Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force											Date: May 2017	
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 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	958.691	124.695	151.373	201.394	0.000	201.394	197.573	185.807	177.999	169.807	1,445.080	3,612.419
675246: *MQ-9 Development and Fielding*	958.691	124.695	120.481	119.783	0.000	119.783	72.932	30.935	26.677	33.245	3.918	1,491.357
675247: *Squadron Operations Centers (SOC)*	0.000	0.000	0.000	7.264	0.000	7.264	5.795	0.000	0.000	0.000	0.000	13.059
675249: *MQ-9 Upgrade*	0.000	0.000	30.892	74.347	0.000	74.347	118.846	154.872	151.322	136.562	1,441.162	2,108.003
Program MDAP/MAIS Code: 424												

Note

This program, BA 07 PE 0205219F, project 675247, Squadron Operations Center, is a new start.

This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Reliability and Maintainability, is a new start.
This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Test Support, is a new start.
This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Communications, is a new start.
This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Urgent Services, 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 on specific aircraft and control station configurations to be tailored to fit mission needs.

In FY17, MQ-9 Upgrade, was a new start.

In FY18 the MQ-9 Reaper system has three separate development programs. This PE includes:

1. 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 and support equipment.

2. Squadron Operations Centers (SOC). This effort is for development and fielding of standardized operations centers to provide mission data and tasking information to the aircrew and disseminate and/or exchange mission data with decision-makers and the intelligence community.

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3. MQ-9 Upgrade. This effort is to develop improvements for existing systems and to field new capabilities for the baseline MQ-9 fleet using a Hybrid Acquisition Strategy.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	122.731	151.373	163.951	0.000	163.951
Current President's Budget	124.695	151.373	201.394	0.000	201.394
Total Adjustments	1.964	0.000	37.443	0.000	37.443
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	6.145	0.000			
• SBIR/STTR Transfer	-4.181	0.000			
• Other Adjustments	0.000	0.000	37.443	0.000	37.443

Change Summary Explanation

FY2016 delta due to $6.145M BTR to fund Hybrid Release 1 and -$4.181M for Small Business Innovation Research (SBIR).

FY2018 increase to fully fund MQ-9 Upgrade program.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675246: *MQ-9 Development and Fielding*	958.691	124.695	120.481	119.783	0.000	119.783	72.932	30.935	26.677	33.245	3.918	1,491.357
Quantity of RDT&E Articles	3	-	-	-	-	-	-	-	-	-		

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 on specific aircraft and control station 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 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 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; hardware and software upgrades to the ground control station. 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, and safety issues. Activities also include 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: FY 2018 Air Force		Date: May 2017
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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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: MQ-9 System Development and Demonstration (SDD)	11.737	17.511	0.000	0.000	0.000
Description: Complete development to meet MQ-9 Capabilities Production Document (CPD) requirements. Including but not limited to engineering change orders and associated studies and general research. ***FY 2016 Accomplishments:*** Continued MQ-9 Block 5 Remotely Piloted (RPA) system capability development to include, but not limited to: • Developmental test for High Capacity Starter Generator • Predator Primary Data Link (PPDL) that will lead to CDL compliance • Two ARC-210 Radios, Redesigned Forward Avionics Bay • Dashboard w/ Integrated Sensor Control System (ISCS) • Mission Control Module/Payload Control Computer • Improved BRU- 71/A Bomb Rack • Improved Stores Management System • High Definition Multi-spectral Targeting System (MTS-B) • Improved Heavyweight Landing Gear • Software development to include integration of numerous approved Software Change Requests (SCRs) • Conducted Electromagnetic Environmental Effects (E3) and Hazards of Electromagnetic Radiation to Ordnance (HERO) testing on the developed MQ-9 Block 5 aircraft system Began and completed Follow-on Operational Test and Evaluation (FOT&E) execution as required to field the Block 5 aircraft and software to include, but not limited to: • Development of verified Technical Orders (Flight Manual and Maintenance Manual) • Training completed following successful Developmental Test (DT) completion • Software regression testing with the fielded Block 1 aircraft system • Trained aircrew for FOT&E • Initiated development to resolve FOT&E identified deficiencies					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
• Tested and fielded MQ-9 Cold Weather Kit Developed and conducted proof install of MQ-9 Block 1 to Block 5 retrofit kit to consolidate MQ-9 fleet to a common baseline. Completed Vortex phase 1 for Block 1 &5 ***FY 2017 Plans:*** Continue MQ-9 Follow-on Operational Test and evaluation (FOT&E) execution as required to field aircraft and software, to include, but not limited to: • Will complete non-FOT&E dependent Predator Primary Data Link (PPDL) characterization efforts on the MQ-9 Block 5 Remotely Piloted Aircraft (RPA) system • Will complete software integration and testing of numerous approved Software Change Requests (SCRs) and identify FOT&E deficiencies • Will complete High capacity starter generator testing. ***FY 2018 Base Plans:*** N/A ***FY 2018 OCO Plans:*** N/A					
Title: Block 30 Ground Control Station (GCS) Development ***Description:*** Develop Block 30 GCS capabilities. ***FY 2016 Accomplishments:*** • Completed Block 30 GCS development • Continued Field Service Representative (FSR) support during FOT&E ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** N/A ***FY 2018 OCO Plans:*** N/A	1.191	0.000	0.000	0.000	0.000
Title: Block 50 Ground Control Station (GCS) Development	52.185	50.341	46.281	-	46.281

