PE NUMBER: 0305205F
PE TITLE: Endurance Unmanned Aerial Vehicles

Exhibit R-2, RDT&E Budget Item Justification

DATE: February 2005

BUDGET ACTIVITY: 07 Operational System Development

PE NUMBER AND TITLE: 0305205F Endurance Unmanned Aerial Vehicles

	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	385.890	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,097.486
4755	Predator	40.162	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	69.992
4799	Global Hawk	345.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,027.494

Global Hawk and Predator no longer share the same Program Element (PE). Effective FY05, Global Hawk funding will be in PE 0305220F, project 675144. The new PE was named GLOBAL HAWK DEVELOPMENT/FIELDING. Predator funding moved to PE 0305219F, project 675143. This PE was named PREDATOR DEVELOPMENT/FIELDING.

(U) A. Mission Description and Budget Item Justification

This program is budget activity 7, Operational Systems Development, because it involves Air Force R&D to develop a highly capable operational system.

Endurance Unmanned Aerial Vehicles (UAVs) are a family of remotely piloted aircraft (RPAs) developed to provide all-weather, day/night, intelligence, surveillance and reconnaissance (ISR) in direct support of theater ISR collection requirements; and integrate with existing ISR architectures for mission planning, data processing, exploitation and dissemination.

The MQ-1 Predator UAV is a long-dwell, autonomous, unmanned reconnaissance system capable of operating over-the-horizon while providing real-time intelligence information to the Joint Task Force Commander. The air vehicle (A/V) carries electro-optical (EO), Infra-Red (IR) and synthetic aperture radar (SAR), and is capable of transmitting near real time imagery to the task force commander throughout the operational theater, All Predator aircraft are being produced with the Multi-spectral Targeting System (MTS) (a sensor turret that incorporates EO/IR, laser designator/range-finder, and IR illuminator), plus the capability to employ Hellfire laser-guided missiles.

The MQ-9 Predator B is a multi-role UAV, larger than the MQ-1 and will be capable of flying at higher speeds and altitudes. The aircraft will primarily function in a hunter-killer role, employing fused multi-spectral sensors to find, fix, and track ground targets and assess post-strike results. It is in continuing development and will field capability through evolving spirals. The first spiral is the flight characterization evaluation of the original off-the-shelf, proto-type aircraft (Spiral 0). Spiral 1 integrates, tests, and demonstrates the ability to deliver Hellfire laser-guided missiles. Spiral 2 increases the aircraft's gross take-off weight, integrate redundant avionics, a digital electronically controlled engine, sensor/stores management computer, MIL-STD-1760 advanced weapons data bus, and improved the human-machine interface.

The Global Hawk System provides high altitude, deep look, long endurance intelligence, surveillance, and reconnaissance (ISR) capability that complements space and other airborne collectors during peacetime, crisis, and war-fighting scenarios.

The Global Hawk System is comprised of an aircraft, a ground segment, and a support segment. The aircraft is a fully autonomous, high altitude, long endurance remotely piloted aircraft (RPA). The RQ-4A is an imagery intelligence-collecting RPA designed to carry 2,000 pounds of payload. The RQ-4B is a multi-intelligence collecting RPA designed to carry a 3,000-pound payload. Payload designs include a Synthetic Aperture Radar (SAR) with Ground Moving Target Indicator (GMTI)

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles

capability, an Electro-Optical (EO)/Infrared (IR) camera, Signals Intelligence (SIGINT), and the Multi-Platform Radar Technology Insertion Program (MP-RTIP). The user will determine the optimal payload configuration and quantity for each aircraft based on current operational requirements. The Ground Station (GS) includes the Mission Control Element (MCE) and the Launch and Recovery Element (LRE). The support segment includes aerospace ground equipment, tech orders, spares, support equipment, and training,etc. to enable the Global Hawk System.

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.

