PE NUMBER: 0207131F
PE TITLE: A-10 SQUADRONS

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2006
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0207131F A-10 SQUADRONS

Cost ($ in Millions)	FY 2005 Actual	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	29.878	56.025	80.771	59.942	0.000	0.000	0.000	Continuing	TBD
4809 A-10 Squadrons	29.878	56.025	80.771	59.942	0.000	0.000	0.000	Continuing	TBD

The FY03 National Defense Authorization Act (NDAA) language directed T&E centers to charge only direct costs beginning in 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 0605807F.

(U) A. Mission Description and Budget Item Justification

The A/OA-10 is the USAF's primary aircraft for Close Air Support (CAS) and Forward Air Control (FAC) support to the ground battle including special forces, with a secondary mission of Combat Search and Rescue (CSAR) and interdiction. Currently, RDT&E funding supports: the Precision Engagement (PE) Program (MN-9805); an A-10 Propulsion Upgrade Study; and a Systems Design and Demonstration (SDD) program for upgraded A-10 engines.

PRECISION ENGAGEMENT

The PE program is a spiral development program providing increased tactical effectiveness (more targets destroyed), greater survivability, and decreased risk of fratricide. These modifications are mandatory for the A/OA-10 to adhere to the regional CINC's requirement for a CAS and FAC platform.

Spiral #1 of the PE modification integrates: MIL-STD 1760 Bus, Joint Direct Attack Munition (JDAM), Wind Corrected Munitions Dispenser (WCMD), LITENING and SNIPER targeting pods, Digital Stores Management System (DSMS), and DC power upgrade. The DSMS replaces the current Armament Control Panel (ACP) (television monitor) and the Interstation Control Unit (ICU) with Multi-Function Color Displays (MFCD) and replaces the current stick and throttle with improved Hands on Throttle and Stick Capable controls reducing 'heads down' time in the cockpit. During spiral #1, the ICU will be replaced with a new processor: the Central Interface Control Unit (CICU). This program does not purchase JDAM/WCMD munitions, targeting pods or their associated support equipment. After Spiral 1, the A/OA-10A will be designated as an A/OA-10C.
Spiral #2 of the PE modification integrates tests, and fields an integrated battlefield air picture, an integrated ground picture, and legacy data link waveform through the addition of a digital data link system. However, A-10 aircraft modification and RDT&E efforts are funded under the Fighter TDL PE 0207445F.

Spiral #3 and subsequent spirals of the A-10 modernization program may include: a moving map, BRU-57 Smart Pack, Small Diameter Bomb (SDB), and additional data link waveforms. Improvements will enhance situational awareness, enable the A-10 to carry two smart weapons on a single parent station, and expand combat data link capability. Through a spiral development approach, the PE program will ultimately improve survivability and tactical affectivity, decrease fratricide, and continue to play a major role as one of the USAF's primary Close Air Support and Forward Air Control weapon systems. Spiral modifications may include some or all software development, integration, and testing.

PROPULSION UPGRADE STUDY

In FY04 Congress provided a $3.0M add to conduct a study to determine the best way to upgrade the engines on the A-10. In FY05, Congress provided an additional

$5.0M which will be applied to existing pre-SDD studies. In FY06, the PUP program was given an another $5.0M to continue Pre SDD sudies. In addition, pre-SDD studies are being conducted by the engine Original Equipment Manufacturer to examine possible solutions, perform trade studies, refine cost data and conduct risk reduction analysis. This effort will provide an updated prime item development specification, interface control document, and qualification plan. A third effort is being conducted by the A-10 prime contractor to identify structural changes required for additional thrust and weight changes.

PROPULSION UPGRADE SYSTEMS DESIGN AND DEMONSTRATION (SDD)

In February 2004, the SECAF and CSAF validated the need for the A-10 Propulsion Upgrade. The Congressional add of $5.0M in FY05, mentioned above, was used to provide a ramp to the FY06 SDD effort. In FY06, SDD continued with development of the integration requirements and design work including development of the evaluation and test requirements as well test hardware. The Air Force will provide TF34-100A engines for the prototype effort.

The FY07 Budget request authorizes $247M in APAF money to procure up to 110 TF-3400B engine kits.

