Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force												Date: May 2021
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 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**
Total Program Element	0.000	122.919	106.885	85.135	0.000	85.135	-	-	-	-	-	-
675212: *MQ-9 SLAM*	0.000	6.290	16.607	38.327	0.000	38.327	-	-	-	-	-	-
675246: *MQ-9 Development and Fielding*	0.000	50.931	32.334	2.694	0.000	2.694	-	-	-	-	-	-
675247: *Squadron Operations Centers (SOC)*	0.000	0.000	0.000	0.251	0.000	0.251	-	-	-	-	-	-
675249: *MQ-9 Upgrade*	0.000	65.698	57.944	43.863	0.000	43.863	-	-	-	-	-	-
Program MDAP/MAIS Code: 424												

Note

This program, BA 7, PE 0205219F, project 675247, Squadron Operations Center, is a new start.

A. Mission Description and Budget Item Justification

The basic MQ-9 Reaper system consists of the aircraft, sensors, Ground Control Station (GCS), communications equipment, weapon kits, support equipment, simulator and training devices, Readiness Spares Packages (RSP), technical data/training, 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 GCS configurations to be tailored to fit mission needs.

The MQ-9 Reaper system has four separate development programs. This PE includes:
1. MQ-9 System Lifecycle Agile Modernization (SLAM). This effort is to develop improvements for existing systems and to field new capabilities for the baseline MQ-9 fleet using an Agile Acquisition Strategy to include concept exploration for an MQ-9 follow-on.
2. MQ-9 Development and Fielding. This effort is for development and fielding of the baseline MQ-9 aircraft and GCSs and associated communications systems, sensors, payloads, simulators, support equipment, and resolving Diminishing Manufacturing Sources (DMS) issues.
3. Squadron Operations Centers (SOC). This effort is for development and fielding of standardized operations centers. SOCs contain the equipment necessary for remote split operations, to provide mission data and tasking information to aircrew, and to disseminate and/or exchange mission data with decision-makers and the intelligence community.
4. MQ-9 Upgrade. This effort is to develop improvements for existing systems and to field new capabilities for the baseline MQ-9 fleet using an Agile Acquisition Strategy.

The Air Force has established the MQ-9 Multi-Domain Operation (M2DO) aircraft configuration which consists of multiple projects intended to keep the platform viable in the wide-spectrum of armed conflict in the near term. These efforts include, but are not limited to, Anti-Jam Global Positioning System, Enhanced Power, Link 16,

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force	Date: May 2021
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*

Open Mission System/Stellar Relay, Signal Excision, Digital Spread Spectrum Signal, Enhanced Line of Site, Enhanced Auto-Takeoff and Landing, Enhanced Autonomy (including Intelligence Electronic Units). The number of M2DO aircraft, and final capabilities within this configuration, are subject to change as requirements evolve.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MQ-9 WEAPON SYSTEM capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 0.179M and in FY21 1.336M is forecasted for civilian pay expenses in this program element.

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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	127.296	162.080	168.160	0.000	168.160
Current President's Budget	122.919	106.885	85.135	0.000	85.135
Total Adjustments	-4.377	-55.195	-83.025	0.000	-83.025
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	-55.195			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-4.377	0.000			
• Other Adjustments	0.000	0.000	-83.025	0.000	-83.025

Change Summary Explanation

FY20 Base
- 4.377M Small Business Innovation Research (SBIR) transfer

FY21 Base
- $55.195M Congressional Appropriation Conference rescission

FY22 Base
- $83.025M reduction identified for higher AF prioritization

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 UAV*	Project (Number/Name) 675212 / *MQ-9 SLAM*	

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
675212: *MQ-9 SLAM*	0.000	6.290	16.607	38.327	0.000	38.327	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MQ-9 System Lifecycle Agile Modernization (SLAM) Program develops and integrates improvements for existing systems and fields new capabilities for the MQ-9 fleet through an Agile Acquisition Strategy to meet evolving mission needs. SLAM includes concept exploration for MQ-9 follow-on effort.

The objective is to enable rapid fielding of new software, hardware, and sustainability for integration into the MQ-9 fleet with requirements from the Candidate Capability List (CCL) that may include, but are not limited to, efforts to reduce system configurations; perform technology upgrades; increase pilot awareness and usability; improve reconnaissance targeting and exploitation; expand weapons system selection and lethality; enlarge suitability to varying operational theaters; improve security and self-protection; reduce logistics footprint; train the warfighter, and prototype.

Activities also include, but are not limited to, studies, analysis, simulations, demonstrations, prototyping and testing, use of subject matter experts agencies to develop and test all current and follow-on MQ-9 system capabilities which include, but are not limited to System Integration Laboratory (SIL)/ Hardware in the Loop Laboratory (HILL) and Detachment 3 (Det 3) improvements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MQ-9 WEAPON SYSTEM capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

Funding may be used to address Diminishing Manufacturing Source (DMS) and Non-Recurring Engineering issues.

