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

Exhibit R-2, RDT&E Budget Item Justification

DATE: February 2005

BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)

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

	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	12.861	16.784	11.211	18.684	18.993	19.535	5.507	5.072	Continuing	TBD
4652	Precision Landing Systems	12.861	16.784	11.211	18.684	18.993	19.535	5.507	5.072	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, and Army. The AF is designated as the lead service to develop the common system architecture. 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 conventional and special operations missions from fixed-base, tactical, shipboard, and special mission environments under a wide range of meteorological conditions. Also, JPALS will enhance DoD's ability to obtain civil interoperability with current and projected Federal Aviation Administration (FAA) and North Atlantic Treaty Organization (NATO) member country landing systems. This program will participate in the development, testing, and implementation of international standards (to include 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 Instrument Carrier Landing Systems). JPALS will facilitate DoD missions and training by enabling US forces to land on any airfield worldwide (land and sea) under peacetime and hostile conditions. JPALS also decreases the time required for deploying forces to a theater by providing an assured landing capability. JPALS provides increased inter- and intra-theater logistics throughput and the ability to fight at night and in inclement weather. Furthermore, JPALS will provide a precision landing capability where none currently exists. It will enhance interoperability for naval aircraft landing at shore-based fields operated by other services and provide interoperability for the Civil Reserve Air Fleet at DoD airfields, especially in the expeditionary environment. The JPALS Analysis of Alternatives (AOA) reflected Local Area Differential Global Positioning System (LDGPS) as the most promising technology to meet the mission need. Development activities are initially focused on reducing technical risks. First, JPALS will employ quality guidance 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) and GPS modernization initiatives. Third, JPALS will develop and integrate encrypted data links and antenna sets. Finally, JPALS will harmonize with U.S. and international civil satellite navigation and ground navigation systems development. This effort will result in avionics modifications to over 15,000 DoD aircraft. Because JPALS will result in a family of systems, other technologies will be monitored and evaluated such as an Autonomous Landing Capability (ALC) and the FAA local and wide area differential GPS alternatives.

This program is in budget activity 4, Demonstration and Validation, 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 2005
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)

		FY 2004	FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	13.847	18.385	25.781	21.260
(U)	Current PBR/President's Budget	12.861	16.784	11.211	18.684
(U)	Total Adjustments	-0.986	-1.601		
(U)	Congressional Program Reductions	-0.108			
	Congressional Rescissions	-0.118	-0.601		
	Congressional Increases				
	Reprogrammings	-0.355	-1.000		
	SBIR/STTR Transfer	-0.405			

(U) Significant Program Changes:

FY06: Reduction due to program restructure. Milestone B moved from 1QFY05 to 3QFY06 to accomodate development of Initial Capabilities Document (ICD), Capabilities Development Document (CDD), and update of Analysis of Alternatives (AoA).

Exhibit R-2a, RDT&E Project Justification			DATE: February 2005
BUDGET ACTIVITY: 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	

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
4652 Precision Landing Systems	12.861	16.784	11.211	18.684	18.993	19.535	5.507	5.072	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, and Army. The AF is designated as the lead service to develop the common system architecture. 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 conventional and special operations missions from fixed-base, tactical, shipboard, and special mission environments under a wide range of meteorological conditions. Also, JPALS will enhance DoD's ability to obtain civil interoperability with current and projected Federal Aviation Administration (FAA) and North Atlantic Treaty Organization (NATO) member country landing systems. This program will participate in the development, testing, and implementation of international standards (to include 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 Instrument Carrier Landing Systems). JPALS will facilitate DoD missions and training by enabling US forces to land on any airfield worldwide (land and sea) under peacetime and hostile conditions. JPALS also decreases the time required for deploying forces to a theater by providing an assured landing capability. JPALS provides increased inter- and intra-theater logistics throughput and the ability to fight at night and in inclement weather. Furthermore, JPALS will provide a precision landing capability where none currently exists. It will enhance interoperability for naval aircraft landing at shore-based fields operated by other services and provide interoperability for the Civil Reserve Air Fleet at DoD airfields, especially in the expeditionary environment. The JPALS Analysis of Alternatives (AOA) reflected Local Area Differential Global Positioning System (LDGPS) as the most promising technology to meet the mission need. Development activities are initially focused on reducing technical risks. First, JPALS will employ quality guidance 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) and GPS modernization initiatives. Third, JPALS will develop and integrate encrypted data links and antenna sets. Finally, JPALS will harmonize with U.S. and international civil satellite navigation and ground navigation systems development. This effort will result in avionics modifications to over 15,000 DoD aircraft. Because JPALS will result in a family of systems, other technologies will be monitored and evaluated such as an Autonomous Landing Capability (ALC) and the FAA local and wide area differential GPS alternatives.

