Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Office of the Secretary Of Defense	Date: February 2016
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*

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	484.441	116.234	132.258	148.184	-	148.184	115.975	117.047	119.153	124.494	Continuing	Continuing
P648: *Joint Capability Technology Demonstration (JCTD)*	484.441	116.234	132.258	148.184	-	148.184	115.975	117.047	119.153	124.494	Continuing	Continuing

Note

The Joint Capability Technology Demonstration (JCTD) Program's mission is to support the identification, development, and demonstration of forward looking concepts encompassing multi-domain technologies to satisfy Multi-Service and Combatant Commands (COCOMs) priorities. Seeking to explore the art of the possible through the use of rigorous prototyping and experimentation, the JCTD program engages the Interagency, International, and non-governmental partners to expand the Department of Defense's (DoD) access to innovation spawning from government, academia and industry. Focused on the core tenets of the Defense Innovation Initiative and Better Buying Power, the JCTD program serves as the vehicle for COCOMs and Services to address strategic priority areas that present significant risk and suffer from inadequate investment in the Department as identified by the Chairman's Gap Assessment, Quadrennial Defense Review, Strategic Defense Reviews and other senior level guidance.

These strategic priorities are the primary driver in the identification of JCTD projects which will be initiated in the following areas: Electromagnetic Spectrum Agility; Space Capability Resilience; Autonomous Systems and Asymmetric Force Application. The objective is to implement measures to maintain U.S. technological superiority across the range of military operations and counter emerging threats while providing effects at range, reducing the cost of operations, and allowing for the rapid insertion of new capabilities to achieve the desired effects within three to five years.

Going forward, JCTDs supporting the DoD's strategic priorities will tend to be longer and larger with increased emphasis on innovation, risk reduction, and affordability. Overall, we envision initiating fewer yet more strategically decisive JCTDs. JCTDs will continue to reinforce key partnerships across the operational and technical communities for expedited development, deployment, evaluation, and transition of capability solutions with the potential to address some of the most highly complex challenges of the Department. In addition, these JCTD partnerships will enable interdepartmental cooperation and capability development with the Departments of Homeland Security, State, Transportation, Energy, Justice, the National Aeronautics and Space Administration, among others.

A. Mission Description and Budget Item Justification

The value and impact of the JCTD program is to cost-effectively address the Department's strategic priorities to maintain U.S. technological superiority and counter emerging threats while promoting affordability and interoperability of Defense systems throughout all Pre-Engineering and Manufacturing Development (Pre-EMD) phases. In FY 2015, the JCTD Program successfully completed the demonstration and transition of several JCTD prototypes that fielded affordable and sustainable solutions to meet immediate operational warfighting needs.

Key values demonstrated by the JCTD program are:

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Office of the Secretary Of Defense	Date: February 2016
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*

• The JCTD Program has a long history of providing enduring capabilities. See "Section D. Acquisition Strategy" for more details on transition.

• The JCTD Program delivers capabilities far quicker than the traditional DoD Planning, Programming, Budgeting, and Execution (PPBE) process. Recent examples include:

1. The Joint Extended Range Illumination Projectiles (JERIP) JCTD delivered 155 millimeter Infrared (IR) and Visual Light (VL) Illumination projectiles, which has allowed the warfighter to see as far as they can shoot and provides extended night time situational awareness in the counter insurgency Area of Operations. As a direct result of the JCTD, JERIP achieved Milestone C as an Army Acquisition Category III Program of Record (PoR), and was approved for full-rate production. The JCTD accelerated and increased this capability, resulting in a direct cost-savings of between $6.000 million-$10.000 million to the development effort.

2. In support of the Army Robotic Systems Joint Program Office, the Autonomous Mobility Applique Systems (AMAS) JCTD successfully developed, demonstrated and transitioned autonomous capabilities to the U.S. Army Route Clearance and Integration System PoR that will be incorporated into existing Tactical Wheeled Vehicle (TWV) PoRs. AMAS has completely changed the Army's future ground robotics plans and requirements and will have a lasting impact on future ground autonomous programs through the application of lessons learned and capability from the AMAS JCTD.