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: Develop GCS capabilities. Major capabilities include, but not limited to, payload separation, open system architecture, multi-level security, ergonomic cockpit design, single seat operations, and reducing or eliminating known deficiencies in legacy GCS. ***FY 2016 Accomplishments:*** Continued Block 50 design/development of hardware and software: • Completed Preliminary Design Review to allow initial test asset procurement • Developed Integrated Communication System ***FY 2017 Plans:*** Continue Block 50 design/development, manufacturing and test including, but not limited to: • Hardware/Software Development • Integration and test • Cockpit Evaluation Team 3 • Critical Design Review • Sub-system TIMs in support of Critical Design Review • Completed initial hardware purchase of 3 Block 50 GCS Development Test assets (3 of 7 total Development Test assets) • Begin Contractor test build • Maintenance evaluation team event • Military Flight release ***FY 2018 Base Plans:*** Will continue Block 50 design/development, manufacturing and test including: • Hardware/Software Development • Integration and test • Procure an additional 4 Block 50 GCS Development Test assets • Continue Contractor test build one and two • Maintenance evaluation team event • Military Flight Release					
Title: MQ-9 MTS-B Electro-Optic/Infrared (EO/IR) Sensor	1.056	0.344	0.345	0.000	0.345
Description: Develop improved Multi-Spectral Targeting System (MTS-B) modes of operation and upgrade full motion video capability to include, but not limited to, an all digital architecture employing High-Definition (HD) camera formats, imagery improvements across all multi-spectral bands (color and infrared) and Target Location					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Accuracy (TLA) enhancements to support use of coordinate seeking weapons, and integration of High Definition Electro-optical Infra-red sensor upgrades, and software updates. ***FY 2016 Accomplishments:*** • Continued management of HD TLA MTS-B system parts obsolescence • Supported final integration and test of all functions of HD TLA MTS-B system on MQ-9 platforms • Completed third round of developmental testing which resulted in a decision to start production of the HD TLA MTS-B(DAS-4) system • Support software development integration • develop integrate, improve EO/IR sensor capabilities, enhanced laser spot tracker capabilities • Continue progress towards improved organic field & depot support & sustainment ***FY 2017 Plans:*** • Support final integration and test of all functions of the DAS-4 system • Support operational test of DAS-4 system and MTS software on MQ-9 platforms • Generate production level documentation to support production cut-in and fielding of DAS-4 and MTS Software on MQ-9 platforms ***FY 2018 Base Plans:*** • Will Support MTS software development integration into the MQ-9 platforms • Will continue to develop, integrate, improve EO/IR sensor capabilities • Will continue to develop, integrate enhanced laser spot tracker capabilities • Will continue to progress towards improved organic field & depot support & sustainment ***FY 2018 OCO Plans:*** N/A					
Title: Operator Simulator ***Description:*** Develop Operator Simulators for training and updates to keep Operator Simulators concurrent with the aircraft and Ground Control Station (GCS) to include Joint Urgent Operational Need (JUON) support emerging Air Force Special Operations Command (AFSOC) configurations. ***FY 2016 Accomplishments:*** Continued to implement updates which will keep the Operator Simulator current with the aircraft and GCS, including, but not limited to: • Sensors	6.000	4.417	7.088	-	7.088

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
• Databases • Weapons upgrades ***FY 2017 Plans:*** 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 ***FY 2018 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					
Title: Synthetic Apeture Radar (SAR) Enhancements ***Description:*** Improvements in MQ-9 capability to disseminate SAR data via a fleet-wide common architecture, improve Moving Target Indicator (MTI) tracking, automation of data exploitation via Continuous Look Attack Management for Predator (CLAMP) and improvement of all-weather GPS weapon targeting. ***FY 2016 Accomplishments:*** • Completed development for initial GCS Block 15 and Block 30 fielding of MQ-9 data dissemination common architecture using multi-intelligence Smart Processing (MISP) capability • Adjusted GPS targeting development to decouple from GCS development schedule • Completed 7 test flights on surrogate aircraft • Evaluate solutions to implement Net-Centric Collaborative Targeting (NCCT) standard fleet-wide using MISP. ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** N/A ***FY 2018 OCO Plans:***	0.400	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: Release 1 and Release 2	50.849	36.706	49.208	0.000	49.208

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 not limited to: TOLD, MTS-B Integration, GCS Block 50, Counter IED, IP Migration, SAR Development, GCS Block 30, Extended Range Phase I, Extended Range Phase II, Extended Range Accel, Enablers Development, Multi Transit Ops, software development required to support new capabilities.

FY 2016 Accomplishments:
Began developing and integrating the software and data to update the MQ-9 Block 5 UAS to include Hybrid Release 1 capabilities: Video Orientented Transceiver for EXchange of Information (VORTEX) Phase 1 data link and AGM-114R Hellfire missile with Common Weapon Library. Activities included:
• Completed System Requirements Review (SRR) and Preliminary Design Review (PDR)
• Systems Integration Laboratory and Hardware In Loop Laboratory testing
• Systems engineering data development, technical orders (TOs) and training documentation development, and test planning
• Software development required to support new capabilities

Began Tech Maturation development on MQ-9 Block 5 UAS capabilities: Stations 1&7 Wiring (BLOS), Extended Range for Block 5 aircraft and Payload Multi-Plexing. Activities included:
• Drawings
• T-2 Mods/Technical Orders
• Systems Integration Laboratory and Hardware In Loop Laboratory testing
• Safety and Airworthiness certifications
• Start of specification work
• Software development required to support new capabilities

FY 2017 Plans:

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue developing and integrating the software and data to upgrade the MQ-9 Block 5 UAS to include Hybrid Release 1 capabilities: Video Oriented Transceiver for EXchange of Information (VORTEX) Phase 1 data link and AGM-114R Hellfire missile with Common Weapon Library. Activities include: • Critical Design Review (CDR) • Systems engineering data development • Systems Integration Laboratory and Hardware In Loop Laboratory testing • Safety and Airworthiness certifications • Technical orders (TOs) and training documentation development • Test planning • Integrated test execution (development test & operational test) • Initial training • Preparation for limited fielding of aircraft (logistics activities) • Software Development to support new capabilities Continue Tech Maturation development to MQ-9 Block 5 UAS capabilities: Stations 1&7 Wiring (BLOS), Extended Range for Block 5 aircraft and Payload Multi-Plexing. Activities include, but not limited to: • Critical Design Review (CDR) • Technology Readiness Review (TRR) • Drawings • T-2 Mods/Technical Orders • Laboratory, ground and flight test • Safety and Airworthiness certifications • Specification work • Software Development to support new capabilities					
FY 2018 Base Plans: Continue developing and integrating the software and data to update the MQ-9 Block 5 UAS capabilities to include but not limited to: • Test and delivery of updated Operational Flight Program (OFP) releases of increased communications, sensors and weapons capabilities • Systems Integration Laboratory and Hardware In Loop Laboratory testing • Systems engineering data development • Technical orders (TOs) and training documentation development • Test planning					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
• Integrated test execution (development test & operational test) • Initial training • Preparation for limited fielding of aircraft (logistics activities) • Software Development to support new capabilities Complete Tech Maturation events for Stations 1&7 Wiring (BLOS), Extended Range for Block 5 aircraft and Payload Multi-Plexing. Activities to include but not limited to: • Drawings • T-2 Mods/Technical Orders • Ground test • Safety and Airworthiness certifications • Specification work • Software Development to support new capabilities ***FY 2018 OCO Plans:*** N/A					
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 IAW with contract standards, developmental testing of new capabilities, and Reliability and Maintainability (R&M) upgrades. ***FY 2016 Accomplishments:*** Continued test support. ***FY 2017 Plans:*** Continue test support. ***FY 2018 Base Plans:*** Will continue test support. ***FY 2018 OCO Plans:*** N/A	0.402	0.730	1.114	0.000	1.114
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) and	0.875	0.171	0.123	0.000	0.123

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Bandwidth Efficient (BE) Common Data Link (CDL) for Command and Control (C2) and ISR transmission to GCS, as well as improved (including BE) Beyond LOS (BLOS) military Satellite Communications (SATCOM) usage. Development and integration of an IP-based RSO network/infrastructure to include: Improvements to Ground Data Terminals (GDT), Design, development, and test of IP-based network interfaces, Improved Predator Primary Data Link (PPDL) capabilities, network systems managers, SATCOM and relay site capabilities upgrades, drafting Technical Orders (TOs) and support documentation, training materials, production drawings, and retrofit acceptance plans. ***FY 2016 Accomplishments:*** Continued the development of: • Fixed Site Satellite Terminal (FSST) and Satellite Earth Terminal Sub-System (SETSS) and relay site equipment • Delivered 1 Satellite Earth Terminal Sub-System (SETSS) and 2 test and monitor subsystems relay site equipment • Electronics Technical Orders • BE-CDL and BE-SATCOM • Remote Split Operations (RSO) Technical Orders • Training courses • Logistics support analysis • IP-based equipment upgrades ***FY 2017 Plans:*** Continue the development of: • Fixed Site Satellite Terminal (FSST), Satellite Earth Terminal Sub-System (SETSS), and relay site equipment • Electronics Technical Orders • BE-CDL and BE-SATCOM • Qualify IP Remote Split Operations (RSO) Network for use by MQ-1/MQ-9 • Development and delivery of SATCOM ground terminal training courses • SATCOM operational durability ***FY 2018 Base Plans:*** • Will SATCOM and Predator Primary Data Link (PPDL), both Line Of Sight (LOS) and Beyond Line of Sight (BLOS), improvements and upgrades					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
• Will enhance Remote Split Operations (RSO) network and supporting communications equipment, including associated Tech Orders, training, and interface updates. ***FY 2018 OCO Plans:*** N/A					
Title: MQ-9 Technology Insertion ***Description:*** Develop program protection Technology Insertion capabilities and functionality for the MQ-9 Weapon System. ***FY 2016 Accomplishments:*** Funded with prior year. ***FY 2017 Plans:*** • Continue development of program protection Technology Insertion capabilities and functionality for the MQ-9 Weapon System including aircraft, sensors, and Ground Control Station (GCS) documentation and drawings ***FY 2018 Base Plans:*** • Will continue development of program protection Technology Insertion capabilities and functionality for the MQ-9 Weapon System including aircraft, sensors, and Ground Control Station (GCS) documentation and drawings ***FY 2018 OCO Plans:*** N/A	0.000	9.292	12.430	0.000	12.430
Title: Reliability and Maintainability ***Description:*** Develop MQ-9 modification improvements for aircraft and ground base infrastructure. Includes engineering change orders and associated studies and general research. ***FY 2016 Accomplishments:*** Continued development of MQ-9 modification improvements for aircraft and ground based infrastructure to improve mission capable rates and reduce reliability and maintainability costs. ***FY 2017 Plans:*** Continue development of MQ-9 modification improvements for aircraft and ground based infrastructure to improve mission capable rates and reduce reliability and maintainability costs. ***FY 2018 Base Plans:***	0.000	0.969	3.194	0.000	3.194