THREE-DIMENSIONAL (3-D) MODELING, DESIGN, AND ENGINEERING ASSESSMENT

In FY05, this effort received a $3.5M Congressional add for an effort to investigate a new wing and fuselage/empennage improvement to increase the service life to 16,000 flight hours.

The digital model captured the most current configuration of the A-10 wing assembly in order to support future sustainment activities of the aircraft. This model is the basis for simulating the effects of differing usage, to include additional weapon or countermeasures installations, on the structure.

In FY06, $1.602M was realigned from the MODE S/MODE 5 program to the 3-D Modeling, Design and Engineering Assessment.

A-10 WING REPLACEMENT PROGRAM

Aging A-10 thin-skin wings must be replaced by new thick-skin wings. Replacement wings can accomplish the CAF Operational Requirements Document (ORD) requirement to keep the A-10 operational until 2028 and the corresponding A-10 Program Management Directive (PMD) requirement to extend the A-10 aircraft service life to 16,000 hours.

The cost of sustaining the thin-skin wings at an acceptable risk level has exceeded its economic limit. It is more cost effective to replace the thin-skin wing than to repair it. The program will replace 197 thin-skin wings currently in the inventory.

As a new start, FY07 PBR provides $741M across the FYDP to begin purchasing wing kits in FY07. The $741M replaces up to 121 wings through the FYDP.

Wings procured in FY10 and FY11 cannot be installed until FY12 and FY13 respectively. Therefore, additional funding will have to be pursued through FY08 POM for these installations outside of the FYDP.

MODE S/MODE 5 EQUIPMENT

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2006
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207131F A-10 SQUADRONS

Mode S is a new civilian mode for the aviation Identify Friend or Foe (IFF) systems. It provides more detailed flight information about an aircraft to ground controllers or other aircraft than currently available. Europe has set a deadline of 31 Mar 09 for aircraft to be equipped with Mode S or risk having those aircraft grounded.

Mode 5 is a secure military only IFF mode used in combat to identify friendly aircraft to prevent fratricide. Mode 5 is being developed by DoD to replace Mode 4, which is no longer NSA certified. All combat aircraft will be required to have this IFF mode by approximately 2015.

Global Air Traffic Management (GATM) is the Air Force program designed to meet the evolving aviation requirements of the International Civil Aviation Organization (ICAO). GATM, Navigation and Safety, and Navigation Warfare (NAVWAR) are major components of the AF's Global Access, Navigation, and Safety (GANS) management effort.

The A/OA-10 RDT&E program is in budget activity 7 - Operational System Development because it supports an operational system.

In FY06, $1.602M was realigned from the MODE S/MODE 5 program to the 3-D Modeling, Design and Engineering Assessment.

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

		FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	30.816	51.835	75.223
(U)	Current PBR/President's Budget	29.878	56.025	80.771
(U)	Total Adjustments	-0.938	4.190	
(U)	Congressional Program Reductions		-0.810	
	Congressional Rescissions	-0.024		
	Congressional Increases		5.000	
	Reprogrammings	-0.049		
	SBIR/STTR Transfer	-0.865		
(U)	Significant Program Changes:			

FY06:
-Congress adds $5M for Propulsion Upgrade Pre-SDD Studies
FY07:
-Increase of $5.216 for the Wing Replacement Program

Exhibit R-2a, RDT&E Project Justification			DATE: February 2006
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0207131F A-10 SQUADRONS	PROJECT NUMBER AND TITLE: 4809 A-10 Squadrons	

Cost ($ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
4809 A-10 Squadrons	29.878	56.025	80.771	59.942	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

The A/OA-10 is the USAF's primary aircraft for Close Air Support (CAS) and Forward Air Control (FAC) support to the ground battle including special forces, with a secondary mission of Combat Search and Rescue (CSAR) and interdiction. Currently, RDT&E funding supports: the Precision Engagement (PE) Program (MN-9805); an A-10 Propulsion Upgrade Study; and a Systems Design and Demonstration (SDD) program for upgraded A-10 engines.

PRECISION ENGAGEMENT

The PE program is a spiral development program providing increased tactical effectiveness (more targets destroyed), greater survivability, and decreased risk of fratricide. These modifications are mandatory for the A/OA-10 to adhere to the regional CINC's requirement for a CAS and FAC platform.