Where appropriate, the MQ-9 Program of Record (PoR) and Air Force Special Operations Command (AFSOC) will cost share on joint efforts that are required by both programs to support new capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: MQ-9 SLAM	6.290	14.723	32.238	-	32.238
Description: Develops and integrates upgrade capabilities to support of the MQ-9 modernization strategy. Development combines the rigor of an event driven development process (referred to as Technology Maturation Effort (TME)) with the expedited delivery of a schedule driven integration and fielding process. New capabilities include, but are not be limited to, upgrades of existing aircraft, Ground Control Station (GCS), communication, payload systems, and software updates. MQ-9 SLAM also addresses and resolves Diminishing Manufacturing Sources (DMS) issues.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675212 / *MQ-9 SLAM*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Candidate Capabilities are determined by ACC and AFSOC direction and inputs that include Joint Urgent Operational Need (JUON) and Urgent Operational Need (UON) requests. Activities also include, but are not limited to, operator simulators, reliability and maintainability, test support, communications, and urgent services. During development MQ-9 PoR and AFSOC will cost share on joint efforts that are required by both programs to support the new capabilities. ***FY 2021 Plans:*** TME developing upgrade capabilities in conjunction with the CCL to include, but not limited to: • Weapons usability improvements • Unified Tactical Situational Awareness • Mode 5 • Ku or Global Positioning System (GPS) jamming • Data encryption, Identification Friend or Foe (IFF), electronic warfare, and signature reduction • Link-16 (Airborne Mission Networking) capability, (e.g., developmental testing, software updates, documentation and training) ***FY 2022 Base Plans:*** Continue TME developing upgrade capabilities in conjunction with the CCL to include, but not limited to: • Weapons usability improvements • Unified Tactical Situational Awareness • Mode 5 • Ku or Global Positioning System (GPS) jamming • Data encryption, Identification Friend or Foe (IFF), electronic warfare, and signature reduction • Link-16 (Airborne Mission Networking) capability, (e.g., developmental testing, software updates, documentation and training) ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase as the MQ-9 SLAM program continues to on-board modernization strategy requirements and implement Technology Maturation Efforts (TME).					
Title: Reliability and Maintainability	0.000	0.000	0.251	-	0.251

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675212 / *MQ-9 SLAM*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Description: Develops MQ-9 Reliability and Maintainability (R&M) improvements for aircraft and ground based infrastructure. Includes engineering change orders, studies, and general research. Addresses and resolves DMS issues. Funding was approved for this R&M effort in the FY20 appropriation--this effort is not a New Start. ***FY 2021 Plans:*** N/A ***FY 2022 Base Plans:*** Develop aircraft and ground based infrastructure to improve mission capable rates and reduce reliability and maintainability costs. Includes addressing and resolving DMS issues. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increased as MQ-9 SLAM Reliability and Maintainability ramps up.					
Title: Test Support ***Description:*** Provides support for, but is not limited to, activities for MQ-9 testing of weapon system hardware/ software testing in accordance with (IAW) contract standards, developmental testing of new capabilities, and R&M upgrades. ***FY 2021 Plans:*** Provide government agencies support for MQ-9 testing to include continued acceptance testing of weapon system hardware/software IAW with contract standards, developmental testing of new capabilities, and R&M improvements. ***FY 2022 Base Plans:*** Continues to provide government agencies support for MQ-9 testing to include continued acceptance testing of weapon system hardware/software IAW with contract standards, developmental testing of new capabilities, and R&M improvements. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increased slightly. MQ-9 SLAM will continue weapon system hardware/software testing.	0.000	0.000	0.200	-	0.200
Title: Communications	0.000	0.043	0.138	-	0.138

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675212 / *MQ-9 SLAM*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Description: Develops communications capabilities such as, but not limited to, network systems managers, SATCOM, and relay site upgrades. Includes drafting technical orders and support documentation, training materials, production drawings, and retrofit acceptance plans (e.g., Bandwidth Efficient Common Data Link (BE-CDL) Secure Voice Multi Level Security (MLS), ARC-210 Guard Squelch, and Secure Communications). ***FY 2021 Plans:*** Continue to develop communications capabilities on encrypted data links, terminal, command and control, ISR transmission, GCS communications, SATCOM, integrated IP-based network interfaces, primary data links, network system managers, operational durability, remote split operations, and support equipment. Also includes associated technical orders and flight manuals. ***FY 2022 Base Plans:*** Continue to develop communications capabilities on encrypted data links, terminal, command and control, ISR transmission, GCS communications, SATCOM, integrated IP-based network interfaces, primary data links, network system managers, operational durability, remote split operations, and support equipment. Also includes associated technical orders and flight manuals. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increased slightly with FY22 for MQ-9 SLAM Communications.					
Title: Concept Exploration for follow-on to MQ-9 ***Description:*** Includes but is not limited to, program planning for the follow-on MQ-9 effort which explores capabilities in a contested environment. ***FY 2021 Plans:*** Development activities, which include but are not limited to, studies, analysis, and prototyping RPA operations in a contested environment. ***FY 2022 Base Plans:*** Continue development activities, which include but are not limited to, studies, analysis, and prototyping RPA operations in a contested environment. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase as SLAM Concept Exploration program requirements increase.	-	1.841	5.500	-	5.500
Accomplishments/Planned Programs Subtotals	6.290	16.607	38.327	-	38.327

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675212 / *MQ-9 SLAM*

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• APAF 06 PRDTB1: *MQ-9*	0.000	0.000	0.000	-	0.000	-	-	-	-	-	-
• APAF 05 PRDTB2: *MQ-9 Mods*	0.000	0.000	0.000	-	0.000	-	-	-	-	-	-

Remarks

PMA costs are included in Other Government Costs.