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop MQ-9 modification improvements for aircraft and ground based infrastructure to improve mission capable rates and reduce reliability and maintainability cost. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	124.695	120.481	119.783	0.000	119.783

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA04: Line Item # PRDTB1: *MQ-9*	656.428	575.552	117.141	271.080	388.221	95.527	181.517	151.667	204.976	458.062	7,722.603
• APAF: BA06:Line Item # PRDTB1: *MQ-9 Spares*	133.588	40.943	48.693	0.000	48.693	119.760	57.714	57.409	51.436	0.00	509.543
• APAF: BA05: Line Item # PRDTB2: *MQ-9 Mods*	184.051	253.997	264.740	56.400	321.140	382.191	177.759	190.615	163.115	2,692.166	4,812.202
• APAF: BA07: Line Item # PRDTB1: *MQ-9*	5.000	35.650	36.368	0.000	36.368	25.882	26.818	26.846	27.383	0.00	205.209

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-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 a Hybrid 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 (referred to as a Hybrid Release). This will allow continued baseline improvements while rapidly integrating limited urgent needs fleet-wide.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force		Date: May 2017
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 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MQ-9 System Development and Demonstration (SDD)	SS/CPIF	GA-ASI : Poway, CA	338.306	8.053	Aug 2016	16.094	May 2017	0.000		0.000		0.000	0.000	362.453	362.453
Block 30 Ground Control Station (GCS) Development	SS/CPFF	GA-ASI : Poway, CA	23.688	1.191	Apr 2016	0.000		0.000		0.000		0.000	0.000	24.879	24.879
Block 50 Ground Control Station (GCS) Development	SS/CPFF	GA-ASI : Poway, CA	138.609	44.678	Mar 2016	46.267	Oct 2016	38.229	Oct 2017	0.000		38.229	82.035	349.818	349.818
MQ-9 Electro-Optical / Infrared (EO/IR) Sensor	SS/CPFF	Raytheon : McKinney, TX	111.199	1.056	Jul 2016	0.344	Feb 2017	0.345	Jun 2018	0.000		0.345	0.000	112.944	112.944
Operator Simulator	SS/CPIF	L3 Comm : Salt Lake City, UT	28.856	6.000	Aug 2016	4.417	Jan 2017	7.088	Apr 2018	0.000		7.088	10.151	56.512	56.512
Synthetic Aperture Radar (SAR) Enhancements	SS/CPFF	GA-MS : Poway, CA	47.707	0.400	Apr 2016	0.000		0.000		0.000		0.000	0.000	48.107	48.107
Hybrid R1 and R2	SS/CPFF	GA-ASI : Poway, CA	0.000	47.027	Mar 2016	33.736	Jun 2017	40.476	Jun 2018	0.000		40.476	39.857	161.096	161.096
Communication	SS/CPFF	GA-ASI : Poway, CA	15.976	0.875	Mar 2016	0.171	Mar 2017	0.123	Mar 2018	0.000		0.123	0.191	17.336	17.336
MQ-9 Program Protection Technology Insertion	SS/CPFF	GA-ASI : Poway, CA	39.431	0.000		8.540	Apr 2017	10.268	Apr 2018	0.000		10.268	0.000	58.239	58.239
Reliability and Maintainability	SS/CPFF	GA-ASI : Poway, CA	3.860	0.000		0.969	May 2017	3.194	Jan 2018	0.000		3.194	0.000	8.023	8.023
Completed Efforts	SS/ Various	Various : Various	77.805	0.000		0.000		0.000		0.000		0.000	0.000	77.805	77.805
Miscellaneous Prior	Various	Various : Various	71.556	0.000		0.000		0.000		0.000		0.000	0.000	71.556	71.556
		Subtotal	896.993	109.280		110.538		99.723		0.000		99.723	132.234	1,348.768	1,348.768

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
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*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	Various	Various : Various	18.687	0.402	Jun 2016	0.730	Apr 2017	1.114	Apr 2018	0.000		1.114	1.732	22.665	22.665
		Subtotal	18.687	0.402		0.730		1.114		0.000		1.114	1.732	22.665	22.665

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Costs	Various	Various : Various	43.011	15.013	Dec 2015	9.213	May 2017	18.946	May 2018	0.000		18.946	33.741	119.924	119.924
		Subtotal	43.011	15.013		9.213		18.946		0.000		18.946	33.741	119.924	119.924

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	958.691	124.695		120.481		119.783		0.000		119.783	167.707	1,491.357	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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*

