Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Office of the Secretary Of Defense	Date: February 2015
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603618D8Z / *Joint Electronic Advanced Technology*

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	-	8.772	10.949	43.966	-	43.966	23.446	14.599	13.186	12.360	Continuing	Continuing
P619: *Joint Electronic Advanced Technology*	-	8.772	10.949	17.466	-	17.466	11.609	11.721	12.300	12.360	Continuing	Continuing
P244: *Advanced EW Technology Maturation Project*	-	-	-	13.500	-	13.500	-	-	-	-	Continuing	Continuing
P245: *EW Enterprise Exploration and Innovation*	-	-	-	13.000	-	13.000	11.837	2.878	0.886	-	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 and systems that are enabled by the significant advances in globally-available commercial electronic components and devices. These threats range from improvised devices being employed by terrorists that are constructed from commercially available electronic and industrial components to dedicated military systems that could be used in ways that diminish our technological advantage in conflicts with nation-states. The rate at which these threats are appearing is accelerating and new threats are appearing quicker than traditional Department of Defense (DoD) requirements and acquisition processes can respond.

The use of asymmetric devices is well understood by both nation-states and terrorists. Using man portable air defense systems, mortars, and improvised explosive devices employing commercial electronic components, terrorists have attacked both air and ground forces, posing threats in any region due to their easy transportability. Unmanned aircraft systems employing advanced commercial electronic components are proliferating and pose threats as both military capabilities and as potential weapons delivery mechanisms.

The extreme 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), Information Operations and EW/Cyber Convergence capabilities that can neutralize threats in fiscally and temporally responsive ways. We must concurrently develop innovative technologies and approaches that will 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's overarching philosophy focuses on innovation to accelerate the pace of EW capabilities development. This program element investigates means to rapidly mitigate new threats by integrating advanced commercial and military off-the-shelf technologies in innovative ways and rapidly demonstrate innovative technological capabilities that can be inserted into the Services' Programs of Record with reduced risk. JEAT efforts are based on three pillars: 1) Experimentation/ Demonstration, 2) Advanced Technology Development/Verification, and 3) Innovative Technology Exploration.

In FY 2016, two efforts were added by the Department to accelerate the fielding of vitally needed EW warfighting capabilities: the Advanced EW Technology Maturation Project and the EW Enterprise Exploration and Innovation Project.

Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Office of the Secretary Of Defense	Date: February 2015
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603618D8Z / *Joint Electronic Advanced Technology*

The Advanced EW Technology Maturation Project is a one-year effort to demonstrate modular, distributed, configurable EW technologies and systems designs that address requirements identified by the United States Marine Corps (USMC) and U.S. Army. Additionally, technologies demonstrated in this effort will be transitioned to the USMC to enable an earlier transition of vital warfighting capabilities within the Intrepid Tiger II (IT2) FY 2017 Program of Record. This effort will specifically mature counter-radar building blocks to provide new, vitally-needed EW capabilities for U.S. Army and USMC air and ground assets while mitigating blue-on-blue and co-site interference impacts.

The EW Enterprise Exploration and Innovation Project is a four-year effort to (1) accelerate the development of innovative countermeasures to new classes of advanced threats that are being developed and fielded by potential adversaries and (2) provide innovative capabilities to counter anti-access/area denial threats posed by countries possessing modern, advanced integrated air defense systems. Work area in (1) will enable direct technology transitions to the U.S. Air Force and U.S. Navy in ongoing Programs of Record. Research in area (2) will enable earlier fielding, and will explore a variety of non-kinetic technologies, tools and techniques to include converged EW/Cyber approaches and battle management optimization and visualization technologies. Five work units are included in this project: Advanced Airborne Countermeasures Development, Advanced Defensive Countermeasures Development, 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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	8.996	10.965	11.969	-	11.969
Current President's Budget	8.772	10.949	43.966	-	43.966
Total Adjustments	-0.224	-0.016	31.997	-	31.997
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.004	-			
• SBIR/STTR Transfer	-0.220	-			
• FFRDC Sec 8104	-	-0.016	-	-	-
• Realignment for Higher Priority Programs	-	-	5.596	-	5.596
• Electronic Warfare Enterprise	-	-	13.000	-	13.000
• Advanced EW Technology Maturation Project	-	-	13.500	-	13.500
• Economic Assumptions	-	-	-0.099	-	-0.099

