Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Office of the Secretary Of Defense	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	100.000	100.000	99.333	0.000	99.333	101.246	103.277	105.298	107.338	Continuing	Continuing
638: *Rapid Prototyping Program*	0.000	0.000	100.000	99.333	0.000	99.333	101.246	103.277	105.298	107.338	Continuing	Continuing
639: *Rapid Prototyping Program - Congressional Add*	0.000	100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.000

Note

The Rapid Prototyping Program is a new effort in FY 2018. To accelerate delivery to the warfighter, Congress provided additional funding in FY 2017 above the President's Budget Request, as indicated in project code 639.

A. Mission Description and Budget Item Justification

The Rapid Prototyping Program (RPP) develops prototypes that deliver needed capabilities, reduce technical and integration risk, and produce warfighter feedback leading to improved requirements and technology upgrades for programs of record. RPP project selection is guided by the priorities of the Department of Defense, the Office of the Under Secretary of Defense for Research and Engineering, the Chairman's Gap Assessment, and Service-identified gaps and needs. RPP rapidly develops and fields cross-cutting prototype capabilities that can be demonstrated in an operational environment to inform Department of Defense and Service leadership.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	100.000	100.000	0.000	100.000
Current President's Budget	100.000	100.000	99.333	0.000	99.333
Total Adjustments	100.000	0.000	-0.667	0.000	-0.667
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	100.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Economic Assumption	-	-	-0.667	-	-0.667

Change Summary Explanation

To accelerate delivery of Rapid Prototyping Program capabilities, Congress provided additional funding in FY 2017 above the President's Budget Request.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / *Rapid Prototyping Program*	Project (Number/Name) 638 / *Rapid Prototyping Program*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
638: *Rapid Prototyping Program*	0.000	0.000	100.000	99.333	0.000	99.333	101.246	103.277	105.298	107.338	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program develops prototypes to deliver capabilities, reduce risk, and inform requirements. RPP facilitates and accelerates joint, cross-cutting prototyping efforts for the Services and Defense Agencies. Funding in this project includes focus areas that enable the new Under Secretary of Defense for Research and Engineering (USD(R&E)) to anticipate and respond to emergent Service and Agency issues and time-sensitive threats by selecting projects within the year of execution. RPP focus areas include artificial intelligence; autonomy; directed energy; electronic warfare; intelligence, surveillance and reconnaissance (ISR) and counter-ISR; force projection; and countering dynamic threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: Artificial Intelligence (AI) Technologies Focus Area	0.000	7.000	7.000
Description: This focus area leverages joint prototyping capabilities and key AI technologies to enable increased situational awareness and faster reaction time. Prototype technologies will advance capabilities such as cognitive performance, object discrimination, and interactive task learning. Specific activities include algorithm development, machine learning transfer, and cognitive architecture and modeling. These prototype capabilities will reduce technical and integration risk and provide joint cross-cutting value to the warfighter. A cross functional team, led by the Office of the Under Secretary of Defense for Research and Engineering, will review and select prototyping proposals from across the Department of Defense in the year of execution. ***FY 2018 Plans:*** Selected RPP prototype projects are anticipated to start in FY 2018. RPP will support one to two AI technology prototyping projects in FY 2018. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. The projects will provide new capabilities, reduce risk, and inform future requirements. ***FY 2019 Plans:*** RPP anticipates supporting one to two AI projects in FY 2019. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation.			
Title: Autonomy Technologies Focus Area	0.000	7.000	7.000
Description: This focus area explores advances in autonomy technology to develop prototypes that enable more effective man-machine teaming and collaboration; use of autonomous systems in complex urban environments; and low-cost, scalable autonomous assets to defeat threats. Prototype technologies will advance capabilities such as scalable autonomous behavior, collaborative actions between autonomous systems, human-above the loop control, and hardware for next-generation			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 638 / *Rapid Prototyping Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
autonomous systems. Specific activities include autonomy algorithm development, modeling and design, and experimentation and evaluation of autonomy systems. These prototype capabilities will reduce technical and integration risk and provide joint cross-cutting value to the warfighter. A cross functional team, led by the Office of the Under Secretary of Defense for Research and Engineering, will review and select prototyping proposals from across the Department of Defense in the year of execution. ***FY 2018 Plans:*** Selected RPP prototype projects are anticipated to start in FY 2018. RPP will support one to two autonomy prototype projects in FY 2018. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. The projects will provide new capabilities, reduce risk, and inform future requirements. ***FY 2019 Plans:*** RPP anticipates supporting one to two autonomy projects in FY 2019. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation.			
Title: Directed Energy (DE) Technologies Focus Area ***Description:*** This focus area matures key technologies through rapid prototyping to develop DE capabilities while informing concept-of-operations (CONOPS) for operational use. DE weapons provide the warfighter with scalable, targeted, and precision engagement while minimizing collateral damage. This focus area will prototype advanced technologies required to enable the broad employment of DE technologies across the joint force. Example technologies include compact, efficient energy generation, energy storage, and thermal management technologies; high efficiency laser diodes; advanced manufacturing and fabrication techniques; and, robust beam control technologies. Specific activities include effects testing to quantify target susceptibility to DE; development, testing, and optimization of DE subsystems; and, integration of weapon prototypes. These prototyping activities will enable faster transition of DE technologies to the warfighter by reducing technical risk, informing joint force CONOPS, and demonstrating the capability DE provides to the warfighter. A cross functional team, led by the Office of the Under Secretary of Defense for Research and Engineering, will review and select prototyping proposals from across the Department of Defense in the year of execution. ***FY 2018 Plans:*** Selected RPP prototype projects are anticipated to start in FY 2018. RPP will support one to two DE prototype projects in FY 2018. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. The projects will provide new capabilities, reduce risk, and inform future requirements. ***FY 2019 Plans:***	0.000	21.000	20.400

