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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Office of the Secretary Of Defense **Date:** February 2016

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603618D8Z I <i>Joint Electronic Advanced Technology</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	10.757	30.879	22.030	-	22.030	14.402	13.003	12.192	12.432	Continuing	Continuing
P619: <i>Joint Electronic Advanced Technology</i>	-	10.757	17.466	10.992	-	10.992	11.657	12.226	12.192	12.432	Continuing	Continuing
P244: <i>Advanced EW Technology Maturation Project</i>	-	0.000	6.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
P245: <i>EW Enterprise Exploration and Innovation</i>	0.000	0.000	7.413	11.038	-	11.038	2.745	0.777	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

To counter the United States' historic technological advantage, nation-states and terrorists are increasingly developing asymmetric capabilities that are enabled by advanced commercial electronic components and devices that have become globally available. These asymmetric threats range from terrorist-employed improvised devices to dedicated military systems that can be used in ways that diminish our technological advantage in conflicts with nation-states. The rate at which new threats are appearing is accelerating and they are appearing quicker than traditional Department of Defense (DoD) requirements and acquisition processes can respond.

The use of asymmetric technologies is well understood by both nation-states and terrorists. Terrorists have attacked air and ground forces using improvised explosive devices based on commercial electronic components and easily transportable man portable air defense systems, and they are increasingly employing commercially-available unmanned air systems to target U.S. and allies' forces. Concurrently, nation-states are developing and proliferating cruise and ballistic missiles, Integrated Air Defense Systems (IADS), and unmanned air systems with advanced capabilities to pose significant threats to our forces.

The dire consequences of technological surprise and the accelerating rate of appearance of new threats highlight the need to rapidly develop and field innovative Electronic Warfare (EW) and EW/Cyber capabilities that can neutralize threats in fiscally and temporally responsive ways. We must, however, also concurrently develop innovative technologies and approaches to give us asymmetric advantages over potential adversaries.

To proactively address the accelerating threat environment and restore the United States' technological overmatch capabilities, the Joint Electronic Advanced Technology (JEAT) program focuses on technological innovation to accelerate the pace of EW capabilities development. JEAT specifically explores and assesses new and innovative approaches to rapidly mitigate advanced threats by integrating advanced commercial and military off-the-shelf technologies in innovative ways and rapidly demonstrating innovative technological capabilities that can be inserted into the Services' Programs of Record with significantly reduced risk. JEAT efforts are based on three pillars (Experimentation/Demonstration, Advanced Technology Development/Verification, and Innovative Technology Exploration) and supported and enabled by JEAT's EW Enterprise Collaboration and Planning efforts.

In FY 2016, the EW Enterprise Exploration and Innovation Project (P245) was added by the Department to accelerate the fielding of vitally needed EW capabilities. This four-year effort has two foci: (1) accelerating the development of innovative countermeasures to new classes of advanced threats that are being developed and

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fielded by potential adversaries and (2) providing innovative capabilities to counter anti-access/area denial threats posed by countries possessing modern, advanced IADS. Work area in area (1) will enable earlier fielding of warfighting essential capabilities through direct technology transitions to ongoing Air Force and Navy Programs of Record (Advanced Airborne Countermeasures Development and Advanced Defensive Countermeasures Development). Work in area (2) will explore a variety of non-kinetic technologies, tools, and techniques to include converged EW/Cyber approaches and battle management optimization and visualization technologies (Non-Kinetic Battle Management and Visualization Technology Development, Advanced EW and EW/Cyber Exploration and Development, and Ultra Wideband Receiver Development).

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	10.949	43.966	23.446	-	23.446
Current President's Budget	10.757	30.879	22.030	-	22.030
Total Adjustments	-0.192	-13.087	-1.416	-	-1.416
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-13.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.188	-			
• Realignment for Higher Priority Programs	-	-	-1.246	-	-1.246
• FY15 Reprog. for Cancelled Account	-0.004	-	-	-	-
• FFRDC Reduction	-	-0.087	-	-	-
• Economic Assumptions	-	-	-0.170	-	-0.170

Change Summary Explanation

FY 2017 realignment reflects funding for higher Departmental priorities and requirements.

