

**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>	DATE <b>February 2007</b>
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<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>
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Cost (\$ in Millions)	FY 2006 Actual	FY 2007 Estimate	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	6.068	9.908	7.544	8.656	7.947	2.443	2.318	2.172	Continuing	TBD
4652 Precision Landing Systems	6.068	9.908	7.544	8.656	7.947	2.443	2.318	2.172	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 designated as the lead service to develop the common system architecture. Following the Joint Requirements Oversight Council (JROC) approval of the Capability Development Document (CDD) in February 2007, the lead service responsibilities will transfer 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&amp;E Budget Item Justification

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BUDGET ACTIVITY

04 Advanced Component Development and Prototypes (ACD&amp;P)

PE NUMBER AND TITLE

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

	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Previous President's Budget	10.951	10.011	10.169	19.130
(U) Current PBR/President's Budget	6.068	9.908	7.544	8.656
(U) Total Adjustments	-4.883	-0.103		
(U) Congressional Program Reductions		-0.065		
Congressional Rescissions		-0.038		
Congressional Increases				
Reprogrammings	-4.712			
SBIR/STTR Transfer	-0.171			
(U) <b><u>Significant Program Changes:</u></b>				
FY06, FY08, FY09: Reductions to fund higher AF and DoD priorities				

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

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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 2006 Actual	FY 2007 Estimate	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	6.068	9.908	7.544	8.656	7.947	2.443	2.318	2.172	Continuing	TBD
Quantity of RDT&E Articles	0	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 designated as the lead service to develop the common system architecture. Following the Joint Requirements Oversight Council (JROC) approval of the Capability Development Document (CDD) in February 2007, the lead service responsibilities will transfer 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.

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**February 2007**

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 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Perform anti-jam and threat analysis	0.993	2.250	1.750	0.500
(U) Perform architecture trade studies and analyses	1.693	3.497	2.581	1.615
(U) MS B preparation	2.628	0.311	0.413	3.250
(U) Prepare for system demonstration	0.226	0.250	0.250	0.250
(U) Perform aircraft requirements and integration studies	0.303	0.500	0.200	0.200
(U) Develop test program	0.225	0.100	0.100	0.200
(U) Develop requirements and system design		2.750	2.000	2.141
(U) Development of future JPALS spirals/increments		0.250	0.250	0.500
(U) Total Cost	6.068	9.908	7.544	8.656

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

	<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>FY 2012</u>	<u>FY 2013</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</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.

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Exhibit R-3, RDT&E Project Cost Analysis												DATE <b>February 2007</b>		
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>					
<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 2006 Cost</u>	<u>FY 2006 Cost</u>	<u>FY 2006 Award Date</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 Requirements & Integration Studies	C/T&M	AES, California, MD	1.515	0.280	Feb-06	0.250	Feb-07	0.080	Jan-08	0.170	Jan-09	Continuing	TBD	TBD
Aircraft Anti-jam & Threat Analyses	C/T&M	AES, California, MD		0.882	Feb-06	1.220	Feb-07	0.700	Jan-08	0.420	Jan-09	0.000	3.222	TBD
Architecture Trade Studies & Analyses	C/T&M	AES, California, MD	15.169	0.600	Feb-06	1.847	Feb-07	1.104	Jan-08	1.362	Jan-09	Continuing	TBD	TBD
Requirements Development/System Design	C/T&M	AES, California, MD				1.448	Feb-07	0.800	Jan-08	1.790	Jan-09	Continuing	TBD	TBD
Program Planning For Future JPALS Spirals	TBD	TBD								0.250	Jan-09	Continuing	TBD	TBD
Subtotal Product Development			16.684	1.762		4.765		2.684		3.992		Continuing	TBD	TBD
Remarks:														
<u>(U) Test &amp; Evaluation</u>														
Flight Test Support	MIPR	46TG/XPRF, Holloman, NM	1.123	0.094	Mar-06	0.417	Mar-07	0.200	Mar-08			0.000	1.834	4.087
Subtotal Test & Evaluation			1.123	0.094		0.417		0.200		0.000		0.000	1.834	4.087
Remarks:														
<u>(U) Management</u>														
Program Management Support	C/T&M	ESC/ITSP II (Various), Bedford, MA	14.369	1.620	May-06	1.638	Jan-07	1.661	Jan-08	1.656	Jan-09	Continuing	TBD	TBD
Specialized Cost Services	C/IDIQ	MCR, Lexington, MA	1.520	0.691	May-06	0.553	Jan-07	0.570	Jan-08	0.587	Jan-09	Continuing	TBD	TBD
GA SPO Operations	Various	Various	3.919	0.161	May-06	0.300	Mar-07	0.300	May-08	0.300	May-09	Continuing	TBD	TBD
Subtotal Management			19.808	2.472		2.491		2.531		2.543		Continuing	TBD	TBD
Remarks:														
<u>(U) Support</u>														
NAVY PM and Engineering	MIPR	Navy OMA21381, NAS Pax River, MD	16.582	0.105	Jan-06							0.000	16.687	16.687
ESC FFRDC Engineering	Various	MITRE	7.575	1.635	Jan-06	2.235	Jan-07	2.129	Jan-08	2.121	Jan-09	Continuing	TBD	TBD