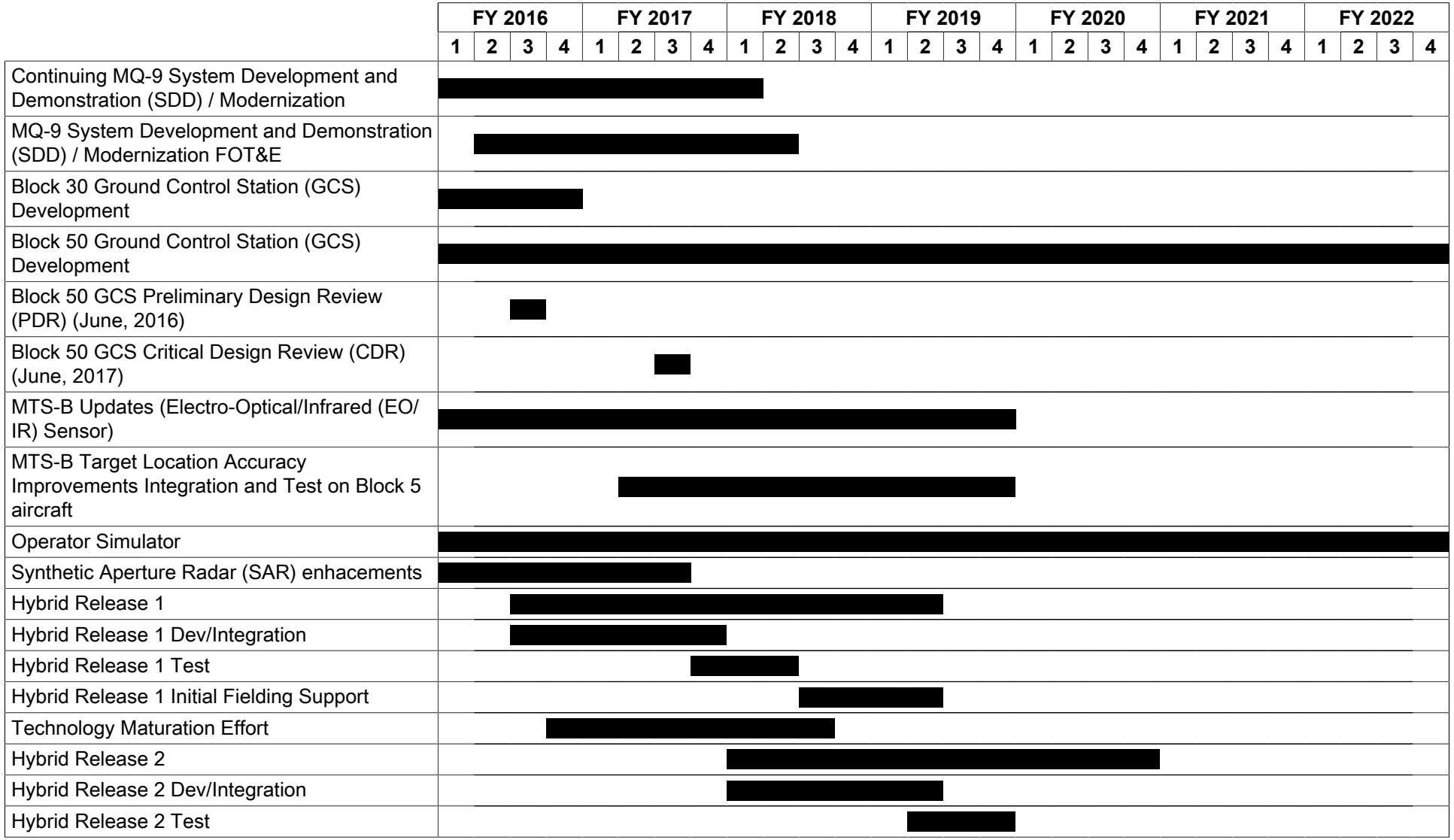

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

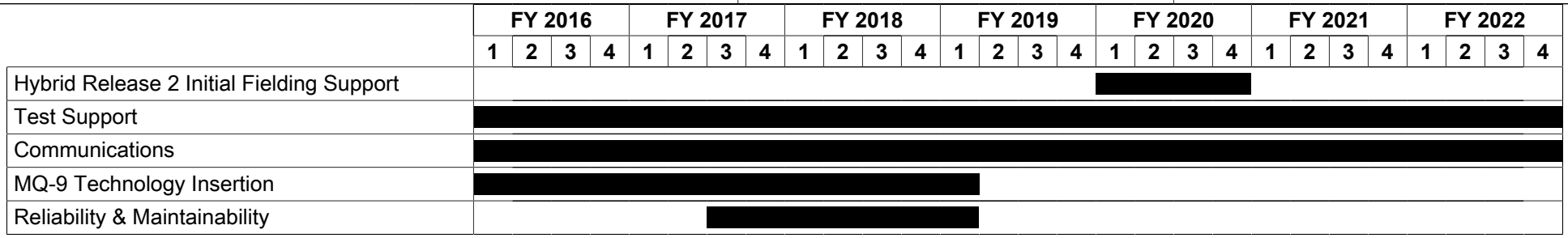

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Continuing MQ-9 System Development and Demonstration (SDD) / Modernization	1	2016	1	2018
MQ-9 System Development and Demonstration (SDD) / Modernization FOT&E	2	2016	2	2018
Block 30 Ground Control Station (GCS) Development	1	2016	4	2016
Block 50 Ground Control Station (GCS) Development	1	2016	4	2022
Block 50 GCS Preliminary Design Review (PDR) (June, 2016)	3	2016	3	2016
Block 50 GCS Critical Design Review (CDR) (June, 2017)	3	2017	3	2017
MTS-B Updates (Electro-Optical/Infrared (EO/IR) Sensor)	1	2016	4	2019
MTS-B Target Location Accuracy Improvements Integration and Test on Block 5 aircraft	2	2017	4	2019
Operator Simulator	1	2016	4	2022
Synthetic Aperture Radar (SAR) enhacements	1	2016	3	2017
Hybrid Release 1	3	2016	2	2019
Hybrid Release 1 Dev/Integration	3	2016	4	2017
Hybrid Release 1 Test	4	2017	2	2018
Hybrid Release 1 Initial Fielding Support	3	2018	2	2019
Technology Maturation Effort	4	2016	3	2018
Hybrid Release 2	1	2018	4	2020
Hybrid Release 2 Dev/Integration	1	2018	2	2019
Hybrid Release 2 Test	2	2019	4	2019
Hybrid Release 2 Initial Fielding Support	1	2020	4	2020
Test Support	1	2016	4	2022
Communications	1	2016	4	2022
MQ-9 Technology Insertion	1	2016	1	2019
Reliability & Maintainability	3	2017	1	2019

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675247: *Squadron Operations Centers (SOC)*	0.000	0.000	0.000	7.264	0.000	7.264	5.795	0.000	0.000	0.000	0.000	13.059
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY18, Squadron Operations Centers (SOC), is a new start.