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

		FY 2004	FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	393.968			
(U)	Current PBR/President's Budget	385.890	0.000		
(U)	Total Adjustments	-8.078	0.000		
(U)	Congressional Program Reductions				
	Congressional Rescissions	-8.078			
	Congressional Increases				
	Reprogrammings				
	SBIR/STTR Transfer				
(U)	Significant Program Changes:				

Exhibit R-2a, RDT&E Project Justification

DATE: February 2005

BUDGET ACTIVITY: 07 Operational System Development

PE NUMBER AND TITLE: 0305205F Endurance Unmanned Aerial Vehicles

PROJECT NUMBER AND TITLE: 4755 Predator

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
4755 Predator	40.162	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	69.992
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

Starting in FY05, all Predator funds will be reported in PE0305219F.

(U) A. Mission Description and Budget Item Justification

The Predator program includes RQ/MQ-1 and MQ-9 unmanned aerial vehicles (UAVs), mobile and fixed Ground Control Stations (GCS), and associated communications and support equipment.

The RQ/MQ-1 Predator Unmanned Aerial Vehicle is a long dwell reconnaissance system capable of surveillance of critical targets at a range of 400 nm from the launch area. Predator is equipped with Electro-Optical/Infrared (EO/IR) and Synthetic Aperture Radar (SAR) sensors. The entire fleet is being fitted with Multi-spectral Targeting System (MTS) sensors capable of laser target designation and illumination. Additionally all aircraft will be modified to allow HELLFIRE laser-guided missile employment. Predator incorporates line-of-sight (LOS) and wide-band Ku-band SATCOM datalinks capable of providing near-real-time (NRT) transmission of high resolution imagery throughout the operational envelope. As Predator moves into its multi-mission role, the Air Force will continue experiments to expand roles, missions, sensors, and new weapons capabilities to leverage its battlefield persistence.

The MQ-9 is currently in flight test and will continue its development as a hunter-killer, Reconnaissance, Surveillance, and Target Acquisition (RSTA) asset. Two aircraft were procured as they were configured from the contractor (Spiral 0). The Air Force is currently defining the full operational configuration for Predator B and will spirally develop the system to meet our requirements. Spiral 1 increases takeoff gross weight, adds redundant avionics , advanced digital sensors, wing hard points for weapons, and delivers a capability to deliver HELLFIRE laser-guided missiles. Spiral 2 will integrate advanced weapons and update the human-machine interface. Subsequent spirals will develop follow-on sensors/payloads and update GCS and associated communications equipment.

Budget Activity Justification: This program is budget activity 7, Operational Systems Development, because it involves Air Force R&D to field a highly capable operational system and provide essential operational capabilities.

(U) B. Accomplishments/Planned Program ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007
(U) Accomplishments/Planned Program	0.000			
(U) Pre-planned Product Improvement (To include: Advanced capabilities, sensor integration, quick reaction capabilities, payload development/integration, weaponization and experimentation)				
(U) MQ-9 Spiral development (aircraft improvements, development and integration of follow-on sensors, weapons and payloads, and associated communications equipment				
(U) Predator View situational awareness/mission planning system				
(U) System concept studies	1.000			
(U) Rectify identified air vehicle and ground station deficiencies to improve reliability and maintainability				
(U) Development and Operational Test				

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT NUMBER AND TITLE 4755 Predator

(U)	Field support	1.000				
(U)	MQ-1 Pre-planned Product Improvement (To include: Advanced capabilities, sensor integration, quick reaction capabilities, payload development/integration, weaponization and experimentation, continuing developmental testing for TCDL integration, and associated communications equipment.	3.000				
(U)	MQ-9 spiral development (aircraft improvements, development and integration of follow-on sensors, weapons and payloads, and associated communications equipment)	27.145				
(U)	Continue a reliability and maintainability program to ensure the continued viability of the MQ-1/MQ-9 air vehicle, ground control station, and associated communications equipment.	4.204				
(U)	Developmental and Operational Test	3.813				
(U)	Total Cost	40.162	0.000	0.000	0.000	

(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, AF (PE 35205F), Predator	196.369									
(U) Aircraft Modification, AF (PE 35205F)	14.178									
(U) Aircraft Initial Spares, AF (PE 35205F	0.377									

