Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*				R-1 ITEM NOMENCLATURE PE 0305219F: *PREDATOR DEVELOPMENT/FIELDING*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	38.605	35.160	28.913	0.000	28.913	12.864	7.273	4.816	0.811	Continuing	Continuing
675143: *Predator*	38.605	35.160	28.913	0.000	28.913	12.864	7.273	4.816	0.811	Continuing	Continuing

Note

FY 2009 funding totals include $12.4M in Congressional Adds.
FY 2009 funding totals include $1.7M included as part of the 2009 Omnibus reprogramming action (IR 09-26).
FY 2010 funding totals include $5.675M in Congressional Adds and $11.4M appropriated for Overseas Contingency Operations.

A. Mission Description and Budget Item Justification

The basic MQ-1 system consists of the aircraft, a control station, communications equipment, support equipment, simulator and training devices, Readiness Spares Packages (RSP), technical data/training, and personnel required to operate, maintain, and sustain the system. This funding supports development and enhancements to the Predator weapon system to include: aircraft, Ground Control Stations, sensors, communication equipment, training systems and support elements. The system is designed to be modular and open-ended: mission-specific equipment is employed in a 'plug-and-play' mission kit concept allowing specific aircraft and control station configurations to be tailored to fit mission needs.

The MQ-1 aircraft is a single-engine, propeller-driven, remotely piloted aircraft (formerly called unmanned aircraft vehicle, UAV) designed to operate over-the-horizon for long endurance sorties. The aircraft is designed to provide real-time Intelligence, Surveillance, Reconnaissance, and Target Acquisition (ISR TA), and attack capability to aggressively prosecute Time Sensitive Targets (TSTs). The MQ-1 operates primarily at medium altitudes, integrating with joint aerospace, ground, and maritime forces as well as coalition and Allied forces, to execute combatant commander priority missions. The aircraft carries a Multi-spectral Targeting System (MTS) (a sensor turret that incorporates electro-optical (EO), Infra-Red (IR), laser designator, and IR illuminator) capable of transmitting real-time motion imagery throughout the operational theater. The program plans to develop a capability for Mode S and develop and incorporate encryption for its data links. Major changes will be classified as distinct blocks or Mission Design Series (MDS) updates. Activities also include studies and analysis to support both current program planning and execution and future program planning. The program will take steps to integrate a high-definition (HD) turret and transmit HD video. The aircraft is configured to carry Hellfire laser-guided missiles.

The Ground Control Station (GCS) functions as the aircraft cockpit and can control the aircraft either within line-of-sight (LOS) or beyond LOS (BLOS) via a combination of satellite relay and terrestrial communications. The GCS is either mobile to support forward operating locations or fixed at a facility to support Remote Split Operations (RSO). The GCS has the capability to perform mission planning; provide a means for manual control; allow control of multiple aircraft and payloads; allow

personnel to launch, recover, and monitor aircraft, payloads, and system communications status; secure data links to receive payload sensor data and command links; monitor threats to the aircraft; display common operation picture; and provide support functions. Additionally, GCS allows for servicing, systems checks, maintaining, launching, and recovering aircraft under LOS control for hand-off to a mobile or fixed facility GCS. The GCS will continue to evolve and upgrade its capabilities to keep pace with MQ-1 aircraft capabilities and the missions they perform.

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.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	36.905	18.101	0.000	0.000	0.000
Current President's Budget	38.605	35.160	28.913	0.000	28.913
Total Adjustments	1.700	17.059	28.913	0.000	28.913
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		17.075			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	-0.016			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	1.700	0.000	28.913	0.000	28.913

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 675143: *Predator*		
Congressional Add: *MQ-9 Reaper Tactical Reconnaissance Improvement*	0.000	10.000
Congressional Add: *Sense and Avoid for Predator*	5.984	3.200
Congressional Add: *Center for Defense UAV Education*	3.989	0.000
Congressional Add: *Predator Mission Aircrew Training System (PMATS)*	2.393	0.000
Congressional Add: *Predator C*	0.000	1.200
	12.366	14.400

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305219F: *PREDATOR DEVELOPMENT/FIELDING*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add Subtotals for Project: 675143		
Congressional Add Totals for all Projects	12.366	14.400

Change Summary Explanation

FY 2009 $12.4M Congressional increase includes: $6.0M for sense and avoid work, $4.0M for Center for UAV Excellence, and $2.4M for PMATS upgrade.
FY 2009 funding totals include $1.7M included as part of the 2009 Omnibus reprogramming action (IR 09-26).
FY 2010 funding totals include $5.675M in Congressional Adds and $11.4M appropriated for Overseas Contingency Operations.
FY 2011 funding added to complete critical improvements to keep aircraft viable beyond FYDP.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305219F: *PREDATOR DEVELOPMENT/ FIELDING*	PROJECT 675143: *Predator*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
675143: *Predator*	38.605	35.160	28.913	0.000	28.913	12.864	7.273	4.816	0.811	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

Note

FY 2009 funding totals include $12.4M in Congressional Adds.
FY 2009 funding totals include $1.7M included as part of the 2009 Omnibus reprogramming action (IR 09-26).
FY 2010 funding totals include $5.675M in Congressional Adds and $11.4M appropriated for Overseas Contingency Operations.