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 will develop standardized configurations and interfaces, define component standards and develop and stand up a SOC Systems Integration Lab (SIL). This is a FY18 NEW START.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Squadron Operations Center	0.000	0.000	7.264	-	7.264
Description: Development of a Squadron Operations Center (SOC) common to ACC, AFSOC, and 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 2016 Accomplishments: N/A					
FY 2017 Plans: N/A N/A					
FY 2018 Base Plans: - Design and develop Remotely Piloted Aircraft Squadron Operations Center (RPA SOC) capabilities - Preliminary Design Review - Initial hardware purchase for test asset					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Hardware/Software Development					
Accomplishments/Planned Programs Subtotals	0.000	0.000	7.264	-	7.264

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF: BA03: Line Item # 837300: *Base Communications Infrastructure*	0.000	0.000	7.529	0.000	7.529	20.784	3.666	6.006	6.115	0.000	37.617

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 Remote Split Operations (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 Systems Integration Lab will be used to further enhance the program's ability to update future RPA-SOC modernization efforts.

D. Acquisition Strategy

Beginning in FY18, Air Force is centrally managing acquisition for SOC within AFLCMC/WII. As part of that effort, this year will include the development of new capabilities and future upgrades for the SOC. AFLCMC/WII will manage the SOC Program for ACC, AFSOC, and ANG through organic development, and hardware/ software procurement using Air Force and GSA contracts.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 UAV*	Project (Number/Name) 675247 / *Squadron Operations Centers (SOC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RPA SOC Development	Various	402nd SMXG : Robins AFB, GA	0.000	0.000		0.000		7.264	Mar 2018	0.000		7.264	5.795	13.059	-
		Subtotal	0.000	0.000		0.000		7.264		0.000		7.264	5.795	13.059	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		7.264		0.000		7.264	5.795	13.059	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675247 / *Squadron Operations Centers (SOC)*

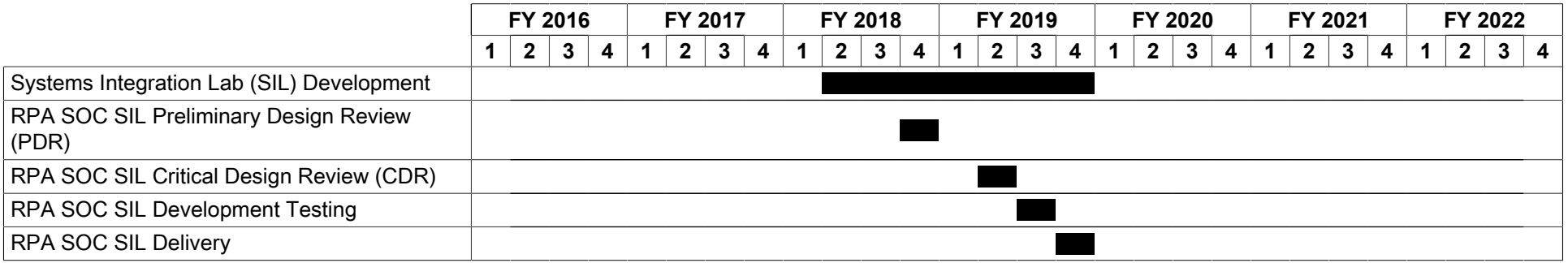

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675247 / *Squadron Operations Centers (SOC)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Systems Integration Lab (SIL) Development	2	2018	4	2019
RPA SOC SIL Preliminary Design Review (PDR)	4	2018	4	2018
RPA SOC SIL Critical Design Review (CDR)	2	2019	2	2019
RPA SOC SIL Development Testing	3	2019	3	2019
RPA SOC SIL Delivery	4	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675249: *MQ-9 Upgrade*	0.000	0.000	30.892	74.347	0.000	74.347	118.846	154.872	151.322	136.562	1,441.162	2,108.003
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Reliability and Maintainability, is a new start.
This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Test Support, is a new start.
This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Communications, is a new start.
This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Urgent Services, is a new start.

A. Mission Description and Budget Item Justification

In FY17, the MQ-9 Upgrade Program was a new start.