Spiral #1 of the PE modification integrates: MIL-STD 1760 Bus, Joint Direct Attack Munition (JDAM), Wind Corrected Munitions Dispenser (WCMD), LITENING and SNIPER targeting pods, Digital Stores Management System (DSMS), and DC power upgrade. The DSMS replaces the current Armament Control Panel (ACP) (television monitor) and the Interstation Control Unit (ICU) with Multi-Function Color Displays (MFCD) and replaces the current stick and throttle with improved Hands on Throttle and Stick Capable controls reducing 'heads down' time in the cockpit. During spiral #1, the ICU will be replaced with a new processor: the Central Interface Control Unit (CICU). This program does not purchase JDAM/WCMD munitions, targeting pods or their associated support equipment. After Spiral 1, the A/OA-10A will be designated as an A/OA-10C.
Spiral #2 of the PE modification integrates tests, and fields an integrated battlefield air picture, an integrated ground picture, and legacy data link waveform through the addition of a digital data link system. However, A-10 aircraft modification and RDT&E efforts are funded under the Fighter TDL PE 0207445F.

Spiral #3 and subsequent spirals of the A-10 modernization program may include: a moving map, BRU-57 Smart Pack, Small Diameter Bomb (SDB), and additional data link waveforms. Improvements will enhance situational awareness, enable the A-10 to carry two smart weapons on a single parent station, and expand combat data link capability. Through a spiral development approach, the PE program will ultimately improve survivability and tactical affectivity, decrease fratricide, and continue to play a major role as one of the USAF's primary Close Air Support and Forward Air Control weapon systems. Spiral modifications may include some or all software development, integration, and testing.

PROPULSION UPGRADE STUDY

In FY04 Congress provided a $3.0M add to conduct a study to determine the best way to upgrade the engines on the A-10. In FY05, Congress provided an additional $5.0M which will be applied to existing pre-SDD studies. In FY06, the PUP program was given an another $5.0M to continue Pre SDD sudies. In addition, pre-SDD studies are being conducted by the engine Original Equipment Manufacturer to examine possible solutions, perform trade studies, refine cost data and conduct risk reduction analysis. This effort will provide an updated prime item development specification, interface control document, and qualification plan. A third effort is being conducted by the A-10 prime contractor to identify structural changes required for additional thrust and weight changes.

Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207131F A-10 SQUADRONS	PROJECT NUMBER AND TITLE 4809 A-10 Squadrons

PROPULSION UPGRADE SYSTEMS DESIGN AND DEMONSTRATION (SDD)

In February 2004, the SECAF and CSAF validated the need for the A-10 Propulsion Upgrade. The Congressional add of $5.0M in FY05, mentioned above, was used to provide a ramp to the FY06 SDD effort. In FY06, SDD continued with development of the integration requirements and design work including development of the evaluation and test requirements as well test hardware. The Air Force will provide TF34-100A engines for the prototype effort.

The FY07 Budget request authorizes $247M in APAF money to procure up to 110 TF-3400B engine kits.

THREE-DIMENSIONAL (3-D) MODELING, DESIGN, AND ENGINEERING ASSESSMENT

In FY05, this effort received a $3.5M Congressional add for an effort to investigate a new wing and fuselage/empennage improvement to increase the service life to 16,000 flight hours.

The digital model captured the most current configuration of the A-10 wing assembly in order to support future sustainment activities of the aircraft. This model is the basis for simulating the effects of differing usage, to include additional weapon or countermeasures installations, on the structure.

In FY06, $1.602M was realigned from the MODE S/MODE 5 program to the 3-D Modeling, Design and Engineering Assessment.

A-10 WING REPLACEMENT PROGRAM

Aging A-10 thin-skin wings must be replaced by new thick-skin wings. Replacement wings can accomplish the CAF Operational Requirements Document (ORD) requirement to keep the A-10 operational until 2028 and the corresponding A-10 Program Management Directive (PMD) requirement to extend the A-10 aircraft service life to 16,000 hours.

The cost of sustaining the thin-skin wings at an acceptable risk level has exceeded its economic limit. It is more cost effective to replace the thin-skin wing than to repair it. The program will replace 197 thin-skin wings currently in the inventory.

As a new start, FY07 PBR provides $741M across the FYDP to begin purchasing wing kits in FY07. The $741M replaces up to 121 wings through the FYDP.