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

(U) B. Accomplishments/Planned Program ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007
(U) Complete development of LDGPS test bed	3.396			
(U) Continue aircraft risk (anti-jam) and integration analyses	3.332			
(U) Continue studies and analyses to refine LDGPS architecture	3.823			
(U) Continue modeling & simulation	2.310			
(U) Complete modeling & simulation		2.476		
(U) Complete aircraft risk (anti-jam) and integration analysis		3.932		

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY 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)	Continue studies and analyses to refine LDGPS architecture		0.528			
(U)	Begin and complete land-based specifications development		4.187			
(U)	Begin and complete JPALS common documents development		1.226			
(U)	Begin and complete JPALS CONOPS development		0.750			
(U)	Begin MS B preparation		0.700			
(U)	Begin demonstration system preparation		0.670			
(U)	Begin aircraft integration studies		1.515			
(U)	Begin test program development		0.800			
(U)	Complete MS B preparation			0.275		
(U)	Complete demonstration system preparation			0.500		
(U)	Complete aircraft integration studies			0.500		
(U)	Complete studies and analyses to refine LDGPS architecture			0.100		
(U)	Continue test program development			0.775		
(U)	Begin development of JPALS ground & air segments			9.061		
(U)	Complete test program development					2.064
(U)	Continue development of JPALS ground & air segments					14.799
(U)	Begin demonstration airborne system upgrade					1.821
(U)	Total Cost	12.861	16.784	11.211		18.684

(U) C. Other Program Funding Summary ($ 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 Cost
(U) Other APPN										

(U) D. Acquisition Strategy

For Demonstration and Validation, award multiple contracts, Time and Materials (T&M), up to Milestone B (Apr 06) followed by a competitive award to single SDD contractor (CPAF).

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2005**

BUDGET ACTIVITY: **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) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2004 Cost	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost to Complete	Total Cost	Target Value of Contract
(U) Product Development													0.000	
NAVY PM and Eng Support	Reimbursable	Navy OMA21381, NAS Pax River, MD	16.421	0.078	Jan-04	0.100	Jan-05	0.105	Jan-06	0.107	Jan-07	Continuing	TBD	TBD
ESC FFRDC Engineering Support	C/CPAF	MITRE Corporation, Bedford, MA	4.121	0.931	Oct-03	1.477	Jan-05	1.099	Jan-06	1.415	Jan-07	0.000	9.043	9.043
Specialized Cost Services	C/IDIQ	MCR, Lexington, MA	0.710	0.323	May-04	0.250	May-05	0.338	May-06	0.086	May-07	Continuing	TBD	TBD
Various	Various	Various	5.625	0.675	Oct-03							0.000	6.300	6.300
LDGPS Technology Development	C/T&M	ARINC Eng Services, LLC, California, MD	11.181	3.988	Dec-03							0.000	15.169	15.460
Initial Capabilities Document (ICD) Prep/Capabilities Descriptiion Document (CDD) Prep	C/T&M	Whitney, Bradley & Brown Inc., Vienna, VA		1.100	Sep-04	0.300	Apr-05					0.000	1.400	1.100
Air Force EGI Studies	SS/T&M	Honeywell, Clearwater, FL	1.000	1.357	Jun-04							0.000	2.357	2.357
Common Documents Task	C/T&M	AES, California, MD				1.226	Aug-04					0.000	1.226	2.226
Common Architecture Task	C/T&M	AES, California, MD				0.528	Sep-04					0.000	0.528	1.129
Modeling & Simulation	C/T&M	AES, California, MD				0.769	Jan-05					0.000	0.769	0.769
Finalize Land-Based Specifications	C/T&M	TBD				4.794	Nov-04					0.000	4.794	5.094
POE Software Sizing	C/T&M	TBD				0.500	Apr-05					0.000	0.500	0.500
Develop JPALS CONOPS	C/T&M	TBD				0.750	Feb-05					0.000	0.750	0.750
Aircraft Integration Studies	C/T&M	TBD				1.515	Apr-05					0.000	1.515	1.515
Develop JPALS Ground & Air Segments	TBD	TBD						5.298	May-06	10.331	May-07	Continuing	TBD	TBD
Demonstration Airborne System Upgrade	TBD	TBD								1.821	Jan-07	Continuing	TBD	TBD

