

**RESEARCH, DEVELOPMENT, TEST, AND EVALUATION**

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ID#	Project#/Name	Description	FY16 Plans	FY16	FY15	FY14	Contractor
			<b>USAF Platform-Specific Funding</b>	<b>123.439</b>			
			<b>SOCOM Platform-Specific Funding</b>	<b>18.151</b>			
			<b>USAF Platform-Relevant Funding</b>	<b>60.335</b>			
	<i>All amounts in millions.</i>						
<b>MQ-9 Platform-Specific RDT&amp;E</b>							
<b>PE 0205219F / MQ-9 UAV</b>		<a href="#">RDTE 4</a>					
	MQ-9 System Development and Demonstration (SDD)	Complete development to meet MQ-9 Capabilities Production Document (CPD) requirements.	Will continue MQ-9 Block 5 Remotely Piloted Aircraft (RPA) system capability development to include: 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	46.372	36.243	31.891	GA-ASI
	Ground Control Station (GCS) Development	Develop Ground Control Station (GCS) capabilities. Major capabilities include payload separation, open system architecture, multi-level security, ergonomic cockpit design, and reducing or eliminating known deficiencies in legacy GCS	Will continue Block 50 design / development, manufacturing and test. Events in FY16 include Software Development and Test, A Critical Design Review and completion of 7 GCS assets.	51.295	37.048	39.977	GA-ASI
	MQ-9 Electro-Optic / Infrared (EO/IR) Sensor	Develop improved Multi-Spectral Targeting System (MTS-B) modes of operation and upgrade full motion video capability to include an all digital architecture employing High-Definition (HD) camera formats, imagery improvements across all multi-spectral bands (color and infrared) and Target Location Accuracy (TLA) enhancements to support future use of coordinate seeking weapons.	Obsolescence management of HD TLA MTS-B system parts. Support final integration and test of all functions of HD TLA MTS-B system on MQ-9 Block 5.	0.367	10.74	0.367	Raytheon
	Operator Simulator	Develop operator simulators for training and updates to keep Operator Simulator current with upgrades to aircraft and Ground Control Station (GCS) to include Joint Urgent Operational Need (JUON) supported emerging Air Force Special Operations Command (AFSOC) configurations.	Will continue to implement updates which will keep the Operator Simulator current with the aircraft and Ground Control Station. These updates will include, but are not limited to, sensor, databases and weapons upgrades.	7.415	11.52	2.046	L-3 Communications
	Synthetic Aperture Radar (SAR) Enhancements	Improvements in MQ-9 capability to disseminate SAR data via a fleet-wide common architecture, improve Ground Moving Target Indicator (GMTI) tracking, automation of data exploitation via Continuous Look Attack Management for Predator (CLAMP) and improvement of GPS targeting.	Continue development and begin integration/test for MQ-9 data dissemination common architecture using dual firewall capability. Continue development for SAR Stationary Targeting Improvements for GPS-based weapons.	2.751	8.513	3.882	GA-RSG