Wings procured in FY10 and FY11 cannot be installed until FY12 and FY13 respectively. Therefore, additional funding will have to be pursued through FY08 POM for these installations outside of the FYDP.

MODE S/MODE 5 EQUIPMENT

Mode S is a new civilian mode for the aviation Identify Friend or Foe (IFF) systems. It provides more detailed flight information about an aircraft to ground controllers or other aircraft than currently available. Europe has set a deadline of 31 Mar 09 for aircraft to be equipped with Mode S or risk having those aircraft grounded.

Mode 5 is a secure military only IFF mode used in combat to identify friendly aircraft to prevent fratricide. Mode 5 is being developed by DoD to replace Mode 4, which is no longer NSA certified. All combat aircraft will be required to have this IFF mode by approximately 2015.

Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207131F A-10 SQUADRONS	PROJECT NUMBER AND TITLE 4809 A-10 Squadrons

Global Air Traffic Management (GATM) is the Air Force program designed to meet the evolving aviation requirements of the International Civil Aviation Organization (ICAO). GATM, Navigation and Safety, and Navigation Warfare (NAVWAR) are major components of the AF's Global Access, Navigation, and Safety (GANS) management effort.

The A/OA-10 RDT&E program is in budget activity 7 - Operational System Development because it supports an operational system.

In FY06, $1.602M was realigned from the MODE S/MODE 5 program to the 3-D Modeling, Design and Engineering Assessment.

(U)	**B. Accomplishments/Planned Program ($ in Millions)**	FY 2005	FY 2006	FY 2007
(U)	Further development/integration requirements efforts for Precision Engagement (PE). PE combines six modifications into one comprehensive modification: definition and initial integration design of JDAM/WCMD, Targeting Pod, DSMS, DC Power and 1760 Bus. PE Spiral #1 efforts include Preliminary Design Review, further refinement of PVI design, maintenance concept, installation design, ILS tasks and design tasks leading to Critical Design Review.	21.696	16.333	10.955
(U)	In FY05 and FY06, Congress provided additional funds which were applied to existing Propulsion Upgrade pre-SDD studies.	4.810	4.190	
(U)	Propulsion Upgrade SDD began in FY06 with design work on engine and airframe changes. Some hardware for the prototype kits will be procured or manufactured. In FY07, the factory test engine will be produced and tested and the airframe kits will be produced. In FY08, test aircraft will be modified with upgraded engines and flight testing will be conducted.		33.900	64.600
(U)	Three Dimensional (3-D) Modeling, Design, and Engineering Assessment is an effort to investigate a new wing and fuselage/empennage improvement to increase the service life to 16,000 flight hours. In FY05, this effort received a $3.5M Congressional add.	3.372	1.602	

A digital model capturing the most current configuration of the A-10 wing assembly is necessary to support future sustainment activities of the aircraft. This model will be used as the basis for simulating the effects of differing usage, to include additional weapon or countermeasures installations, on the structure. This will be done by using the digital definition to develop finite element models for stress and thermal analyses as needed. These same digital models can be used as input to aerodynamic analyses to develop airloads for the baseline and a multitude of weapons load configurations. These models can also be used to simulate various production and maintenance related activities to include development of appropriate shop aids, tools, procurement of spares, assist in validating first articles, etc. Finally, these models can be used to simulate impacts to systems and avionics hardware due to modifications associated with updates, capability enhancements, or engineering evaluations.

The use of digital modeling and simulation as described would provide a benefit to the A-10 program by reducing

Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207131F A-10 SQUADRONS	PROJECT NUMBER AND TITLE 4809 A-10 Squadrons

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

		FY 2005	FY 2006	FY 2007
	overall costs of sustainment activities by providing a common baseline that can be maintained and shared amongst A-10 government and contractor organizations.			
(U)	Wing Replacement Program -- To increase the aircraft service life, aging A-10 thin-skin wings must be replaced by new thick-skin wings like those used on the later lots of production aircraft. Replacement wings can accomplish the CAF Operational Requirements Document (ORD) requirement to keep the A-10 operational until 2028 and the corresponding A-10 Program Management Directive (PMD) requirement to extend the A-10 aircraft service life to 16,000 hours. The cost of sustaining the thin-skin wings at an acceptable risk level has exceeded its economic limit. It is more cost effective to replace the thin-skin wing than to repair it. The program will replace 197 thin-skin wings currently in the inventory.			5.216
(U)	Total Cost	29.878	56.025	80.771