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 638 / *Rapid Prototyping Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
RPP anticipates supporting one to two DE projects in FY 2019. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2018 and FY 2019 are funded for a similar level of effort in this focus area. Minor changes are due to small internal baseline adjustments.			
Title: Electronic Warfare (EW) Technologies Focus Area ***Description:*** This focus area develops new concepts and key technologies to improve the ability to detect, locate, and classify electronic threats; deter electronic attacks targeting military operations; defeat electronic attacks using kinetic and non-kinetic methods; and, create electromagnetic interference effects on enemy systems. Prototype technologies will advance capabilities like air and ground electronic support (ES) and electronic attack (EA), tactical EW systems, and EW mission command systems. Specific activities include development and testing of electronic protection systems, distributed and coordinated ES/EA systems, broadband radio frequency components and systems, and EW analysis support systems. These prototype capabilities will reduce technical and integration risk and provide joint cross-cutting value to the warfighter. A cross functional team, led by the Office of the Under Secretary of Defense for Research and Engineering, will review and select prototyping proposals from across the Department of Defense in the year of execution. ***FY 2018 Plans:*** Selected RPP prototype projects are anticipated to start in FY 2018. RPP will support one to two EW prototype projects in FY 2018. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. The projects will provide new capabilities, reduce risk, and inform future requirements. ***FY 2019 Plans:*** RPP anticipates supporting one to two EW projects in FY 2019. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2018 and FY 2019 are funded for a similar level of effort in this focus area. Minor changes are due to small internal baseline adjustments.	0.000	19.000	18.993
Title: Intelligence, Surveillance, and Reconnaissance (ISR) and Counter-ISR Technologies Focus Area ***Description:*** This focus area explores joint prototypes and concept-of-operations for long range ISR capabilities while deterring the adversary's ISR capabilities. Developed prototypes will improve situational awareness; indications and warnings; threat detection; and, inform tactical and strategic decisions. Counter-ISR capabilities will prevent or disrupt the adversary's ability to detect, track, localize, and engage our forces. Specific activities include design and development of interoperable ISR	0.000	17.000	16.940

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 638 / *Rapid Prototyping Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
system architectures; vulnerability analysis and exploitation; advanced sensors; anti-jam antenna systems; materials with novel electromagnetic properties; on-board processing; fusion of intelligence data; and, platform integration testing. These prototype capabilities will reduce technical and integration risk and provide joint cross-cutting value to the warfighter. A cross functional team, led by the Office of the Under Secretary of Defense for Research and Engineering, will review and select prototyping proposals from across the Department of Defense in the year of execution. ***FY 2018 Plans:*** Selected RPP prototype projects are anticipated to start in FY 2018. RPP will support one to two ISR and counter-ISR prototype projects in FY 2018. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. The projects will provide new capabilities, reduce risk, and inform future requirements. ***FY 2019 Plans:*** RPP anticipates supporting one to two ISR and counter-ISR projects in FY 2019. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2018 and FY 2019 are funded for a similar level of effort in this focus area. Minor changes are due to small internal baseline adjustments.			
Title: Force Projection Technologies Focus Area ***Description:*** This focus area matures joint prototypes to maintain U.S. dominance in the air, space, and ground domains; rapidly and precisely defeat foreign threats; and maintain a decisive conventional force. Prototype technologies will advance capabilities in long range weapons; kinetic and non-kinetic precision weapons; novel delivery systems and weapon effects; and, countermeasure mitigation. Specific activities include weapon development, effects testing, CONOPS experimentation, and scalable lethality based on target characterization. These prototype capabilities will reduce technical and integration risk and provide joint cross-cutting value to the warfighter. A cross functional team, led by the Office of the Under Secretary of Defense for Research and Engineering, will review and select prototyping proposals from across the Department of Defense in the year of execution. ***FY 2018 Plans:*** Selected RPP prototype projects are anticipated to start in FY 2018. RPP will support one to two weapon prototype projects in FY 2018. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. The projects will provide new capabilities, reduce risk, and inform future requirements. ***FY 2019 Plans:***	0.000	15.000	15.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 638 / *Rapid Prototyping Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
RPP anticipates supporting one to two weapon projects in FY 2019. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation.			
Title: Prototyping for Countering Dynamic Threats Technologies Focus Area ***Description:*** This focus area enables experimentation and red teaming to evaluate emerging capabilities against dynamic threats. Projects enable the warfighter to identify technical and operational deficiencies; rapidly identify and characterize new threats; explore emerging and novel attack capabilities; and, improve warfighter readiness. Prototypes explore advanced capabilities to conduct dynamic attacks on military operations with artificial intelligence, autonomy, directed energy, electronic warfare, and kinetic systems. Specific activities include evaluating advanced attack or penetration systems; developing and replicating adversary techniques and procedures; using effective simulation and modeling; and, identifying mitigation strategies. These prototype capabilities will reduce technical and integration risk and provide joint cross-cutting value to the warfighter. A cross functional team, led by the Office of the Under Secretary of Defense for Research and Engineering, will review and select prototyping proposals from across the Department of Defense in the year of execution. ***FY 2018 Plans:*** Selected RPP prototype projects are anticipated to start in FY 2018. RPP will support one to two dynamic threat prototype projects in FY 2018. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation. The projects will provide new capabilities, reduce risk, and inform future requirements. ***FY 2019 Plans:*** RPP anticipates supporting one to two dynamic threat projects in FY 2019. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation.	0.000	14.000	14.000
Accomplishments/Planned Programs Subtotals	0.000	100.000	99.333

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 638 / *Rapid Prototyping Program*

E. Performance Metrics

RPP performance metrics are specific to each effort and include measures identified in the specific project plans. In addition, project completions and successes are monitored against schedules and deliverables stated in the execution documents. The ultimate measure of success is adoption and transition of RPP capabilities by the Services and supporting entities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 638 / *Rapid Prototyping Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
VARIOUS	MIPR	MULTI : MULTI	0.000	-		100.000		99.333		-		99.333	Continuing	Continuing	-
		Subtotal	0.000	-		100.000		99.333		-		99.333	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		100.000		99.333		-		99.333	Continuing	Continuing	N/A

Remarks

NA

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 638 / *Rapid Prototyping Program*