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	Test Support	Provides 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. Air Force Test Center executes Flight Operations Authority responsibilities and provides Combined Test Force support, Edwards AFB controlled airspace range time and assets, test scheduling, frequency management and test related munitions support. Naval Air Warfare Center (NAWC) China Lake provides on-site facilities support, controlled airspace range time, assets, and ground targets for weapons testing. Joint Interoperability Test Command provides standards conformance testing and interoperability certification. NAWC Patuxent River provides Electromagnetic Environmental Effects testing.	Will continue test support.	1.003	2.176	1.565	
	Communications	Develop MQ-9 communications capabilities including encrypted and improved Line of Sight (LoS) data links to ROVER terminals (VORTEX) and Bandwidth Efficient (BE) Common Data Link (CDL) for Command and Control (C2) and Intelligence, Surveillance, and Reconnaissance (ISR) transmission to Ground Control Stations (GCS), as well as improved (including BE) Beyond LoS (BLOS) military SATCOM usage.	Will continue the development of Fixed Site Satellite Terminal (FSST) and Satellite Earth Terminal SubSystem (SETSS) and relay site equipment, TO development, BE-CDL and BE-SATCOM development, RSO TO development, training course development, logistics support analysis, and IP-base network equipment development.	0.953	3.42	2.269	GA-ASI
	Multi-aircraft Transit Operations (MTO)	Multi-aircraft transit operation is to develop a core functionality to enable one pilot to safely control multiple RPA in non-segregated airspace on an instrument flight rules (IFR) flight plan between airfield and mission area(s)	Will continue development of multi-aircraft operations engineering prototype to flight testable system; complete systems engineering artifacts and transition to acquisition program of record.	1.638	3.846	1.327	GA-ASI
	MQ-9 Technology Insertion	Develop program protection Technology Insertion capabilities and functionality for the MQ-9 Weapon System.	Will continue development of program protection Technology Insertion capabilities and functionality for the MQ-9 Weapon System including aircraft, sensors, and Ground Control Station documentation and drawings.	11.645	18.555	3.731	GA-ASI
			<b>Total</b>	<b>123.439</b>			
<b>PRIOR YEARS RDT&amp;E FOR MQ-9</b>							
	Counter-IED Development and Demonstration	Adding "Step Stare" (converts motion video imagery into still frame imagery for change detection analysis) mode capability to the MTS-B EO/IR sensor; also includes associated GCS development and testing.				3.53	
	Reliability and Maintainability	Develop MQ-9 modification improvements for aircraft and ground base infrastructure.			1.118		
	Extended Range	Develop Extended Range capability to increase operational range and endurance of the baseline MQ-9.			15.422	8.387	
	Urgent Services	Urgent services, engineering change orders, program office support, studies and general research, and other higher level initiatives directed by the Air Force.				4.795	
	Afghan Enablers Development	Support Joint Urgent Operational Need (JUON) requirements to rapidly field sensor cross cue (slew-to-cue) functionality to improve track through clouds capability, advanced weapons, and high definition full motion video.				0.537	

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<b>MQ-9 Relevant RDT&amp;E</b>							
PE 0604233F / Specialized Undergraduate Flight Training	Predator Reaper Integrated Mission Environment (PRIME) support	Supports Air Education and Training Command's (AETC) implementation of Undergraduate Remotely Piloted Aircraft (RPA) Training (URT). URT produces RPA pilots and Sensor Operators from accession sources to man RPA squadrons.	In FY2016 Project 674101 Undergraduate Remotely Piloted Aircraft Training includes a new start effort for Remotely Piloted Aircraft (RPA) Predator Reaper Integrated Mission Environment (PRIME) Desktop Training System (DTS).	0.72			
PE 0305206F / Airborne Reconnaissance Systems	Common-Airborne Sense and Avoid (C-ABSAA)	C-ABSAA is an analysis and developmental effort in the pre-Material Development Decision phase of the acquisition lifecycle which supports emerging warfighter requirements to fully integrate Group 4-5 RPA into the National Airspace System (NAS), international airspace, other nations' sovereign airspace, and operational combat airspace to conduct the entire range of military operations across all mission environments.	- Will continue to support Air Combat Command with Analysis of Alternatives study. - Will continue to collaborate with FAA and NASA on national policy and standards, and to build and exercise modeling and simulation capabilities to support requirements, policy/standards, and technology development. - Will continue SAA science and technology research and development with the AFRL.	19.735			
PE 0602202F / Human Effectiveness Applied Research	<a href="#">Human Role in Semiautonomous Systems</a>	Research new control/display concepts and technologies (e.g., information portrayal, control devices, decisionaiding algorithms). Identify best design to direct operator attention.	Integrate the current states of the platform, mission, environment, and airman operator into a global state database. Develop guidelines for interface design based upon computational problem solving method. Investigate ways to represent autonomous system competency against the current task/situation. Explore airman-autonomy teaming methods and metrics for Air Force applications. Perform advanced simulation of adjustable and adaptive automation to support flexible control of autonomous systems depending on mission and environmental context.	6.062	5.58	5.923	
PE 0602203F / Aerospace Propulsion	Missile and Remotely Piloted Aircraft Engine Technologies	Develop limited life engine components for missile and remotely piloted aircraft (RPA) applications, including longrange supersonic and hypersonic vehicles.	Complete development of advanced modeling and simulation tools for variable cycle component design, advanced cooling concepts, compact augmentors, and composite structures. Continue to demonstrate advanced component designs in rig testing. Utilize validation data to develop improved test protocol for small engine augmentor designs.	5.054	4.541	3.814	
PE 0603456F / Human Effectiveness Advanced Technology Development	Human Role in Semiautonomous Systems	Develop and demonstrate an integrated human-centered interface to control multiple RPAs that have various levels of autonomy and that optimize network-centric information flow.	Foster advancements in the design, demonstration, and evaluation of novel airman interface designs that support decisionmaking and situation awareness while controlling multiple RPAs in a highly dynamic mission environment.	1.58	1.766	1.972	
PE 0304260F / Airborne SIGINT Enterprise	Special Programs (Airborne SIGINT Development - Special Platforms)	This project supports special Signals Intelligence (SIGINT) studies as well as the development and integration of advanced SIGINT capabilities for special programs including, but not limited to: Quick Reaction Capability (QRC) sensors, the Processing, Exploitation, and Dissemination (PED) associated with these systems, and other efforts approved by the USAF SIGINT Capabilities Working Group (SCWG).	Continue to modernize SIGINT systems on the MQ-1B/9A RPA	2.93	2.222		