A. Mission Description and Budget Item Justification

The basic MQ-1/MQ-9 system consists of the aircraft, a control station, and the communications support equipment and personnel required to operate, maintain, and sustain the system. The system is designed to be modular and open-ended: mission-specific equipment is employed in a 'plug-and-play' mission kit concept allowing specific aircraft and control station configurations to be tailored to fit mission needs.

The MQ-1 Predator aircraft is a single-engine, propeller-driven, remotely piloted aircraft designed to operate over-the- horizon at medium altitude for long endurance sorties. The aircraft is designed to provide real-time Intelligence, Surveillance, Reconnaissance and Target Acquisition (ISR TA) and attack roles to aggressively prosecute Time Sensitive Targets (TST). The MQ-1 will operate primarily at medium altitudes, integrating with joint aerospace, ground, and maritime forces as well as coalition and Allied forces, to execute combatant commander priority missions. The aircraft carries a Multi-spectral Targeting System (MTS) (a sensor turret that incorporates electro-optical (EO), Infra-Red (IR), laser designator/range-finder, and IR illuminator) capable of transmitting real-time motion imagery throughout the operational theater. Additionally the aircraft is multi-configurable to carry either a synthetic aperture radar (SAR) or Hellfire laser-guided missiles. The MQ-1 aircraft will continue to evolve and upgrade the MQ-1's capabilities to satisfy new requirements and address reliability and maintainability (R&M) issues as they arise.

The MQ-9 Predator B aircraft is a single-engine, turbo-prop remotely piloted aircraft designed to operate over-the-horizon at medium-to-high altitude for long endurance sorties. The aircraft will be designed primarily to prosecute critical emerging TSTs as a radar-based attack asset with organic hard-kill capability (hunter-killer) and also perform ISR TA as a secondary role. In the hunter killer role, the aircraft will employ fused multi-spectral sensors to automatically find, fix, and track ground targets (Automatic Target Cueing (ATC)) and assess post-strike results. The MQ-9 is in continuing development. Flight characterization evaluation of the original off-the-shelf, prototype aircraft is complete. The next step will be to develop and test a 'baseline' capable system and includes both a risk reduction phase and a System Development & Demonstration (SDD) phase. Risk reduction started in FY03 and includes system design, drawings, specifications, and MIL-STD-1760 efforts. The SDD phase begins in FY04 and includes developing and testing the MQ-9's baseline capability. The baseline capability will include increasing the aircraft's gross

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
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take-off weight; enhancing aircraft systems to include integrated redundant avionics, ice detection capability, navigation system upgrades, electrical system upgrades, secure data links, sensor/stores management computer, MIL-STD-1760 advanced weapons data bus, advanced sensor and weapons payloads, and improved human-machine interface; integrating standard 'precision' weapons (GBU-12/38); hardware and software upgrades to the GCS for MQ-9 operations; completing airworthiness certification and accreditation; and producing applicable training devices that emulate aircraft capabilities. Subsequent block upgrades will continue to evolve the MQ-9's capabilities to satisfy new requirements and address R&M issues as they arise.

Approximately 15 Predator B aircraft will be purchased prior to completion of SDD due to Congressional and OSD funding adds. To maintain a basic operational capability, these aircraft will require reliability/maintainability and P3I development to keep them viable. Much of this development will be common to MQ-1 R&M and P3I development.