D. Acquisition Strategy

Acquisition of MQ-9 SLAM is accomplished via sole-source contracts with General Atomics-ASI, Raytheon, and L-3 Communications, prime contractors, and United States Government (USG) Labs. Management of development and fielding of new capabilities will be through an Agile Acquisition Strategy that combines the rigor of an event driven development process (referred to as a Technology Maturation Effort (TME)) with the expedited delivery of a schedule driven integration and fielding process. This will allow continued baseline improvements while rapidly integrating limited urgent needs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 UAV*	Project (Number/Name) 675212 / *MQ-9 SLAM*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MQ-9 SLAM	SS/CPAF	GA-ASI : Poway, CA	0.000	5.649	Jul 2020	14.296	Nov 2020	26.013	Nov 2021	-		26.013	-	-	-
Reliability and Maintainability	SS/CPAF	GA-ASI : Poway, CA	0.000	-		-		0.251	Apr 2022	-		0.251	-	-	-
Communications	SS/CPAF	GA-ASI : Poway, CA	0.000	-		0.043	Jan 2021	0.138	Jan 2022	-		0.138	-	-	-
Concept Exploration for follow-on to MQ-9	Various	Various : Various	0.000	-		1.841	Jul 2021	5.500	Jul 2022	-		5.500	-	-	-
		Subtotal	0.000	5.649		16.180		31.902		-		31.902	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	-	-	-
Test Support	Various	Various : Various	0.000	-		-		0.200	Nov 2021	-		0.200	-	-	-
		Subtotal	0.000	-		-		0.200		-		0.200	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Costs	Various	Various : Various	0.000	0.641	Jul 2020	0.427	Apr 2021	6.225	Apr 2022	-		6.225	-	-	-
		Subtotal	0.000	0.641		0.427		6.225		-		6.225	-	-	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	0.000	6.290		16.607		38.327		-		38.327	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675212 / *MQ-9 SLAM*

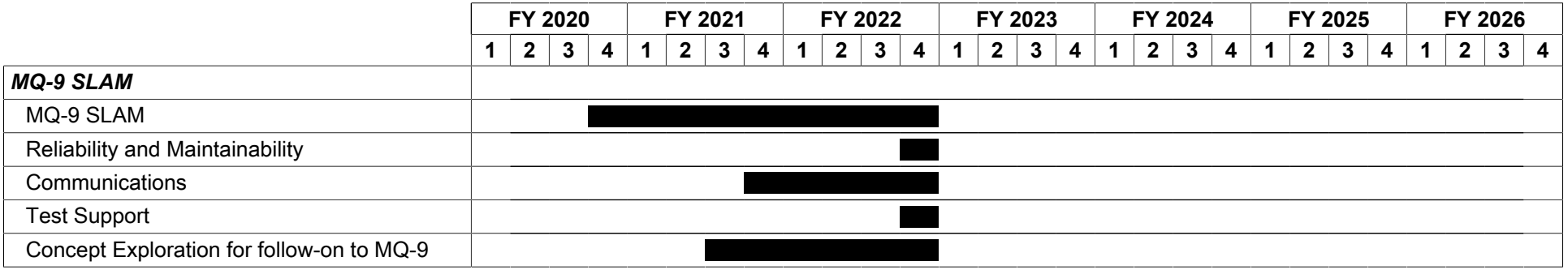

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675212 / *MQ-9 SLAM*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MQ-9 SLAM				
MQ-9 SLAM	4	2020	4	2022
Reliability and Maintainability	4	2022	4	2022
Communications	4	2021	4	2022
Test Support	4	2022	4	2022
Concept Exploration for follow-on to MQ-9	3	2021	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 UAV*	Project (Number/Name) 675246 / *MQ-9 Development and Fielding*	

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
675246: *MQ-9 Development and Fielding*	0.000	50.931	32.334	2.694	0.000	2.694	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Quantity of RDT&E Articles refers only to test aircraft.

A. Mission Description and Budget Item Justification

The basic MQ-9 Reaper system consists of the aircraft, sensors, Ground Control Station (GCS), communications equipment, weapon kits, support equipment, simulator and training devices, Readiness Spares Packages (RSP), technical data/training, 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 GCS configurations to be tailored to fit mission needs.

The MQ-9 Reaper aircraft is a single-engine, turbo-prop Remotely Piloted Aircraft (RPA) designed to operate over-the-horizon at medium-to-high altitude for long endurance sorties. The aircraft is designed to primarily prosecute critical emerging Time-Sensitive-Targets (TSTs) using a Synthetic Aperture Radar (SAR), Electro-optical/Infrared (EO/IR), and laser designator-based attack asset with on-board hard-kill weapon capability (hunter-killer). It also performs Intelligence, Surveillance, Reconnaissance, and Target Acquisition (ISR TA).

The MQ-9 system is continuing to develop and field capabilities to meet evolving mission needs through incremental upgrades, including but not limited to, increasing the maximum gross takeoff and landing weight; increasing operational range and endurance; propulsion system improvements; integrated redundant avionics; incorporating provisions for a Foreign Military Sales (FMS) exportable version of the weapon system; communications upgrades to include but not limited to datalink encryption, Internet Protocol (IP) networking, secure voice and data communications; navigation system upgrades; electrical system upgrades; sensor/stores management computer improvement; MIL STD-1760 advanced weapons data bus; advanced sensor and weapon payloads; improved human-machine interface (HMI); software updates needed to support new configurations and development; integrating additional precision weapons; and hardware and software upgrades to the GCS. The program will also complete airworthiness and weapon system certification and accreditation; produce applicable training for payloads funded in other program elements (e.g. SIGINT, communications, Wide Area Motion Imagery (WAMI), Near Vertical Direction Finding (NVDF), Gorgon Stare Quick Reaction Capability, advanced Counter-Improvised Explosive Device (C-IED), missile defense, hyperspectral, and other sensors and weapons). Development efforts will address reliability, maintainability, sustainability, Diminishing Manufacturing Sources (DMS), and safety issues. Activities also include, but are not limited to, trade studies, analyses, preliminary systems engineering, system and subsystem level testing in accordance with DoD and military standards, and specification development in support of both current program planning and execution, and studies supporting analysis and investment in future MQ-9 program planning.