Exhibit R-3, RDT&E Project Cost Analysis

DATE: February 2005

BUDGET ACTIVITY: 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

	Subtotal Product Development			39.058	8.452		12.209		6.840		13.760		Continuing	TBD	TBD
	Remarks:														
(U)	Test & Evaluation														
	Responsible Test Organization	Reimbursable	Navy-NAWCAD, NATC, Pax River, MD	1.041									0.000	1.041	1.041
	Flight Test Support	Reimbursable	46TG/XPRF, Holloman, NM	0.606	0.512	Mar-04	0.800	Mar-05	0.775	Mar-06	2.064	Mar-07	0.000	4.757	4.757
	Subtotal Test & Evaluation			1.647	0.512		0.800		0.775		2.064		0.000	5.798	5.798
	Remarks:														
(U)	Management														
	ESC FFRDC	C/T&M	MITRE Corp, Bedford, MA	1.086	0.200	Oct-03	0.285	Jan-05	0.290	Jan-06	0.295	Jan-07	Continuing	TBD	TBD
	Program Management Support	C/T&M	ESC/ITSP II (Various), Bedford, MA	10.426	2.403	May-04	2.203	May-05	1.995	May-06	2.033	May-07	Continuing	TBD	TBD
	GA SPO Operations	Various	Various	0.725	1.294	May-04	1.287	May-05	1.311	May-06	0.532	May-07	Continuing	TBD	TBD
	Subtotal Management			12.237	3.897		3.775		3.596		2.860		Continuing	TBD	TBD
	Remarks:														
(U)														0.000	
	Subtotal			0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000
	Remarks:														
(U)	Total Cost			52.942	12.861		16.784		11.211		18.684		Continuing	TBD	TBD

Exhibit R-4, RDT&E Schedule Profile		DATE: February 2005
BUDGET ACTIVITY: 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

