

UNCLASSIFIED

PE NUMBER: 0604240F
 PE TITLE: B-2 Advanced Technology Bomber

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2008
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BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604240F B-2 Advanced Technology Bomber
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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	214.649	295.945	351.417	429.058	143.981	57.040	19.378	Continuing	TBD
3843 B-2 Advanced Technology Bomber	214.649	295.945	351.417	429.058	143.981	57.040	19.378	Continuing	TBD

FY2008 funding totals do not include \$14.1M GWOT requirements still pending congressional consideration

(U) A. Mission Description and Budget Item Justification

The B-2A Spirit is the world's most advanced long-range strike asset. The unique combination of range, payload and stealth (anti-access and global strike missions) characteristics allow the B-2 to target and destroy the highest value enemy targets, regardless of location, and return home safely. The array of planned RDT&E projects are necessary to both preserve this strategic advantage as well as increase the flexibility and lethality of this national asset tasked across a broad spectrum, from tactical to national objectives. The Radar Modernization (RMP) and Aft Deck Programs address potential fleet grounding issues.

Avionics upgrades include, but are not limited to, RMP, Link-16 Center Instrument Display (CID)/In-Flight Replanner (IFR), Ultra High Frequency (UHF) Satellite Communication (SATCOM), Extremely High Frequency (EHF) SATCOM and Computers, Mode 5/S Identification Friend or Foe (IFF), Defensive Management System (DMS) Display Systems, and Moving Target Kill upgrades. RMP changes the operating frequency of the radar to enable the B-2 to operate as the primary user worldwide in the future. Link-16 CID/IFR upgrade allows the B-2 access to theater tactical data links, improving on-board situational awareness while greatly enhancing the ability of the theater commanders to coordinate the B-2 with other assets. UHF SATCOM provides beyond line of sight secure communications to aircrews enabling verbal and data updates to missions. EHF SATCOM and Computers provides a secure, survivable communication and Net Ready infrastructure systems upgrade, preserving the critical ability to guarantee communication in a nuclear environment, as well as a basis for surveillance and reconnaissance. EHF SATCOM and Computers will provide a dramatic increase in the B-2 processing capability, paving the way for greater bandwidth and integration into the Global Information Grid (GIG). Upgrades include extremely high frequency components and the computer infrastructure upgrades, such as but not limited to, flight management processors and onboard network components necessary to host new capability on the aircraft. Mode S provides enhanced surveillance functions with commercial Air Traffic Management to allow operations in controlled air space; Mode 5 provides enhanced combat identification of friend or foe functions for military Air Traffic Management. Display systems, radar, and Defense Management System (DMS) upgrades improve system performance, increase reliability and supportability, counter hardware obsolescence, and update the current analog design with modern digital technology, positioning B-2 for increased combat lethality and the world's premier, anti-access moving target kill capability. Defense Management System upgrades and improved displays are essential to meeting Aircraft Availability Improvement Program (AAIP) goals in this aging aircraft.

Armament upgrades include, but are not limited to, integration of new and/or advanced weapons into the B-2 to destroy a wider array of target sets, to include moving target sets, as well as destroy more targets per sortie. The Massive Ordnance Penetrator (MOP) armament effort will lead to a B-2 fit check and lay the foundation for initial capability and ultimately, a fully operational capability. In addition, the Moving Target Kill (MTK) effort will leverage a high precision munition such as Small Diameter Bomb II (SDB II) as the mobile target munition and form the foundation to exploit the modularity and improved precision algorithms of Universal Armament Interface. MOP and MTK projects initiate the efforts to design, develop, integrate and test hardware and software required to employ both weapons from the B-2. The

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30K lb MOP will provide the nation with the ability to hold additional Hardened and Deeply Buried Targets (HDBT) at risk that are out of reach of the current 5K lb class penetrator munitions. The B-2 is the only anti-access penetrating platform capable of carrying the MOP. Finally, basic armament improvements include, but are not limited to, stores management hardware and software modernization and improvements to enable a simultaneous configuration of the Rotary Launch Assemblies (RLA) and the Smart Bomb Release Assemblies (SBRA), thus affording maximum strike flexibility.

