Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Air Force												Date: February 2015
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305205F / *Endurance Unmanned Aerial Vehicles*							
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
Total Program Element	-	1.000	20.000	-	-	-	-	-	-	-	-	21.000
675372: *Integrated Sensor IS Structure*	-	1.000	-	-	-	-	-	-	-	-	-	1.000
67A026: *MAGIC*	-	-	20.000	-	-	-	-	-	-	-	-	20.000

Note

In FY 2015, 675372, Integrated Sensor IS Structure, was completed.

A. Mission Description and Budget Item Justification

This PE focuses USAF efforts on long endurance platforms that provide days or months of endurance and their associated sensors and communications suites. Efforts include, but are not limited to, optionally piloted airships, Remotely Piloted Aircraft (RPAs), or more standard aircraft platforms flown as manned or unmanned.

The Integrated Sensor Is Structure (ISIS) project intended to develop a radar that is fully integrated into a station-keeping, stratospheric airship. ISIS intended to support the nation's need for persistent wide-area surveillance, tracking, and engagement of time-critical air and ground targets. Automated surveillance and tracking included air targets to the radar horizon of 600 km and all ground targets to a range of 300 km. The radar aperture intended to provide track data directly to users in-theater. After program restructure, the effort was reduced to radar and airship material risk reductions. The program efforts complete in FY 2015.

The Medium Altitude Global ISR and Communications (MAGIC) project is developing a multiple-day, medium altitude ISR unmanned aircraft system (UAS) to provide long endurance surveillance with a multiple sensor payload. This concept was initiated by the Office of the Secretary of Defense (OSD) as a Joint Capabilities Technology Demonstration (JCTD) in the 3rd Quarter FY 2010 with a competition between five defense industry partners. Aurora Flight Sciences' Orion Remotely Piloted Aircraft (RPA) concept was chosen as the JCTD candidate by OSD/Director of Defense, Research and Engineering (DDR&E) per the recommendation of the Combatant Commands (COCOMs). The MAGIC/Orion RPA initiative was subsequently released from the JCTD process and transitioned to the Air Force as the sponsor of this developmental initiative in the 3rd Quarter FY 2011. Aurora completed the first flight test series from 24 August to 16 November 2013 (5 sorties, 10.4 hours) and the second flight test series from 1 June to 7 August 2014 (8 sorties, 35.9 hours). A third flight test series is underway and has accomplished a maximum sortie duration of 80.0 hours.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Air Force	Date: February 2015
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*

B. Program Change Summary ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	1.000	-	-	-	-
Current President's Budget	1.000	20.000	-	-	-
Total Adjustments	-	20.000	-	-	-
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	20.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments	-	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2014	FY 2015
Project: 67A026: *MAGIC*		
Congressional Add: *MAGIC*	-	20.000
Congressional Add Subtotals for Project: 67A026	-	20.000
Congressional Add Totals for all Projects	-	20.000

Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force			Date: February 2015
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305205F / *Endurance Unmanned Aerial Vehicles*	Project (Number/Name) 675372 / *Integrated Sensor IS Structure*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
675372: *Integrated Sensor IS Structure*	-	1.000	-	-	-	-	-	-	-	-	-	1.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2015, 675372, Integrated Sensor Is Structure, was completed.

A. Mission Description and Budget Item Justification

The Integrated Sensor Is Structure (ISIS) Program intended to develop a radar fully integrated into a station-keeping stratospheric airship. ISIS intended to support the nation's need for persistent wide-area surveillance, tracking, and engagement of time-critical air and ground targets. Automated surveillance and tracking objectives included air targets to the radar horizon of 600 km and all ground targets to a range of 300 km. The radar aperture also intended to provide track data directly to users in-theater. The objective system was planned to launch from CONUS locations with a multi-year operational life.

DARPA funded development of the prototype in FY09-12. Air Force contributed funding from FY10-FY14 to this joint DARPA/Air Force project. This project included completion of the designs for the radar, propulsion, power systems, and the airframe, but was focused on demonstrating the ability to manufacture and demonstrate performance objectives of the radar and material objectives of the airship. The radar element and airship materials demonstrations will be completed in FY2015, using prior year funding.

Funds also covered studies and analysis to support current program planning and execution and future program planning.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: ISIS	1.000	-	-	-	-
Description: Design, develop, and demonstrate radar technologies involving large apertures and low power. Design and demonstrate power generation and airship materiel technologies.					
FY 2014 Accomplishments: Conducted selected radar demonstration and air ship risk reduction activities.					
FY 2015 Plans: N/A					
FY 2016 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*	**Project (Number/Name)** 675372 / *Integrated Sensor IS Structure*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
N/A ***FY 2016 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.000	-	-	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This was a Cost-Plus-Fixed-Fee contract with a total value of $462M. The project was funded with a cost sharing agreement between the Air Force and DARPA under a Memorandum of Agreement. Air Force funds intended for the contract were provided to DARPA via a Military Interdepartmental Purchase Request (MIPR) for obligation. The Air Force Research Laboratory acted as the Contracting Officer's Technical Representative for DARPA. The prime contractor is Lockheed Martin Aeronautics of Palmdale, CA and the radar sub is Raytheon Space and Airborne Systems, El Segundo, CA.

