PE NUMBER: 0207141F
PE TITLE: F-117A SQUADRON

Exhibit R-2, RDT&E Budget Item Justification

DATE: February 2005

BUDGET ACTIVITY: 07 Operational System Development

PE NUMBER AND TITLE: 0207141F F-117A SQUADRON

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	13.920	29.399	13.600	47.798	32.126	5.740	4.098	0.000	Continuing	TBD
3956	F-117A Stealth Fighter	13.920	29.399	13.600	47.798	32.126	5.740	4.098	0.000	Continuing	TBD

The FY03 National Defense Authorization Act (NDAA) language directed T&E centers to charge only direct costs beginning FY06; this resulted in a zero-balance transfer (ZBT) of funding over the FYDP from the customer accounts (for indirect test costs) to T&E support, PE 65807F.

(U) A. Mission Description and Budget Item Justification

The F-117 is the world's first operational low-observable (LO) combat aircraft. Its combination of stealth and precision weapons delivery capability allows the United States Air Force to hold even the most highly defended targets at risk. The program completed production in Jul 1990 with the delivery of the final F-117 (Aircraft number 843). The single operational F-117 unit is the 49th Fighter Wing stationed at Holloman AFB, NM. The program is now primarily engaged in modernization and sustainment activities for the F-117, which is projected to remain in service through at least 2018.

This project provides research and development funding for multiple modifications to the F-117 weapon system to enhance combat capability while improving safety, reliability and supportability:

- Development efforts continue for smart weapons integration, primarily in revisions to the Operational Flight Program (OFP). The current program scope implements three weapons capabilities: EGBU-27, JDAM and WCMD. System Development & Demonstration (SDD) started in FY01.

- The Combat Capability Sustainment Program (CCSP) replaces obsolete avionics systems, establishes new vendors and improves reliability and maintainability to keep the F-117 operational through its service life. CCSP began Concept & Technology Development (CTD) in FY00 with Congressional Add funding. Beginning in FY2004, SDD started for Expanded Data Transfer System (EDTS) and Brooklyn Bridge. EDTS is the system that allows data to be transferred from the mission planning environment to the aircraft for operations. The Brooklyn Bridge modifies the F-117 outboard elevon actuator support structure to significantly reduce cost and maintenance hours required to replace the actuator.
- The F-117 Weapon System Trainer (WST) requires a replacement for the imagery computer/image generation system. The vendor of the current system, SGI, no longer manufactures replacement boards for the imagery computer. Furthermore, the vendor no longer supports the current maintenance contract. Recently, the computer was responsible for 80% of the total WST downtime and will likely increase in severity in the future.

- The F-117 Mission Planning System (MPS) requires an operational system upgrade. The National Imaging and Mapping Agency (NIMA) is migrating to DVD format for all mapping database operations and the F-117 MPS operating system cannot be modified to function with this capability. Additionally, the current MPS Solaris operating system and Sybase database product are no longer supported by the Air Force Mission Support System (AFMSS) program office. These obsolescence issues drive the requirement for both hardware and software upgrades.

- Common Data Recorder - The current Structures Tracking and Engine Management System (STEMS) and Low Observable Instrumentation System (LOIS) have limited memory capacity and obsolescence issues. The STEMS recorder is required to determine inspection intervals of the engines and structures of the aircraft to

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207141F F-117A SQUADRON

predict economic life of the aircraft. Additional memory is required to record additional parameters and increase the fidelity of the inspection intervals circumventing catastrophic failures. The LOIS functionality can be combined into STEMS to reduce the cost of supporting two unique subsystems. Additionally, this approach allows for future add-ins such as recording of flight, video, and crash data.

- Dual Radio - In the last several years, employment and tactics have changed and the F-117 is now required to integrate with conventional strike packages, support aircraft, and special operations forces both in the air and on the ground. This requires the ability to communicate on and monitor multiple frequencies at the same time. This project will enable the pilot to receive and transmit target, threat, and other critical mission data on two UHF channels at the same time. The dual radio capability will meet this requirement as well as allow the development of advanced tactics to support time sensitive targeting. Additionally, international communications requirements have changed and VHF 8.33KHz channel spacing has been mandated in many parts of the world. The current radio is UHF only. This project will provide growth capability to meet the required international communications capability on VHF once a VHF capable antenna is available to the aircraft

- SATCOM Antenna - The requirement to function in a network centric combat environment and to have beyond line of sight, reach-back capability to obtain Time Sensitive Targeting (TST) information has increased in importance as F-117 employment and tactics continue to evolve. This SATCOM antenna project will extend the F-117s ability to receive and transmit dynamic targeting data from beyond line of sight locations to a point much closer to the target area.

