

UNCLASSIFIED

PE NUMBER: 0604800F
 PE TITLE: Joint Strike Fighter EMD

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2007
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BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604800F Joint Strike Fighter EMD
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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	2,264.836	2,132.924	1,780.874	1,541.202	1,145.968	789.053	975.178	734.894	Continuing	TBD
3831 Joint Strike Fighter	2,264.836	2,132.924	1,780.874	1,541.202	1,145.968	789.053	975.178	734.894	Continuing	TBD

(U) A. Mission Description and Budget Item Justification

The Joint Strike Fighter (JSF) program will develop and deploy a family of highly common , affordable next generation, stealthy, multi-role strike fighter aircraft that meets the operational needs of the USAF, USN, USMC and Allies. This is a joint program with no executive service. Service Acquisition Executive (SAE) authority alternates between the Department of the Navy and the Department of the Air Force and currently resides with the Navy. Navy and Air Force each provide approximately equal shares of annual funding to the program. The United Kingdom and seven other International countries are participants in the JSF program.

This program is funded under System Development and Demonstration (SDD) because it encompasses system development and demonstration of new end items prior to a production approval decision.

Quantity of 15 AF and DoN RDT&E articles (1 in FY 2007, 4 in FY 2008, 8 in FY 2009, and 2 in FY 2010) reflects flight test articles; 7 ground test articles are also budgeted in SDD.

(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	2,333.009	1,999.068	1,708.903	1,393.280
(U) Current PBR/President's Budget	2,264.836	2,132.924	1,780.874	1,541.202
(U) Total Adjustments	-68.173	133.856		
(U) Congressional Program Reductions	-0.800	-31.706		
Congressional Rescissions	-0.068	-5.438		
Congressional Increases		171.000		
Reprogrammings	-5.681			
SBIR/STTR Transfer	-61.624			

(U) Significant Program Changes:

NOTE: PB07 eliminated funding for the F136 Alternate Engine Program. The program change summary reflects Congressional increases for F136 development and second source tire research in the FY07 National Defense Appropriations Act (NDAA). The program change summary also reflects JSF RDT&E increases in FY08 and FY09 to fund Small Diameter Bomb (SDB)-1 integration, Joint Reprogramming Center (JRC) development, and Net Ready Key Performance Parameter (KPP).

Exhibit R-2a, RDT&E Project Justification

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BUDGET ACTIVITY 05 System Development and Demonstration (SDD)					PE NUMBER AND TITLE 0604800F Joint Strike Fighter EMD			PROJECT NUMBER AND TITLE 3831 Joint Strike Fighter		
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
3831 Joint Strike Fighter	2,264.836	2,132.924	1,780.874	1,541.202	1,145.968	789.053	975.178	734.894	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

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This program is funded under System Development and Demonstration (SDD) because it encompasses system development and demonstration of new end items prior to a production approval decision.

Quantity of 15 AF and DoN RDT&E articles (1 in FY 2007, 4 in FY 2008, 8 in FY 2009, and 2 in FY 2010) reflects flight test articles; 7 ground test articles are also budgeted in SDD.

(U) B. Accomplishments/Planned Program (\$ in Millions)

	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) System Development and Demonstration (SDD) for Air System with Lockheed Martin including International Commonality Effort (ICE) commenced in FY02. Critical Design Reviews (CDR) were completed for both the Conventional Take Off and Landing (CTOL) and Short Take Off and Vertical Landing (STOVL) variants in 2Q FY06. CDR for the Carrier Variant (CV) is planned for 3Q FY07. CTOL first flight was successfully completed on 15 Dec 06 signifying the start of SDD Flight Test. FY08 and FY09 continue SDD execution of the Air System, including airframe, vehicle systems, mission systems, autonomic logistics, systems engineering and integrated test efforts.	3,896.145	3,612.282	2,818.707	2,201.846
(U) SDD for the F135 Propulsion System with Pratt & Whitney including International Commonality Effort (ICE) commenced in FY02. The F135 engine has completed over 6900 test hours (13000 total hours planned in the SDD phase) with 9 ground test and 3 flight test engines. FY08 and FY09 continue SDD execution of the F135 Propulsion System, including engine testing, autonomic logistics, integration and performing technology maturation efforts.	741.955	718.995	623.395	386.545
(U) SDD for the F136 Propulsion System with the Fighter Engine Team (General Electric/Rolls Royce) commenced in 4Q FY05 for a second, interchangeable JSF engine to compete in production with F135 starting in FY12. Efforts include technology maturation, engine testing, autonomic logistics and integration. The F136 has completed over 240 test hours with 2 engines. PB08 does not fund the F136 Alternate Engine Program.	344.420	340.000	0.000	0.000
(U) SDD Systems Engineering (SE) and mission support activities, including Modeling, Simulation and	271.898	326.688	519.104	692.456