The GCS functions as the aircraft cockpit and can control the aircraft either within Line-of-Sight (LOS) or Beyond Line-of-Sight (BLOS) via a combination of satellite relay and terrestrial communication architectures. The GCS is either mobile to support forward operating locations or fixed at a facility to support reach back Remote Split Operations (RSO). The GCS has the capability to perform mission planning; provide a means for manual control; and enable personnel to launch, recover, and monitor

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

aircraft, payloads, and system communications status. It incorporates secure data links to send aircraft and payload commands and receive system telemetry and payload data; monitors threats to the aircraft; displays the common operational picture; and provides support functions. Launch and Recovery GCS (LRGCS) is used for servicing, systems checks, maintenance, launch and recovery of aircraft under LOS control for hand-off to a mobile or fixed facility GCS, and conducting operations within LOS range of the LRGCS. GCS upgrades will be developed and fielded in coordination with improvements to other MQ-9 system capabilities and in response to evolving operational and information assurance/certification and accreditation requirements.

This project will also increase interoperability among developed systems by developing common standards and tools.

MQ-9 Program of Record (PoR) and Air Force Special Operations Command (AFSOC) will cost share during development, where appropriate, on joint efforts that are required by both programs to support the new capabilities.

Funding may be used to address DMS and Non-Recurring Engineering (NRE) issues.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MQ-9 WEAPON SYSTEM capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

This program is 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. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Ground Control Station (GCS) Development	20.641	8.666	0.350	-	0.350
Description: Develop GCS capabilities. Major capabilities include, but are not limited to, flight payload separation, open system architecture, processors, multi-level security, ergonomic cockpit design, single seat operations, reducing or eliminating known deficiencies in legacy GCS, and updates to facilitate single software. ***FY 2021 Plans:*** Continue GCS design/development, manufacturing and testing to include, but not limited to: • Hardware/Software Development • Integration and test • Continue GCS Development Test assets • Continue Contractor test build • Maintenance evaluation team event • Military Flight Release • Resolution of DMS issues • Field Service Representative (FSR) support during IOT&E					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
• Block 30 Articulating Arm • Block 30 Monitor • Processor(s) ***FY 2022 Base Plans:*** Will continue GCS design/development, manufacturing and testing to include, but not limited to: • Hardware/Software Development • Integration and test • Continue GCS Development Test assets • Continue Contractor test build • Maintenance evaluation team event • Military Flight Release • Resolution of DMS issues • Field Service Representative (FSR) support during IOT&E • Block 30 Articulating Arm • Block 30 Monitor • Processor(s) ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased for GCS development as effort ramps down.					
Title: Operator Simulator ***Description:*** Develop Operator Simulators for training, updates to keep Operator Simulators concurrent with the aircraft and GCS to include Joint Urgent Operational Need (JUON) support emerging AFSOC configurations. MQ-9 PoR and AFSOC will cost share development, where appropriate, on joint efforts that are required by both programs to support the new capabilities. ***FY 2021 Plans:*** Continue to implement updates which will keep the Operator Simulator current with the aircraft and GCS including, but not limited to: • Sensors and Sensor Integration - The Air Force continues to evaluate options to reduce lifecycle costs for the EO/IR sensor for the MQ-9A platform which could include development and/or integration efforts to support dual sourcing an alternative material EO/IR solution • Databases • Weapons upgrades	1.925	2.273	0.000	-	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
• Resolution of DMS issues ***FY 2022 Base Plans:*** Will continue to implement updates which will keep the Operator Simulator current with the aircraft and GCS including, but not limited to: • Sensors • Databases • Weapons upgrades • Resolution of DMS issues ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased as Operator Simulator development effort ramps down.					
Title: Release 1 and Release 2 ***Description:*** Release 1 and Release 2 continue execution of a subset of work previously performed under the System Developmemt and Demonstration (SDD) effort, while rapidly integrating upgrades or improvements (including limited urgent needs) fleet-wide. Development will combine the rigor of an event driven development process (referred to as a Technology Maturation Effort (TME)) with the expeditious delivery of a schedule driven integration and fielding process (referred to as a Release). These efforts may include, but are not limited to: Cryptographic Core Module (CCM), MTS-B Integration, Ground Control Station (GCS), Internet Protocol (IP) Migration, Synthetic Aperture Radar (SAR) Development, Extended Range, Station 1 & 7, Enablers Development, Multi Transit Ops, weapons integration, and testing on MQ-9 platform for capabilities such as rockets, missiles, bombs, guns and direct energy weapons, as well as software development required to support new capabilities. MQ-9 PoR and AFSOC will cost share during development, where appropriate, on joint efforts that are required by both programs to support the new capabilities. ***FY 2021 Plans:*** Developing and integrating the software and data to update the MQ-9 Block 5 UAS capabilities including, but not limited to: • Resolution of DMS issues • Cryptographic Core Module (CCM) • System supportability analysis • Evaluation of design code software ***FY 2022 Base Plans:***	8.500	11.903	0.200	-	0.200

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Continue developing and integrating the software and data to update the MQ-9 Block 5 UAS capabilities including, but not limited to: • Resolution of DMS issues • Cryptographic Core Module (CCM) • Emergency Line of Sight (E-LoS) System • System supportability analysis • Evaluation of design code software ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased for Cryptographic Core Module (CCM) and the Emergency Line of Sight (E-LoS) System, as program ramps down.					
Title: Test Support ***Description:*** Provides Other Government Agency support for MQ-9 testing to include, but not limited to, continued acceptance testing of weapon system hardware and software in accordance with contract standards, developmental testing of new capabilities, and Reliability and Maintainability (R&M) upgrades. MQ-9 PoR and Air Force Special Operations Command (AFSOC) will cost share development, where appropriate, on joint efforts that are required by both programs to support the new capabilities. ***FY 2021 Plans:*** Will continue test support. ***FY 2022 Base Plans:*** Will continue test support. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased as the Test Support development efforts ramp down support of software updates to include but not limited to LoS data links, ATLC, and open system architecture.	0.143	0.332	0.088	-	0.088
Title: Communications ***Description:*** Develop MQ-9 communications capabilities including, but not limited to, encrypted and improved LoS data links to ROVER/Video Data Link terminals (VORTEX/Airborne Platform Video Data Link), Bandwidth Efficient (BE) Common Data Link (CDL) for Command and Control (C2) and ISR transmission to GCS, improved (including BE) Beyond LOS (BLOS) military Satellite Communications (SATCOM) usage, control module, and secure triple link modem. Development and integration of an IP-based remote split operations (RSO) network/ infrastructure to include: Improvements to Ground Data Terminals (GDT), Design, development, and test of IP-	3.434	6.653	0.550	-	0.550