Change Summary Explanation

FY 2016 realignment reflects funding for higher Departmental priorities and requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense			Date: February 2015
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603618D8Z / *Joint Electronic Advanced Technology*	Project (Number/Name) P619 / *Joint Electronic Advanced Technology*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
P619: *Joint Electronic Advanced Technology*	-	8.772	10.949	17.466	-	17.466	11.609	11.721	12.300	12.360	Continuing	Continuing

A. Mission Description and Budget Item Justification

Asymmetric electronic threats enabled by significant advances in globally-available commercial electronic components and devices are proliferating at an alarming rate. This project investigates means to rapidly mitigate new threats by integrating advanced commercial and military off-the-shelf technologies in innovative ways and rapidly demonstrate innovative technological capabilities that can be inserted into the Services' Programs of Record with reduced risk. Efforts concurrently develop innovative technologies and approaches that will give us asymmetric advantages over potential adversaries.

Three efforts currently comprise this project: Experimentation/Demonstration, Advanced Technology Development/Verification, and Innovative Technology Exploration. In FY 2015, we are adding a new effort, EW Enterprise Collaboration and Planning, that addresses selection, organization, oversight, and coordination of new and emerging Electromagnetic Spectrum (EMS) warfare concepts and related efforts within the EW and Countermeasures Office (EW&C) in the Office of the Assistant Secretary of Defense for Research and Engineering (OASD(R&E)). In FY 2016, this area will be expanded to provide analysis and national and international coordination on emerging Information Operations and Electronic Warfare (EW)/Cyber Convergence topics.

Experimentation/Demonstration (First effort: Vigilant Hammer (VH)):

Experimentation/Demonstration efforts focus on experimenting with and demonstrating technologies and approaches to address compelling issues facing the warfighter. Our first Experimentation/Demonstration effort, VH, is a recurring multi-year, multi-agency, live, virtual, and constructive field experimentation venue of increasing complexity focused on advancing the state of the art for the detection, classification, geolocation and prosecution of electromagnetic signals of interest using both Department of Defense (DoD) and national resources. VH is modeled after Joint Electronic Advanced Technology's (JEAT) highly successful BLACK DART, Trident Spectre, and Rotorcraft Aircraft Survivability Equipment Experiment (RASE) venues, and will include both scripted and free play scenarios intended to give participants an opportunity to explore the efficacy of existing and new technological capabilities and approaches to engage emerging EMS threats. Engagement payloads will be developed and vetted in the Distributed Electronic Effects Development (DEED) laboratory discussed below. Additional venues that address pressing warfighter concerns like advanced electro-optical threats and millimeter wave threats will be added in future years.

Advanced Technology Development/Verification (ATD/V) (Ongoing effort: DEED):

ATD/V focuses on research to mature and assess emerging technologies to address compelling EW and converged EW/Cyber warfighter needs. Our ongoing ATD/V effort, DEED, is a laboratory and developmental venue that matures and assesses emerging EW and converged EW/Cyber technologies to enable, e.g., more effective coordination of sensor and electronic attack capabilities to deliver multi-point, collaborative EW and cyber capabilities to warfighters. DEED specifically seeks to identify and pair synergistic technologies to develop systems with capabilities that are greater than the sum of the individual parts.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603618D8Z / *Joint Electronic Advanced Technology*	**Project (Number/Name)** P619 / *Joint Electronic Advanced Technology*

Innovative Technology Exploration (Ongoing effort: Adaptive/Asymmetric Technology (A/AT)):

Innovative Technology Exploration encompasses a wide variety of efforts focusing on analyses and studies of emerging asymmetric threats for the Director, EW&C. Past work includes the Aircraft Survivability Equipment Joint Analysis Team, the Helicopter Survivability Task Force, and advanced analytic studies of the link budget associated with addressing highly advanced, agile threats. Our ongoing effort in this area, A/AT, produces studies that are strongly supported by the Services and Office of the Secretary of Defense (OSD), and past studies have resulted in significant technology investments by DoD.

