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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305205F / <i>Endurance Unmanned Aerial Vehicles</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	15.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A026: <i>MAGIC</i>	-	15.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Medium Altitude Global ISR and Communications (MAGIC) project was an Air Force led technology and concept development to demonstrate the ability for a Remotely Piloted Aircraft (RPA) to stay airborne 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 Combatant Commanders 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.

The MAGIC project was intended to provide the USAF with 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 for the long endurance demonstration was managed by the 645th Aeronautical Systems Group (AESG).

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 provided \$10M of FY 2011. Congressional Adds of \$19M in FY 2012, \$50M in FY 2013 and \$20M in FY 2015, provided the program manager with the funding for the continuation of the Orion RPA development and initiation of the three phase flight testing series. Congressional adds of \$5M in FY 2016, \$50M in FY 2017 and \$40M in FY 2018, continues the Orion Unmanned Aerial System (UAS) spiral development of a long endurance UAS that meets airworthiness and cybersecurity requirements, and provides a minimum interoperability and mission capability.

Orion RPA flight test series and demonstrations were accomplished at Naval Air Weapons Station (NAWS) China Lake, CA between August 2013 and March 2015. The objectives to test/demonstrate basic air vehicle performance, expansion of the flight characteristic envelope and a multiple day sortie and integration of a nominal sensor payload, were successfully accomplished on the prototype (Block 0) Orion RPA in a controlled environment, non-representative of an operational setting. Subsequent development efforts concentrated on the validation of the Orion RPA system requirements and concept design/specifications for a follow-on air vehicle (Block 1) capable of operational deployment in the event that the Air Force chooses the Orion RPA as a quick reaction capable system for a theater of operation or a program of record. Currently, there is no validated requirement for the Orion RPA.

A Congressional Add of \$15M in FY 2019 completed flight software development, air vehicle system and ground test and begins performance characterization flight test.

A Congressional Add of \$15M in FY 2020 will continue performance characterization flight test and begin manufacturing of Air Vehicle 02.

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This program element may include necessary civilian pay expenses required to manage, execute, and deliver Orion RPA capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	15.000	0.000	0.000	0.000	0.000
Current President's Budget	15.000	15.000	0.000	0.000	0.000
Total Adjustments	0.000	15.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	15.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 67A026: *MAGIC*

Congressional Add: *MAGIC*

Congressional Add Subtotals for Project: 67A026

Congressional Add Totals for all Projects

	FY 2019	FY 2020
	15.000	15.000
	15.000	15.000
	15.000	15.000

C. Accomplishments/Planned Programs (\$ in Millions)

Congressional Add: *MAGIC*

FY 2019 Accomplishments: - Completed flight software development, air vehicle system and ground test
 - Began performance characterization flight test

FY 2020 Plans: - Continues performance characterization flight test
 - Begins manufacturing of Air Vehicle 02

	FY 2019	FY 2020
	15.000	15.000
Congressional Adds Subtotals	15.000	15.000

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D. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
E. Acquisition Strategy There is currently no validated requirement for the Orion RPA. The concept for the Air Force to develop a long endurance, persistent ISR capability for the Combatant Commanders was an outgrowth of a JCTD started in FY 2010. Previous development efforts included: completion of studies analysis, development of a prototype air vehicle (Block 0), 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 to include a multiple day, long duration flight demonstration. Starting with a portion of the FY 2015 funds, Congressional adds have continued hardware and software engineering and development efforts, while working towards operational airworthiness and cybersecurity standards, and mission requirements for a deployable air vehicle (Block 1).		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	C/CPAF	Not specified. : Manassas, VA	-	-		-		-		-		-	Continuing	Continuing	-
MAGIC Block 1 Initial Design and Development	SS/CPFF	Aurora : Manassas, VA	-	-		-		-		-		-	Continuing	Continuing	39.900
MAGIC Block 1 Design and Development Completion	SS/CPFF	Aurora : Manassas, VA	-	11.900	Aug 2019	11.900	Jul 2020	-		-		-	Continuing	Continuing	11.900
Subtotal			-	11.900		11.900		-		-		-	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Management Services	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
PMA	Allot	645 AESG : Dayton, OH	-	-		-		-		-		-	Continuing	Continuing	0.100
PMA, Final Block 1 Support	Allot	645 AESG : Dayton, OH	-	3.100	Mar 2020	3.100	Apr 2020	-		-		-	Continuing	Continuing	3.100
Not specified.	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Subtotal			-	3.100		3.100		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	
	Project Cost Totals		-	15.000	15.000	-	-	-	Continuing	Continuing

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MAGIC																												
Block 1 Initial Design and Development																												
MAGIC Block 1 Final																												
Block 1 Design and Development Completion																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MAGIC</i>				
Block 1 Initial Design and Development	1	2019	3	2021
<i>MAGIC Block 1 Final</i>				
Block 1 Design and Development Completion	3	2019	3	2022