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
based network interfaces, Improved Predator Primary Data Link (PPDL) capabilities, reduction of legacy C-band signal blockages, network systems managers, SATCOM and relay site capabilities upgrades, drafting Technical Orders (TOs) and support documentation, training materials, production drawings, and retrofit acceptance plans. MQ-9 PoR and AFSOC will cost share development, where appropriate, on joint efforts that are required by both programs to support the new capabilities. ***FY 2021 Plans:*** Continue to develop and enhance MQ-9 communications capabilities, to include but not limited to, solutions of various DMS issues. ***FY 2022 Base Plans:*** Continue to develop and enhance MQ-9 communications capabilities, to include but not limited to, solutions of various DMS issues. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased as communications development ramps down.					
Title: MQ-9 Technology Insertion ***Description:*** Develop program protection Technology Insertion capabilities and functionality for the MQ-9 Weapon System. MQ-9 PoR and AFSOC will cost share during development, where appropriate, on joint efforts that are required by both programs to support the new capabilities. ***FY 2021 Plans:*** MQ-9 Technology Insertion efforts will continue during FY21. ***FY 2022 Base Plans:*** MQ-9 Technology Insertion efforts will continue during FY22. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased as the Communications security control module of the MQ-9 Technology Insertion effort ramps down.	16.288	2.507	1.506	-	1.506
Accomplishments/Planned Programs Subtotals	50.931	32.334	2.694	-	2.694

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• APAF 04 Line Item PRDTB1: *MQ-9*	308.600	343.600	3.288	-	3.288	-	-	-	-	-	-
• APAF 06 Line Item PRDTB1: *MQ-9 Spares*	55.943	33.128	14.387	-	14.387	-	-	-	-	-	-
• APAF 05 Line Item PRDTB2: *MQ-9 Mods*	110.437	108.230	13.769	-	13.769	-	-	-	-	-	-
• APAF 07 Line Item PRDTB1: *MQ-9*	22.107	26.585	26.596	-	26.596	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The MQ-9 Reaper system will be acquired via sole-source contracts with General Atomics Aeronautical Systems Inc. (GA-ASI), L3Comm, and Raytheon as the prime contractors. GA-ASI is the prime contractor for aircraft and ground control stations. GA-Mission Systems (GA-MS) is the prime contractor for Lynx SAR. L3Comm is the prime contractor for the Predator Satellite Link. Raytheon is the prime contractor for the MTS-B EO/IR sensor system. Management of development and fielding of new capabilities will be through an acquisition strategy that combines the rigor of an event driven development process (referred to as a Technology Maturation Effort (TME)) with the expeditious delivery of a schedule driven integration and fielding process. This will allow continued baseline improvements while rapidly integrating limited urgent needs fleet-wide.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Control Station (GCS) Development	SS/CPFF	GA-ASI : Poway, CA	0.000	20.641	Mar 2020	7.143	Mar 2021	0.350	Mar 2022	-		0.350	-	-	349.818
Multi-Spectral Targeting System (MTS)-B EO/IR Sensor	SS/CPFF	Raytheon : McKinney, TX	0.000	-		-		-		-		-	-	-	112.944
Operator Simulator	TBD	TBD : TBD	0.000	1.925	Mar 2020	2.273	Mar 2021	-		-		-	-	-	56.512
Release1 and Release 2	SS/CPFF	GA-ASI : Poway, CA	0.000	8.500	Feb 2020	11.903	Mar 2021	0.200	Mar 2022	-		0.200	-	-	161.096
Communications	SS/CPFF	GA-ASI : Poway, CA	0.000	3.434	Nov 2019	6.653	Nov 2020	0.550	Nov 2021	-		0.550	-	-	17.336
MQ-9 Program Protection Technology Insertion	SS/CPFF	GA-ASI : Poway, CA	0.000	14.586	Apr 2020	2.507	Nov 2021	1.014	Nov 2022	-		1.014	-	-	58.239
Completed Efforts	SS/ Various	Various : Various	0.000	-		-		-		-		-	-	-	77.805
		Subtotal	0.000	49.086		30.479		2.114		-		2.114	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	-	-	-
Test Support	Various	Various : Various, CA	0.000	0.143	Oct 2019	0.332	Oct 2020	0.088	Oct 2021	-		0.088	-	-	22.665
		Subtotal	0.000	0.143		0.332		0.088		-		0.088	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Costs	Various	Various : Various	0.000	1.702	May 2020	1.523	Apr 2021	0.492	Apr 2022	-		0.492	-	-	119.924
		Subtotal	0.000	1.702		1.523		0.492		-		0.492	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 UAV*	Project (Number/Name) 675246 / *MQ-9 Development and Fielding*	

	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	0.000	50.931		32.334		2.694		-		2.694	-	-	N/A

Remarks

PMA costs are included in Other Government Costs.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