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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
P619: <i>Joint Electronic Advanced Technology</i>	-	10.757	17.466	10.992	-	10.992	11.657	12.226	12.192	12.432	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project investigates means to (1) rapidly mitigate new asymmetric electronic threats that have been enabled by the global proliferation of electronic components and devices with advanced capabilities and (2) guarantee U.S. technological overmatch capabilities through the development of new asymmetric capabilities. Laboratory efforts and field experimentation venues focus on fully understanding current capabilities and exploring, demonstrating, and assessing new and innovative capabilities. Developmental efforts seek to produce new capabilities by integrating advanced commercial and military off-the-shelf technologies in innovative ways not being explored by the Services. Laboratory/field experimentation and developmental efforts are focused on demonstrating new capabilities that can be rapidly inserted into the Services' Programs of Record with reduced risk. Oversight efforts within the Electronic Warfare (EW) and Countermeasures Office (EW&C) in the Office of the Assistant Secretary of Defense for Research and Engineering (OASD(R&E)) assess and ensure coordination of all Departmental EW Research and Development (R&D) efforts and coordinate national and international efforts in emerging Information Operations and EW/Cyber Convergence topics. Four efforts comprise this project: Experimentation/ Demonstration, Advanced Technology Development/Verification, Innovative Technology Exploration, and EW Enterprise Collaboration and Planning.

Experimentation/Demonstration (E/D):

E/D explores and demonstrates technologies and approaches to address compelling warfighting issues. The first E/D venue, Vigilant Hammer (VH), is a recurring multi-year, multi-agency, live, virtual, and constructive field experimentation venue of increasing complexity and difficulty focused on advancing the state of the art for the detection, classification, geolocation and prosecution of electromagnetic signals of interest using DoD and national resources. Modeled after Joint Electronic Advanced Technology's (JEAT) highly successful BLACK DART, Trident Spectre, and Rotorcraft Aircraft Survivability Equipment (RASE) Experiment venues, VH includes both scripted and free play scenarios intended to give participants an opportunity to explore the efficacy of existing and new capabilities and approaches to engage emerging Electromagnetic Spectrum (EMS) threats. Additional venues addressing emerging concerns (e.g., advanced electro-optical and millimeter wave threats) will be added in future years.

Advanced Technology Development/Verification (ATD/V):

ATD/V research efforts to mature and assess emerging technologies that address compelling EW and converged EW/Cyber warfighting needs. JEAT's ongoing ATD/V effort, Distributed Electronic Effects Development (DEED), is a laboratory and developmental venue that matures and assesses emerging EW and converged EW/Cyber technologies to enable, for example, more effective coordination of sensor and electronic attack capabilities to enable multi-point, collaborative EW/Cyber capabilities. DEED specifically identifies and pairs synergistic technologies to develop systems with capabilities that are greater than the sum of the individual parts.

Innovative Technology Exploration (ITE):

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ITE conducts analyses and studies of emerging asymmetric threats for the Director, EW&C. Past work includes support to Office of the Secretary of Defense's (OSD) Aircraft Survivability Equipment Joint Analysis Team and the Helicopter Survivability Task Force, which resulted in rapid technology investments by DoD to address crucial warfighting needs. Current efforts are focused on advanced analytic studies of link budgets associated with addressing highly advanced agile threats.

EW Enterprise Collaboration and Planning (EW C&P):

EW C&P supports all activities of the Director, EW&C related to the selection, organization, oversight, and coordination of all EW and EW-related R&D across DoD and oversees and ensures proper coordination and collaboration between OSD and the Joint Staff, Combatant Commands, and the Services on an extensive variety of EW-related activities within DoD and world-wide. EW C&P identifies, assesses, and develops recommendations to address EW-related threat trends impacting sensor, seeker, communications, and battle management technologies and countermeasures to these threats; provides programmatic and budget review and recommendations; and provides decision support to the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSDA(AT&L)) on Programs of Record including technology availability and maturity, Critical Program Information standards, Foreign Disclosure, and Technical Signals Requirements.