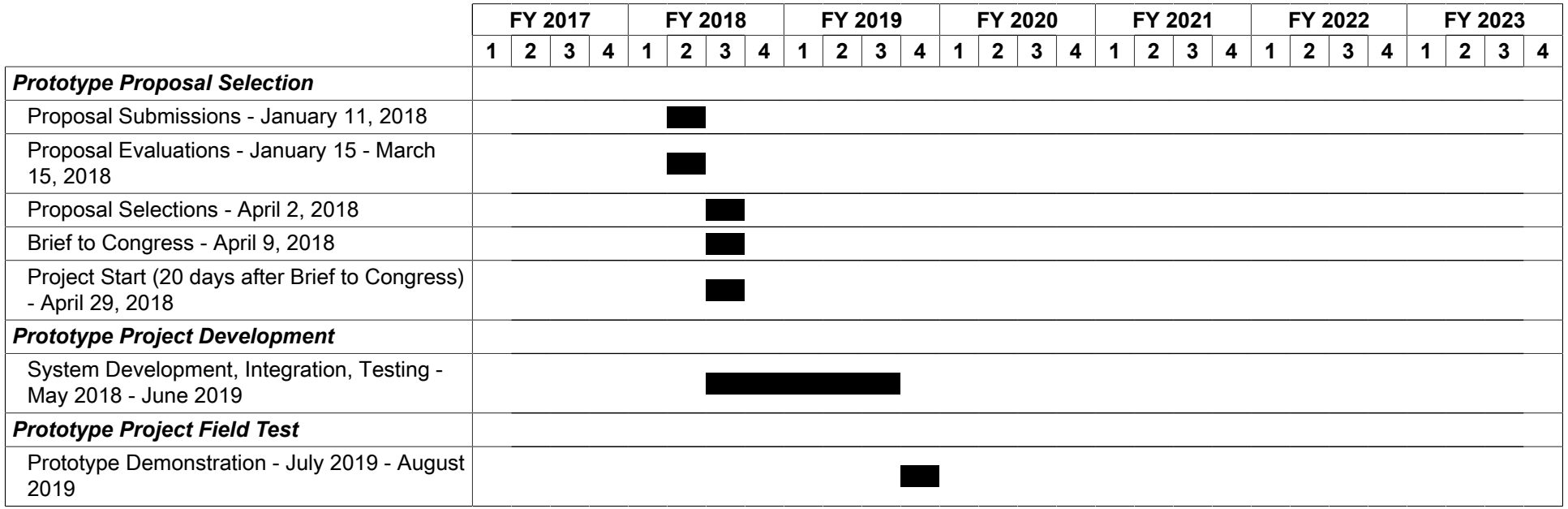

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 638 / *Rapid Prototyping Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Prototype Proposal Selection				
Proposal Submissions - January 11, 2018	2	2018	2	2018
Proposal Evaluations - January 15 - March 15, 2018	2	2018	2	2018
Proposal Selections - April 2, 2018	3	2018	3	2018
Brief to Congress - April 9, 2018	3	2018	3	2018
Project Start (20 days after Brief to Congress) - April 29, 2018	3	2018	3	2018
Prototype Project Development				
System Development, Integration, Testing - May 2018 - June 2019	3	2018	3	2019
Prototype Project Field Test				
Prototype Demonstration - July 2019 - August 2019	4	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / *Rapid Prototyping Program*	Project (Number/Name) 639 / *Rapid Prototyping Program - Congressional Add*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
639: *Rapid Prototyping Program - Congressional Add*	0.000	100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