Structures improvements include, but are not limited to, Aft Deck upgrade which addresses an interim and long term solution to persistent cracking of aft deck surfaces while preserving the key stealth characteristics that are vital to the survivability of the B-2; windshield redesign provides improved components and windshield manufacturing processes to remedy windshield cracking and electrical conductivity limitations; Proximity Sensor Logic Unit (PSLU) replacement counters obsolescence issues with electronic components, improving safety of maintainers working around various aircraft bay doors.

Engine improvements include, but are not limited to, the F-118 engine service life extension program. Stage 1 and 3 engine fan blade improvements will reduce engine changes, increasing aircraft availability.

Low Observable (LO) programs include, but are not limited to, improvements to door edge treatments, tile protection system, Magnetic Radar Absorbing Material (MAGRAM) picture framing, hot structures, tailpipe material maintenance improvements, nozzle bay doors, windshield low observable treatments, advanced topcoat system, RF diagnostics and LO diagnostic tools development such as improvements of the Signature Diagnostic System database and Low Observable Combat Readiness Model. These upgrades decrease maintenance manhours and increase aircraft availability while improving/maintaining LO signature of the B-2 fleet.

Baseline support provides support of the B-2 flight test aircraft, maintains B-2 unique flight test infrastructure, ensures the B-2 training systems keep pace with aircraft system updates and counters obsolescence issues, ensures the Mission Planning System keeps pace with aircraft modifications and mission planning system updates, provides for other B-2 unique government costs, and also includes acquisition planning activities.

This program is included in budget activity code 05, System Development and Demonstration because of the significant development and testing associated with the maintenance and upgrade of B-2 capabilities.

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

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Previous President's Budget	241.608	244.019	249.374
(U) Current PBR/President's Budget	214.649	295.945	351.417
(U) Total Adjustments	-26.959	51.926	
(U) Congressional Program Reductions		-0.003	
Congressional Rescissions		-1.889	
Congressional Increases		53.800	
Reprogrammings	-20.237	0.018	
SBIR/STTR Transfer	-6.722		
(U) <u>Significant Program Changes:</u>			

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Changes to FY08 budget are primarily due to Congressional Plus-up to Radar Modernization Program (RMP). Increased funds are required for development and flight test challenges. Changes to the FY09 budget are primarily due to RMP and adjustments to EHF SATCOM and Computers. Increased funding to EHF Increment 2 in FY09/10 reduces schedule risk.

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05 System Development and Demonstration (SDD)				0604240F B-2 Advanced Technology Bomber			3843 B-2 Advanced Technology Bomber			
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	
3843 B-2 Advanced Technology Bomber	214.649	295.945	351.417	429.058	143.981	57.040	19.378	Continuing	TBD	
Quantity of RDT&E Articles	0	0	0	0	0	0	0			

(U) A. Mission Description and Budget Item Justification

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not limited to, stores management hardware and software modernization and improvements to enable a simultaneous configuration of the Rotary Launch Assemblies (RLA) and the Smart Bomb Release Assemblies (SBRA), thus affording maximum strike flexibility.

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This program is included in budget activity code 05, System Development and Demonstration because of the significant development and testing associated with the maintenance and upgrade of B-2 capabilities.

(U) <u>B. Accomplishments/Planned Program (\$ in Millions)</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Continue B-2 baseline support to include developmental flight test aircraft modification and base of operations; Mission Planning, Trainer support, long range planning, studies, program integration activities, and other government costs.	7.330	13.839	15.209
(U) Continue development of Aft Deck, Low Observable improvements, Mode 5/S IFF, Proximity Sensor Logic Unit (PSLU), Moving Target Kill (MTK), Massive Ordnance Penetrator (MOP), Display Systems, Integrated Windshield Solution, Trainer Upgrades, and other airframe and avionics improvements.	27.979	42.269	39.438
(U) Continue development of EHF SATCOM and Computers to include Increment 1 Component Advanced Design (CAD), Increment 1 System Development and Demonstration (SDD) and design and fabrication of new and modified components for two test aircraft and two Force Development Evaluation (FDE) aircraft, and Increment 2 CAD and SDD	76.290	135.098	213.699
(U) Continue development of Radar Modernization Program including continuing System Development and Demonstration (SDD) and design and fabrication of new and modified components for test aircraft and six	103.050	104.739	83.071