The Ground Control Station (GCS) functions as the aircraft cockpit and can control the aircraft either within line-of-sight (LOS) or beyond LOS (BLOS) via a combination of satellite relay and terrestrial communications. The GCS is either mobile to support forward operating locations or at a fixed facility to support Remote Split Operations (RSO). A mobile GCS is containerized for deployability while a fixed facility GCS consists of similar capability in a permanent facility. The GCS has the capability to perform mission planning; provide a means for manual and/or autonomous control of multiple aircraft and payloads; allow personnel to launch, recover, and monitor aircraft, payloads, and system communications status; secure data links to receive payload sensor data and command links; monitor threats to the aircraft; display common operation picture; and provide support functions. Additionally, a Launch and Recover GCS (LRGCS) allows for servicing, systems checks, maintaining, launching, and recovering aircraft under LOS control for hand off to a mobile or fixed GCS. The GCS will continue to evolve and upgrade its capabilities to fully support the MQ-1 and MQ-9 aircraft and the missions they perform.
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.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: MQ-1 Pre-planned Product Improvement.	20.565	18.328	20.936	0.000	20.936
FY 2009 Accomplishments: In FY 2009: Developed upgrades/integration of aircraft, sensors, data links (encryption and tactical common data link), training devices, ground station, weapons; plus experimentation					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305219F: *PREDATOR DEVELOPMENT/ FIELDING*	PROJECT 675143: *Predator*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: In FY 2010: Continues above. *FY 2011 Base Plans:* In FY 2011: Continues above. *FY 2011 OCO Plans:* In FY 2011 OCO: N/A					
MAJOR THRUST: Developmental and Operational Test support *FY 2009 Accomplishments:* In FY 2009: Conducted Developmental and Operational Test support *FY 2010 Plans:* In FY 2010: Conduct Developmental and Operational Test support *FY 2011 Base Plans:* In FY 2011: Conduct Developmental and Operational Test support *FY 2011 OCO Plans:* In FY 2011 OCO: N/A	0.625	1.032	0.749	0.000	0.749
MAJOR THRUST: MQ-1 EO/IR *FY 2009 Accomplishments:* In FY 2009: Improved EO/IR sensor *FY 2010 Plans:* In FY 2010: N/A	3.349	0.000	7.228	0.000	7.228

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305219F: *PREDATOR DEVELOPMENT/ FIELDING*	PROJECT 675143: *Predator*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: In FY 2011: Continue to improve EO/IR sensor *FY 2011 OCO Plans:* In FY 2011 OCO: N/A					
MAJOR THRUST: Vortex encryption *FY 2009 Accomplishments:* In FY 2009: Began development of Vortex encryption (Omnibus) *FY 2010 Plans:* In FY 2010: Continue development of Vortex encryption (OCO) *FY 2011 Base Plans:* In FY 2011: N/A *FY 2011 OCO Plans:* In FY 2011 OCO: Not Applicable.	1.700	1.400	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	26.239	20.760	28.913	0.000	28.913

	FY 2009	FY 2010
Congressional Add: MQ-9 Reaper Tactical Reconnaissance Improvement *FY 2009 Accomplishments:* In FY 2009: N/A	0.000	10.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305219F: *PREDATOR DEVELOPMENT/ FIELDING*	PROJECT 675143: *Predator*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: In FY 2010: Develop MQ-9 Reaper Tactical Reconnaissance Improvement (Added to Predator program in OCO)		
Congressional Add: Sense and Avoid for Predator *FY 2009 Accomplishments:* In FY 2009: Continued development of Sense and Avoid capability for Predator *FY 2010 Plans:* In FY 2010: Continues development of Sense and Avoid capability for Predator	5.984	3.200
Congressional Add: Center for Defense UAV Education *FY 2009 Accomplishments:* In FY 2009: Funded Center for Defense UAV Education at University of North Dakota *FY 2010 Plans:* In FY 2010: N/A	3.989	0.000
Congressional Add: Predator Mission Aircrew Training System (PMATS) *FY 2009 Accomplishments:* In FY 2009: Upgraded Predator Mission Aircrew Training System *FY 2010 Plans:* In FY 2010: N/A	2.393	0.000
	0.000	1.200

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305219F: *PREDATOR DEVELOPMENT/ FIELDING*	PROJECT 675143: *Predator*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Predator C *FY 2009 Accomplishments:* In FY 2009: N/A *FY 2010 Plans:* In FY 2010: Develops Predator C		
Congressional Adds Subtotals	12.366	14.400

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PE 0305219F: *MQ-1A Predator UAV, (APAF)*	422.928	198.889	245.457	0.000	245.457	123.004	99.690	75.052	44.834	0.000	0.000
• PE 0305219F (1): *MQ-1A Predator UAV, (OPAF)*	2.900	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D. Acquisition Strategy