To accelerate delivery of Rapid Prototyping Program (RPP) capabilities, Congress provided additional funding in FY 2017 above the President's Budget Request. In FY 2017, RPP funded eight Service and Defense Agency selected projects under project 639. Focus areas for future RPP projects are included in project 638.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: Electronic Warfare (EW) ***Description:*** This is a twelve month project that developed and demonstrated prototypes to address emerging Service challenges resulting from the increasingly congested and contested electromagnetic spectrum (EMS) battlespace. The EW project prototyped seven coordinated capabilities to expand the Army toolset, extend EW capabilities to lower echelons of troops, and address priority operational needs. These capabilities include enhanced mobility for terrestrial signals intelligence (SIGINT), aerial and ground tactical EW systems, radio frequency interference mitigation, EW common visualization and planning tools, improved direction finding, and distributed dismounted EW systems. Each of these technologies were tested in individual and integrated technical assessments with warfighter participation. The prototypes leveraged partners from Army, Marine Corps, Air Force, and industry. Using FY 2017 funding, the capabilities individually transitioned to several programs of record in FY 2018 including Prophet; Terrestrial Layer Support (TLS) to Multi-Domain Battle/Joint Combined Arms Maneuver; Multi-Function Electronic Warfare Air-Large; and, EW Planning and Management Tool.	22.601	-	-
Title: Position, Navigation, and Timing (PNT) ***Description:*** This twelve month project integrated commercial-off-the-shelf (COTS) technologies to provide PNT assurance by using emerging technologies for operations in a global positioning system (GPS) challenged environment. Current Army systems lack a common, integrated PNT capability to enable free maneuver in an anti-assess/area denial (A2/AD) environment. The PNT prototype system uses an enhanced defense GPS receiver (DAGR) device (ED3) with a chip-scale atomic clock (CSAC) accessory module to integrate multiple global navigation satellite system (GNSS) receivers; an embedded chip-scale atomic clock for independent timing; and, a native inertial navigation unit (INU) to provide a cross-checking reference signal. The project developed platform-specific interfaces to integrate these COTS systems into the Abrams, Bradley, Paladin, and Stryker tactical vehicle platforms. Using FY 2017 funds, additional platform integration, safety testing, technical assessment, and operational demonstrations with the warfighter will be completed in FY 2018. The PNT prototype system and demonstrations informed senior	12.523	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 639 / *Rapid Prototyping Program - Congressional Add*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Army leadership and transitioned to the Army PM PNT portfolio; Assured PNT, Mounted; and, Anti-Jam Antenna System (AJAS) programs of record.			
Title: Passive Wide-Area Detection of Small Unmanned Aerial Systems (sUAS) ***Description:*** This twelve month project developed and prototyped a counter-UAS capability to automatically detect, track, and classify targets; and, provided threat alerts indicating small unmanned aerial systems (sUAS) in complex land and shipboard environments. The counter sUAS system integrated an all-passive sensor suite including acoustic sensors, wide-area electro-optical (EO) and infrared (IR) cameras, and high-speed EO and IR inspection cameras. This prototype capability was developed to address shortfalls in the ability of currently deployed counter-UAS systems to detect emerging classes of targets. The project also developed an open architecture fusion engine that correlates and classifies threats to alert an operator to sUAS incursions more rapidly than current systems. Using FY 2017 funding, the prototype system was demonstrated against Class 1 and 2 UASs in a variety of operational environments in FY 2018. This project directly supports a U.S. Strategic Command Joint Emerging Operational Need and a U.S. Central Command Joint Urgent Operational Need. After a successful demonstration, the capability will transition to the Service and joint rapid capability fielding programs in support of multiple counter-sUAS efforts.	4.600	-	-
Title: Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2) ***Description:*** This twelve month effort prototyped and demonstrated capabilities to enable U.S. Marine Corps 21st century maneuver in complex terrain and contested littoral environments. Prior to S2ME2, the Marine Corps did not have the equipment, training, or concept-of-operations (CONOPS) to operate in the increasingly non-permissive maritime domain. This effort matured and demonstrated a subset of technologies identified in the S2ME2 2017 Advanced Naval Technology Exercise, which were validated at the Bold Alligator and Dawn Blitz 2017 exercises. Specifically, S2ME2 focused on seven technology thrusts with disruptive potential: 1) Long Range Littoral Reconnaissance: Unmanned capabilities to safely increase the reach and situational awareness of individual Marines; 2) Unmanned Intelligence, Surveillance, Reconnaissance, and Targeting (ISR-T): Maturation of an existing commercial vertical takeoff and landing aircraft for shipboard operations; 3) Unmanned Fire Support: Precision fire support with autonomous magazines deployed from off shore staging forces; 4) Coalition Tactical Awareness and Response (CTAR): Extension of commercial satellite services to the Regiment level; 5) Fourth Generation Long Term Evolution (4GLTE) Long Range Communications: Modified commercial technology to provide ship-to-ship high bandwidth communications; 6) Global Positioning System (GPS) Anti-jam Steerable Parasitic Array: A novel, low size, weight, power, and cost GPS antenna array with the ability to null jammers; and 7) Low Probability of Intercept/Low Probability of Detection/Anti-Jam Communications: Replacement of omni-directional communications with tracked and targeted communication links. For each thrust, S2ME2 investigated emerging and mature government and commercial technologies; developed requirements; integrated technologies on operational systems for relevant demonstrations; explored improved CONOPS; and, informed senior Navy and Marine Corps	7.076	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 639 / *Rapid Prototyping Program - Congressional Add*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
leadership on future procurement and training needs. Following a series of live tests and field demonstrations, the S2ME2 project transitioned to the U.S. Navy and Marine Corps.			
Title: High Power Microwave (HPM) for Air Base Air Defense ***Description:*** This twelve month project leveraged Air Force Research Laboratory experimentation to rapidly prototype an advanced High Power Microwave (HPM) capability. Two HPM prototypes were developed to demonstrate stand-off, non-kinetic defeat of enemy unmanned aerial systems (UAS) and missiles. The Tactical HPM Operational Responder (THOR) counter-UAS prototype provides an ability to address autonomous UAS swarms as part of an integrated base air defense. The second HPM prototype, Counter Cruise Missile Extended Range Air Base Air Defense (ABAD), is designed to deliver sufficient power levels to negate cruise missile threats. Both systems provide a low cost per shot and a deep magazine. The HPM for ABAD project conducted risk mitigation for both prototype systems optimizing size, weight, and power; developed hardware and software solutions to increase lethality; validated desired effects; and, integrated subsystems for demonstration. The two prototypes were technically and operationally assessed at multiple facilities with military operators. The HPM prototypes will transition to the Air Force and Navy and will provide capabilities to the U.S. Pacific Command and U.S. Strategic Command.	26.000	-	-
Title: Open Mission Systems Contribution for Next-Generation Architectures (OCNA) ***Description:*** This is a twenty-four month project that combined open systems architecture standards; on-board, high-speed data communications with shared apertures; and shared processing to enable the rapid integration and fielding of new cutting-edge warfighting capabilities. Open Mission Systems (OMS) is a non-proprietary, open standard that allows rapid integration of new capabilities and reduces vendor lock. This project conducted research, development, and experimentation to expand OMS for next generation military capabilities. In FY 2017, the project designed on-board, high-speed data communications and conducted a lab demonstration of representative OMS services using a government reference software. Leveraging FY 2017 funds, the project continues to mature this capability through FY 2020, leading to a flight demonstration of on-board, high-speed data communications, together with OMS-compliant advanced services including timing, sensing, and communication. The demonstrated capability will transition to multiple classified programs and support the Air Force Life Cycle Management Center.	10.000	-	-
Title: Army Navy/Transportable Radar Surveillance and Control Model 2 (AN/TPY-2) Adjunct Sensor Prototype (ADJ-P) for Hypersonic Glide Defense (HGD) ***Description:*** This an eighteen month project that developed and integrated a Phase 1 and Phase 2 configuration of an ADJ-P for HGD to increase the effectiveness of the TYP-2 radar system. The ADJ-P uses the X-band frequency, enabling a threat track quality comparable to the existing AN/TPY-2 radars. The Phase 1 configuration included hardware, firmware, and software enhancements that were tested in a scaled environment to prove operational relevancy. The Phase 2 configuration integrated additional enhancements to the ADJ-P including a high power transmitter and improved threat track software. With FY 2017	12.000	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 639 / *Rapid Prototyping Program - Congressional Add*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
funding, the ADJ-P completed design reviews in FY 2018 and will conduct testing and demonstrations for both the Phase 1 and Phase 2 configurations in FY 2019. The findings from these demonstrations will inform senior leadership and proven capabilities will transition to the Missile Defense Agency AN/TPY-2 Program of Record.			
Title: Mission Rehearsal Trainer (MRT) ***Description:*** MTR is a twenty-four month effort that developed distributed learning and training system that trains, prepares, and increases the performance of personnel in the Time Sensitive Targeting cell (TSTC). MTR is a scenario-driven training system that enables an instructor to improve the speed and proficiency of target intelligence officers through realistic scenarios of increasing complexity. The MRT project developed hardware hosted on the U.S. Pacific Command Joint Intel Operations Center (U.S. PACOM JIOC) and expanded a current intelligence surveillance and reconnaissance (ISR) training system employed at Massachusetts Institute for Technology (MIT) Lincoln Laboratory (LL). With FY 2017 funds, the MRT system was technically assessed and demonstrated in FY 2018 with intel operators and instructors using real world scenarios, while also validating training scenarios specifically desired by the USPACOM JIOC TSTC. The MTR reached initial operational capability at the U.S. PACOM JIOC TSTC and transitioned to U.S. PACOM JIOC. MTR was developed to support U.S. PACOM's JIOC TSTC cell specific training needs, but the capability is extensible to the TST cells in other Combatant Commands. After full operational capability is achieved in FY 2019, the Mission Rehearsal Trainer will transition to U.S. Pacific Command for operational use.	5.200	-	-
Accomplishments/Planned Programs Subtotals	100.000	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