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 2016 Air Force			Date: February 2015
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305205F / *Endurance Unmanned Aerial Vehicles*	Project (Number/Name) 675372 / *Integrated Sensor IS Structure*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Report Finalization and Closeout	C/CPFF	Lockheed Martin : Palmdale, CA	-	0.400	Dec 2013	-		-		-		-	-	0.400	462.000
		Subtotal	-	0.400		-		-		-		-	-	0.400	462.000

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Closeout Support	Various	AFRL : WPAFB, OH	-	0.500		-		-		-		-	Continuing	Continuing	-
Program Support	Allot	645th AESG : WPAFB, OH	-	0.100		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.600		-		-		-		-	-	-	-

	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.000		-		-		-		-	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*	**Project (Number/Name)** 675372 / *Integrated Sensor IS Structure*

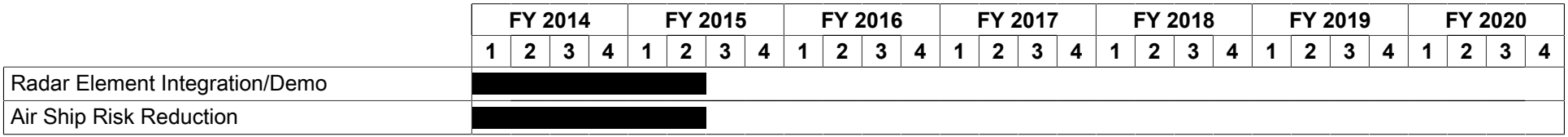

Exhibit R-4A, RDT&E Schedule Details: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*	**Project (Number/Name)** 675372 / *Integrated Sensor IS Structure*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Radar Element Integration/Demo	1	2014	2	2015
Air Ship Risk Reduction	1	2014	2	2015

Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force			Date: February 2015
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305205F / *Endurance Unmanned Aerial Vehicles*	Project (Number/Name) 67A026 / *MAGIC*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
67A026: *MAGIC*	-	-	20.000	-	-	-	-	-	-	-	-	20.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Medium Altitude Global ISR and Communications (MAGIC) project is an Air Force led technology and concept development to demonstrate the ability for a Remotely Piloted Aircraft (RPA) to stay aloft in the medium altitude structure for a multiple day duration mission with a minimum of 1,000 pounds payload capacity of intelligence, surveillance and reconnaissance sensor systems. The MAGIC concept was initiated by OSD/DDR&E in FY 2010 in response to the COCOMs ranking this type of initiative as the highest priority for a Joint Concept and Technology Demonstration (JCTD). In FY 2011, the Air Force accepted this initiative as the sponsor and MAGIC was subsequently removed from consideration as a JCTD and transitioned into the Air Force as a developmental project.

Persistent ISR supports both regular and irregular warfare. The MAGIC project will provide the USAF with critically needed data regarding sensor and aircraft performance parameters at a multiple day duration at medium altitude flight. The objectives laid out in the JCTD competition and selection of Aurora Flight Sciences' Orion RPA is being honored by the Air Force.

In FY 2010, OSD/DDR&E (now ASD/R&E) provided $5M of initial funding to AFRL to initiate the MAGIC project. In FY 2011, ASD/R&E provided an additional $5M to keep the MAGIC project development moving forward. The Air Force followed suit and provided $10M of FY 2011 Below Threshold Reprogramming (BTR) to allow the Aurora Flight Sciences' Orion RPA development team to set up an operational endurance engine bench test and software integrations lab in preparation for a future long duration flight demonstration of the Orion RPA. Congressional Adds of $19M in FY 2012 and $50M in FY 2013 provided the Endurance UAV program manager with the funding needed for the continuation of the Orion RPA development and initiation of the three phase flight testing series.

In January 2012, Aurora Flight Sciences (AFS) at their Manassas, VA headquarters facility initiated their testing profile by performing a 123 hour duration endurance engine bench test. Flight Test Series #1 (FT1, Basic Performance) was accomplished with five flights totaling 10.4 flight hours between 24 August and 16 November 2013. Basic automated take-off and landing procedures plus basic flight maneuvers were the test objectives for FT1. FT2, Envelope Expansion, was accomplished with eight flights totaling 35.9 flight hours between 1 June and 7 August 2014. Operating at increasingly highter altitudes and varying airspeeds to collect fuel flow data in determining best endurance airspeed, increasingly heavier take-off gross weights and landing energies plus continuing inflight maneuvers were the test objectives of FT2. FT3, Payload Integration, began in November 2014 and is projected to complete in March 2015. The objective of FT3 operates increasingly longer durations with nominal payloads representative of operational requirements and will prove the concept of multiple day endurance.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015
Congressional Add: MAGIC	-	20.000

Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*	**Project (Number/Name)** 67A026 / *MAGIC*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015
FY 2014 Accomplishments: N/A ***FY 2015 Plans:*** Payload integration and test		
Congressional Adds Subtotals	-	20.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The MAGIC project is being executed by the 645 AESG (BIG SAFARI SPO) to develop a COCOM requested long endurance remotely piloted aircraft (RPA) to address urgent and emerging operational needs for long dwell, persistent ISR requirements. The acquisition strategy for the Air Force to develop a long endurance, persistent ISR capability for the COCOMs was an outgrowth of a Joint Capabilities Technology Demonstration (JCTD) started in FY 2010. Efforts concerning this initiative, contracted with Aurora Flight Sciences and their Orion RPA, include: completion of studies analysis, development of a prototype air vehicle, bench testing of engines and other aircraft components, ground continuity testing of select avionics, flight controls, and engine components, slow and high speed ground taxiing and a full flight series testing of the Orion RPA capabilities with a culmination of a long duration flight demonstration. Concurrent efforts will continue in FY 2015 between the Aurora Flight Sciences production and management teams and the BIG SAFARI SPO to identify best of breed sensor systems and the availability of government furnished equipment (GFE) to fulfill the proposed payload configurations and continue hardware and software development and integration to meet operational airworthiness standards and mission requirements.

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 2016 Air Force			Date: February 2015
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305205F / *Endurance Unmanned Aerial Vehicles*	Project (Number/Name) 67A026 / *MAGIC*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Design and Development	SS/CPFF	Aurora : Manassas, VA	-	-		10.800	Jan 2015	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		10.800		-		-		-	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test	SS/CPFF	Aurora : Manassas, VA	-	-		7.600	Jan 2015	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		7.600		-		-		-	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	SS/FFP	multiple : ,	-	-		1.600	Jan 2015	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		1.600		-		-		-	-	-	-

	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		20.000		-		-		-	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*	**Project (Number/Name)** 67A026 / *MAGIC*

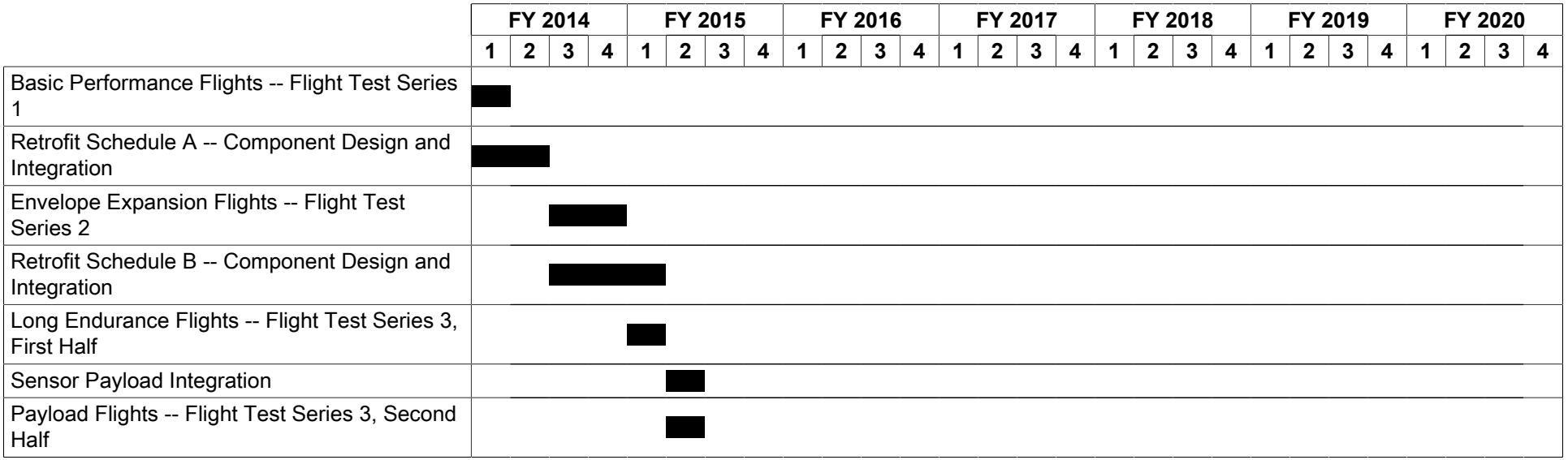

Exhibit R-4A, RDT&E Schedule Details: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*	**Project (Number/Name)** 67A026 / *MAGIC*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Basic Performance Flights -- Flight Test Series 1	1	2014	1	2014
Retrofit Schedule A -- Component Design and Integration	1	2014	2	2014
Envelope Expansion Flights -- Flight Test Series 2	3	2014	4	2014
Retrofit Schedule B -- Component Design and Integration	3	2014	1	2015
Long Endurance Flights -- Flight Test Series 3, First Half	1	2015	1	2015
Sensor Payload Integration	2	2015	2	2015
Payload Flights -- Flight Test Series 3, Second Half	2	2015	2	2015