- IRADS - The F-117 Stealth Fighter IRADS system was originally designed using technology and components available in the late 1970s. Component obsolescence, vanishing vendors, and hardware deterioration have started to impact aircraft supportability. This modification refurbishes the existing IRADS to eliminate known obsolescence and supportability issues and to allow continued IRADS capability through the service life of the F-117.

- CMDI - The F-117 aircraft is experiencing supportability problems with the current cockpit sensor displays and processing elements. Since the development of the CMDI in 1986, Cathode Ray Tube (CRT) technology for military aircraft and specifically the CMDI CRT has become obsolete and unsupportable. The CRT based displays are high failure rate items and their special purpose features (size, technology type, and proprietary interfaces) make them extremely expensive to maintain or replace. This modification replaces the existing CMDI with a supportable, new technology CMDI.

This program is in budget activity 7, Operational System Development, because all aircraft have been delivered and the program is in its deployment phase.

NOTES:
- The user has requested an acceleration of the Dual Radio and the SATCOM Antenna programs into FY05. The Air Force plans to submit New Start Letters of Notification.
- In the FY06 BES, Dual Radio & SATCOM Antenna were addressed as a part of "Second Radio". Each project has been split out in the FY06 PB as a stand-alone project.

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207141F F-117A SQUADRON

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

		FY 2004	FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	14.627	29.661	56.914	46.925
(U)	Current PBR/President's Budget	13.920	29.399	13.600	47.798
(U)	Total Adjustments	-0.707	-0.262		
(U)	Congressional Program Reductions				
	Congressional Rescissions		-0.262		
	Congressional Increases				
	Reprogrammings	-0.265			
	SBIR/STTR Transfer	-0.442			

(U) Significant Program Changes:

- $1.469M decrease in FY06 for Test & Evaluation (T&E) infrastructure realignment into PE 65807F
- Deferred FY06 investment in obsolescence mitigation one year (FY06 to FY07) for the Infrared Acquisition and Designation System (IRADS), due AF priorities.

Exhibit R-2a, RDT&E Project Justification

DATE: February 2005

BUDGET ACTIVITY: 07 Operational System Development

PE NUMBER AND TITLE: 0207141F F-117A SQUADRON

PROJECT NUMBER AND TITLE: 3956 F-117A Stealth Fighter

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
3956	F-117A Stealth Fighter	13.920	29.399	13.600	47.798	32.126	5.740	4.098	0.000	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

The F-117 is the world's first operational low-observable (LO) combat aircraft. Its combination of stealth and precision weapons delivery capability allows the United States Air Force to hold even the most highly defended targets at risk. The program completed production in Jul 1990 with the delivery of the final F-117 (Aircraft number 843). The single operational F-117 unit is the 49th Fighter Wing stationed at Holloman AFB, NM. The program is now primarily engaged in modernization and sustainment activities for the F-117, which is projected to remain in service through at least 2018.

This project provides research and development funding for multiple modifications to the F-117 weapon system to enhance combat capability while improving safety, reliability and supportability:

- Development efforts continue for smart weapons integration, primarily in revisions to the Operational Flight Program (OFP). The current program scope implements three weapons capabilities: EGBU-27, JDAM and WCMD. System Development & Demonstration (SDD) started in FY01.

- The Combat Capability Sustainment Program (CCSP) replaces obsolete avionics systems, establishes new vendors and improves reliability and maintainability to keep the F-117 operational through its service life. CCSP began Concept & Technology Development (CTD) in FY00 with Congressional Add funding. Beginning in FY2004, SDD started for Expanded Data Transfer System (EDTS) and Brooklyn Bridge. EDTS is the system that allows data to be transferred from the mission planning environment to the aircraft for operations. The Brooklyn Bridge modifies the F-117 outboard elevon actuator support structure to significantly reduce cost and maintenance hours required to replace the actuator.
- The F-117 Weapon System Trainer (WST) requires a replacement for the imagery computer/image generation system. The vendor of the current system, SGI, no longer manufactures replacement boards for the imagery computer. Furthermore, the vendor no longer supports the current maintenance contract. Recently, the computer was responsible for 80% of the total WST downtime and will likely increase in severity in the future.

- The F-117 Mission Planning System (MPS) requires an operational system upgrade. The National Imaging and Mapping Agency (NIMA) is migrating to DVD format for all mapping database operations and the F-117 MPS operating system cannot be modified to function with this capability. Additionally, the current MPS Solaris operating system and Sybase database product are no longer supported by the Air Force Mission Support System (AFMSS) program office. These obsolescence issues drive the requirement for both hardware and software upgrades.

- Common Data Recorder - The current Structures Tracking and Engine Management System (STEMS) and Low Observable Instrumentation System (LOIS) have limited memory capacity and obsolescence issues. The STEMS recorder is required to determine inspection intervals of the engines and structures of the aircraft to predict economic life of the aircraft. Additional memory is required to record additional parameters and increase the fidelity of the inspection intervals circumventing catastrophic failures. The LOIS functionality can be combined into STEMS to reduce the cost of supporting two unique subsystems. Additionally, this approach allows for future add-ins such as recording of flight, video, and crash data.

