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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	12.773	17.863	7.817	-	7.817	0.000	2.344	0.000	0.000	0.000	40.797
RQ7: RQ-7 Shadow UAV	-	12.773	17.863	7.817	-	7.817	0.000	2.344	0.000	0.000	0.000	40.797

A. Mission Description and Budget Item Justification

The RQ-7Bv2 Shadow Tactical Unmanned Aircraft System (TUAS) provides the Army Brigade Commander with dedicated Reconnaissance, Surveillance and Target Acquisition (RSTA), Intelligence, Battle Damage Assessment (BDA), and Force Protection. In line with the Army's Aviation Restructure Initiative (ARI) three Shadow Platoons are being integrated into the 11 Combat Aviation Brigade (CAB) Apache Reconnaissance Battalions. This will provide Aviation Brigades with Manned-Unmanned-Teaming (MUM-T) and enhanced Aerial Scout capabilities. The RQ-7B Shadow has logged approximately 1,180,000 flight hours, most of which were flown in support of Overseas Contingency Operations (OCO).

The full Shadow system consists of four air vehicles with payload, two Universal Ground Control stations, two Universal Ground Data Terminals, one Portable Ground Control Station with Portable Ground Data Terminal, Ground Support Equipment, two launchers, ten High Mobility Multipurpose Wheeled Vehicles (HMMWVs) with trailer(s), and a Light Medium Tactical Vehicle. Each system is equipped with one Maintenance Section Multifunctional (MSM) and is supported at the division level by a Mobile Maintenance Facility (MMF). The baseline fielded payload was the electro-optic infrared (EO/IR), but half of those have been replaced with a Laser Designator (LD) payload. An Improved Payload for Shadow, selected by Product Manager Electro-Optic/Infrared (PdM EO/IR), will be integrated and qualified in FY 2019-2020. 110 of 115 Shadow systems required by the Army Acquisition Objective (AAO) have been resourced.

Justification: Fiscal Year (FY) 2020 RQ-7Bv2 TUAS Base funding of \$7.817 million will be utilized for the following: 1) \$4.757M will be used for test and evaluation of the RQ-7Bv2 TUAS, 2) \$3.060M provides interoperability and enhancements for the One System Remote Video Terminal (OSRVT).

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	12.773	12.863	10.817	-	10.817
Current President's Budget	12.773	17.863	7.817	-	7.817
Total Adjustments	0.000	5.000	-3.000	-	-3.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-3.000	-	-3.000

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<div>Change Summary Explanation</div> <div>+\$5M increase for RQ-7B digital enhancements</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV				Project (Number/Name) RQ7 / RQ-7 Shadow UAV			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RQ7: RQ-7 Shadow UAV	-	12.773	17.863	7.817	-	7.817	0.000	2.344	0.000	0.000	0.000	40.797
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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Justification: Fiscal Year (FY) 2020 RQ-7Bv2 TUAS Base funding of \$7.817 million will be utilized for the following: 1) \$4.757M will be used for test and evaluation of the RQ-7Bv2 TUAS, 2) \$3.060M provides interoperability and enhancements for the One System Remote Video Terminal (OSRVT).

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

	FY 2018	FY 2019	FY 2020
Title: Air Vehicle Improvements	5.543	3.768	-
Description: Air Vehicle Improvements			
FY 2019 Plans: Complete developmental testing of the ability to operate in a GPS denied environment; Interoperability software modifications that support Manned Unmanned Teaming with the AH-64 Apache Helicopter.			
FY 2019 to FY 2020 Increase/Decrease Statement: Assured Positioning, Navigation, and Timing development should be completed in FY 2019.			
Title: Ground Equipment Improvements	2.933	7.218	-
Description: Ground Equipment Improvements			