3. The High Speed Container Delivery System (HSCDS) JCTD developed a parachute system to offload up to eight Container Delivery System bundles at an elevation of 250 feet and 250 knots from C-130J and C-17 aircraft. This has significantly improved the accuracy of existing delivery systems while providing increased safety for the aircraft and friendly ground forces. HSCDS transitioned to the Army's Product Manager for Force Sustainment Systems, has been extensively used in Afghanistan and used to deliver humanitarian assistance to Yazidi people on Mount Sinjar, Iraq.

• The JCTD Program enables coalition cooperative development by leveraging partner nation expertise and resources; approximately one-fifth of JCTD projects involve some degree of participation from coalition partners. As a result of successful past collaborations, the program now enjoys routine interactions with the United Kingdom, Canada, Australia, and the Republic of Korea.

• The JCTD Program also enables development and execution of interdepartmental cooperation projects with the Department of Homeland Security, State, Transportation, and the National Aeronautics and Space Administration.

MEASURABLE OUTCOMES:

• JCTDs will demonstrate capability objectives within three to five years.
• The JCTD program will continue to achieve high transition rates. In FY 2015, 100 percent of completed JCTDs successfully transitioned. Seven of nine completed JCTDs transitioned to a new or existing Program(s) of Record, two of nine transitioned to fieldable-prototypes (residual capabilities) sustained by non-JCTD funds in direct support of operations in theater.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Office of the Secretary Of Defense	Date: February 2016
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603648D8Z *I Joint Capability Technology Demonstration (JCTD)*

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	119.790	141.540	125.003	-	125.003
Current President's Budget	116.234	132.258	148.184	-	148.184
Total Adjustments	-3.556	-9.282	23.181	-	23.181
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-9.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.009	-			
• Baseline adjustments for higher priorities and requirements	-	-	24.058	-	24.058
• FY15 Reprog. for Cancelled Account	-0.047	-	-	-	-
• Other Reprogrammings	-0.500	-	-	-	-
• FFRDC	-	-0.282	-	-	-
• Economic Assumptions	-	-	-0.877	-	-0.877

Change Summary Explanation

The FY 2017 baseline adjustment of $23.207 million was added for COCOM support to include experimentation and prototyping activities.

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 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*				Project (Number/Name) P648 / *Joint Capability Technology Demonstration (JCTD)*			
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**
P648: *Joint Capability Technology Demonstration (JCTD)*	484.441	116.234	132.258	148.184	-	148.184	115.975	117.047	119.153	124.494	Continuing	Continuing

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The Joint Capability Technology Demonstration (JCTD) Program's mission is to support the identification, development, and demonstration of forward looking concepts encompassing multi-domain technologies to satisfy Multi-Service and Combatant Commands (COCOMs) priorities. Seeking to explore the art of the possible through the use of rigorous prototyping and experimentation, the JCTD program engages the Interagency, International, and non-governmental partners to expand the Department of Defense's (DoD) access to innovation spawning from government, academia and industry. Focused on the core tenets of the Defense Innovation Initiative and Better Buying Power, the JCTD program serves as the vehicle for COCOMs and Services to address strategic priority areas that present significant risk and suffer from inadequate investment in the Department as identified by the Chairman's Gap Assessment, Quadrennial Defense Review, Strategic Defense Reviews and other senior level guidance.

These strategic priorities are the primary driver in the identification of JCTD projects which will be initiated in the following areas: Electromagnetic Spectrum Agility; Space Capability Resilience; Autonomous Systems; and, Asymmetric Force Application. The objective is to implement measures to maintain U.S. technological superiority across the range of military operations and counter emerging threats while providing effects at range, reducing the cost of operations, and allowing for the rapid insertion of new capabilities to achieve the desired effects within three to five years.

Going forward, JCTDs supporting the DoD's strategic priorities will tend to be longer and larger with increased emphasis on innovation, risk reduction, and affordability. Overall, we envision initiating fewer yet more strategically decisive JCTDs. JCTDs will continue to reinforce key partnerships across the operational and technical communities for expedited development, deployment, evaluation, and transition of capability solutions with the potential to address some of the most highly complex challenges of the Department. In addition, these JCTD partnerships will enable interdepartmental cooperation and capability development with the Departments of Homeland Security, State, Transportation, Energy, Justice, and the National Aeronautics and Space Administration.