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

	FY 2015	FY 2016	FY 2017
<p>Title: Experimentation/Demonstration (E/D)</p> <p>Description: The Vigilant Hammer (VH) series of multi-year, multi-agency, live, virtual and constructive field experimentation venues explores and assesses technologies that seek to more effectively sense, classify, geolocate, prosecute, and assess attack effects against modern, agile and cognitive signals in dense and highly complex signals environments. Leveraging JEAT's history of conducting highly successful and cost effective experiments, VH gages the collective ability of DoD and the Intelligence Community to provide the essential robust, adaptive, effective networks of sensing and electronic attack capabilities through the use of collaborative, distributed sets of electronic systems. Detailed planning for a second E/D venue focusing on another EW-related high priority area will begin in FY 2016.</p> <p>FY 2015 Accomplishments: VH 1 was conducted in March of FY 2015 and the final report was completed in December 2015. Assessment of VH 1 results guided planning efforts for VH 2, which started in 4Q FY 2015.</p> <p>FY 2016 Plans: VH 2 will be conducted in May of FY 2016 with a final report to be produced within a couple of months after the event. Building on the signals detection, classification, geolocation and prosecution emphases of VH 1, more active attack methodologies are being added to the event. All means of spectrum sensing and attack will be included to address a much larger community than VH 1 as well as a first-ever characterization of our national ability to remotely assess in near real time wide area spectrum attack effectiveness on adversary systems. Assessment of VH 2 results will guide planning efforts for VH 3, which will begin in 4Q FY 2016.</p> <p>FY 2017 Plans:</p>	4.061	8.400	4.019

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
Building on the results of earlier VH events, VH 3 will increase electromagnetic battlespace complexity and demonstrate a wider variety both EW and Radio Frequency-enabled digital EW tools and techniques. VH 3 will also seek to involve greater numbers and varieties of operational users to increase both developer and operational community awareness of spectrum challenges and opportunities.				
<p>Title: Advanced Technology Development/Verification (ATD/V)</p> <p>Description: ATD/V research efforts mature and assess emerging technologies to address compelling EW and converged EW/Cyber warfighting needs. These efforts utilize JEAT's Distributed Electronic Effects Development (DEED) laboratory and developmental environment which focuses on identifying and integrating multiple advanced technologies to synergistically create effects that are far greater than the sum of the constituent systems and identifying innovative approaches to accomplish military objectives to more cost effectively utilize the spectrum.</p> <p>FY 2015 Accomplishments: In FY 2015, DEED explored new and innovative technologies and approaches to deliver multi-point, collaborative EW and EW/Cyber capabilities to warfighters through more effective coordination of distributed (primarily Unmanned Aerial Vehicle (UAV) based) sensor and electronic attack capabilities. Capability integration and effect quantification will ultimately prepare products for evaluation in venues like VH. DEED also maintains access to a small fleet of UAVs for the purpose of experimentation with distributed EW payloads when they are mature enough for open air experimentation following integration in the DEED laboratory.</p> <p>FY 2016 Plans: FY 2016 continues FY 2015 efforts with an emphasis on the creation of techniques and approaches that can be employed from distributed systems (primarily UAV based), specifically focusing on the development of multi-point Digital Radio Frequency Memory-like techniques that can be synergistically/cooperatively employed by UAVs. Efforts will focus on the development and demonstration of effects by combining two or more existing components/technologies to produce new and unique capabilities with greater warfighting value than the sum of the parts. Integration into prototypical systems and quantification of the benefits of the DEED's controlled laboratory environment will also occur with the goal of preparing products for evaluation in venues like VH.</p> <p>FY 2017 Plans: Build on FY 2016 efforts, FY 2017 efforts will use DEED and other available laboratories to explore the power of delivering spectrum effects from distributed networks of devices. Promising candidates will be evaluated for integration within appropriate field demonstrable systems (with a focus on UAV integration) for demonstrations in VH 3.</p>		1.527	3.253	1.511
<p>Title: Innovative Technology Exploration (ITE)</p> <p>Description: ITE supports the Assistant Secretary of Defense for Research and Engineering (ASD(R&E)), and the Director, EW&C, through studies and analyses of emerging asymmetric threats. Past efforts include supporting the Aircraft Survivability</p>		1.494	1.950	1.478