The MQ-9 Upgrade Program will develop improvements for existing systems and field new capabilities for the MQ-9 fleet through a Hybrid Acquisition Strategy. The objective is to enable fielding of new hardware and/or software for integration into the MQ-9 fleet on an 18-month schedule. The first two releases are under the auspices of the baseline MQ-9 Development and Fielding program. Candidate Release 3 and 4 upgrades include, but are not limited to, implementing an Autonomous Systems upgrade, upgrading the data links to use the new Bandwidth Efficient Common Data Link (BE-CDL), enhancing Joint Direct Attack Munition (JDAM) and AGM-114 HELLFIRE targeting and employment, integration of new weapons such as Guided Bomb Unit (GBU)-54, and Joint Air-to-Ground Missile (JAGM) implementing the results of the Technology Insertion program, and software updates needed to support new configurations and development. Development efforts will address reliability, maintainability, sustainability, and safety issues. Activities also include 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: MQ-9 Upgrade - Release 3 and Release 4	0.000	30.892	67.663	0.000	67.663
Description: Develop upgrade capabilities to support Releases 3 and 4 of the Hybrid Acquisition 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 (referred to as a Release). New capabilities will include upgrades of existing aircraft, GCS, communication, payload systems, and software updates needed to support new configurations and development as well as the addition of new capabilities and subsystems. Final lists of upgrades included in each release will be determined as part of future Executive Oversight Council direction and inputs from JUONs and UON requests. Formal approval of Release 3 content will be established in					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2018 and is currently subject to fluctuation pending customer priorities. Some current candidates for Release 3 include, but not limited to: • Tech Insertion integration • AGM-114 HELLFIRE enhancements • JAGM Integration • GBU-54 • Auto Take-off and Landing Capability (ATLC) • Software Development to support new capabilities Some current candidates for Release 4 include the following: • Autonomous Systems upgrades • Differential Global Positioning System (GPS) enhancements • Bandwidth Efficient (BE) Common Data Link (CDL) for Command and Control (C2) and Intelligence, Surveillance, and Reconnaissance (ISR) transmission to Ground Control Stations (GCS) • Improved (including BE) Beyond Line of Sight (BLoS) military SATCOM usuage • Will provide Other Government Agency 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 Reliability and Maintainability (R&M) upgrades. • Software Development to support new capabilities ***FY 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** Begin Technology Maturation Effort (TME) developing upgrade capabilities to include, but not limited to: • JAGM Blk 5 • JAGM integration • GBU-54 & integration • Tech Insertion (TI) & TI integration • Auto-lock & integration • Secure Comm & integration • DAS-4 Tos/Training • Tracking Thru Clouds & integration • Software fixes					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
• NCCT • Minotaur • AGM-114 HELLFIRE enhancements • 3 button Mouse • ATLC • BE-CDL • STIG JDAM • M Code • ADS-B • Mode 5 • Block 50 Sync • Link 16 • Next Gen SAR • Block 50 Impr 1 • GPS Jamming • KU Jamming • ER Cross Satellite • NCCT • Formal approval of Release 3 content will be established in FY2018 and is currently subject to fluctuation pending customer priorities • Provide Other Government Agency 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 Reliability and Maintainability (R&M) upgrades. • Software development required to support new capabilities					
FY 2018 Base Plans: Will continue Tech Maturation effort (TME) developing upgrade capabilities to include, but not limited to: • JAGM Blk 5 • JAGM integration • GBU-54 & integration • Tech Insertion (TI) & TI integration • Auto-lock & integration • Secure Comm & integration • DAS-4 Tos/Training					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
• Tracking Thru Clouds & integration • Software fixes • NCCT • Minotaur • AGM-114 HELLFIRE enhancements • 3 button Mouse • ATLC • BE-CDL • STIG JDAM • M Code • ADS-B • Mode 5 • Block 50 Sync • Link 16 • Next Gen SAR • Block 50 Impr 1 • GPS Jamming • KU Jamming • ER Cross Satellite • NCCT • Formal approval of Release 3 content will be established in FY2018 and is currently subject to fluctuation pending customer priorities • Software development required to support new capabilities • Continue providing Other Government Agency 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 Reliability and Maintainability (R&M) upgrades. ***FY 2018 OCO Plans:*** N/A					
Title: MQ-9 Upgrade - Reliability and Maintainability ***Description:*** Develop MQ-9 modification improvements for aircraft and ground base infrastructure. Includes engineering change orders and associated studies and general research ***FY 2018 Base Plans:***	-	-	3.330	-	3.330

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Development of MQ-9 upgrades for aircraft and ground base infrastructure to improve mission capable rates and reduce reliability and maintainability costs.					
Title: MQ-9 Upgrade - Test Support ***Description:*** Develop MQ-9 communications capabilities such as, but not limited to: network systems managers, SATCOM and relay site capabilities upgrades, drafting technical orders (TOs) and support documentation, training materials, production drawings, and retrofit acceptance plans. ***FY 2018 Base Plans:*** Start Test Support	-	-	1.242	-	1.242
Title: MQ-9 Upgrade - Communications ***Description:*** Develop MQ-9 communications capabilities such as, but not limited to: network systems managers, SATCOM and relay site capabilities upgrades, drafting technical orders (TOs) and support documentation, training materials, production drawings, and retrofit acceptance plans. ***FY 2018 Base Plans:*** Development of communications capabilities such as encrypted and improved data links, terminals, command and control, ISR transmissions, GCS communications, SATCOM usage, developm and integrate IP-based network interfaces, improve primary data links and capabilities, network systems managers, drafting technical orders and support documentation, training materials production drawings and retrofit acceptance plans, test and monitor relay equipment, operational durability, enhance remote split operations and supporting communications equipment including associated tech orders, training and interface updates.	-	-	0.188	-	0.188
Title: MQ-9 Upgrade - Urgent Services ***Description:*** Urgent Services, engineering change orders, program office support, studies and general research, and other high level initiatives directed by the Air Force. ***FY 2018 Base Plans:*** Urgent services, engineering change orders, studies and general research, and other higher level initiatives directed by the Air Force	-	-	1.924	-	1.924
Accomplishments/Planned Programs Subtotals	0.000	30.892	74.347	0.000	74.347

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675249 / *MQ-9 Upgrade*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA06 Line Item	5.000	35.650	36.368	0.000	36.368	25.882	26.818	26.846	27.383	0.000	205.209
# PRDTB1: *MQ-9 Spares*											
• APAF: BA05 Line Item	184.051	253.997	264.740	56.400	321.140	382.191	177.759	190.615	163.115	2,682.166	4,812.202
# PRDTB2: *MQ-9 Mods*											

Remarks

D. Acquisition Strategy

This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade, is a new start.