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Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV	Project (Number/Name) RQ7 / RQ-7 Shadow UAV		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
FY 2019 Plans: Continue to fund Ground Equipment Improvements and will continue development of interoperability capabilities through use of Universal Ground Data Terminals and Universal Ground Control Stations. Network Security and System Vulnerability.				
FY 2019 to FY 2020 Increase/Decrease Statement: Assured Positioning, Navigation, and Timing development should be completed in FY 2019.				
Title: Test and Evaluation Description: Test and Evaluation		0.900	3.542	3.427
FY 2019 Plans: Continue Funds Operational Test for the Shadow V2 Block III upgrade and continues to fund test and evaluation of Air Vehicle and Ground Equipment.				
FY 2020 Plans: Will continue Funds Test and Evaluation for the Shadow V2 Block III upgrade				
FY 2019 to FY 2020 Increase/Decrease Statement: Funds will increase for Shadow due to improvements.				
Title: System Engineering/Program Management Description: System Engineering/Program Management		1.278	1.868	1.330
FY 2019 Plans: Continue to fund System Engineering/Program management				
FY 2020 Plans: Will continue to fund System Engineering/Program management				
FY 2019 to FY 2020 Increase/Decrease Statement: Price increase due to inflation.				
Title: One System Remote Video Terminal (OSRVT) Description: OSRVT		2.119	1.467	3.060
FY 2019 Plans: Continue to fund interoperability and performance improvements for OSRVT.				
FY 2020 Plans:				

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Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV			Project (Number/Name) RQ7 / RQ-7 Shadow UAV					
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2018	FY 2019	FY 2020		
Will Continue to fund interoperability and performance improvements for OSRVT.											
FY 2019 to FY 2020 Increase/Decrease Statement: Price increase of OSRVT due to interoperability and performance improvements.											
Accomplishments/Planned Programs Subtotals							12.773	17.863	7.817		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• A00018: RQ-7 UAV MODS	193.160	154.114	8.983	-	8.983	-	16.366	-	-	Continuing	Continuing
Remarks											
D. Acquisition Strategy A System Capability Demonstration (SCD) was conducted with four contractors. The results from the SCD in conjunction with proposal evaluations resulted in the competitive down select of a Best Value TUAS. A successful Milestone II Army Systems Acquisition Review Council (ASARC) was conducted 21 December 1999 and a Milestone III Decision was reached on 25 September 2002. The full rate production contract was awarded 27 December 2002 and in FY 2009 the last of the authorized 104 systems was placed on contract. Continued development of the selected Tactical Unmanned Aircraft Vehicle (TUAV) system will be accomplished through a series of modifications and retrofits such as Shadow v2, Communications Relay, Laser Designator, Block III engine, and reliability upgrades. Development/ integration of these improved capabilities will be through individual efforts on a competitive technical services contract with Shadow contractors. Development of the Block III engine was accomplished through a competitive process. Management responsibilities of the TUAV RQ-7B variant EO/IR/LD payload was transferred from Program Executive Office (PEO) Aviation to PEO Intelligence, Electronic Warfare and Sensors (IEW&S) on 14 February 2017. This was done in accordance with (IAW) ASA(ALT) memorandum titled: Transfer of Army Office of Primary Responsibility and Program Management Responsibility for RQ-7B Shadow EO/IR/LD. An Improved Payload for Shadow, competitively selected by PEO IEW&S - Product Manager Electro-Optic/Infrared (PdM EO/IR), will be integrated and qualified in FY 2019-2020.											
E. Performance Metrics N/A											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV				Project (Number/Name) RQ7 / RQ-7 Shadow UAV					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Base: Program Management	RO	PM UAS : Redstone Arsenal, AL	3.662	0.426		0.705		-		-		-	Continuing	Continuing	Continuing
Subtotal			3.662	0.426		0.705		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
OIF Improvements / Block Upgrades / Capability Improvements	SS/CPFF	AAI Corporation : Hunt Valley, MD	4.605	-		1.869		-		-		-	0.000	6.474	-
System Engineering / Reliability Solutions	SS/CPFF	AAI Corporation : Hunt Valley, MD	2.025	-		6.116		-		-		-	Continuing	Continuing	-
Ground Equipment Improvements	C/CPFF	TBD: Competitive in FY18 : TBD: Competitive in FY18	19.298	2.933	Dec 2017	-		-		-		-	Continuing	Continuing	Continuing
Block III Engine Development	C/CPFF	LSF : Redstone Arsenal, AL	30.725	-		-		-		-		-	0.000	30.725	-
Other Air Vehicle Improvements	C/CPFF	TBD: Competitive in FY18 : TBD: Competitive in FY18	16.643	0.375		0.246		-		-		-	Continuing	Continuing	Continuing
Assured, Positioning, Navigation, and Timing (APNT)	C/CPFF	TBD: Competitive in FY18 : TBD: Competitive in FY18	3.587	5.168	Dec 2017	2.755		-		-		-	Continuing	Continuing	-
Payload Improvements	SS/CPFF	Various : Various	4.750	-		-		-		-		-	0.000	4.750	-
One System Remote Video Terminal (OSRVT)	SS/CPFF	AAI Corporation, MD : AAI Corporation, MD	14.406	2.119		1.467		3.060		-		3.060	Continuing	Continuing	Continuing
Subtotal			96.039	10.595		12.453		3.060		-		3.060	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV				Project (Number/Name) RQ7 / RQ-7 Shadow UAV					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	Various : Various	2.928	0.284		0.262		0.685		-		0.685	Continuing	Continuing	Continuing
Base: Government Engineering and Logistic Support	MIPR	Various : Various	1.463	0.568		0.901		0.645		-		0.645	Continuing	Continuing	Continuing
Subtotal			4.391	0.852		1.163		1.330		-		1.330	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
RQ-7 Developmental Testing of Product Development	Various	Various : Various	6.088	0.800		1.443		-		-		-	Continuing	Continuing	Continuing
RQ-7 Operational Testing of Product Developments	MIPR	Various : Various	0.500	0.100		2.099		3.427		-		3.427	Continuing	Continuing	Continuing
OSRVT Developmental Testing	MIPR	Various : Various	0.100	-		-		-		-		-	0.000	0.100	-
OSRVT - Operational Testing	MIPR	Various : Various	2.033	-		-		-		-		-	0.000	2.033	-
Subtotal			8.721	0.900		3.542		3.427		-		3.427	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			112.813	12.773		17.863		7.817		-		7.817	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army