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Subtotal Support	Corporation, Bedford, MA	24.157	1.740	2.235	2.129	2.121	Continuing	TBD	TBD	
Remarks:										
(U) <u>Reprogramming</u>								0.000		
Subtotal Reprogramming		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Remarks:										
(U) Total Cost		61.772	6.068	9.908	7.544	8.656	Continuing	TBD	TBD	

Exhibit R-4, RDT&E Schedule Profile

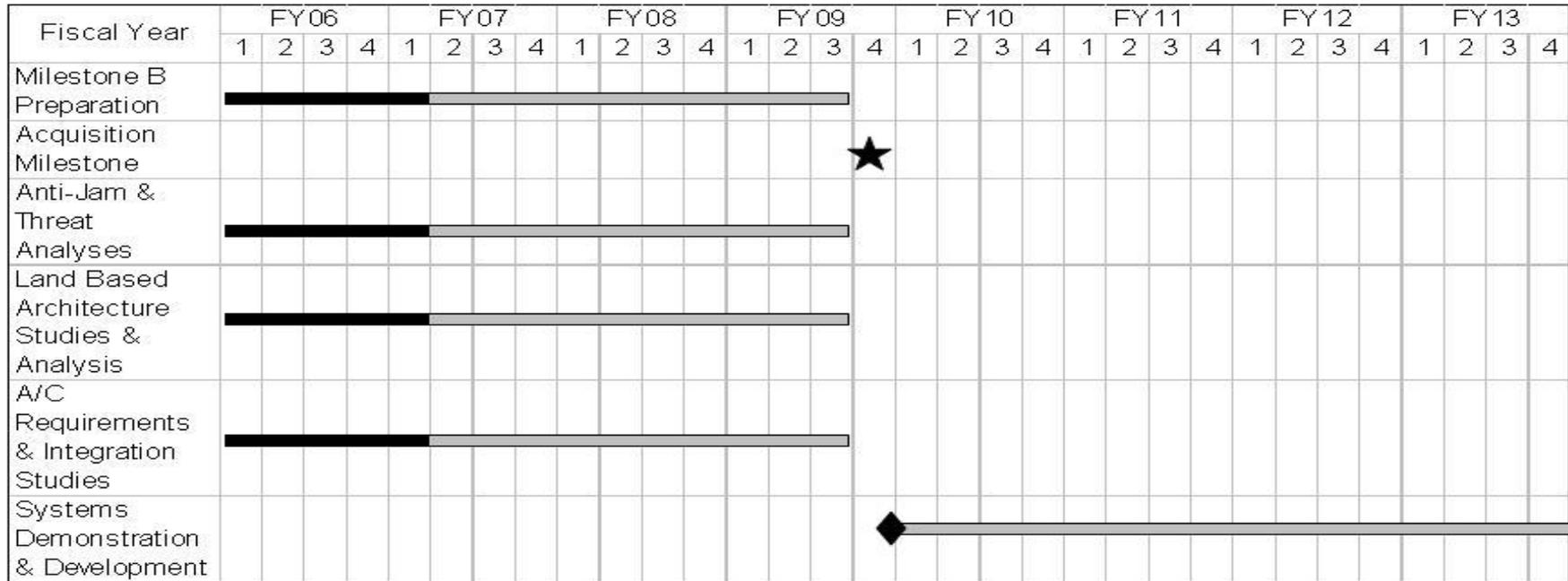
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04 Advanced Component Development and Prototypes (ACD&P)

PE NUMBER AND TITLE  
0603860F Joint Precision Approach  
and Landing Systems - Dem/Val

PROJECT NUMBER AND TITLE  
4652 Precision Landing Systems



As of December 2006

- ★ Milestone B
- ◆ Begin SDD
- ☆ Milestone C
- █ Planned Ongoing Activity
- █ Ongoing Activity that is Complete

Exhibit R-4a, RDT&E Schedule Detail

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PROJECT NUMBER AND TITLE

4652 Precision Landing Systems

(U) Schedule Profile

FY 2006

FY 2007

FY 2008

FY 2009

(U) Complete anti-jam and threat analyses

3Q

(U) Complete requirements & integrations studies

3Q

(U) Complete Land Based architecture studies and analyses

3Q

(U) Complete Milestone B prep work

3Q

(U) Milestone B

4Q

(U) Begin Systems Development and Design (SDD)

4Q