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<p>Equipment Joint Analysis Team and the Helicopter Survivability Task Force, both of which resulted in significant strategic technology investments by the DoD. The current ongoing ITE effort is Adaptive/Asymmetric Technology (A/AT).</p> <p>FY 2015 Accomplishments: FY 2015 efforts focused on analysis of alternative Courses of Action (COAs) related to packaging and deploying advanced EW technologies being developed in related development efforts. Evaluation of complex spectrum environments, system-to-system interactions, and link budget analyses impacting EW effects employment on advanced threats.</p> <p>FY 2016 Plans: FY 2016 efforts will focus on analysis of alternative COAs employing advanced, adaptive and cognitive EW technologies emerging in commercial data communications, radar, and other advanced spectrum domains previously dominated by DoD. The evaluation of complex spectrum environments, system-to-system interactions; link budget analyses; size, weight and power analysis; and other relevant analytic studies will be accomplished under this effort, including issues related to modeling of many advanced jammers operating in the same airspace.</p> <p>FY 2017 Plans: FY 2017 efforts will focus on expanding and assessing FY 2016-developed alternative COAs for employing advanced, adaptive and cognitive EW technologies emerging in commercial data communications, radar, and other advanced spectrum domains previously dominated by DoD. The evaluation of complex spectrum environments; system-to-system interactions; link budget analyses; size, weight and power analysis; and issues related to modeling of many advanced jammers operating in the same airspace will continue, with a focus of developing demonstrable prototypes for use in VH 3.</p>				
<p>Title: EW Enterprise Collaboration and Planning (EW C&P)</p> <p>Description: This effort supports the EW&C Director's management, oversight, and coordination of the plethora of EMS warfare related activities for ASD(R&E). It includes maintaining cognizance to all EW capabilities development activities worldwide; overseeing the extensive number and variety of EW-related R&D activities within DoD; exploring new and innovative EMS technologies and approaches; coordinating Departmental EW-related R&D, programs, protocols, and policy; analyzing requisite technologies and efforts; ensuring intelligence requirements for EMS warfare-related efforts are met; managing all EMS development and operational interfaces across DoD and with international partners; and reporting relevant information both within the DoD and to Congress and other external groups as necessary.</p> <p>FY 2015 Accomplishments: In FY 2015, EW C&P efforts produced the fifth of five Comprehensive EW Reports to Congress providing the consolidated status of EW, strategy and planning. EW gaps were evaluated and mitigating EW capabilities were identified and recommended as directed by Joint Chiefs of Staff /Joint Requirements and OSD/ATL in conjunction with Strategic Command/Joint Electronic</p>		3.675	3.863	3.984