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(U) B. Accomplishments/Planned Program (\$ in Millions)	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Analysis (MS&A) efforts, risk reduction activities and program office functions commenced in FY02. FY08 and FY09 continue SE and Mission Support activities, including MS&A, risk reduction, Government verification and test, non-test systems engineering and technical support and program office functions.				
(U) Total Cost	5,254.418	4,997.965	3,961.206	3,280.847
Note: Total cost includes USN and International partner contributions in addition to USAF funding. Exhibit R-2 data reflects USAF funding only.				

(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) USN RDT&E	2187.090	2163.931	1701.832	1518.670	1016.454	1030.304	724.859	650.701	Continuing	TBD
(U) USN RDT&E - JRC			5.540	30.233	28.830	35.645	20.696	13.033	Continuing	TBD
(U) Int'l Partner Funding	802.492	701.110	478.500	220.975	166.230	136.530	6.500		Continuing	TBD
(U) USN PROCUREMENT		124.498	1232.162	1768.529	3375.113	3237.579	5422.725	5288.927	Continuing	TBD
(U) USAF PROCUREMENT	117.447	648.491	1461.713	1906.291	2457.303	3544.111	4914.085	5222.638	Continuing	TBD
(U) USN Initial Spares and Repair Parts		0.000	84.981	40.499	232.852	185.114	252.942	358.306	Continuing	TBD
(U) USAF Initial Spares and Repair Parts		77.011	40.007	109.696	122.635	228.821	358.581	376.115	Continuing	TBD
(U) USN MILCON										
(U) USAF MILCON 0207142F	0.000	0.000	74.300	64.458	98.400	128.902	33.998	77.930	Continuing	TBD
(U) USAF MILCON 91211F										

This is a joint program with no executive service. Service Acquisition Executive (SAE) authority alternates between the Department of the Navy and the Department of the Air Force and currently resides with the Navy. Program Element 0604800N continues USN development efforts budgeted in 0603800N prior to FY2002. The United Kingdom and other International countries are participants in the SDD phase of JSF.

Note: The USAF PROCUREMENT line includes all JSF funding in Budget Activities 01 and 06. USAF Initial Spares and Repair Parts is a subset of USAF PROCUREMENT. USN Initial Spares and Repair Parts is a subset of USN PROCUREMENT. International Partner Funding includes funds provided under the Italy and Netherlands Bilateral agreements. Special Memorandum of Understanding provisions exist for those two countries to pursue country unique requirements.

RELATED RDT&E: Funding prior to JSF SDD (FY94-FY01): USN PE 0603800N \$1,950,617; USAF PE 0603800F \$1,907,352; DARPA PE 0603800E \$118,056. UK \$201,221; Multi-Lateral \$32,100; Canada \$10,600; and Italy \$10,000 for a total of \$4,229,896.

Exhibit R-2a, RDT&E Project Justification

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(U) **D. Acquisition Strategy**

Activities in the prior phase of JSF centered around three distinct objectives to provide a sound foundation for the start of System Development & Demonstration (SDD) in Fall 2001:

- (1) facilitated the Services' development of fully validated, affordable operational requirements;
- (2) lowered risk by investing in and demonstrating key leveraging technologies that lowered the cost of development, production and ownership; and
- (3) demonstrated operational concepts.

Early warfighter and technologist interaction was an essential aspect of the requirements definition process and achieved JSF affordability goals. To an unprecedented degree, the JSF Program used cost-performance trades early, as an integral part of the weapon system development process. The Services defined requirements through an iterative process, balancing weapon system capability against life cycle cost (LCC) at every stage. Each iteration of the requirements was provided to industry. They evolved their designs and provided cost data back to the warfighters. The warfighters evaluated trades and made decisions for the next iteration. This iterative process produced iterations of the Services' Joint Interim Requirements Documents in 1995, 1997, 1998 and culminated in the approved joint Operational Requirements Document (ORD) in FY2000.

A sizable technology maturation effort was conducted to reduce risk and LCC through technology maturation and demonstrations. The primary emphasis was on technologies identified as high-payoff contributors to affordability, supportability, survivability and lethality. Numerous demonstrations were accomplished to validate performance and LCC impact to component, subsystem and the total system.