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

		FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
(U)	TDL (PE 0207445F)-RDT&E		25.080	17.674	28.029				Continuing	TBD
(U)	TDL (PE 0207445F)-APAF	5.139								

(U) D. Acquisition Strategy

- Precision Engagement and Digital Data Link (now under PE 0207445F) development will be conducted under the A-10 Prime Contract which was awarded in Dec 1997 on a full-and-open basis. Cost Plus Award Fee (CPAF) contract awarded for specific modernization efforts.
- The Propulsion Upgrade Program will have two major contracts. The AF plans to procure the Engine Upgrade kits via sole source; while the integration portion will be competed on a full-and -open basis.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2006**

BUDGET ACTIVITY: **07 Operational System Development**

PE NUMBER AND TITLE: **0207131F A-10 SQUADRONS**

PROJECT NUMBER AND TITLE: **4809 A-10 Squadrons**

(U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2005 Cost	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												
Precision Engagement Development	SS/CPFF	Lockheed Martin Systems Integration--Owego NY		20.669	Mar-05	7.758	Jan-06			Continuing	TBD	
Precision Engagement Spiral 3	CPFF	Lockheed Martin Systems Integration--Owego NY						10.459	Jan-07	Continuing	TBD	
Propulsion Upgrade Study	FP	Whitney Bradley & Brown Inc--Vienna VA				4.190				Continuing	TBD	
Propulsion Upgrade	SS/CPFF	General Electric, Lynn MA		3.800	Mar-05	25.200	Dec-05	53.890	Dec-06	Continuing	TBD	
Airframe Integration	CPFF	Lockheed Martin Systems Integration--Owego NY		0.650	Mar-05	6.880	Nov-05	8.200	Nov-06	Continuing	TBD	
											0.000	
Three-Dimensional (3D) Modeling, Design, and Engineering Assessment	CPFF	Aerospace Engineering Spectrum (AES)--Ogden UT		3.372	Sep-05	1.602	Feb-06				4.974	
A-10 Wing Replacement Program	TBD	TBD						5.216	Jun-07		5.216	
Subtotal Product Development			0.000	28.491		45.630		77.765		Continuing	TBD	0.000
Remarks:												
(U) Support												
USAF (Multiple) PE				0.687	Apr-05	3.675	Jan-06	0.496	Jan-07	1.101	5.959	
USAF (Multiple) Propulsion				0.700	Jul-05	1.820	Nov-05	1.151	Nov-06	Continuing	TBD	
Navy											0.000	
Subtotal Support			0.000	1.387		5.495		1.647		Continuing	TBD	0.000
Remarks:												
(U) Test & Evaluation												

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2006**

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
07 Operational System Development	**0207131F A-10 SQUADRONS**	**4809 A-10 Squadrons**

	USAF (40th FTS) PE			Feb-05	4.900	Jan-06			4.900	
	USAF (40th FTS) Propulsion SDD						1.359	Nov-06	0.461	1.820	3.601
	Subtotal Test & Evaluation	0.000	0.000		4.900		1.359		0.461	6.720	3.601
	Remarks:										
(U)	Management										
										0.000	
	Subtotal Management	0.000	0.000		0.000		0.000		0.000	0.000	0.000
	Remarks:										
(U)	Total Cost	0.000	29.878		56.025		80.771		Continuing	TBD	3.601

Exhibit R-4, RDT&E Schedule Profile		DATE: February 2006
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0207131F A-10 SQUADRONS	PROJECT NUMBER AND TITLE: 4809 A-10 Squadrons