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

	FY 2015	FY 2016	FY 2017
<p>Warfare Center, the Services, and Combatant Commands. Briefings and insights were presented to the Defense Science Board (DSB) on EW and EW C&P efforts assessing and defending the DSB recommendations through the POM-review process resulted in funding for four new defensive countermeasure projects and the accelerated development of a new modular, reconfigurable technology that is being adopted by the U.S. Marine Corps. Efforts played a significant role in the development of chartering documents and organizational processes establishing the EW Executive Committee; provided oversight for the EW Community of Interest, JEAT programmatic efforts, and VH products; opened new interactions with the Intelligence Community at Senior levels with Defense Information Operations Cyber; advanced the priority of engineering level analysis and reporting from priority 17 to priority 3; stimulated a new Central Intelligence Group-directed study into Foreign Material Exploitation and Acquisition (FME/FMA); organized a new security portfolio for EW Special Access programs; advanced initiatives for the establishment vulnerability portfolios; and provided leadership of efforts to identify potential technological solutions to address Joint Urgent Operational Need SO-0010.</p> <p>FY 2016 Plans: FY 2016 efforts include analysis of alternative COAs for employing advanced, adaptive and cognitive EW technologies emerging in commercial data communications, radar, and other advanced spectrum domains previously dominated by DoD. Complex spectrum environments; system-to-system interactions; link budget analyses; size, weight and power analysis; and other relevant analytic studies will be assessed as part of this effort and include issues related to modeling of many advanced jammers operating in the same airspace. Plans and exploratory investigations will evolve to evaluate and harvest emerging concepts and technologies from the R&E Reliance Process and the EW Science and Technology Community of Interest Roadmap. Multi-platform, multi-aperture synchronization and control technologies, and software algorithms and associated autonomous control systems are expected to be among the initial focal concepts as well as investigations into robust command and control mechanisms with high reliability and strong anti-jam configurations and measuring data throughput requirements, enhanced fusion and geolocation mechanisms. EW C&P efforts will continue monitoring of evolving, ever-changing threats and alternative countermeasure technologies along with recurring annual reassessments of net progress vis-à-vis realized improvements in mission effectiveness. Analysis and coordination of national and international efforts addressing emerging Information Operations and EW/Cyber Convergence topics will also begin.</p> <p>FY 2017 Plans: FY 2017 efforts will focus on the development of a variety of new EW capabilities including distributed cooperative or coherent aperture techniques; battle management and visualization technologies for optimization of non-kinetic fires; asymmetric targeting technologies; passive system countermeasure techniques; and national technical means applications to EW. Efforts will also seek to advance imaging Infrared Countermeasures technologies and expand U.S.-Australia collaboration in EW/Cyber.</p>			
Accomplishments/Planned Programs Subtotals	10.757	17.466	10.992

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C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603618D8Z / <i>Joint Electronic Advanced Technology</i>				Project (Number/Name) P244 / <i>Advanced EW Technology Maturation Project</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
P244: <i>Advanced EW Technology Maturation Project</i>	-	0.000	6.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Advanced Electronic Warfare (EW) Technology Maturation Project is a one-year effort to mature and demonstrate modular, distributed, configurable EW technologies and systems designs addressing U.S. Marine Corps (USMC) and U.S. Army warfighting requirements that will accelerate the fielding of advanced EW capabilities in the FY 2017 Intrepid Tiger II (IT2) Program of Record. This effort will develop and integrate capabilities to counter radar targets while mitigating blue-on-blue and co-site interference impacts into an existing communications jamming capability.

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

	FY 2015	FY 2016	FY 2017
Title: Advanced EW Technology Maturation Project	-	6.000	-
<p>Description: Technologies demonstrated in this effort will be integrated into future USMC and U.S. Army precision EW system of systems architectures and will enable distributed, adaptive, and scalable counter-communications and counter-radar EW capabilities that are compliant with existing open architecture systems and net-centric architectures.</p> <p>The architectural and battle management research in this effort will also inform USMC and U.S. Army EW developers on a wide variety of implementation options affecting collaborative, networked, multi-element system designs. These capabilities are envisioned to support combat and contingency operations throughout the world, and are anticipated to transition to the warfighter in IT2 and future U.S. Army and Joint Service programs.</p> <p>FY 2016 Plans: FY 2016 efforts focus on maturing technologies developed by Defense Advanced Research Projects Agency and the Services, to enable the integration of counter-radar electronic attack capabilities into existing counter-communications EW systems. The new capabilities developed in this effort will counter current and future radar threats, provide improved communications operational availability by adding a spectral "relocation" coordination capability and mitigate co-site interference on a mission by mission basis, utilizing dynamically reprogrammable channelized amplifiers and digital filters.</p> <p>These objectives will be accomplished via the following:</p> <ul style="list-style-type: none"> • Identifying technology requirements needed to provide spectrum diverse capabilities from direct current to millimeter wave • Developing / evaluating / integrating advanced transceiver technologies to include but not limited to digital Radio Frequency (RF) memory devices • Developing / evaluating / integrating advanced modem and network technologies; including waveform transitions and policy based spectrum planning 			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<ul style="list-style-type: none"> • Developing / evaluating / integrating channelized, efficient amplifier technologies • Evaluating simultaneous transmit and receive antenna technologies and analog cancellers • Evaluating phased array antennas • Integrating digital interoperability compatibility by providing dual/tri-redundant data link functionality and spectrum relocation 				
Accomplishments/Planned Programs Subtotals		-	6.000	-
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				
E. Performance Metrics				
N/A				