(U) D. Acquisition Strategy

Both the MQ-1 Predator and MQ-9 Predator B will be acquired through the BIG SAFARI Program Office. MQ-1 Predator is in accelerated production with ISR sensors, laser designators, and weapon delivery capability. MQ-9 Predator B will be acquired as a 'Hunter Killer' system through a series of spirals to rapidly deliver combat capability. Each spiral will build on the delivered capability from the previous spirals and will include advanced sensor capabilities and evolving weapon payloads. Prime contractor for both aircraft is General Atomics Aeronautical Systems Inc.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2005**

BUDGET ACTIVITY: **07 Operational System Development**

PE NUMBER AND TITLE: **0305205F Endurance Unmanned Aerial Vehicles**

PROJECT NUMBER AND TITLE: **4755 Predator**

(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														
General Atomics Aeronautical Systems Incorporated (GA-ASI)	SS/CPFF	GA-ASI Rancho Bernardo CA		36.891	Feb-04							Continuing	TBD	
Subtotal Product Development			0.000	36.891		0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:														
(U) Support														
ASC	SS/T&M	Wright-Patterson AFB OH		0.750	Feb-04							Continuing	TBD	
Subtotal Support			0.000	0.750		0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:														
(U) Test & Evaluation														
AFOTEC	MIPR	Kirtland AFB NM		1.000	Feb-04							Continuing	TBD	
Misc	Various	Various		1.700	Feb-04							Continuing	TBD	
Subtotal Test & Evaluation			0.000	2.700		0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:														
(U) Total Cost			0.000	40.341		0.000		0.000		0.000		Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile		DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT NUMBER AND TITLE 4755 Predator

Exhibit R-4a, RDT&E Schedule Detail		DATE: February 2005
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0305205F Endurance Unmanned Aerial Vehicles	PROJECT NUMBER AND TITLE: 4755 Predator

(U) Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007
(U) MQ-9 Spiral 0 Complete	4Q			
(U) MQ-9 Spiral 1 Demonstration	4Q			

Exhibit R-2a, RDT&E Project Justification

DATE: February 2005

BUDGET ACTIVITY: 07 Operational System Development

PE NUMBER AND TITLE: 0305205F Endurance Unmanned Aerial Vehicles

PROJECT NUMBER AND TITLE: 4799 Global Hawk

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
4799	Global Hawk	345.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,027.494
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

Global Hawk and Predator no longer share the same Program Element (PE). Effective FY05, Global Hawk funding will be in PE 0305220F, project 675144. The new PE was named GLOBAL HAWK DEVELOPMENT/FIELDING. Predator funding moved to PE 0305219F, project 675143. This PE was named PREDATOR DEVELOPMENT/FIELDING.

(U) A. Mission Description and Budget Item Justification

This program is budget activity 7, Operational Systems Development, because it utilizes Air Force R&D to develop a highly capable operational system.

The Global Hawk System provides high altitude, deep look, long endurance intelligence, surveillance, and reconnaissance (ISR) capability that complements space and other airborne collectors during peacetime, crisis, and war-fighting scenarios.

The Global Hawk System is comprised of an aircraft, a ground segment, and a support segment. The aircraft is a fully autonomous, high altitude, long endurance remotely piloted aircraft (RPA). The RQ-4A is an imagery intelligence-collecting RPA designed to carry 2,000 pounds of payload. The RQ-4B is a multi-intelligence collecting RPA designed to carry a 3,000-pound payload. Payload designs include a Synthetic Aperture Radar (SAR) with Ground Moving Target Indicator (GMTI) capability, an Electro-Optical (EO)/Infrared (IR) camera, Signals Intelligence (SIGINT), and the Multi-Platform Radar Technology Insertion Program (MP-RTIP). The user will determine the optimal payload configuration and quantity for each aircraft based on current operational requirements. The Ground Station (GS) includes the Mission Control Element (MCE) and the Launch and Recovery Element (LRE). The support segment includes aerospace ground equipment, tech orders, spares, support equipment, and training,etc. to enable the Global Hawk System.

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.