RPP performance metrics are specific to each effort and include measures identified in the specific project plans. In addition, project completions and successes are monitored against schedules and deliverables stated in the execution documents. The ultimate measure of success is adoption and transition of RPP capabilities by the Services and supporting entities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 639 / *Rapid Prototyping Program - Congressional Add*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Electronic Warfare (EW)	MIPR	U.S. Air Force Research Laboratory (AFRL) : NY (4 MIPRs)	-	5.403	Nov 2017	-		-		-		-	0.000	5.403	-
Electronic Warfare (EW)	MIPR	U.S. Army Product Manager Electronic Warfare & Cyber : MD (7 MIPRs)	-	10.437	Dec 2017	-		-		-		-	0.000	10.437	-
Electronic Warfare (EW)	MIPR	Naval Sea Systems Command (NAVSEA) : DC (1 MIPR)	-	0.500	Dec 2017	-		-		-		-	0.000	0.500	-
Electronic Warfare (EW)	MIPR	U.S. Army Communications-Electronics RD&E Center (CERDEC) : VA (1 MIPR)	-	3.200	Nov 2017	-		-		-		-	0.000	3.200	-
Electronic Warfare (EW)	MIPR	U.S. Army Research, Development and Engineering Command (RDECOM) : MA (1 MIPR)	-	0.100	Dec 2017	-		-		-		-	0.000	0.100	-
Electronic Warfare (EW)	MIPR	U.S. Army S&T Communications Directorate : MD (2 MIPRs)	-	2.961	Dec 2017	-		-		-		-	0.000	2.961	-
Position, Navigation, and Timing (PNT)	MIPR	U.S. Army Program Manager Position, Navigation, and Timing (PNT) : MD (1 MIPR)	-	2.813	Dec 2017	-		-		-		-	0.000	2.813	-
Position, Navigation, and Timing (PNT)	MIPR	U.S. Army Program Manager Position, Navigation, and	-	4.643	Dec 2017	-		-		-		-	0.000	4.643	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Timing (PNT) Part I : MD (1 MIPR)													
Position, Navigation, and Timing (PNT)	MIPR	U.S. Army Program Manager Position, Navigation, and Timing (PNT) Part II : MD (1 MIPR)	-	3.231	Dec 2017	-		-		-		-	0.000	3.231	-
Position, Navigation, and Timing (PNT)	MIPR	U.S. Army Program Manager Position, Navigation, and Timing (PNT) Part III : MD (1 MIPR)	-	0.498	Dec 2017	-		-		-		-	0.000	0.498	-
Position, Navigation, and Timing (PNT)	IA	Department of Energy (Savannah River Operations) : SC (1 MIPR)	-	1.338	Jan 2018	-		-		-		-	0.000	1.338	-
Passive Wide-Area Detection of Small Unmanned Aerial Systems (sUAS)	MIPR	Naval Undersea Warfare Center : WA (2 MIPRs)	-	0.880	Nov 2017	-		-		-		-	0.000	0.880	-
Passive Wide-Area Detection of Small Unmanned Aerial Systems (sUAS)	MIPR	Naval Research Laboratory : DC (1 MIPR)	-	3.720	Nov 2017	-		-		-		-	0.000	3.720	-
Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2)	MIPR	Space and Warfare Systems Command : CA (5 MIPRs)	-	3.215	Dec 2017	-		-		-		-	0.000	3.215	-
Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2)	MIPR	Naval Research Laboratory : DC (2 MIPRs)	-	0.665	Dec 2017	-		-		-		-	0.000	0.665	-
Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2)	MIPR	Naval Surface Warfare Center Dahlgren : VA (4 MIPRs)	-	2.190	Dec 2017	-		-		-		-	0.000	2.190	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2)	MIPR	Defense Logistics Agency : PA (1 MIPR)	-	0.324	Dec 2017	-		-		-		-	0.000	0.324	-
Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2)	MIPR	Naval Undersea Warfare Center : RI (2 MIPRs)	-	0.394	Dec 2017	-		-		-		-	0.000	0.394	-
Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2)	MIPR	Naval Sea Systems Command : DC (1 MIPR)	-	0.142	Dec 2017	-		-		-		-	0.000	0.142	-
Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2)	MIPR	U.S. Army Communications-Electronics Command : MD (1 MIPR)	-	0.121	Dec 2017	-		-		-		-	0.000	0.121	-
Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2)	MIPR	Marine Corps Air Station : NC (2 MIPRs)	-	0.025	Dec 2017	-		-		-		-	0.000	0.025	-
High Power Microwave (HPM) for Air Base Air Defense	MIPR	Air Force Research Laboratory High Powered Electromagnetics Division : NM (4 MIPRs)	-	3.550	Nov 2017	-		-		-		-	0.000	3.550	-
High Power Microwave (HPM) for Air Base Air Defense	MIPR	Defense MicroElectronics Activity : CA (2 MIPRs)	-	18.000	Dec 2017	-		-		-		-	0.000	18.000	-
High Power Microwave (HPM) for Air Base Air Defense	MIPR	Navy Research Laboratory : DC (2 MIPRs)	-	4.450	Dec 2017	-		-		-		-	0.000	4.450	-
Open Mission Systems Contribution for Next-Generation Architectures (OCNA)	MIPR	Air Force Research Laboratory : OH (2 MIPRs)	-	10.000	Dec 2017	-		-		-		-	0.000	10.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 639 / *Rapid Prototyping Program - Congressional Add*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Navy/Transportable Radar Surveillance and Control Model 2(AN/TPY-2) Adjunct Sensor Prototype (ADJ-P) for Hypersonic Glide Defense (HGD)	MIPR	U.S. Army Armament Research, Development and Engineering Center : NJ (1 MIPR)	-	12.000	Dec 2017	-		-		-		-	0.000	12.000	-
Mission Rehearsal Trainer (MRT)	MIPR	Air Force Life Cycle Management : MA (1 MIPR)	-	3.700	Nov 2017	-		-		-		-	0.000	3.700	-
Mission Rehearsal Trainer (MRT)	MIPR	U.S. Pacific Command (USPACOM) : HI (1 MIPR)	-	1.500	Dec 2017	-		-		-		-	0.000	1.500	-
		Subtotal	-	100.000		-		-		-		-	0.000	100.000	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	100.000		0.000		-		-		-	0.000	100.000	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Office of the Secretary Of Defense		Date: February 2018
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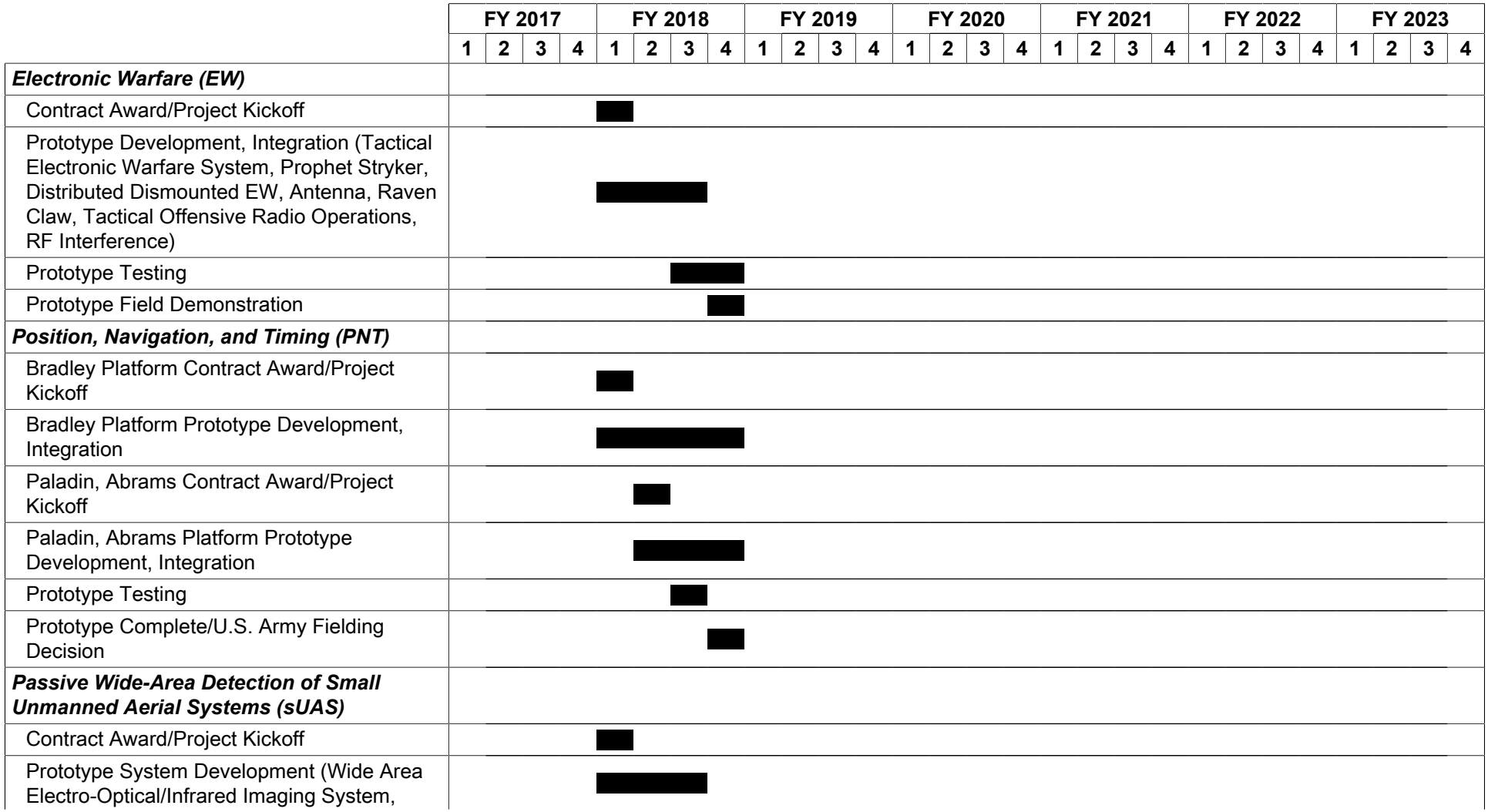