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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
P245: <i>EW Enterprise Exploration and Innovation</i>	0.000	0.000	7.413	11.038	-	11.038	2.745	0.777	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

This four-year project, which begins in FY 2016, accelerates the development of innovative technologies to provide countermeasures to new classes of Electronic Warfare (EW) threats enabled by the global proliferation of advanced electronics technologies. New countermeasure capabilities are needed to address threats characterized by significantly expanded spectral and temporal coverage and resolution, increasingly complex and diverse waveforms, and have great agility. Countermeasures are needed for both emitting (e.g., radars and communications) and non-emitting (e.g., passive radars and sensors and weapon seekers) threat systems. Countermeasures are also needed to guarantee assured command and control and robust battle management capabilities in the face of advanced persistent electronic attacks by technologically advanced adversaries. Five efforts will be initiated in FY 2016 to address EW Enterprise Exploration and Innovation: Advanced Airborne Countermeasures Development, Advanced Defensive Countermeasures Development, Non-Kinetic Battle Management and Visualization Technology Development, Advanced EW and EW/Cyber Exploration/Development, and Ultra Wideband Receiver Development.

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

	FY 2015	FY 2016	FY 2017
<p>Title: Advanced Airborne Countermeasures Development</p> <p>Description: This effort develops advanced countermeasures to protect airborne assets against a wide variety of increasingly sophisticated threat systems possessing expanded spectral and temporal coverage and resolution using complex and diverse waveforms and having significant agility. Efforts will specifically address advanced EW, sensor, and seeker threats involving Radio Frequency (RF) and/or electro-optical technologies. Integration of technology products within existing and developmental architectures will be guaranteed by close coordination with both warfighters and technology developers.</p> <p>FY 2016 Plans: FY 2016 efforts will begin development of countermeasures to a specific set of classified airborne threats. Devices developed in this effort will be designed to fit within the existing architectures and be compatible with existing and developmental operational constructs to enable earlier transitions to the warfighter.</p> <p>FY 2017 Plans: FY 2017 efforts will continue FY 2016 work with a focus on demonstrating developed countermeasures in relevant operational environments.</p>	-	2.900	3.500
<p>Title: Advanced Defensive Countermeasures Development</p> <p>Description: This effort develops advanced countermeasures to defend Naval assets against advanced threat weapons employing increasingly sophisticated and diverse RF and/or electro-optical seeker technologies. Integration of technology</p>	-	1.500	2.000