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

EW C&P supports the activities of the Director, EW&C related to the selection, organization, oversight, and coordination of new and emerging EMS warfare concepts and related efforts. It includes efforts related to the identification, assessment, formulation of recommendations to address EW-related threat trends impacting sensor, seeker, communications and battle management technologies and countermeasures for these threats; programmatic and budget review and recommendations; and decision support to the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD(AT&L)) on selected programs of record including Critical Program Information standards, Foreign Disclosure advice, and Technical Signals Requirements. This effort further solicits and provides advisory information between OSD and the Joint Staff, Combatant Commands, Service sponsors and Research Engineers including oversight of an extensive variety of EW-related Research and Development (R&D) activities within the department and world-wide. EW C&P efforts support all three JEAT pillars.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: Experimentation/Demonstration Vigilant Hammer (VH)	2.376	4.139	8.400

Description: The VH series of multi-year, multi-agency, live, virtual and constructive field experimentation venues will host projects that seek to more effectively sense, classify, geolocate, prosecute and assess attack effects against modern, agile and cognitive signals in a dense and highly complex signals environment. VH leverages JEAT's history of conducting highly successful and cost effective experiments to gage the collective ability of DoD and the Intelligence Community to provide a robust, adaptive and effective network of sensing and electronic attack effects using a collaborative, distributed set of electronic systems. A second JEAT demonstration series focusing on another high priority issue area will begin detailed planning in FY 2016.

FY 2014 Accomplishments:
VH Planning and Design – Efforts focused on VH event design and planning efforts to enable VH 1 to be conducted in March of 2015. VH 1 included both scripted and free play scenarios to give participants opportunities to identify synergies and incrementally build capabilities to engage modern signals threats in a dense and highly complex EMS threats environment.

FY 2015 Plans:
VH 1 will be conducted in March of FY 2015 with a final report to be produced within a couple of months after the event. Assessment of VH 1 results will guide planning efforts for VH 2, which will begin in 4Q FY 2015.

FY 2016 Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603618D8Z / *Joint Electronic Advanced Technology*	**Project (Number/Name)** P619 / *Joint Electronic Advanced Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
VH 2 will build on the signals detection, classification, geolocation and prosecution emphasis of VH 1 to add significantly more active attack methodologies to the event. All means of spectrum sensing and attack will be included, which will draw in a much larger community than VH 1. The community will also be first challenged with the experiment objective of gaging our national ability to remotely assess the effects of spectrum attack on adversary systems in near real time.			
Title: Advanced Technology Development/Verification (ATD/V) ***Description:*** ATD/V efforts research to mature and assess emerging technologies to address compelling EW and converged EW/Cyber warfighter needs. Our current ATD/V effort, Distributed Electronic Effects Development (DEED) is a laboratory and developmental venue that will mature and assess emerging EW and converged EW/Cyber technologies to enable, e.g., more effective coordination of sensor and electronic attack capabilities to deliver multi-point, collaborative EW and cyber capabilities to warfighters. DEED specifically seeks to identify and integrate advanced technology devices in a way that creates effects that are greater than the sum of the effects that would be created by the constituent parts. It also seeks to identify innovative ways to accomplish military objectives by using the spectrum in a cost effective way in which we spend less than our adversaries so that we win the cost exchange equation. ***FY 2014 Accomplishments:*** FY 2014 efforts focused on establishing the DEED laboratory at appropriate classification levels to evaluate techniques for collaborative EW technique development with an emphasis on the use of Unmanned Aerial Vehicle (UAV) applications. Initial arrangements to bring the first distributed EW effects payloads into the DEED laboratory were made. ***FY 2015 Plans:*** FY 2015 efforts will begin identifying and assessing new and innovative EW technologies. Emphasis will be placed on the creation of techniques and approaches that include distributed systems (primarily UAV based). These technologies will be created by combining two or more existing components to produce a new and unique capability that provide more warfighting value than the sum of its parts. Laboratory evaluation of these capabilities in the DEED laboratory will seek to integrate and quantify the benefits of the new approaches, and seek to ultimately prepare products for evaluation in venues like VH. Access will be maintained to a small fleet of UAVs for the purpose of experimentation with distributed EW payloads when they prove to be mature enough for open air experimentation through work-ups in the DEED laboratory. ***FY 2016 Plans:*** FY 2016 efforts build on the FY 2015 efforts using DEED and other available laboratories to pursue opportunities with a theme of using the power of distributed networks of devices to deliver spectrum effects. A regular outreach to government and industry will be maintained in FY 2016, and promising technologies will be evaluated and possibly paired together for the purpose of creating new capability that is more than the sum of the individual technological parts.	5.000	1.557	3.253
Title: Innovative Technology Exploration (ITE)	1.396	1.507	1.950