(U) B. Accomplishments/Planned Program ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007
(U) ACCOMPLISHMENTS / PLANNED PROGRAM	0.000			
(U) Continue spiral development and related tasks, including aircraft ($92.5M), payloads ($30.9M), ground stations ($10.1M), support segment ($21.4M), systems engineering ($26.2M), program management ($31.3M), and test ($16.6M) to satisfy ORD requirements.	229.108			
(U) Provide government test and evaluation support at Edwards AFB	8.200			
(U) Provide government program management, mission support, and other related costs.				
(U) Demonstrations and exercises	0.363			
(U) Provide government program management, mission support, and other related costs.	8.862			
(U) MP-RTIP sensor adaptation	30.062			
(U) Continue advanced Airborne Signals Intelligence Payload (ASIP) modernization for Global Hawk and	62.833			

Exhibit R-2a, RDT&E Project Justification		DATE: February 2005
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0305205F Endurance Unmanned Aerial Vehicles	PROJECT NUMBER AND TITLE: 4799 Global Hawk

	U-2.*				
(U)	Congressional Plus Up for Advanced Imagery Architecture and Lithium Batteries	6.300			
(U)	Total Cost	345.728	0.000	0.000	0.000

*ASIP platform integration for Global Hawk is in the spiral development line and for the U-2 it is in PE 0305202F.

(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)	AF RDT&E	345.728									TBD
(U)	Other APPN										
(U)	AF MILCON	22.300									TBD
(U)	AF O&M	35.500									TBD
(U)	AF MILPERS	11.200									TBD
(U)	Aircraft Procurement, APPN 10 AF (HAE UAV)	246.752									TBD
(U)	Aircraft Procurement APPN 11 AF (HAE UAV)										TBD
(U)	Other Procurement, 3080 (HAE UAV)	0.192									TBD

All Other Program Funding is within PE 0305205F up through FY04. Funding is in PE 0305220F in FY05 and out.

(U) D. Acquisition Strategy

The Global Hawk program uses Spiral Development to provide the warfighter with a near-term, combat capability with increased, time-phased capability improvements as soon as technology and risk achieve satisfactory levels.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2005**

BUDGET ACTIVITY: **07 Operational System Development**

PE NUMBER AND TITLE: **0305205F Endurance Unmanned Aerial Vehicles**

PROJECT NUMBER AND TITLE: **4799 Global Hawk**

(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														
NGIS	SS CPAF	San Diego CA	690.126	229.491	Feb-04							Continuing	TBD	
NG-ESL	SS: CPAF	San Jose CA	73.681	49.197	Feb-04							Continuing	TBD	
Raytheon	SS: CPAF	Falls Church VA		4.235	Feb-04							Continuing	TBD	
L-3	SS: CPAF	Garland,TX		6.600	Feb-04							Continuing	TBD	
NG	SS: CPAF	Melbourne FL	10.960	30.062	Mar-04							Continuing	TBD	
Subtotal Product Development			774.767	319.585		0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:														
(U) Support														
NGIS	SS/CP	San Diego CA	6.797	3.352	Jan-04							Continuing	TBD	
Other Govt Orgs	Various			3.162	Dec-03							Continuing	TBD	
Subtotal Support			6.797	6.514		0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:														
(U) Test & Evaluation														
AFFTC	PO	Edwards AFB	33.890	8.200	Apr-04							Continuing	TBD	
Demos and Exercise support	PO	Various		0.363	Feb-04							Continuing	TBD	
Subtotal Test & Evaluation			33.890	8.563		0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:														
(U) Management														
A&AS	PR	Dayton, OH	43.094	11.066	Mar-04							Continuing	TBD	
Other Govt Orgs	PR	Various										Continuing	TBD	
Subtotal Management			43.094	11.066		0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:														
(U) Total Cost			858.548	345.728		0.000		0.000		0.000		Continuing	TBD	0.000

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

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
07 Operational System Development	0305205F Endurance Unmanned Aerial Vehicles	4799 Global Hawk