A. Mission Description and Budget Item Justification

The value and impact of the JCTD program is to cost-effectively address the Department's strategic priorities to maintain U.S. technological superiority and counter emerging threats while promoting affordability and interoperability of Defense systems throughout all Pre-Engineering and Manufacturing Development (Pre-EMD) phases. In FY 2015, the JCTD Program successfully completed the demonstration and transition of several JCTD prototypes that fielded affordable and sustainable solutions to meet immediate operational warfighting needs.

Key values demonstrated by the JCTD program are:

• The JCTD Program has a long history of providing enduring capabilities. See "Section D. Acquisition Strategy" for more details on transition.

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 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

• The JCTD Program delivers capabilities far quicker than the traditional DoD Planning, Programming, Budgeting, and Execution (PPBE) process. Recent examples include:

1. The Joint Extended Range Illumination Projectiles (JERIP) JCTD delivered 155 millimeter Infrared (IR) and Visual Light (VL) Illumination projectiles, which has allowed the warfighter to see as far as they can shoot and provides extended night time situational awareness in the counter insurgency Area of Operations. As a direct result of the JCTD, JERIP achieved Milestone C as an Army Acquisition Category III Program of Record (PoR), and was approved for full-rate production. The JCTD accelerated and increased this capability, resulting in a direct cost-savings of between $6.000 million-$10.000 million to the development effort.

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• The JCTD Program enables coalition cooperative development by leveraging partner nation expertise and resources; approximately one-fifth of JCTD projects involve some degree of participation from coalition partners. As a result of successful past collaborations, the program now enjoys routine interactions with the United Kingdom, Canada, Australia, and the Republic of Korea.

• The JCTD Program also enables development and execution of interdepartmental cooperation projects with the Department of Homeland Security, State, Transportation, and the National Aeronautics and Space Administration.

MEASURABLE OUTCOMES:

• JCTDs will demonstrate capability objectives within three to five years.
• The JCTD program will continue to achieve high transition rates. In FY 2015, 100 percent of completed JCTDs successfully transitioned. Seven of nine completed JCTDs transitioned to a new or existing Program(s) of Record, two of nine transitioned to fieldable-prototypes (residual capabilities) sustained by non-JCTD funds in direct support of operations in theater.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Anti-Jam Precision Guided Munitions (AJPGM)	5.900	-	-

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Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Description: AJPGM will enable precision navigation capability in severely degraded Global Positioning System (GPS) environments. AJPGM will also deliver low cost home-on-jam capability. Specifics related to technologies, current capability, and threats are classified. ***FY 2015 Accomplishments:*** Integrated sensor assemblies with surrogate weapon platforms. Conducted flight test technical demonstrations. Conducted flight test operational demonstrations using surrogate platforms. Completed a limited utility assessment based on demonstrations. Completed sensor integration with Joint Direct Attack Munitions and Small Diameter Bomb guided test vehicles and live weapon variants. Conducted technical demonstrations using inert weapon platforms. Conducted operational flight demonstrations with live weapons. Completed the utility assessment. Transitioned to Air Force Program Execution Office, Weapons, Program of Record. Completed the JCTD.			
Title: Advanced Weapons Enhanced by Submarine Unmanned Aerial System against Mobile targets (AWESUM) ***Description:*** AWESUM will deliver an undersea launched Unmanned Aerial System (UAS), optimized for deployment through existing submarine three inch countermeasure launcher, to perform targeting, Intelligence, Surveillance, and Reconnaissance (ISR), and the potential for limited attack capabilities. This effort will specifically address requirements from an Anti-Access/Anti-Denial perspective and the unique challenges to U.S. Forces. It will enhance the ability to find, fix, target, and track maritime targets to support standoff weapon engagements, provide targeting for long range torpedo engagements, enhance ISR and Battle Damage Assessment capabilities, and provide Special Operations support functions. ***FY 2015 Accomplishments:*** Finalized shipboard integration activities, increased UAS endurance and communications, and successfully conducted an at-sea Operational Demonstration of the capability. Transitioned the AWESUM capabilities to Navy Submarine Combat System Program Office (Program Manager, Ship - 425) and Undersea Integration Program Office (Program Manager, Warfare - 770) Programs of Record. Completed the JCTD.	2.875	-	-
Title: Dense Pack Access Retrieval and Transit (DPART) ***Description:*** DPART will demonstrate a hybrid powered material handling equipment that can selectively access twenty-foot equivalent unit (TEU) containers and an electric large wheeled vehicle system that omni-directionally moves them in confined spaces (including ships underway and land based facilities). The technology will allow the Department to rapidly and selectively access, project, reconstitute and redeploy flexible, scalable and tailorable joint forces and logistical support across the range of military operations. ***FY 2015 Accomplishments:***	2.011	-	-