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603618D8Z / *Joint Electronic Advanced Technology*	**Project (Number/Name)** P619 / *Joint Electronic Advanced Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Description: Our ongoing ITE effort, A/AT, directly supports Assistant Secretary of Defense for Research and Engineering (ASD(R&E)), Director, EW&C through analyses and studies of emerging asymmetric threats. Past efforts under this JEAT project include the Aircraft Survivability Equipment Joint Analysis Team and the Helicopter Survivability Task Force, both of which resulted in significant strategic technology investments by the Department. ***FY 2014 Accomplishments:*** FY 2014 A/AT efforts included a landmark study of the challenges associated with performing electronic attack on advanced threats that are part of a sophisticated integrated air defense system. This study pointed out the challenges of taking a conventional approach to defeating this type of system, and recommended that specific live evaluations occur to test alternative means of solving this very difficult problem. Extensive coordination with the Naval Air Warfare Center's Warfare Analysis Department enabled the formulation of plans to create modeling and analytics on very advanced electronic attack techniques and the effect that they will have in critical future warfighting engagements. ***FY 2015 Plans:*** FY 2015 efforts are focusing on analysis of alternative courses of action related to packaging and deploying advanced EW technology, particularly that which is of interest in related development efforts. 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. ***FY 2016 Plans:*** FY 2016 efforts will focus on analysis of alternative courses of action employing advanced, adaptive and cognitive EW technologies emerging in commercial data communications, radar and other advanced spectrum domains previously dominated by DoD. 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.			
Title: EW Enterprise Collaboration and Planning	-	3.746	3.863
Description: This effort supports the EW&C Director's management, oversight, and coordination of the plethora of EMS warfare related activities to the ASD(R&E). It includes: oversight of an extensive volume and variety of R&D activities within the department and world-wide; exploration of new and innovative EMS technologies and approaches; coordination of Departmental R&D, programs, protocols, and policy; analyses of requisite technologies and efforts; ensuring intelligence requirements for EMS warfare related efforts are met; management of interfaces with international partners; management of all EMS development and operational interfaces across the DoD; and reporting relevant information both within the Department and to Congress and other external groups as necessary.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603618D8Z / *Joint Electronic Advanced Technology*	**Project (Number/Name)** P619 / *Joint Electronic Advanced Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
FY 2015 Plans: FY 2015 efforts are focusing on analysis of alternative courses of action related to packaging and deploying advanced EW technology, particularly that which is of interest in related development efforts. 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. FY 2015 efforts focus on establishing a cross-service, cross-discipline EW/Cyber Convergence plan and an associated experimentation and prototype planning process; live, virtual and constructive experimentation involving advanced EW/Cyber visualization, employment optimization, battle management and engagement algorithms; promulgation and implementation monitoring of selected, approved FY 2014 EW Assessment recommendations evolved from coordinated analysis and requirements definition with the Joint Chiefs of Staff, United States Strategic Command, United States Pacific Command, and the Services; evaluation and reporting of recommended new Science and Technology (S&T) investment strategies in EW components and systems required to adapt to the evolving challenge of modern electromagnetic sensors, weapons and countermeasures; preparing and presenting plans for enhanced range testing of future systems in support of budgeting decisions; and other Departmental oversight efforts related to EMS warfare capabilities. This project will lead the R&E interactions with Australia under the U.S.-Australia-U.S. Ministerial of Defense Acquisition Committee, and support the coordination of EMS-related R&D and developmental programs within the Department at all classification levels. ***FY 2016 Plans:*** FY 2016 efforts include analysis of alternative courses of action employing advanced, adaptive and cognitive EW technologies emerging in commercial data communications, radar and other advanced spectrum domains previously dominated by DoD, and 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. Plans and exploratory investigations will evolve to evaluate and harvest emerging concepts and technologies from the R&E Reliance Process and the EW S&T Community of Interest Road Map. Initial areas of focus are expected to be multi-platform, multi-aperture synchronization and control technologies and software algorithms and associated autonomous control systems. Included will be investigations into robust command and control mechanisms with high reliability and strong anti-jam configurations. Measurements in data throughput requirements, enhanced fusion and geolocation mechanisms are also planned for evaluation. Monitoring of evolving, ever-changing threats and alternative countermeasure technologies will continue along with recurring annual reassessments of net progress vis-à-vis realized improvements in mission effectiveness. Analysis and national and international coordination will also begin on emerging Information Operations and EW/Cyber Convergence topics.			
Accomplishments/Planned Programs Subtotals	8.772	10.949	17.466

