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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	7.817	-	-	-	-	-	-	-	-	-	-
RQ7: <i>RQ-7 Shadow UAV</i>	-	7.817	-	-	-	-	-	-	-	-	-	-

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 provides the CABs with Manned- Unmanned- Teaming (MUM-T) and enhanced Aerial Scout capabilities. The RQ-7B Shadow has logged approximately 1,265,000 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 also equipped with one Maintenance Section Multifunctional (MSM) at the division level. 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 was competitively selected by Product Manager Aerial Enhanced Radars Optics and Sensors (PdM AEROS). The PM integrated and qualified the new payload in FY 2019-2020. 110 of 115 Shadow systems required by the Army Acquisition Objective (AAO) have been resourced.

FY2022 Funding for RQ-7B UAV is zero (\$0).

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	7.817	0.000	0.000	-	0.000
Current President's Budget	7.817	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Army										Date: May 2021		
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
RQ7: RQ-7 Shadow UAV	-	7.817	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY2022 Funding for RQ-7B has decreased to \$0.

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 provides the CABs with Manned- Unmanned- Teaming (MUM-T) and enhanced Aerial Scout capabilities. The RQ-7B Shadow has logged approximately 1,265,000 flight hours, most of which were flown in support of Overseas Contingency Operations (OCO).

The RQ-7Bv2 completed Log demo and Follow-on Operational Test and Evaluation #2 (FOTE2) in October 2020 at Ft. Bliss, Texas. FOTE2 evaluated capability Block III from the 2017 update to the TUAS Objective Requirement Document. The RQ-7B v2 Block III System Modification includes Weatherization, Small Mission (SMC) Computer A-kit, Electro Optical / Infrared / Laser Designator (EO/IR/LD) Universal Interface Assembly, Block III Engine, Communications Relay Installation Kit, and Voice over Internet Protocol (VoIP). Weatherization modifications allow the AV to fly in low visibility conditions and in up to two inches of rain per hour. The SMC is an onboard computer that provides airborne processing power. The SMC addresses obsolescence concerns, features a dual processor, and provides 50x more processing power than the current computer.

The EO/ IR/LD Universal Interface Assembly eliminates reliance on a proprietary payload interface, introducing the capability to support payloads from multiple vendors. The Block III engine improves reliability over the current engine, increases thrust and reduces the noise signature of the Shadow system. The Communication Relay upgrade enables voice communications to additional users who utilize other waveforms in the VHF and UHF bands. The VoIP upgrade extends voice communications range from 85 km to 125 km, and provides a more reliable means of voice communications. The overall performance enhancements increase the Shadow's mission capability and survivability.

The Improved EO/IR/LD payload features a modular design that includes enhanced high-resolution HD imagery, improved geo-location precision and an extended long-range target designation capability.

FY2022 Funding for RQ-7B UAV is zero (\$0).

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

	FY 2020	FY 2021	FY 2022
Title: Test and Evaluation	3.427	-	-
Description: Test and Evaluation			
Title: System Engineering/Program Management	1.330	-	-
Description: System Engineering/Program Management			

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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
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
Title: One System Remote Video Terminal (OSRVT)	3.060	-	-
Description: OSRVT			
Accomplishments/Planned Programs Subtotals	7.817	-	-

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2022</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• A00018: RQ-7 UAV MODS	68.983	30.000	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The PM competitively awarded System Capability Demonstration (SCD) contracts to four vendors. 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 Dec 99 and a Milestone III Decision was reached on 25 Sep 02. The PM awarded a full rate production contract was 27 Dec 02 and in FY 2009 the last of the authorized 104 systems was placed on contract. The PM accomplished continued development of the selected Tactical Unmanned Aircraft Vehicle (TUAV) system 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. The PM accomplished development of the Block III engine 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 Feb 17. 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 Aerial Enhanced Radars Optics and Sensors (PdM AEROS) The PM integrated and qualified the Improved Payload in FY 2019-2020.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army												Date: May 2021			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 7				PE 0305233A / RQ-7 UAV				RQ7 / RQ-7 Shadow UAV							
Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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	4.793	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			4.793	-		-		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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	6.474	-		-		-		-		-	0.000	6.474	-
System Engineering / Reliability Solutions	SS/CPFF	AAI Corporation : Hunt Valley, MD	8.141	-		-		-		-		-	Continuing	Continuing	-
Ground Equipment Improvements	C/CPFF	TBD: Competitive in FY18 : TBD: Competitive in FY18	22.231	-		-		-		-		-	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	17.264	-		-		-		-		-	Continuing	Continuing	Continuing
Assured, Positioning, Navigation, and Timing (APNT)	C/CPFF	TBD: Competitive in FY18 : TBD: Competitive in FY18	11.510	-		-		-		-		-	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	17.992	3.060		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			119.087	3.060		-		-		-		-	Continuing	Continuing	N/A

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Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Contractor Engineering Support	Various	Various : Various	3.474	0.685		-		-		-		-	Continuing	Continuing	Continuing
Base: Government Engineering and Logistic Support	MIPR	Various : Various	2.932	0.645		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			6.406	1.330		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
RQ-7 Developmental Testing of Product Development	Various	Various : Various	8.331	-		-		-		-		-	Continuing	Continuing	Continuing
RQ-7 Operational Testing of Product Developments	MIPR	Various : Various	2.699	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			13.163	3.427		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		143.449	7.817	0.000	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army **Date: May 2021**

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV	Project (Number/Name) RQ7 / RQ-7 Shadow UAV
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Event Name	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	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
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 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV	Project (Number/Name) RQ7 / RQ-7 Shadow UAV
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
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