing Systems). JPALS will facilitate DOD missions and training by enabling US forces to land on any JPALS-equipped airfield worldwide (land and sea) under peacetime and hostile conditions. Furthermore, JPALS will provide a precision landing capability where none currently exists: interoperability for naval aircraft landing at shore-based airfields operated by other services; interoperability for Navy/USMC and Army aircraft landing at civil airports, and for the Civil Reserve Air Fleet landing at DOD airfields. The 2005 JPALS Analysis of Alternatives (AoA) Update identified a family of systems (FoS) based on GPS technology solutions for fixed base, tactical and sea-based environments and Enhanced Vision Systems (EVS) for the special operations environment as the best choice for mitigating the capability gaps and meeting user needs. Development activities are initially focused on reducing technical risks. First, JPALS will provide needed guidance quality in the presence of Global Positioning System (GPS) jamming. Second, its architecture will be developed to integrate and synchronize with related Communication, Navigation and Surveillance/Air Traffic Management (CNS/ATM), GPS modernization initiatives, and net-centricity operations. Third, JPALS will develop and integrate encrypted data links and antenna sets. Finally, because a cornerstone of the JPALS implementation strategy is world wide military and civil interoperability, JPALS will harmonize with US and international civil satellite navigation and ground navigation systems development to support development of an international implementation timeline and strategy. JPALS will result in avionics modifications to over 13,000 DOD aircraft. EVS technologies will also be monitored and evaluated, because they are a planned future JPALS increment and have the potential to provide an autonomous near zero visibility landing capability for special operations and Air Mobility Command first-in aircraft.

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**Exhibit R-2a, RDT&E Project Justification**

DATE

**February 2008**

BUDGET ACTIVITY <b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	PE NUMBER AND TITLE <b>0603860F Joint Precision Approach and Landing Systems - Dem/Val</b>	PROJECT NUMBER AND TITLE <b>4652 Precision Landing Systems</b>
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(U) <b><u>B. Accomplishments/Planned Program (\$ in Millions)</u></b>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Perform anti-jam and threat analysis	1.220	0.700	0.500
(U) Perform architecture trade studies and analyses	1.774	1.104	0.700
(U) Perform aircraft requirements and integration studies	0.250	0.080	0.115
(U) Flight test support	0.417	0.200	0.000
(U) Requirements development and system design, analysis, engineering, test and evaluation	5.613	4.797	3.493
(U) Development of future JPALS spirals/increments	0.250	0.250	0.250
(U) MS B preparation	0.000	0.320	2.421
(U) Total Cost	9.524	7.451	7.479

(U) <b><u>C. Other Program Funding Summary (\$ in Millions)</u></b>	<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>	<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>Complete</u>	
(U) Other APPN									

(U) **D. Acquisition Strategy**  
 All contracts will be competitively awarded. For Technology Demonstration (TD) efforts leading to Milestone B, we awarded multiple Time and Materials (T&M) contracts.

UNCLASSIFIED

**Exhibit R-3, RDT&E Project Cost Analysis**

DATE

**February 2008**

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(U) <u>Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior to FY 2007 Cost</u>	<u>FY 2007 Cost</u>	<u>FY 2007 Award Date</u>	<u>FY 2008 Cost</u>	<u>FY 2008 Award Date</u>	<u>FY 2009 Cost</u>	<u>FY 2009 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
(U) <u>Product Development</u>												
Aircraft Anti-jam & Threat Analyses	C/T&M	AES, California, MD		1.220	Feb-07	0.700	Feb-08	0.500	Feb-09	Continuing	TBD	TBD
Architecture Trade Studies & Analyses	C/T&M	AES, California, MD		1.774	Feb-07	1.104	May-08	0.700	May-09	Continuing	TBD	TBD
Aircraft Requirements & Integration Studies	C/T&M	AES, California, MD		0.250	Feb-07	0.080	Feb-08	0.115	Feb-09	Continuing	TBD	TBD
Requirements Development, System Design, Analysis, Engineering, Test and Evaluation	C/T&M	AES, California, MD		5.613	Feb-07	4.797	Apr-08	3.493	Apr-09	Continuing	TBD	TBD
Program Planning For Future JPALS Spirals	C/T&M	ESC / ETASS / PASS / ITSP II (Various), Bedford, MA		0.250	Feb-07	0.250	May-08	0.250	May-09	Continuing	TBD	TBD
Milestone B preparation	C/T&M	ESC / ETASS / PASS / ITSP II (Various), Bedford, MA				0.320	Jun-08	2.421	Feb-09	Continuing	TBD	TBD
Subtotal Product Development			0.000	9.107		7.251		7.479		Continuing	TBD	TBD
Remarks:												
(U) <u>Test &amp; Evaluation</u>												
Flight Test Support	MIPR	46TG/XPRF, Holloman, NM		0.417	Mar-07	0.200	Mar-08			Continuing	TBD	TBD
Subtotal Test & Evaluation			0.000	0.417		0.200		0.000		Continuing	TBD	TBD
Remarks:												
(U) Total Cost			0.000	9.524		7.451		7.479		Continuing	TBD	TBD