In November 1996, contracts were awarded to Boeing and Lockheed Martin for Concept Demonstration Programs. These competing contractors built and flew concept demonstrator aircraft, conducted concept unique ground demonstrations, and refined their respective weapon system concepts. Specifically, Boeing and Lockheed Martin demonstrated commonality and modularity, Short Take Off Vertical Landing (STOVL) hover and transition, and low speed handling qualities of their respective weapon system concepts. Pratt and Whitney provided propulsion hardware and engineering support. General Electric continued development of a second, interchangeable engine for competition in production.

Following evaluation of proposals and a favorable Milestone B decision, the JSF Program entered SDD on 26 October 2001 with SDD contract awards to Lockheed Martin and Pratt & Whitney. The SDD plan reflects a block approach, based on open systems architecture, for accomplishing aircraft and weapons integration. A primary objective of the block approach is to demonstrate incremental Air System maturity to transition to Low Rate Initial Production (LRIP) and ultimately Full Rate Production (FRP). The JSF Acquisition Strategy and updated program schedule were approved following the May 05 DAB. The program entered SDD with the Fighter Engine Team (General Electric/Rolls-Royce) on 22 August 2005 for development, production qualification, delivery, and flight test support of the F136 Alternate Engine.

USAF procurement is planned to begin in FY 2007 with advance procurement in FY 2006. DoN procurement is planned to begin in FY 2008 with advance procurement in FY 2007.

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Exhibit R-3, RDT&E Project Cost Analysis

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<u>(U) Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method & Type</u>	<u>Performing Activity & 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>														
Lockheed Martin	C/CPAF	Ft. Worth, TX	10,297.578	3,894.000	Oct-05	3,612.282	Oct-06	2,818.707	Oct-07	2,201.846	Oct-08	Continuing	TBD	25,704.015
Lockheed Martin	SS/BOA	Ft. Worth, TX	5.630	0.000		0.000							5.630	3.200
Lockheed Martin	SS/IDIQ	Ft. Worth, TX	8.910	2.144	Dec-05	0.000							11.054	6.188
Pratt & Whitney	SS/CPAF	Hartford, CT	3,364.879	737.789	Oct-05	718.995	Oct-06	623.395	Oct-07	386.545	Oct-08	Continuing	TBD	5,878.004
Pratt & Whitney	SS/BOA/IDIQ	Hartford, CT	46.503	4.166	Feb-06								50.669	50.624
General Electric	SS/CPAF	Cincinnati, OH	486.026	2.314	Jun-06	0.000							488.340	546.624
General Electric	SS/BOA	Cincinnati, OH	5.239	0.309	Jun-06								5.548	7.219
General Electric	SS/IDIQ	Cincinnati, OH	4.262	0.000		0.000							4.262	4.884
General Electric	SS/CPAF	Cincinnati, OH	101.930	341.798	Oct-05	340.000							783.728	435.072
Systems Engineering		Various	98.094	56.329	Oct-05	64.522	Oct-06	47.417	Oct-07	36.685	Oct-08	Continuing	TBD	214.196
Subtotal Product Development			14,419.051	5,038.849		4,735.799		3,489.519		2,625.076		Continuing	TBD	32,850.026
Remarks:														
<u>(U) Support</u>														
NAWC Lakehurst	Various	NAWC Lakehurst	1.652	0.653	Oct-05	0.689	Oct-06	1.520	Oct-07	2.062	Oct-08	Continuing	TBD	TBD
NAWC Patuxent River	Various	Patuxent River, VA	108.704	31.490	Oct-05	33.506	Oct-06	60.055	Oct-07	100.245	Oct-08	Continuing	TBD	TBD
NAWC China Lake ASC/AFRL	Various	Various	30.325	10.330	Oct-05	9.546	Oct-06	21.054	Oct-07	28.560	Oct-08	Continuing	TBD	TBD
	Various	Wright Patterson AFB	19.089	3.170	Oct-05	4.996	Oct-06	2.980	Oct-07	14.948	Oct-08	Continuing	TBD	TBD
AFFTC	Various	Various	23.602	7.363	Oct-05	9.389	Oct-06	20.708	Oct-07	28.090	Oct-08	Continuing	TBD	
ESC	Various	Hanscom AFB	4.749	0.749	Oct-05	1.789	Oct-06	3.947	Oct-07	5.354	Oct-08	Continuing	TBD	
Fuel	Various	Various	4.595	6.249	Oct-05	0.000							10.844	
Miscellaneous	Various	Various	124.416	42.121	Oct-05	36.981	Dec-06	178.372	Oct-07	166.774	Oct-08	Continuing	TBD	
Anteon/Sverdrup	C/CPAF	Arlington, VA	13.104	6.447	Dec-05	3.306	Dec-06	1.129	Dec-07	9.892	Dec-08	Continuing	TBD	
Wyle/AI-ES, Arlington, VA	SS/CPFF	Arlington, VA	15.619	6.681	Dec-05	4.735	Dec-06	3.597	Dec-07	14.168	Dec-08	Continuing	TBD	
Subtotal Support			345.855	115.253		104.937		293.362		370.093		Continuing	TBD	TBD