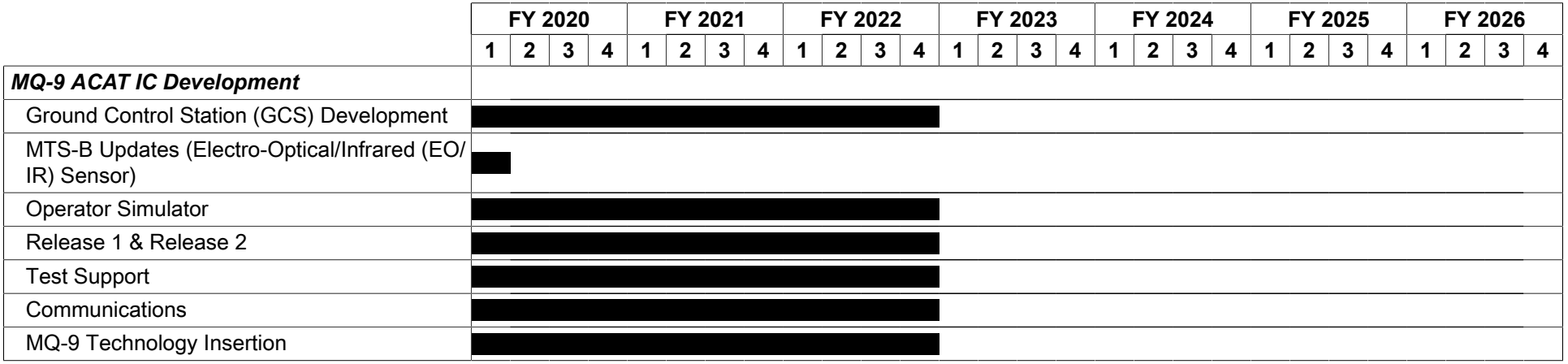

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MQ-9 ACAT IC Development				
Ground Control Station (GCS) Development	1	2020	4	2022
MTS-B Updates (Electro-Optical/Infrared (EO/IR) Sensor)	1	2020	1	2020
Operator Simulator	1	2020	4	2022
Release 1 & Release 2	1	2020	4	2022
Test Support	1	2020	4	2022
Communications	1	2020	4	2022
MQ-9 Technology Insertion	1	2020	4	2022

Note

PMA costs are included in Other Government Costs.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 UAV*	Project (Number/Name) 675247 / *Squadron Operations Centers (SOC)*	

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
675247: *Squadron Operations Centers (SOC)*	0.000	0.000	0.000	0.251	0.000	0.251	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0205219F, project 675247, Squadron Operations Center, is a new start.

FY22 3600 for SOC is a New Start as the last year of funding appropriated was FY19. Requirement remains valid in order to support the DT/OT SOC efforts to develop and test new technological and platform advancements.

A. Mission Description and Budget Item Justification

The SOC is required to employ Remote Split Operations (RSO). It provides the communications, network, aircraft control and sensor distribution circuits to effectively execute RSO missions. The SOC provides CONUS-based aircrews mission data, tasking, and ability to disseminate and exchange mission data with decision-makers and intelligence entities. This effort defines component standards, develops and stands up a SOC Systems Integration Lab (SIL), and integrates new technologies to maintain currency with technological and platform advancements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MQ-9 WEAPON SYSTEM capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Squadron Operations Center	0.000	0.000	0.251	0.000	0.251
Description: Development of a SOC common to Air Combat Command (ACC), Air Force Special Operations Command (AFSOC), and Air National Guard (ANG). Major capabilities include secure mission communications; data reception, recording, editing, analysis, dissemination, and exchange; mission planning, preparation, and support; mission execution (e.g., updates to threat tracking and targeting, weather tracking, mission status and capability; tactical situational awareness; etc.); and mission reconstruction and debriefing.					
FY 2021 Plans: No Funding					
FY 2022 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675247 / *Squadron Operations Centers (SOC)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Necessary for Developmental/Operational Testing of DT/OT SOC which is required to develop and test new technologies to remain up to date with technological and platform advancements. ***FY 2022 OCO Plans:*** n/a ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Requirement remains valid and the increase reflects the need of the RPA-SOC project					
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.251	0.000	0.251

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• OPAF 03 Line Item 837300: *Base Communications Infrastructure*	7.898	82.160	70.370	-	70.370	-	-	-	-	-	-

Remarks

Since 2004, MQ-1/MQ-9 squadrons have acquired equipment, on an ad hoc basis, to provide the communications, network, aircraft control, and sensor distribution circuits needed to execute RSO missions. OPAF funding will be used to standardize and modernize existing RPA SOC capability, which is required to reduce security vulnerabilities, as well as address end of life/end of support issues of existing RPA SOC equipment. The Developmental Testing (DT) SOC will be used to further enhance the program's ability to update future RPA-SOC modernization efforts.

D. Acquisition Strategy

AFLCMC/WII manages the SOC Program for ACC, AFSOC, and ANG through organic development at the 402 SMXG, and hardware/software procurement utilizing the Air Force NETCENTS contract vehicle, as well as other Air Force and General Service Administration (GSA) contracts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675247 / *Squadron Operations Centers (SOC)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RPA SOC Support	TBD	NTEK : TBD	0.000	-		-		0.251	Mar 2022	-		0.251	-	-	-
		Subtotal	0.000	-		-		0.251		-		0.251	-	-	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	0.000	-		0.000		0.251		-		0.251	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675247 / *Squadron Operations Centers (SOC)*

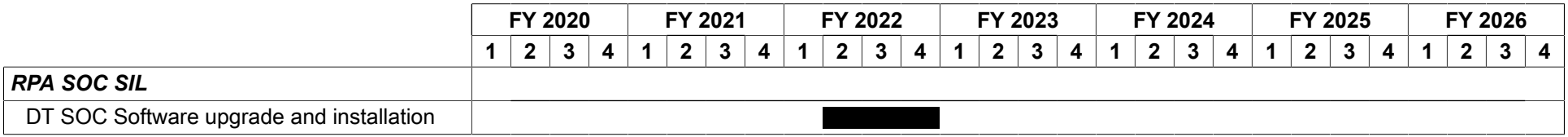

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675247 / *Squadron Operations Centers (SOC)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RPA SOC SIL				
DT SOC Software upgrade and installation	2	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 UAV*	Project (Number/Name) 675249 / *MQ-9 Upgrade*	

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
675249: *MQ-9 Upgrade*	0.000	65.698	57.944	43.863	0.000	43.863	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MQ-9 Upgrade Program develops and integrates improvements for existing systems and fields new capabilities for the MQ-9 fleet through an Agile Acquisition Strategy.