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207141F F-117A SQUADRON	PROJECT NUMBER AND TITLE 3956 F-117A Stealth Fighter

- Dual Radio - In the last several years, employment and tactics have changed and the F-117 is now required to integrate with conventional strike packages, support aircraft, and special operations forces both in the air and on the ground. This requires the ability to communicate on and monitor multiple frequencies at the same time. This project will enable the pilot to receive and transmit target, threat, and other critical mission data on two UHF channels at the same time. The dual radio capability will meet this requirement as well as allow the development of advanced tactics to support time sensitive targeting. Additionally, international communications requirements have changed and VHF 8.33KHz channel spacing has been mandated in many parts of the world. The current radio is UHF only. This project will provide growth capability to meet the required international communications capability on VHF once a VHF capable antenna is available to the aircraft

- SATCOM Antenna - The requirement to function in a network centric combat environment and to have beyond line of sight, reach-back capability to obtain Time Sensitive Targeting (TST) information has increased in importance as F-117 employment and tactics continue to evolve. This SATCOM antenna project will extend the F-117s ability to receive and transmit dynamic targeting data from beyond line of sight locations to a point much closer to the target area.

- IRADS - The F-117 Stealth Fighter IRADS system was originally designed using technology and components available in the late 1970s. Component obsolescence, vanishing vendors, and hardware deterioration have started to impact aircraft supportability. This modification refurbishes the existing IRADS to eliminate known obsolescence and supportability issues and to allow continued IRADS capability through the service life of the F-117.

- CMDI - The F-117 aircraft is experiencing supportability problems with the current cockpit sensor displays and processing elements. Since the development of the CMDI in 1986, Cathode Ray Tube (CRT) technology for military aircraft and specifically the CMDI CRT has become obsolete and unsupportable. The CRT based displays are high failure rate items and their special purpose features (size, technology type, and proprietary interfaces) make them extremely expensive to maintain or replace. This modification replaces the existing CMDI with a supportable, new technology CMDI.

This program is in budget activity 7, Operational System Development, because all aircraft have been delivered and the program is in its deployment phase.

NOTES:
- The user has requested an acceleration of the Dual Radio and the SATCOM Antenna programs into FY05. The Air Force plans to submit New Start Letters of Notification.
- In the FY06 BES, Dual Radio & SATCOM Antenna were addressed as a part of "Second Radio". Each project has been split out in the FY06 PB as a stand-alone project.

(U)	**B. Accomplishments/Planned Program ($ in Millions)**	FY 2004	FY 2005	FY 2006	FY 2007
(U)	Continue SDD for Smart Weapons Integration	10.307	13.066	0.900	0.817
(U)	SDD for CCSP Expanded Data Transfer System (EDTS)	3.392	6.519		
(U)	SDD for Brooklyn Bridge	0.221			
(U)	Continue Concept Technology and Development (CTD) for CCSP		2.745		
(U)	SDD for Weapon System Trainer (WST) Image Generation System		2.917	0.820	8.553
(U)	Mission Planning System (MPS) Upgrade		3.414	0.820	4.665
(U)	Modify flight test assets to conform with current modifications of operational jets		0.738	0.050	0.319
(U)	Initiate Common Data Recorder SDD			0.400	4.906

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207141F F-117A SQUADRON	PROJECT NUMBER AND TITLE 3956 F-117A Stealth Fighter

(U)	Initiate Dual Radio SDD				5.560	
(U)	Initiate SATCOM Antenna SDD				5.050	
(U)	Initiate SDD for CCSP IRADS					19.726
(U)	Initiate SDD for CCSP CMDI					8.812
(U)	Total Cost	13.920	29.399	13.600		47.798

(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)	Aircraft Procurement (BA-5), Appn 3010/BP1100, AF F117A Squadrons, PE 27141F	22.612	22.673	17.221	21.763	85.855	80.879	80.983	25.986	Continuing	TBD
(U)	Aircraft Procurement (BA-5), Appn 3010/BP1200, AF F117A Squadrons, PE 27141F	3.821								Continuing	TBD
(U)	Aircraft Procurement (BA-5), Appn 3010/BP1600, AF F117A Squadrons, PE 27141F	0.000	1.029	0.000	0.000	2.753	2.838	2.854	2.887	Continuing	TBD

(U) D. Acquisition Strategy

RDT&E funds are executed to develop improved capability, reliability, maintenance and safety modifications. Operational Flight Program (OFP) software is continuously updated as needed to complement modification development efforts. The contracting approach varies by individual effort and involves Cost Plus Fixed Fee (CPFF) and Cost Plus Award Fee (CPAF) contract types.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: February 2005