PE Spiral 1 Master Schedule

Dominant Air Power: Design For Tomorrow…Deliver Today

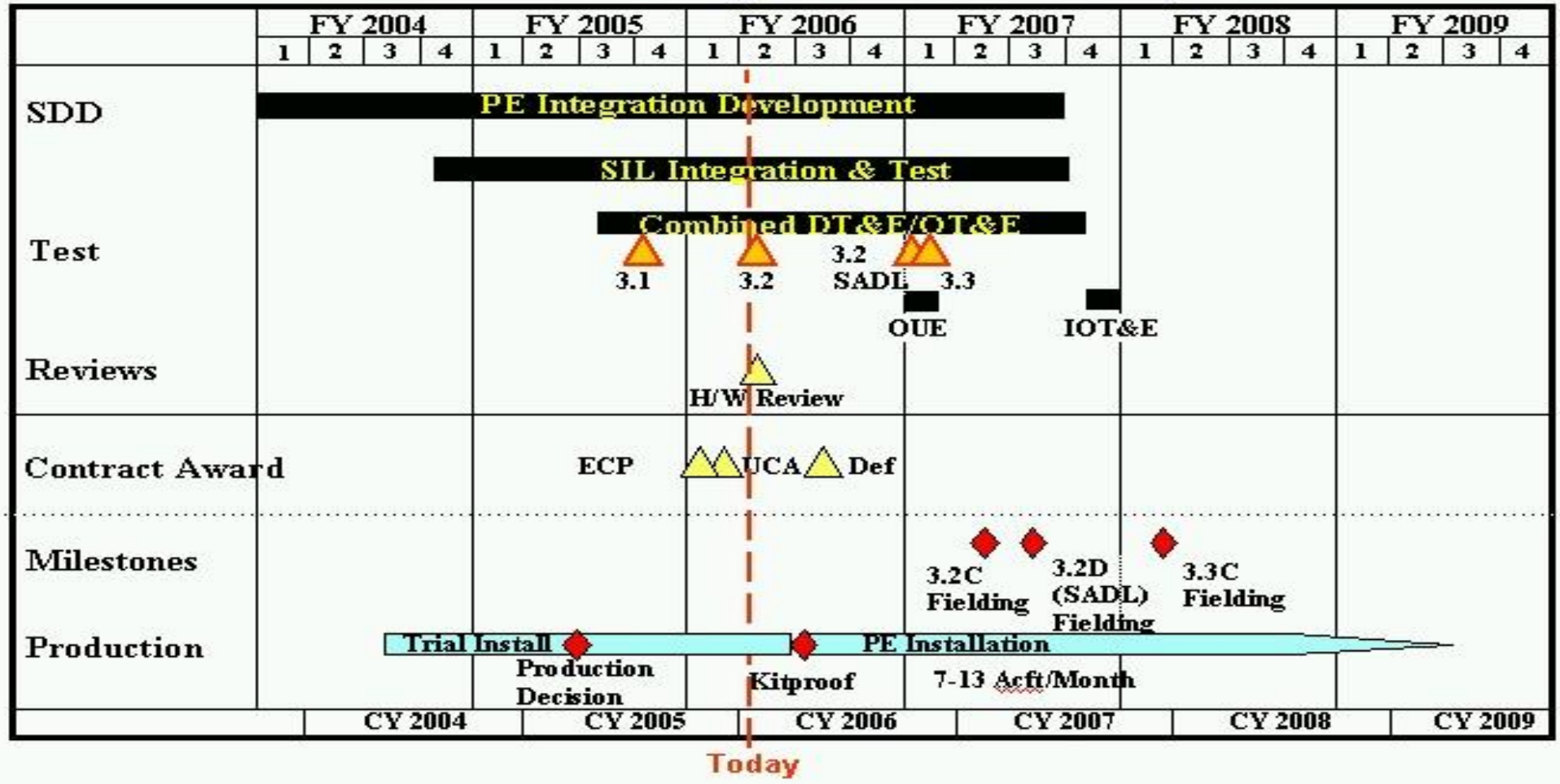

Exhibit R-4, RDT&E Schedule Profile		DATE: February 2006
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0207131F A-10 SQUADRONS	PROJECT NUMBER AND TITLE: 4809 A-10 Squadrons