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(U) <u>B. Accomplishments/Planned Program (\$ in Millions)</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
developmental units.			
(U) Total Cost	214.649	295.945	351.417

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

	<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) A/C Proc, AF, Combat A/C/BA07/B-2A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(U) A/C Proc, AF, Post Prod Support/BA07	17.662	0.000	0.000	0.000	0.000	1.180	2.896	Continuing	TBD
(U) A/C Proc, AF, Modifications/BA05/B-2A	50.939	207.654	330.392	67.678	73.698	133.534	188.117	Continuing	TBD
(U) A/C Prod, AF, ICS	29.662	34.545	36.783	31.011	21.810	13.224	8.766	Continuing	TBD
(U) A/C Proc, AF, Cmn Spt Eq/BA07/Items<\$2M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	TBD
(U) A/C Proc, AF, A/C Initial Spares/BA06/B-2A	2.083	4.337	0.830	5.282	14.493	12.194	6.612	Continuing	TBD
(U) A/C Proc, AF, Other Procurement/BA07/B-2A	0.000	0.000	19.566	19.971	62.582	0.000	0.000	0.000	TBD
(U) Proc (Other), AF/BA 02,03, 04/B-2A	8.055	4.204	4.359	0.000	0.000	0.000	0.000	0.000	TBD
(U) Military Construction/BA01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	TBD

(U) **D. Acquisition Strategy**

Key elements of the overall acquisition strategy include: use of sole source contract with a prime/integrating contractor (Northrop Grumman); use of cost plus award fee (CPAF) development contracts; and the combination of developmental upgrades with software sustainment blocks to minimize the number of software releases, aircraft downtime, and differences in fielded configurations.

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Exhibit R-3, RDT&E Project Cost Analysis

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(U) Cost Categories (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method & Type</u>	<u>Performing Activity & 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>												
Air Vehicle	Multiple	Various		205.653	Oct-06	280.933	Oct-07	323.027	Oct-08	Continuing	TBD	
Aircrew Training	Multiple	Various		0.000	N/A	0.530	Jan-08	12.450	Jan-09	Continuing	TBD	
Mission Planning	Multiple	Various		0.771	Jul-07	1.635	Jan-08	1.538	Jan-09	Continuing	TBD	
Engines	Multiple	Various		0.000	N/A	0.000	N/A	0.000	N/A		0.000	
Subtotal Product Development			0.000	206.424		283.098		337.015		Continuing	TBD	0.000
Remarks:												
(U) <u>Support</u>												
Other Govt Costs	N/A	Various		6.290	Oct-06	9.024	Oct-07	10.933	Oct-08	Continuing	TBD	
Subtotal Support			0.000	6.290		9.024		10.933		Continuing	TBD	0.000
Remarks:												
(U) <u>Test & Evaluation</u>												
Govt Test	N/A	AFFTC		1.805	Oct-06	3.365	Oct-07	3.469	Oct-08	Continuing	TBD	
Subtotal Test & Evaluation			0.000	1.805		3.365		3.469		Continuing	TBD	0.000
Remarks:												
(U) <u>Management</u>												
Cancelled Year Invoices	N/A	Various		0.130	Jun-07	0.458	Mar-08				0.588	
Subtotal Management			0.000	0.130		0.458		0.000		0.000	0.588	0.000
Remarks:												
(U) Total Cost			0.000	214.649		295.945		351.417		Continuing	TBD	0.000
Award dates listed are the first incremental funding opportunity associated with cost categories												