Exhibit R-4, RDT&E Schedule Profile

DATE

February 2008

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and Landing Systems - Dem/Val

PROJECT NUMBER AND TITLE  
4652 Precision Landing Systems

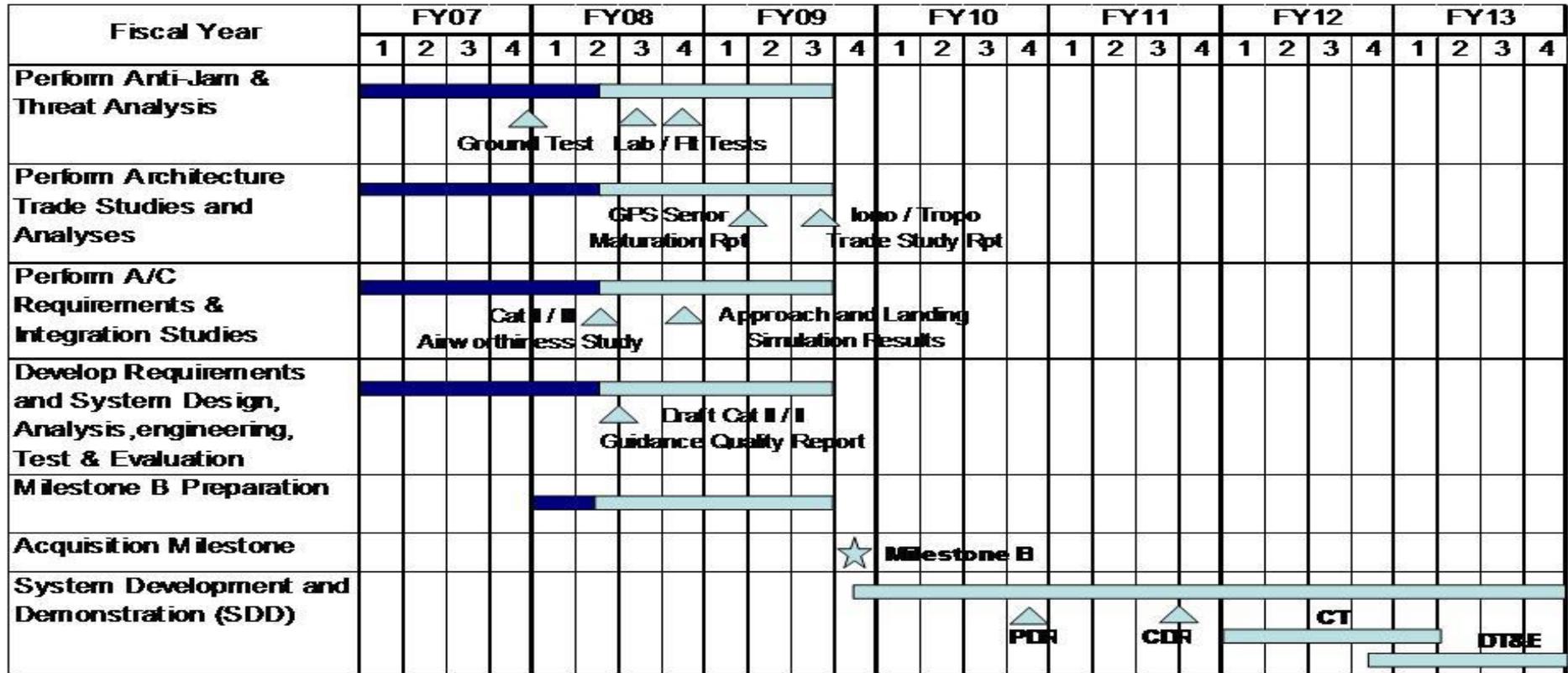


Exhibit R-4a, RDT&E Schedule Detail

DATE

February 2008

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04 Advanced Component Development and Prototypes (ACD&P)

PE NUMBER AND TITLE

0603860F Joint Precision Approach and Landing Systems - Dem/Val

PROJECT NUMBER AND TITLE

4652 Precision Landing Systems

(U) **Schedule Profile**

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Anti-Jam & Threat Analysis Tests	4Q	3-4Q	
(U) Complete Anti-Jam & Threat Analysis			3Q
(U) Sensor and Iono/Tropo Reports			1-3Q
(U) Complete Architecture Trade Studies and Analyses			3Q
(U) Category (Cat) II/III Air Worthiness Study/Simulation		2-4Q	
(U) Complete A/C Requirements & Integration Studies			3Q
(U) Draft Cat II/III Guidance Quality Report		1Q	
(U) Complete Requirements and System Design, Analysis, Engineering, and Test and Evaluation			3Q
(U) Complete Milestone B Preparation			3Q
(U) Acquisition Milestone			4Q
(U) Begin System Development and Demonstration (SDD)			4Q