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 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Completed the final Technical Demonstration and Operational Utility Assessment of the omni-directional hybrid (diesel and battery) Container-Lift and Maneuver System (C-LMS) that allowed the movement of TEU containers, and the electric powered Autonomous Naval Transport-Large Wheeled Vehicle system (ANT-LWV) that moved military large wheeled vehicles. Additionally, a Universal Remote Controller (URC) was developed and demonstrated that allowed the operator to control both systems via one source. The demonstrations validated that the systems can be operated aboard vessels in sea state three and can traverse 15 degree ramps while moored or underway. DPART plans to transition to the General Services Administration Schedule 56 and to existing Programs of Record such as within U.S Navy Military Sealift Command (MSC) (potentially Joint High Speed Vessel), U.S. Army Depots within Army Materiel Command, and ammunition depots within Joint Munitions Command. JCTD residuals will transition to one or more operational users such as U.S. Marine Corps Blount Island Command or MSC. Completed the JCTD.			
Title: Joint Operational Long Term Evolution Deployable Tactical Cellular System (JOLTED TACTICS) ***Description:*** JOLTED TACTICS will demonstrate a joint architecture for an interoperable, lightweight, portable, ground mobile, airborne, and/or maritime communications-on-demand packages to allow users to quickly establish secure (Sensitive But Unclassified (SBU) and Suite-B for classified) wireless Long Term Evolution (LTE) Line-of-Sight and Beyond-Line-Of-Sight networks anytime, anywhere with minimal training and equipment. ***FY 2015 Accomplishments:*** Completed the Suite-B Information Assurance Certification. Completed two Operational Demonstrations (including the Tigershark Unmanned Air Vehicle) and the Operational Utility Assessment. Transitioned the residual equipment to U.S. Special Operations Command. Delivered the JCTD Final Report and completed the JCTD.	1.700	-	-
Title: Mobility ***Description:*** Mobility allows the use of Commercial of the Shelf (COTS) mobile devices to wirelessly access multiple security domains using security enhanced thin-client applications and thick-client solutions in enterprise and expeditionary environments. Mobility will prototype a capability for classified and unclassified access on a single hand-held device with use of National Security Agency certified commercial cryptography. Access will be provided to mobile domains through various communications transports in enterprise and expeditionary environments. ***FY 2015 Accomplishments:*** Integrated key technologies, while obtaining security certifications and approvals, to operate thick-client COTS mobile devices on the unclassified Marine Corps Enterprise Network-Non-Secure Internet Protocol Router and on classified closed tactical networks. U.S. Central Command (USCENTCOM) with the U.S. Marine Corps (USMC) recognized early, the merit of the thick-client COTS technology deploying it with the 15th Marine Expeditionary Unit prior to a full operational assessment in support of real-world	1.400	-	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
operations within the USCENTCOM Area of Responsibility. USCENTCOM implemented the MobiKEY (Trademark) capability gaining access to USCENTCOM's unclassified government virtual network from open internet locations in the U.S., Europe, and Southwest Asia, while keeping the security protocols intact. An Operational Demonstration and Military Utility Assessment was conducted on both the thick-client COTS mobile devices and MobiKEY (thin-client COTS device), both were found to have military utility. Transitioned Mobility prototype technologies to USMC Programs of Record. Extended use of MobiKEY at USCENTCOM through June 2016. Completed the JCTD.			
Title: Signal Intelligence Derived Electromagnetic Spectrum (SDEST) ***Description:*** SDEST will leverage National Security Agency (NSA) modernization initiatives to deliver Electo-Magnetic Spectrum (EMS) Target Folders (TF) providing a comprehensive view of the environment. It will compile relevant EMS Object Models (OM) supporting Kinetic/Non-Kinetic targeting, utilizing data from across the Global Cryptologic Enterprise. SDEST uses Cloud, Public Key Infrastructure (PKI), Smart Data Tagging and Cyber-Pilot technologies to enable timely and legal extraction and dissemination. It will deliver OMs via Electromagnetic Space Analysis Center (E-Space) managed Secret Internet Protocol Router Network (SIPRNet) and Joint Worldwide Intelligence Communications System widget query capabilities, and develop subscription services tailored to user-specified criteria. ***FY 2015 Accomplishments:*** Incorporated Object Models and Target Folders utilizing cloud-based data processing and correlation, Smart Data Tagging, and PKI access on Joint World Wide Intelligence Communications System. Implemented a cross-domain solution to allow users access to SDEST on SIPRNet. Conducted an Operational Utility Assessment, transitioned SDEST capabilities to E-SPACE for operator use on both SIPRNet and JWICS. Completed the JCTD.	1.925	-	-
Title: Innovative Projects and Transition Support less than $1.000 Million ***Description:*** Provide resources for approved JCTD projects requiring less than $1.000 million for enhancements to support successful operational demonstrations. ***FY 2015 Accomplishments:*** - Smart Power Infrastructure Demo for Energy Reliability & Security (SPIDERS) a cyber-secure “smart” micro-grid with demand side management and integration of renewable energy and storage on military installations, in partnership with Department of Homeland Security and Department of Energy. The residual micro-grid system transitioned to the Naval Facilities Engineering Command (NAVFAC) Hawaii and Marine Corps Base Hawaii. - Joint Biological Decontamination System (JBADS), a biological decontamination system that employs an innovative closed-loop, hot/humid forced air technique to significantly decontaminate the exterior/interior of a fully encapsulated aircraft.	