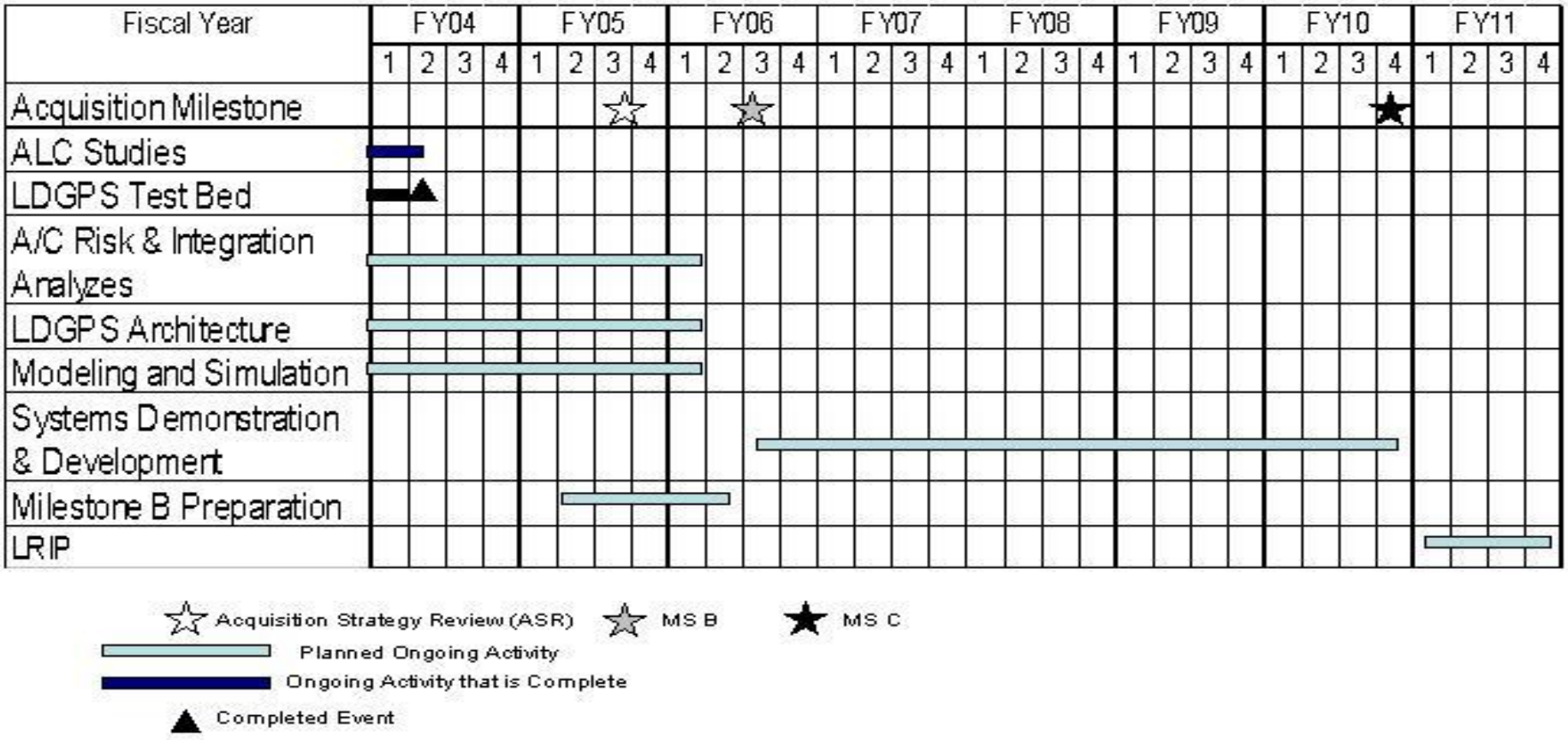

Exhibit R-4a, RDT&E Schedule Detail		DATE February 2005
BUDGET ACTIVITY **04 Advanced Component Development and Prototypes (ACD&P)**	PE NUMBER AND TITLE **0603860F Joint Precision Approach and Landing Systems - Dem/Val**	PROJECT NUMBER AND TITLE **4652 Precision Landing Systems**

(U) Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007
(U) Complete Automonous Landing Capability (ALC) Studies	1Q			
(U) Complete LDGPS Test Bed Development	2Q			
(U) Begin Milestone B prep work		2Q		
(U) Acquisition Strategy Review (ASR)		3Q		
(U) Complete aircraft risk (anti-jam) and integration analyses			1Q	
(U) Complete LDGPS architecture studies and analyses			1Q	
(U) Complete modeling and simulation			1Q	
(U) Complete Milestone B prep work			2Q	
(U) Milestone B			3Q	
(U) Begin Systems Development and Design (SDD)			3Q	