Date: March 2019

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2040 / 7

R-1 Program Element (Number/Name)	Program Element Description	Program Element Status	Program Element Comments

PE 0305233A / RQ-7 UAV

Project (Number/Name)	Start Date	End Date	Duration (Days)	Progress (%)	Status	Notes
101	2023-01-01	2023-01-15	14	100	Completed	Project 101 completed on time.
102	2023-01-15	2023-02-01	16	75	In Progress	Project 102 is 75% complete.
103	2023-02-01	2023-02-15	14	50	In Progress	Project 103 is 50% complete.
104	2023-02-15	2023-03-01	15	25	In Progress	Project 104 is 25% complete.
105	2023-03-01	2023-03-15	14	10	In Progress	Project 105 is 10% complete.
106	2023-03-15	2023-03-31	15	0	Not Started	Project 106 has not started yet.
107	2023-03-31	2023-04-15	15	0	Not Started	Project 107 has not started yet.
108	2023-04-15	2023-04-30	15	0	Not Started	Project 108 has not started yet.
109	2023-04-30	2023-05-15	15	0	Not Started	Project 109 has not started yet.
110	2023-05-15	2023-05-31	15	0	Not Started	Project 110 has not started yet.

RQ7 / RQ-7 Shadow UAV

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
Assured Positioning, Navigation, and Timing (APNT)																												
	APNT																											
OSRVT Increment II Interoperability Improvements																												
	OSRVT																											
Improved Payload Integration																												
					Payload Integration																							
Test and Evaluation																												
									Test																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV	Project (Number/Name) RQ7 / RQ-7 Shadow UAV	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Block III Engine Development	1	2015	3	2016
Assured Positioning, Navigation, and Timing (APNT)	3	2016	4	2019
OSRVT Increment II Interoperability Improvements	1	2013	4	2020
Improved Payload Integration	2	2019	4	2020
Test and Evaluation	1	2020	4	2020