4.933	-	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Kestrel Eye, a very small, 25 kilogram class satellite that provides “good enough” 1.5 meter resolution and visible imagery. Imagery tasking and delivery is controlled directly by the Combatant Commander to ensure sufficient timelines for near real-time situational awareness and decision-making in the field. Army Program Executive Office Missiles & Space (PEO-M&S) will take on initial acquisition of Kestrel Eye spacecraft and the overall system. Kestrel Eye will transition to Program Executive Office, Intelligence and Electronic Warfare Systems (PEO-IEWS) for the longer term. - Unified Command and Control (UC2) provides network enclaves to allow operational commanders to manage cyber risk to their own mission without introducing risk to the Global Information Grid. UC2 provided key lessons learned for assured terrestrial transport to protect core Command and Control (C2) in Anti-Access/Area Denial environments and allows greater access to assured C2 for Component Commanders, Joint Task Forces, and functional component headquarters. Tactical Switching and Maritime Operations Centers will include UC2 to fulfill coalition communications requirements. Pacific Air Forces has indicated that it will leverage UC2 lessons learned to implement a future Commercial-Solutions-for-Classified for coalition/partner connectivity. - Regional Domain Awareness (RDA) demonstrates a standards-based unclassified framework for information sharing between U.S. government agencies and international partners. RDA Service Oriented Architecture software and related documentation has a targeted transition to Defense Information Systems Agency (DISA) Program Executive Office for Command and Control Multi-National Information Systems (MNIS)/DISA Development & Business Center, Enterprise-Wide Services Collaboration Branch. Additionally, one operational node was provided to U.S. Navy 6th Fleet. - Kinetic/Non-kinetic Integrated Force Effects (KNIFE) provides Combatant Commanders with four dimensional (4D) views of composite targeting effects that dynamically updates to inform strategic and operation decision-making in a compressed timeframe. KNIFE is available on the Joint Worldwide Intelligence Communications System. The transition target is the Integrated Strategic Planning and Analysis Network Global Adaptive Planning Collaborative Information Environment. - Arctic Collaborative Environment (ACE) is an open-access, web-based, Arctic regional and national decision-support system that integrates geo-referenced data from existing remote sensing assets. The ACE capability has transitioned to U.S. National Ice Center (USNIC) and University of Alaska Fairbanks (UAF) as an open source web service/application and is currently transitioning to Alaska Command, Joint Task Force Alaska. - Coalition Tactical Awareness and Response (CTAR) provides a highly mobile capability adaptable to austere operating environments to receive commercial satellite Synthetic Aperture Radar (SAR). CTAR produces value-added maritime vessel detection position reporting via Over The Horizon Gold (OTG) Message Transmission Format. This enables detection of "dark" vessels because they are not emitting electromagnetic radiation from radar or other electro-magnetic communications.			
Title: Combatant Commander (COCOM) Support, Transition Enabling and Strategic Project Operational Management	18.000	19.200	19.700
Description: This effort is comprised of three programs that support the entire JCTD Program, separate from the specific JCTD projects. The three programs are (1) Unified COCOM Direct Support, (2) JCTD Pre-Transition and (3) Program Integration Office for execution of select, classified projects. (1) COCOM Direct Support: The COCOMs are essential in specifying capability			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
needs, project development, demonstration, assessment, and transition of JCTDs. The JCTD Program provides direct support to COCOMs, enabling the COCOMs to provide an on-site JCTD operational manager, typically one to two full-time equivalents (FTEs). (2) JCTD Pre-Transition: In some cases, Service or Agency partner transition funding is not available for one to two years following the JCTD assessment phase due to Service or Agency commitments. In such cases, where there is a clear transition and the need to sustain the capability for a short time prior to availability of Service or Agency transition funds, the JCTD Pre-Transition fund may be used to meet that need. (3) Program Integration Office: Executes a select number classified project in areas such as electronic miniaturization, electronic countermeasures, advanced mobile ad hoc network communications, space situational awareness (SSA) intelligence surveillance and reconnaissance (ISR), sensor platforms and communications, and persistence surveillance. ***FY 2015 Accomplishments:*** Provided COCOM direct participation to enable COCOM staff participation in developing and executing Pre-Engineering and Manufacturing Development (Pre-EMD) prototypes while addressing the strategic priorities of the Department. Sustained selected projects until program of record funds are received. COCOM liaisons provided direct support and coordination for JCTD operational demonstrations and military utility assessments. Developed and executed projects selected as a result of the Technology Assessment Panels. Executed a limited number of classified projects. ***FY 2016 Plans:*** Continue to provide COCOM direct participation in developing and executing Pre-EMD prototypes. Develop and execute projects selected as a result of the Technology Assessment Panels. Sustain selected projects until Program of Record (POR) funds are received. Execute a limited number of classified projects. ***FY 2017 Plans:*** Continue to provide COCOM direct participation to enable COCOM staff participation in developing and executing Pre-EMD prototypes. Develop and execute projects selected as a result of the Technology Assessment Panels. Sustain selected projects until POR funds are received. Execute a limited number of classified projects.			
Title: Enabling Technologies (ET) ***Description:*** The ET fund is used to assess or mature emerging capabilities that support the initiation of a Pre-Engineering and Manufacturing Development (Pre-EMD) prototype. Emerging Technology investments are small, short (less than one year) efforts that may lead to a prototype, depending on the final assessment and determination of technical maturity. ***FY 2015 Accomplishments:*** Projects included:	7.000	5.000	5.000