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PE 0603211F / Aerospace Technology Dev/ Demo	Flight Systems Control	This program integrates and demonstrates advanced control technologies that improve the performance, reliability, safety, and survivability of existing and future, manned and unmanned, aerospace systems.	Further development and demonstration of technologies for situational awareness, autonomous control, and survivability for unmanned systems and manned platforms. Continue demonstration of autonomous and safe airspace interoperability for manned and remotely piloted aircraft systems. Continue development and demonstration of airborne control of teams of unmanned aircraft. Complete development and demonstration of improved accuracy, situational awareness, and safety for air drop operations.	24.254	18.375		
			<b>Total</b>	<b>60.335</b>			
<b>SOCOM RDT&amp;E</b>							
PE 1105219BB / MQ-9 Unmanned Aerial Vehicle (UAV)	S851: MQ-9 Unmanned Aerial Vehicle (UAV)	This project identifies, develops, integrates, and tests Special Operations Forces (SOF) - unique mission kits, mission payloads, weapons, and modifications on MQ-9 Unmanned Aerial Vehicles (UAVs), ground control stations, and training systems.	Develops, tests, and integrates SOF-unique mission kits, mission payloads, weapons and modifications on MQ-9 UAVs, ground control stations, and training systems.	18.151	14.902	13.272	GENERAL ATOMICS
<b>Missile Defense Agency RDT&amp;E</b>							
PE 0603177C / Discrimination Se		In FY 2016, the Discrimination Sensor Technology program element (PE) will complete technology demonstration of real time stereo tracking with Multi-Spectral Targeting System Cs (MTS-Cs) to meet Aegis Launch-on-Remote (LoR) quality of service performance.	<ul style="list-style-type: none"> <li>- Complete Multi-Spectral Targeting System - C (MTS-performance):</li> <li>-- Conduct Continental United States (CONUS) checko characterization and confirm system readiness in prep</li> <li>-- Conduct MTS-C CTV-02+ pre and post-test perform</li> <li>-- Analyze BMDS test data to verify demonstration of q</li> <li>-- Analyze airborne sensor BMDS test data to demonst</li> <li>- Configure an Extended Range MQ-9 Reaper with an Outside Continental United States (OCONUS) enduran</li> <li>- Partner with the Air Force to characterize MTS perfor</li> </ul>	28.2	34.535	29.523	