Exhibit R-4, RDT&E Schedule Profile

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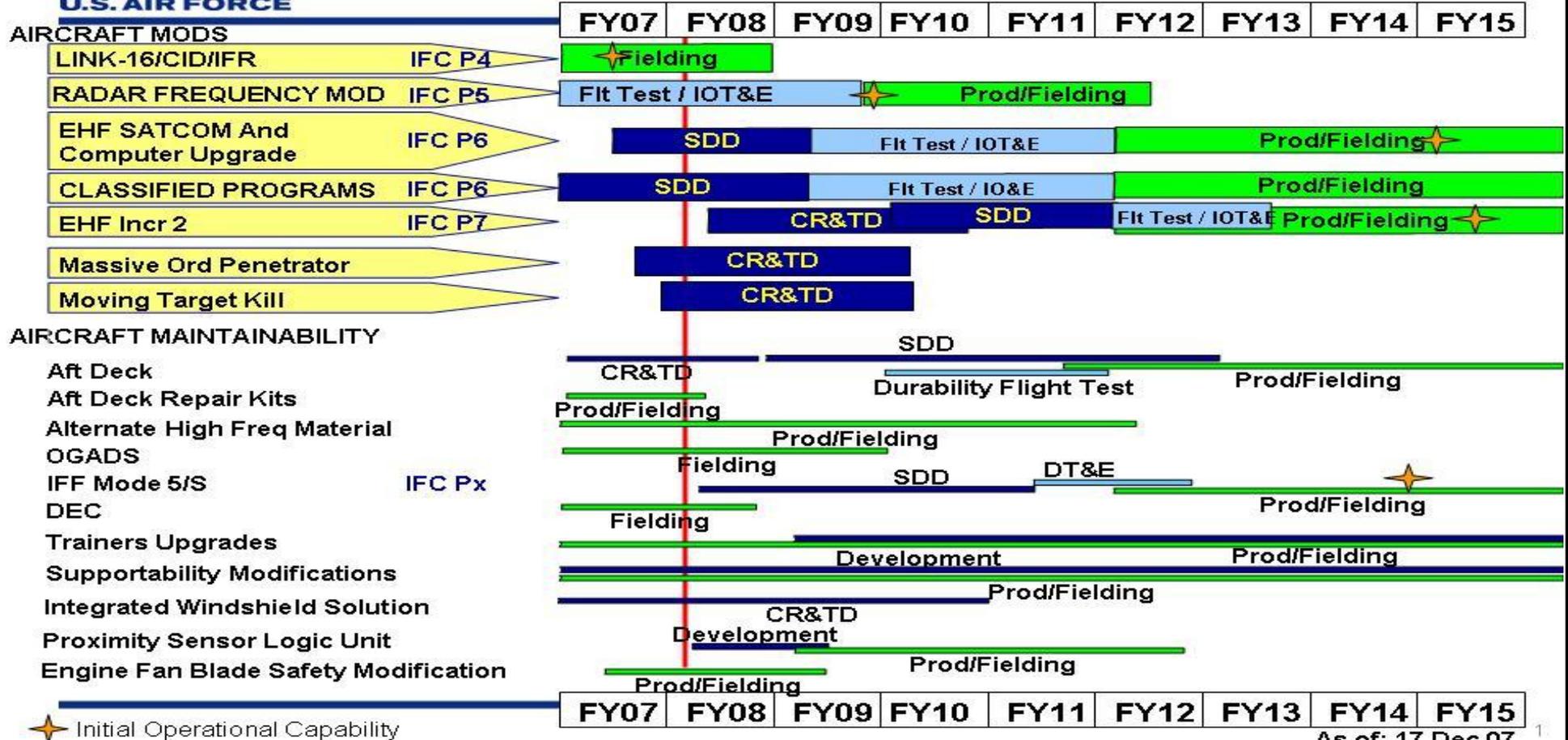
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U.S. AIR FORCE

B-2 Detailed Schedule



★ Initial Operational Capability

As of: 17 Dec 07

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Exhibit R-4a, RDT&E Schedule Detail

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(U) Schedule Profile

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) EHF Increment 1 Milestone B	2Q		
(U) EHF Increment 1 SDD Contract Award	3Q		
(U) EHF Flight Test Begins			1Q
(U) EHF Increment 2 CAD Contract Award		2Q	
(U) Mode S/5 IFF Contract Award		2Q	
(U) Proximity Sensor Logic Unit Contract Award		2Q	
(U) Moving Target Kill Contract Award	3Q		
(U) Massive Ordnance Penetrator Contract Award	2Q		
(U) Aft Deck Milestone B		3Q	
(U) Aft Deck SDD Contract Award		4Q	