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603618D8Z / *Joint Electronic Advanced Technology*	**Project (Number/Name)** P619 / *Joint Electronic Advanced Technology*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense			Date: February 2015
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603618D8Z / *Joint Electronic Advanced Technology*	Project (Number/Name) P244 / *Advanced EW Technology Maturation Project*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
P244: *Advanced EW Technology Maturation Project*	-	-	-	13.500	-	13.500	-	-	-	-	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 2014	FY 2015	FY 2016
Title: Advanced EW Technology Maturation Project	-	-	13.500

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.

The architectural and battle management research in this effort also will 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.

FY 2016 Plans:

FY 2016 efforts focus on maturating 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.

These objectives will be accomplished via the following:

• 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

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603618D8Z / *Joint Electronic Advanced Technology*	**Project (Number/Name)** P244 / *Advanced EW Technology Maturation Project*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
• 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	-	-	13.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense			Date: February 2015
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603618D8Z / *Joint Electronic Advanced Technology*	Project (Number/Name) P245 / *EW Enterprise Exploration and Innovation*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
P245: *EW Enterprise Exploration and Innovation*	-	-	-	13.000	-	13.000	11.837	2.878	0.886	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

This four-year project 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 and Development, and Ultra Wideband Receiver Development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: Advanced Airborne Countermeasures Development (AACD)	-	-	4.000
Description: AACD develops advanced countermeasures to protect airborne assets against a wide variety of increasingly sophisticated threat systems possessing expanded spectral and temporal coverage and resolution, complex and diverse waveforms and having significant agility. Efforts will specifically address advanced EW, sensor, and seeker threats involving 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. ***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.			
Title: Advanced Defensive Countermeasures Development (ADCD)	-	-	2.000
Description: ADCD 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 products within existing and developmental architectures will be guaranteed by close coordination with both warfighters and technology developers. ***FY 2016 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense		Date: February 2015
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
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.			
Title: Non-Kinetic Battle Management and Visualization Technology Development ***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. ***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.	-	-	2.105
Title: Advanced EW and EW/Cyber Exploration and Development (AEWCED) ***Description:*** AEWCED establishes a recurring multi-year, multi-agency, Live, Virtual, and Constructive (LVC) venue of increasing complexity to advance the state of the art for countering advanced RF, Electro-Optical (EO) and digital emitters and collectors. The event will be modeled after the highly successful BLACK DART, Trident Spectre, and Rotorcraft Aircraft Survivability Equipment Experiment (RASE) venues, and will include both scripted and free play scenarios intended to give participants an opportunity to explore the efficacy of existing and new technological capabilities to engage emerging threats. AEWCED includes the development and vetting of technologies and engagement payloads in a laboratory environment prior to participation in field experimentation events. ***FY 2016 Plans:*** FY 2016 will begin development of a new, recurring multi-year, multi-agency, LVC venue of increasing complexity focused on advancing the state of the art for countering advanced RF, EO and digital emitters and collectors. FY 2016 efforts also include the initial development of new converged EW/Cyber tools and techniques for demonstration in AEWCED 1 and/or VH 3.	-	-	2.895
Title: Ultra Wideband Receiver Development (UWBR) ***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	-	-	2.000

Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense		Date: February 2015
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
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 experimentation/demonstration venues. ***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.			
Accomplishments/Planned Programs Subtotals	-	-	13.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A