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<p>products within existing and developmental architectures will be guaranteed by close coordination with both warfighters and technology developers.</p> <p>FY 2016 Plans: FY 2016 efforts will begin development of robust countermeasures to a new class of seeker threats employing increasingly sophisticated and diverse RF and/or electro-optical seeker technologies. Integration of technology products within existing and developmental architectures and concepts of operations will be guaranteed by close coordination with both warfighters and technology developed.</p> <p>FY 2017 Plans: FY 2017 efforts will continue FY 2016 work with a focus on demonstrating developed countermeasures in relevant operational environments.</p>				
<p>Title: Non-Kinetic Battle Management and Visualization Technology Development</p> <p>Description: Non-Kinetic Battle Management and Visualization Technology Development explores a variety of technologies to significantly increase the fidelity and level of control of Electromagnetic (EM) battlespace situational awareness, visualization and control technologies available to warfighters in Battle Management (BM) centers. Legacy BM tools, Intelligence Community capabilities and state-of-the-art data processing, display and visualization technologies will be leveraged to incorporate information from all EM battlespace sensor feeds, to include national assets, to develop the most advanced and realistic EM battlespace possible.</p> <p>FY 2016 Plans: FY 2016 will begin development of the next generation of EM battlespace situational awareness, visualization and control technologies. Hardware- and software-in-the-loop laboratory capabilities will be leveraged to the maximum extent to enable build-assess-improve cyclic capability growth.</p> <p>FY 2017 Plans: FY 2017 will continue development of the next generation of EM battlespace situational awareness, visualization and control technologies. Hardware- and software-in-the-loop laboratory capabilities will be leveraged to the maximum extent to enable build-assess-improve cyclic capability growth. Capabilities developed in this effort will be employed for analysis of environments and effects within VH3 with a focus on utilizing operational users and transitioning newly developed capabilities to these users.</p>		-	2.100	1.266
<p>Title: Advanced EW and EW/Cyber Exploration/Development</p> <p>Description: This task will work on access and payload capability for EMS-Cyberspace capability to achieve closed network access and effects against hard-to-reach targets in Anti-Access Area Denial (A2AD) environments. This initiative focuses on the continuum between EW effects such as jamming and Cyber effects to produce greater military impact against the adversary. This</p>		-	0.413	1.740

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603618D8Z / <i>Joint Electronic Advanced Technology</i>	Project (Number/Name) P245 / <i>EW Enterprise Exploration and Innovation</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<p>effort will also incorporate algorithms, signal processing and techniques for increasing the viable standoff distance for prosecution, interrogation and disruption of adversary threats.</p> <p>FY 2016 Plans: FY 2016 will begin development of composite EW and Offensive Cyber Operations capabilities against A2AD threats, including advanced adversary weaponry, for employment on software-defined and reprogrammable transceivers.</p> <p>FY 2017 Plans: FY 2017 will continue development of composite EW and Offensive Cyber Operations capabilities against A2AD threats, including advanced adversary weaponry, for employment on software-defined and reprogrammable transceivers. Initial prototypes will be demonstrated in field experimental venues such as VH 3.</p>				
<p>Title: Ultra Wideband Receiver Development (UWBR)</p> <p>Description: UWBR will explore technologies to provide significantly greater instantaneous bandwidth with extreme sensitivity to enhance the detection, identification, classification, geolocation, and cueing of countermeasures against threat emitter systems that have increased spectral coverage, bandwidth, agility, and waveform diversity. A variety of innovative technologies will be explored, developed, and demonstrated in dense, extremely complex EM environments, possibly to include VH and/or subsequent JEAT E/D venues.</p> <p>FY 2016 Plans: FY 2016 efforts will focus on the acceleration of efforts to (1) develop chip-scale, hyper sensitive and ultra wide band receiver components, (2) develop algorithms and components to process the vast amounts of collected data, and (3) initially characterize system performance. Brassboard capability demonstrations in laboratory and/or field environments will be used to baseline and assess performance in increasingly complex EM environments.</p> <p>FY 2017 Plans: FY 2017 efforts will continue focus on the acceleration of efforts to (1) develop chip-scale, hyper sensitive and ultra wide band receiver components, (2) develop algorithms and components to process the vast amounts of collected data, and (3) initially characterize system performance. Brassboard capability demonstrations in laboratory and/or field environments will be used to baseline and assess performance in increasingly complex EM environments. Early prototype systems will be demonstrated in field experimental venues such as VH 3.</p>		-	0.500	2.532
Accomplishments/Planned Programs Subtotals		-	7.413	11.038
C. Other Program Funding Summary (\$ in Millions)				
N/A				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2017 Office of the Secretary Of Defense		Date: February 2016
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603618D8Z / <i>Joint Electronic Advanced Technology</i>	Project (Number/Name) P245 / <i>EW Enterprise Exploration and Innovation</i>

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A