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 639 / *Rapid Prototyping Program - Congressional Add*

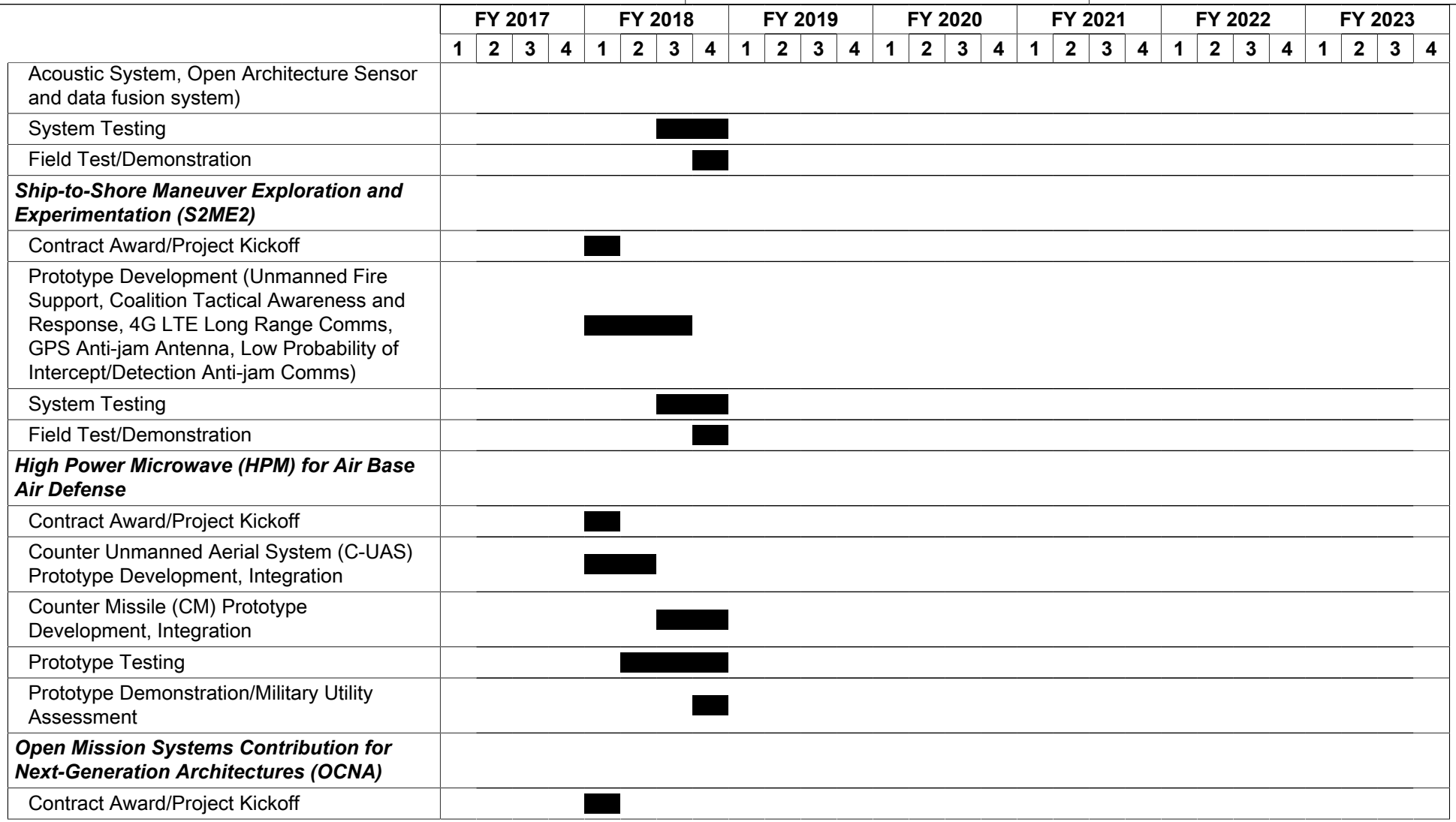

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 639 / *Rapid Prototyping Program - Congressional Add*