Acquisition of MQ-9 upgrades will initially be accomplished via sole-source contracts with General Atomics-ASI and L-3 Communications, the prime contractors. Management of development and fielding of new capabilities will be through a Hybrid 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 (referred to as a Hybrid Release). This will allow continued baseline improvements while rapidly integrating limited urgent needs fleet-wide.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
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 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MQ-9 Upgrade - Hybrid Release 3 and out	SS/CPFF	GA-ASI : Poway, CA	0.000	0.000		28.937	Aug 2017	60.694	Jun 2018	0.000		60.694	1,567.092	1,656.723	1,656.723
Operator Simulator	SS/CPIF	L3 Comm : Salt Lake City, UT	0.000	0.000		0.000		0.000		0.000		0.000	137.452	137.452	137.452
Reliability and Maintainability	SS/CPFF	GA-ASI : Poway, CA	0.000	0.000		0.000		3.330	Jan 2018	0.000		3.330	38.960	42.290	42.290
Communications	SS/CPFF	GA-ASI : Poway, CA	0.000	0.000		0.000		0.188	Mar 2018	0.000		0.188	2.195	2.383	2.383
Urgent Services	SS/CPFF	GA-ASI : Poway, CA	0.000	0.000		0.000		1.924	Mar 2018	0.000		1.924	22.510	24.434	24.434
		Subtotal	0.000	0.000		28.937		66.136		0.000		66.136	1,768.209	1,863.282	1,863.282

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	Various	Various : Various	0.000	0.000		0.000		1.242	Mar 2018	0.000		1.242	23.565	24.807	24.807
		Subtotal	0.000	0.000		0.000		1.242		0.000		1.242	23.565	24.807	24.807

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Costs	Various	Various : TBD	0.000	0.000		1.955	May 2017	6.969	May 2018	0.000		6.969	197.404	206.328	206.328
		Subtotal	0.000	0.000		1.955		6.969		0.000		6.969	197.404	206.328	206.328

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / *MQ-9 UAV*	Project (Number/Name) 675249 / *MQ-9 Upgrade*	

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		30.892		74.347		0.000		74.347	1,989.178	2,094.417	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675249 / *MQ-9 Upgrade*

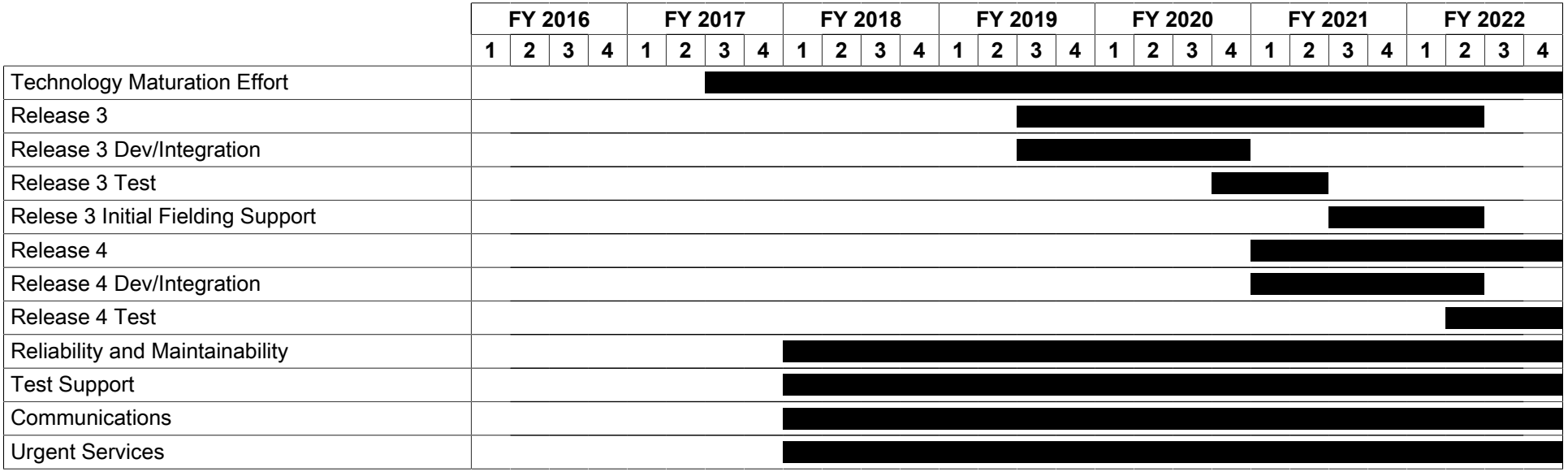

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0205219F / *MQ-9 UAV*	**Project (Number/Name)** 675249 / *MQ-9 Upgrade*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Technology Maturation Effort	3	2017	4	2022
Release 3	3	2019	2	2022
Release 3 Dev/Integration	3	2019	4	2020
Release 3 Test	4	2020	2	2021
Relese 3 Initial Fielding Support	3	2021	2	2022
Release 4	1	2021	4	2022
Release 4 Dev/Integration	1	2021	2	2022
Release 4 Test	2	2022	4	2022
Reliability and Maintainability	1	2018	4	2022
Test Support	1	2018	4	2022
Communications	1	2018	4	2022
Urgent Services	1	2018	4	2022