BUDGET ACTIVITY: 07 Operational System Development

PE NUMBER AND TITLE: 0207141F F-117A SQUADRON

PROJECT NUMBER AND TITLE: 3956 F-117A Stealth Fighter

(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														
Smart Weapon Integration SDD	CPAF	Lockheed Martin, Palmdale CA	5.800	10.307		13.066		0.900		0.817		0.105	30.995	
CCSP CTD	CPFF	Lockheed Martin, Palmdale CA		0.000		2.745	Feb-05	0.000		0.000		0.000	2.745	
CCSP EDTS SDD	CPFF	Lockheed Martin, Palmdale CA		3.392	Jan-04	6.519		0.000		0.000		0.000	9.911	
Brooklyn Bridge SDD	CPFF	Lockheed Martin, Palmdale CA		0.221	Dec-03	0.000		0.000		0.000		0.000	0.221	
Weapon System Trainer Image Generation Sys Upgrd SDD	CPFF	Lockheed Martin, Palmdale CA		0.000		2.917	Feb-05	0.820		8.553		0.000	12.290	
Mission Planning System, Operating System Upgrade SDD	CPFF	Lockheed Martin, Palmdale CA		0.000		3.414	Feb-05	0.820		4.665		0.000	8.899	
Modify flight test assets to conform with current modifications of operational jets	CPFF	Lockheed Martin, Palmdale CA		0.000		0.738	Nov-05	0.050		0.319		Continuing	TBD	
Common Data Recorder SDD	CPFF	Lockheed Martin, Palmdale CA		0.000		0.000		0.400	Jan-06	4.906		0.000	5.306	
Dual Radio SDD	CPFF	Lockheed Martin, Palmdale CA		0.000		0.000		5.560	Oct-05	0.000		0.000	5.560	
SATCOM Antenna SDD	CPFF	Lockheed Martin, Palmdale CA				0.000		5.050	Oct-05	0.000		0.000	5.050	
CCSP IRADS SDD	CPFF	Lockheed Martin, Palmdale CA		0.000		0.000		0.000		19.726	Jan-07	Continuing	TBD	
CCSP CMDI SDD	CPFF	Lockheed Martin, Palmdale CA		0.000		0.000		0.000		8.812	Jan-07	Continuing	TBD	
Subtotal Product Development			5.800	13.920		29.399		13.600		47.798		Continuing	TBD	0.000
Remarks:														
(U) Support													0.000	

Exhibit R-3, RDT&E Project Cost Analysis

DATE: February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
07 Operational System Development	0207141F F-117A SQUADRON	3956 F-117A Stealth Fighter

	Subtotal Support	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Remarks:								
(U)	Test & Evaluation								
								0.000	
	Subtotal Test & Evaluation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Remarks:								
(U)	Management								
								0.000	
	Subtotal Management	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Remarks:								
(U)	Total Cost	5.800	13.920	29.399	13.600	47.798	Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile		DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207141F F-117A SQUADRON	PROJECT NUMBER AND TITLE 3956 F-117A Stealth Fighter

F-117 Program Appn 3600, P.E. 27141F

Description	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Smart Weapons Integration	Cnt	Cnt	Cnt	Cnt	Cnt			
CCSP EDTS SDD	2Q	Cnt						
Brooklyn Bridge SDD	1Q							
CCSP CTD		2Q	Cnt					
WST Image Generation SDD		2Q	Cnt	Cnt				
MPS OS (AFMSS) SDD		2Q	Cnt	Cnt		2Q	Cnt	
Modify Flight Test Jets		2Q	Cnt	Cnt	Cnt	Cnt		
Dual Radio SDD			1Q					
SATCOM Antenna SDD			1Q					
Common Data Recorder SDD			3Q	Cnt				
CCSP IRADS/SD SDD				2Q	Cnt	Cnt		
CCSP CMDI SDD				2Q				

Exhibit R-4a, RDT&E Schedule Detail			DATE: February 2005
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0207141F F-117A SQUADRON		PROJECT NUMBER AND TITLE: 3956 F-117A Stealth Fighter

(U) Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007
(U) CCSP EDTS SDD (Jan 04 - Sep 05)	2Q			
(U) Brooklyn Bridge SDD (Dec 03 - Sep 04)	1Q			
(U) Continue CCSP CTD		2Q		
(U) Initiate WST SDD		2Q		
(U) Initiate for MPS SDD		2Q		
(U) Modify flight test assets to conform with current modifications of operational jets		2Q		
(U) Dual Radio SDD			1Q	
(U) SATCOM Antenna SDD			1Q	
(U) Common Data Recorder SDD			3Q	
(U) CCSP IRADS SDD				2Q
(U) CCSP CMDI SDD				2Q