The objective is to enable rapid fielding of new software, hardware, and sustainability measures for integration into the MQ-9 fleet. Per the Candidate Capability List (CCL) signed on 01 November 2019, capabilities may include, but are not limited to, efforts to reduce system configurations; enable battlespace integration; implement open architecture; enable mission resiliency; mitigate Diminishing Manufacturing Sources and Material Shortages (DMSMS) through planned technology upgrades; enable airspace integration; increase weather tolerance; enable airborne situational awareness; enable operations in a contested environment; build open architecture; improve cybersecurity resilience; improve reliability and maintainability; increase lethality; improve the human machine interface to enhance the user experience; and improve readiness.

Activities also include studies, analysis, simulations, demonstrations, prototyping, and testing. The Upgrade Program may use subject matter experts and agencies to develop and test MQ-9 system capabilities and make improvements to System Integration Laboratory (SIL)/ Hardware in the Loop Laboratory (HILL) and Detachment 3 (Det 3).

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MQ-9 WEAPON SYSTEM capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

Funding may be used to address Diminishing Manufacturing Source (DMS) and Non-Recurring Engineering issues.

MQ-9 Program of Record (PoR) and Air Force Special Operations Command (AFSOC) will cost share on joint efforts that are required by both programs to support the new capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: MQ-9 Upgrade	60.988	50.469	41.263	-	41.263
Description: Develop and integrate upgrade capabilities in support of the MQ-9 Upgrade Strategy. Development will combine the rigor of an event driven development process (referred to as Technology Maturation Effort (TME)) with the expeditious delivery of a schedule driven integration and fielding process. New capabilities include, but are not limited to, upgrades of existing aircraft, Ground Control Stations (GCSs),					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675249 / *MQ-9 Upgrade*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
communication capabilities, payload systems, and the Multi-Spectral Targeting System (MTS-B). Upgrade capabilities also include software updates, the addition of new capabilities and subsystems, and the resolution of DMS issues. Candidate capabilities are determined by Major Command (Air Combat Command (ACC), Air Force Special Operations Command (AFSOC)) direction and inputs that included Joint Urgent Operational Need (JUON) and Urgent Operational Need (UON) requests. Activities also include, but are not limited to, operator simulators, reliability and maintainability, test support, communications, and urgent services. MQ-9 PoR and AFSOC will cost share development, where appropriate, on joint efforts that are required by both programs to support the new capabilities. ***FY 2021 Plans:*** TME to develop upgrade capabilities in conjunction with the CCL to include, but not limited to: • Unified Tactical Situational Awareness • Design, development, and integration of Moving Target Indicator (MTI) capability on medium altitude air vehicles • Automated Takeoff and Landing Capability (ATLC) • Weapons usability improvements (i.e., auto-lockout, JAGM, and four rail) • Reconnaissance, targeting, and technology improvements in MTS-B, Synthetic Aperture Radar, sensors, sensor upgrades, and GPS • System corrections, technology upgrades within the GCS, Unmanned Aerial Vehicle communications, and ground support (i.e., batteries, engine, BE-CDL, and Beyond Line of Sight (BLOS)) • Expansion of theater capabilities with Mode 5 • MTS-B High-Definition Short Wave Infrared/Pulse Repetition Frequency, two-color laser system, inertial measurement unit/autoloader • Secure communications • Improvements to system security and the ability to self-protect through Ku or GPS jamming, data encryption, IFF, electronic warfare, and signature reduction • Link-16 (Airborne Mission Networking) capability					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675249 / *MQ-9 Upgrade*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
• Gorgon Stare ***FY 2022 Base Plans:*** Continue TME developing upgrade capabilities in conjunction with the CCL to include, but not limited to: • Unified Tactical Situational Awareness • Design, development, and integration of Moving Target Indicator (MTI) capability on medium altitude air vehicles • Automated Takeoff and Landing Capability (ATLC) • Weapons usability improvements (i.e., auto-lockout, JAGM, and four rail) • Reconnaissance, targeting, and technology improvements in MTS-B, Synthetic Aperture Radar, sensors, sensor upgrades, and GPS • System corrections, technology upgrades within the GCS, Unmanned Aerial Vehicle communications, and ground support (i.e., batteries, engine, BE-CDL, and Beyond Line of Sight (BLOS)) • Expansion of theater capabilities with Mode 5 • MTS-B High-Definition Short Wave Infrared/Pulse Repetition Frequency, two-color laser system, inertial measurement unit/autoloader • Secure communications • Improvements to system security and the ability to self-protect through Ku or GPS jamming, data encryption, IFF, electronic warfare, and signature reduction • Link-16 (Airborne Mission Networking) capability • Gorgon Stare ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased as MQ-9 Upgrade efforts were rephased based upon program execution requirements.					
Title: Operator Simulator ***Description:*** Develop operator simulators for training and perform updates to keep operator simulators current with the aircraft and GCSs. Operator Simulator also includes, but is not limited to: JUONs, UONs, and support for emerging AFSOC configurations. ***FY 2021 Plans:*** Continue implementing updates to keep the operator simulator current with the aircraft and GCSs. ***FY 2022 Base Plans:***	4.048	3.635	1.100	-	1.100