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Exhibit R-3, RDT&E Project Cost Analysis

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BUDGET ACTIVITY						PE NUMBER AND TITLE				PROJECT NUMBER AND TITLE			
05 System Development and Demonstration (SDD)						0604800F Joint Strike Fighter EMD				3831 Joint Strike Fighter			
Remarks:													
(U) <u>Test & Evaluation</u>													
NAWC Patuxent	Various	NAWC Patuxent	52.961	16.819	Oct-05	46.302	Oct-06	50.973	Oct-07	96.690	Oct-08	Continuing	TBD
Edwards AFB	Various	Edwards AFB	43.828	23.654	Oct-05	38.317	Oct-06	35.751	Oct-07	48.620	Oct-08	Continuing	TBD
Other (including Classified PIDs)	Various	Various	22.101	4.317	Oct-05	19.322	Oct-06	6.409	Oct-07	30.470	Oct-08		82.619
NAWC China Lake	Various	NAWC China Lake	16.461	3.688	Oct-05	14.391	Oct-06	4.406	Oct-07	5.060	Oct-08	Continuing	TBD
WEPS	Various	Eglin AFB	2.336	27.522	Oct-05	2.043	Oct-06	43.261	Oct-07	66.550	Oct-08	Continuing	TBD
OT	Various	Various	0.000	4.400	Oct-05	8.300	Oct-06	8.400	Oct-07	8.580	Oct-08	Continuing	TBD
Subtotal Test & Evaluation			137.687	80.400		128.675		149.200		255.970		Continuing	TBD 0.000
Remarks:													
(U) <u>Management</u>													
Stanley	SS/CPFF	Arlington, VA	42.330	11.994	Oct-05	10.163	Oct-06	10.366	Oct-07	10.574	Oct-08	Continuing	TBD TBD
Mantech	SS/CPFF	Arlington, VA	9.881	3.982	Dec-05	6.429	Dec-06	6.558	Dec-07	6.689	Dec-08	Continuing	TBD TBD
Program Management Support			4.157	3.940	Oct-05	11.962	Oct-06	12.201	Oct-07	12.445	Oct-08	Continuing	TBD
Subtotal Management			56.368	19.916		28.554		29.125		29.708		Continuing	TBD TBD
Remarks:													
(U) Total Cost			14,958.961	5,254.418		4,997.965		3,961.206		3,280.847		Continuing	TBD TBD
Remarks: Prior Years reflect \$6,423,001 USAF/\$6,527,380 USN/2,008,579 International/Total \$14,958,960													
FY 2006 reflects \$2,264,836 USAF/\$2,187,090. USN/\$802,492 International/Total \$5,254,418													
FY 2007 reflects \$2,132,924 USAF/\$2,163,931 USN/\$701,110 International/Total \$4,997,965													
FY 2008 reflects \$1,780,874 USAF/\$1,701,832 USN/\$478,500 International/Total \$3,961,206													
FY 2009 reflects \$1,541,202 USAF/\$1,518,670 USN/\$220,975 International/Total \$3,280,847													

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Exhibit R-4a, RDT&E Schedule Detail

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BUDGET ACTIVITY

05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE

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PROJECT NUMBER AND TITLE

3831 Joint Strike Fighter

(U) Schedule Profile

	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) DAB Program Review (DPR)	2Q	2Q	2Q	2Q
(U) Critical Design Reviews (CDR 1&2 FY06, CDR 3 FY07)	2Q	3Q		
(U) F-35A Conventional Takeoff and Landing (CTOL) First Flight		1Q		
(U) F-35B Short Take Off and Vertical Landing (STOVL) First Flight			3Q	
(U) F-35A CTOL (Optimized Design) First Flight				1Q
(U) F-35C Carrier Variant (CV) First Flight				3Q