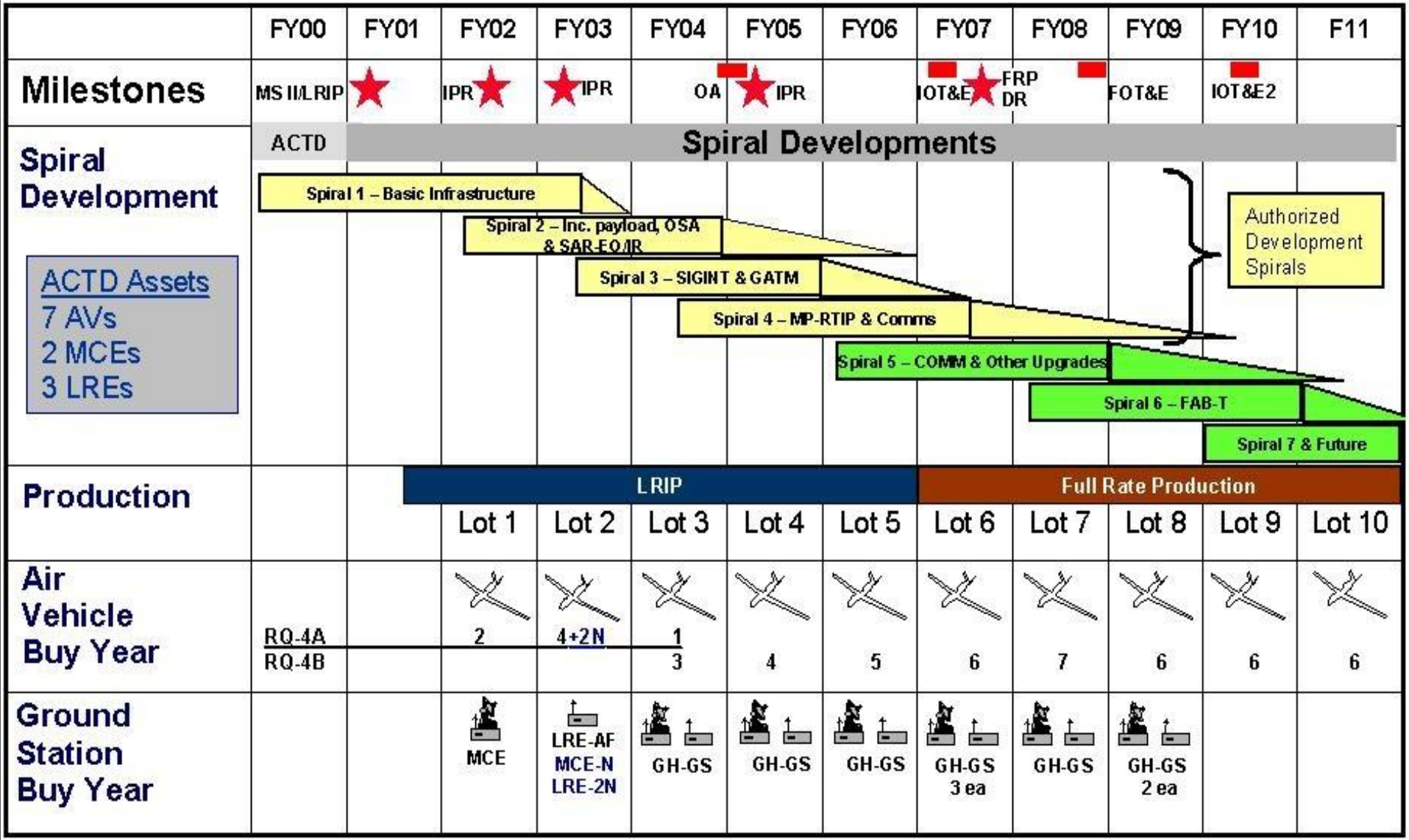

Exhibit R-4a, RDT&E Schedule Detail		DATE: February 2005
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0305205F Endurance Unmanned Aerial Vehicles	PROJECT NUMBER AND TITLE: 4799 Global Hawk

(U) Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007
(U) Complete Global Hawk/German ELINT Flight Demonstration	1Q			
(U) Delivery of AF2	2Q			
(U) Award EMD Spiral 4A UCA contract	1Q			