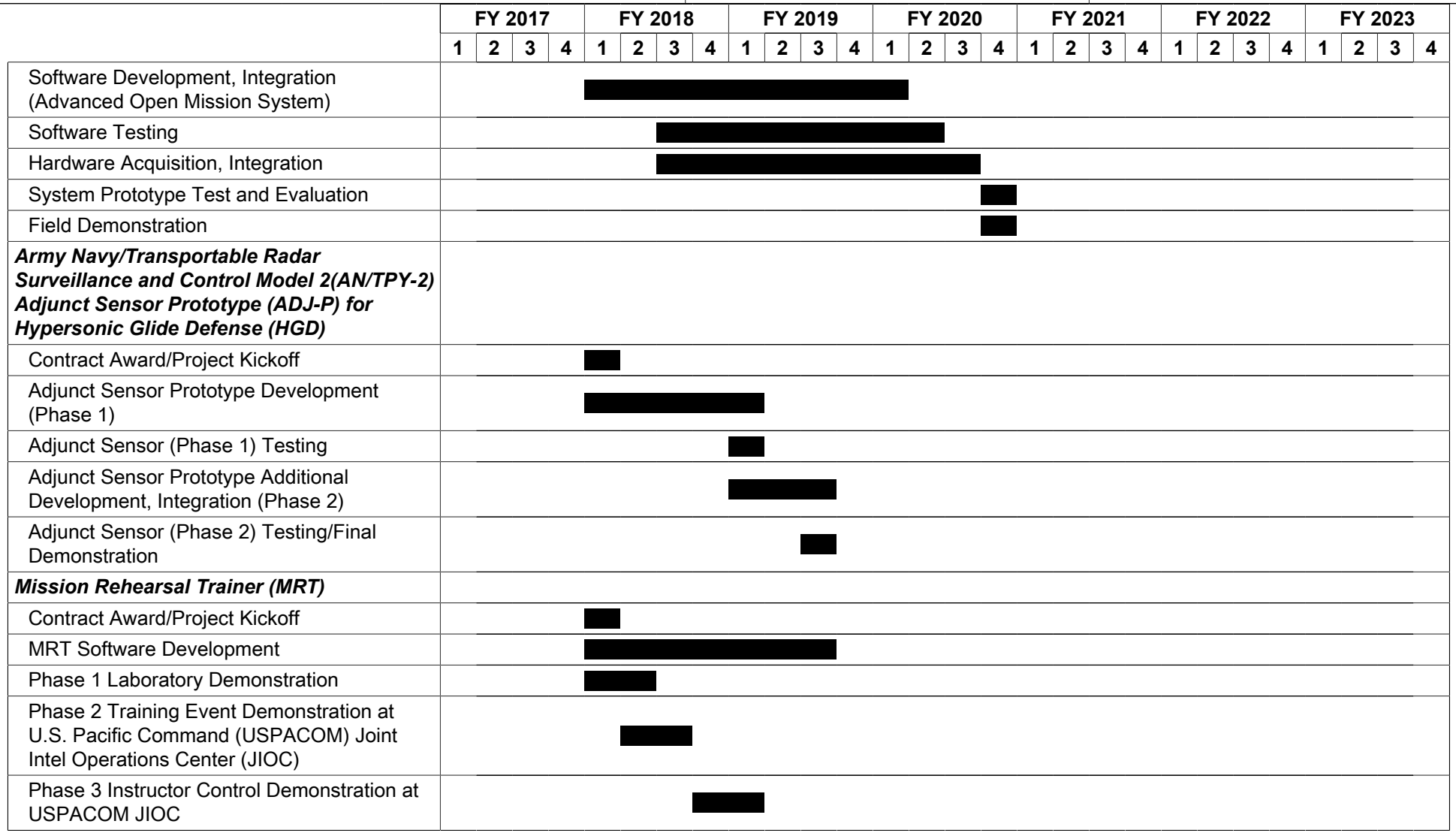

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 639 / *Rapid Prototyping Program - Congressional Add*

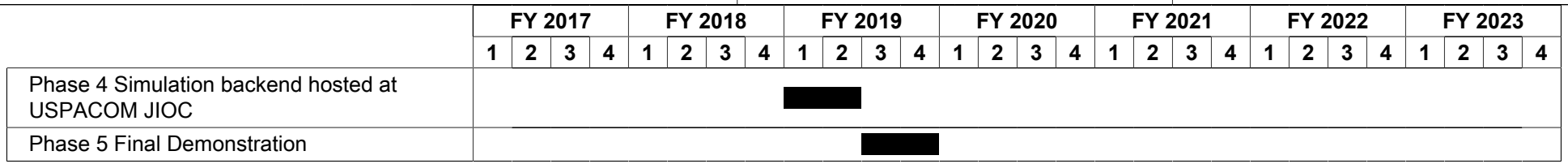

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Office of the Secretary Of Defense		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604331D8Z / *Rapid Prototyping Program*	**Project (Number/Name)** 639 / *Rapid Prototyping Program - Congressional Add*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Electronic Warfare (EW)				
Contract Award/Project Kickoff	1	2018	1	2018
Prototype Development, Integration (Tactical Electronic Warfare System, Prophet Stryker, Distributed Dismounted EW, Antenna, Raven Claw, Tactical Offensive Radio Operations, RF Interference)	1	2018	3	2018
Prototype Testing	3	2018	4	2018
Prototype Field Demonstration	4	2018	4	2018
Position, Navigation, and Timing (PNT)				
Bradley Platform Contract Award/Project Kickoff	1	2018	1	2018
Bradley Platform Prototype Development, Integration	1	2018	4	2018
Paladin, Abrams Contract Award/Project Kickoff	2	2018	2	2018
Paladin, Abrams Platform Prototype Development, Integration	2	2018	4	2018
Prototype Testing	3	2018	3	2018
Prototype Complete/U.S. Army Fielding Decision	4	2018	4	2018
Passive Wide-Area Detection of Small Unmanned Aerial Systems (sUAS)				
Contract Award/Project Kickoff	1	2018	1	2018
Prototype System Development (Wide Area Electro-Optical/Infrared Imaging System, Acoustic System, Open Architecture Sensor and data fusion system)	1	2018	3	2018
System Testing	3	2018	4	2018
Field Test/Demonstration	4	2018	4	2018
Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2)				
Contract Award/Project Kickoff	1	2018	1	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Office of the Secretary Of Defense		Date: February 2018
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Prototype Development (Unmanned Fire Support, Coalition Tactical Awareness and Response, 4G LTE Long Range Comms, GPS Anti-jam Antenna, Low Probability of Intercept/Detection Anti-jam Comms)	1	2018	3	2018
System Testing	3	2018	4	2018
Field Test/Demonstration	4	2018	4	2018
High Power Microwave (HPM) for Air Base Air Defense				
Contract Award/Project Kickoff	1	2018	1	2018
Counter Unmanned Aerial System (C-UAS) Prototype Development, Integration	1	2018	2	2018
Counter Missile (CM) Prototype Development, Integration	3	2018	4	2018
Prototype Testing	2	2018	4	2018
Prototype Demonstration/Military Utility Assessment	4	2018	4	2018
Open Mission Systems Contribution for Next-Generation Architectures (OCNA)				
Contract Award/Project Kickoff	1	2018	1	2018
Software Development, Integration (Advanced Open Mission System)	1	2018	1	2020
Software Testing	3	2018	2	2020
Hardware Acquisition, Integration	3	2018	3	2020
System Prototype Test and Evaluation	4	2020	4	2020
Field Demonstration	4	2020	4	2020
Army Navy/Transportable Radar Surveillance and Control Model 2(AN/TPY-2) Adjunct Sensor Prototype (ADJ-P) for Hypersonic Glide Defense (HGD)				
Contract Award/Project Kickoff	1	2018	1	2018
Adjunct Sensor Prototype Development (Phase 1)	1	2018	1	2019
Adjunct Sensor (Phase 1) Testing	1	2019	1	2019
Adjunct Sensor Prototype Additional Development, Integration (Phase 2)	1	2019	3	2019
Adjunct Sensor (Phase 2) Testing/Final Demonstration	3	2019	3	2019
Mission Rehearsal Trainer (MRT)				

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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Contract Award/Project Kickoff	1	2018	1	2018
MRT Software Development	1	2018	3	2019
Phase 1 Laboratory Demonstration	1	2018	2	2018
Phase 2 Training Event Demonstration at U.S. Pacific Command (USPACOM) Joint Intel Operations Center (JIOC)	2	2018	3	2018
Phase 3 Instructor Control Demonstration at USPACOM JIOC	4	2018	1	2019
Phase 4 Simulation backend hosted at USPACOM JIOC	1	2019	2	2019
Phase 5 Final Demonstration	3	2019	4	2019