The MQ-1 Predator system will be acquired via sole-source acquisition strategies with General Atomics-ASI and Raytheon as the prime contractors.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305219F: *PREDATOR DEVELOPMENT/ FIELDING*	PROJECT 675143: *Predator*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MQ-1/MQ-9 Development	Various/ Various	General Atomics-ASI Rancho Bernardo CA	374.995	18.328	Jan 2010	20.809	Jan 2011	0.000		20.809	Continuing	Continuing	Continuing
EO/IR	Various/ Various	Raytheon McKinney TX	4.209	0.000		7.228	Jan 2011	0.000		7.228	Continuing	Continuing	Continuing
Congressional Adds	Various/ Various	Various Various	9.974	14.400		0.000		0.000		0.000	0.000	24.374	0.000
PMATS GWOT Supplemental	SS/CPIF	L3 Comm Salt Lake City	2.393	0.000		0.000		0.000		0.000	0.000	2.393	0.000
Vortex	Various/ Various	Various Various	1.700	1.400	Jan 2010	0.000		0.000		0.000	0.000	3.100	0.000
		Subtotal	393.271	34.128		28.037		0.000		28.037			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development and Operational Test Support	TBD/TBD	TBD TBD	1.083	1.032	Mar 2010	0.876	Jan 2011	0.000		0.876	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force		DATE: February 2010
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			1.083	1.032		0.876		0.000		0.876			0.000

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	394.354	35.160		28.913		0.000		28.913			

Remarks

Total Prior Years Cost may include only FY 2009 data.

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305219F: *PREDATOR DEVELOPMENT/ FIELDING*	PROJECT 675143: *Predator*

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MQ-1 Predator Program Schedule

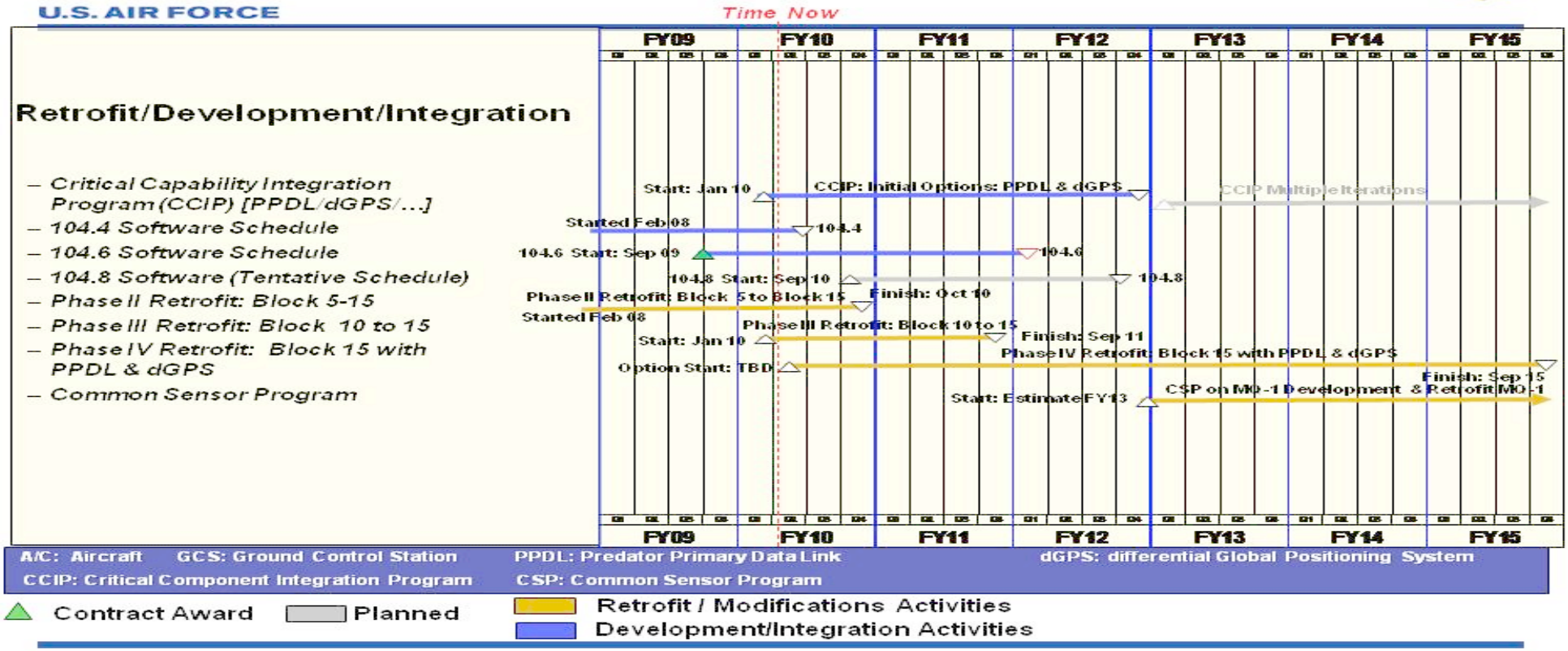

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305219F: *PREDATOR DEVELOPMENT/ FIELDING*	PROJECT 675143: *Predator*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
Critical Capability Integration Program Development	2	2010	4	2011
Software Version 104.4 Development	1	2009	3	2010
Software Version 104.6 Development	4	2009	4	2011