PUP Master Schedule

Current Status – Detailed IMP/IMS In Work

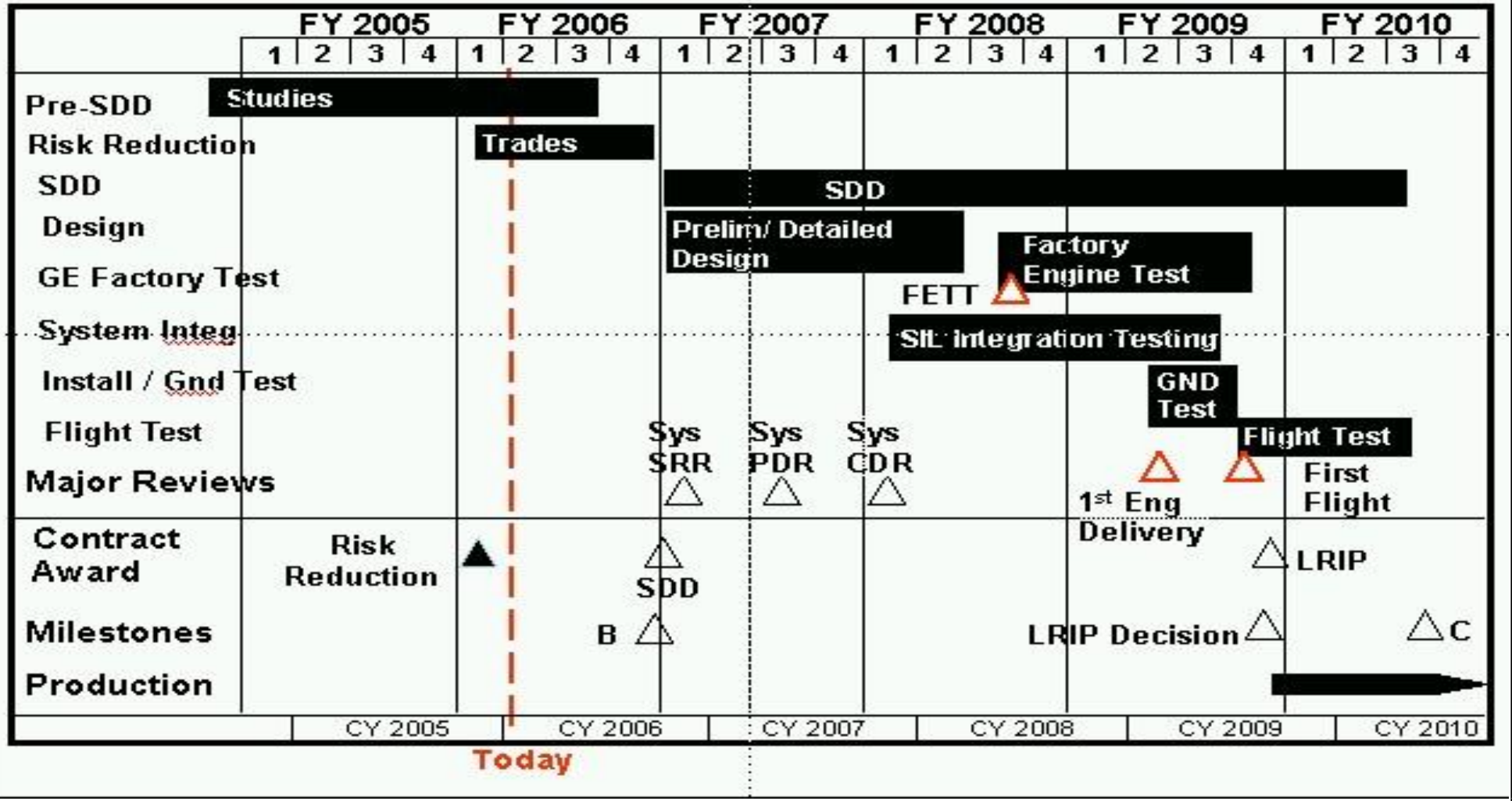

Exhibit R-4a, RDT&E Schedule Detail

DATE: **February 2006**

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
07 Operational System Development	**0207131F A-10 SQUADRONS**	**4809 A-10 Squadrons**

(U) Schedule Profile	FY 2005	FY 2006	FY 2007
(U) Precision Engagement Developmental Test	1-4Q		
(U) Precision Engagement Initial Operational Testing	3-4Q		
(U) Precision Engagement Initial Operating Capability (IOC)	3Q		
(U) Precision Engagement Production/Installation	3-4Q	1-4Q	1-4Q
(U) Engine Upgrade Systems Design and Demonstration (SDD)		3-4Q	1Q
(U) -- Engine Upgrade SDD SRR		3Q	
(U) -- Engine Upgrade SDD PDR			1Q