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675249 / *MQ-9 Upgrade*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Continue implementing updates to keep the operator simulator current with the aircraft and GCSs. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased as MQ-9 Upgrade operator simulators ramps down.					
Title: Test Support ***Description:*** MQ-9 Upgrade testing provides support including, but not limited to: activities for MQ-9 testing of weapon system hardware and software IAW contract standards, developmental testing of new capabilities, and R&M upgrades. ***FY 2021 Plans:*** Continue providing government agencies support for MQ-9 testing to include continued acceptance testing of weapon system hardware and software IAW with contract standards, developmental testing of new capabilities, and R&M improvements. ***FY 2022 Base Plans:*** Continue providing government agencies support for MQ-9 testing to include continued acceptance testing of weapon system hardware and software IAW with contract standards, developmental testing of new capabilities, and R&M improvements. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased as the Test Support development efforts ramp down	0.662	3.766	1.500	-	1.500
Title: Communications ***Description:*** Develop MQ-9 communications capabilities including, but not limited to: network system managers, SATCOM, and relay site upgrades. MQ-9 Upgrade Communications also includes drafting technical orders, support documentation, training materials, production drawings, and retrofit acceptance plans (i.e., BE CDL, Secure Voice Multi-Level Security (MLS), ARC-210 Guard Squelch, and Secure Communications). ***FY 2021 Plans:*** MQ-9 Upgrade communications capabilities development will continue. ***FY 2022 Base Plans:*** MQ-9 Upgrade communications capabilities development will continue. ***FY 2021 to FY 2022 Increase/Decrease Statement:***	0.000	0.074	0.000	-	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675249 / *MQ-9 Upgrade*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Funding decreased slightly for MQ-9 Upgrade Communications.					
Accomplishments/Planned Programs Subtotals	65.698	57.944	43.863	-	43.863

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• APAF 06 PRDTB1: *MQ-9 UAV*	54.069	14.268	13.795	-	13.795	-	-	-	-	-	-
• APAF 05 PRDTB2: *MQ-9 Mods*	143.977	46.781	130.518	-	130.518	-	-	-	-	-	-

Remarks

PMA costs are included in Other Government Costs.

D. Acquisition Strategy

Acquisition of MQ-9 Upgrade is accomplished via sole-source contracts with General Atomics-ASI, Raytheon, and L-3 Communications, prime contractors, and Other Government Agencies. Management of development and fielding of new capabilities will be through an Agile Acquisition Strategy that combines the rigor of an event driven development process (referred to as a Technology Maturation Effort (TME)) with the expedited delivery of a schedule driven integration and fielding process. This will allow continued baseline improvements while rapidly integrating limited urgent needs fleet-wide.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 UAV*	Project (Number/Name) 675249 / *MQ-9 Upgrade*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	-	-	-
MQ-9 Upgrade	SS/CPFF	GA-ASI : Poway, CA	0.000	59.069	Mar 2020	48.468	Jan 2021	41.263	Jan 2022	-		41.263	-	-	-
Operator Simulator	TBD	TBD : TBD	0.000	4.048	Mar 2020	3.635	Jan 2021	1.100	Jan 2022	-		1.100	-	-	-
Communications	SS/CPFF	GA-ASI : Poway, CA	0.000	-		0.074	Oct 2020	-		-		-	-	-	-
		Subtotal	0.000	63.117		52.177		42.363		-		42.363	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	-	-	-
Test Support	Various	Various : Various	0.000	0.662	Nov 2019	3.766	Nov 2020	1.500	Nov 2021	-		1.500	-	-	-
		Subtotal	0.000	0.662		3.766		1.500		-		1.500	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	-	-	-
Other Government Costs	Various	Various : Various	0.000	1.919	May 2020	2.001	May 2021	-		-		-	-	-	-
		Subtotal	0.000	1.919		2.001		-		-		-	-	-	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	0.000	65.698		57.944		43.863		-		43.863	-	-	N/A

Remarks

PMA costs are included in Other Government Costs.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675249 / *MQ-9 Upgrade*

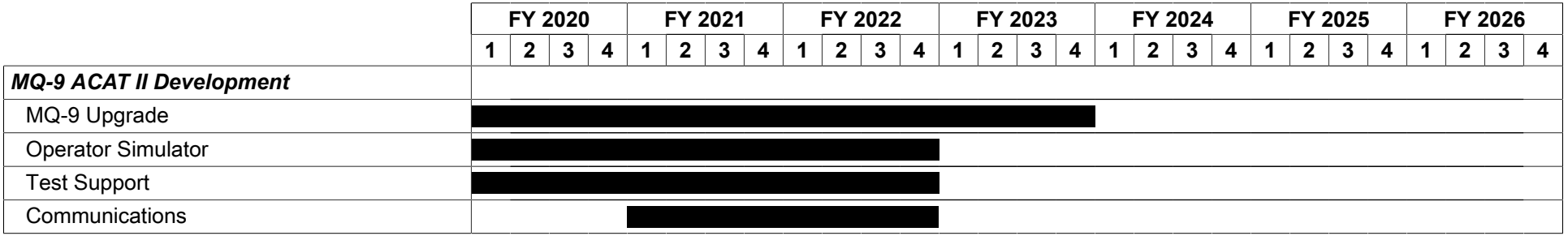

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675249 / *MQ-9 Upgrade*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MQ-9 ACAT II Development				
MQ-9 Upgrade	1	2020	4	2023
Operator Simulator	1	2020	4	2022
Test Support	1	2020	4	2022
Communications	1	2021	4	2022