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Improved three dimensional capabilities for synthetic aperture radar (SAR) and Light Detection and Ranging (LIDAR) airborne systems - A validated secure micro-digital data link prototype, sense and avoid algorithms for unmanned aerial systems - Multispectral analysis of unclassified satellite imagery in the Arctic Ocean - Tactical radiological and chemical sensing capabilities for Chemical, Biological, Radiation, Nuclear forces - Net-enabled jammer capability enhancement under the CERBERUS JCTD - Enhanced unmanned underwater vehicle (UUV) centric intelligence surveillance, and reconnaissance (ISR) solutions for command control anti-jam - A reconnaissance capability for various ports and piers, scanning infrared (IR) sensors to detect and track unmanned aerial vehicles at various ranges - Tunable modifications of wideband electronic warfare (EW) receivers - Combat identification (ID) capability by utilizing topological and multiple hypothesis track algorithms - Small satellite capability with mission specific optional payloads - A virtual enterprise node to interface with Joint Information Environment (JIE) and Real Time Mission Partner Environment ***FY 2016 Plans:*** Projects will continue to be used to assess or mature emerging capabilities that support the initiation of a Pre-Engineering and Manufacturing Development Prototypes. Selected efforts will be small, focused, and executable in less than one year and require a concrete deliverable prototype hardware and/or software, integrated subsystem or technology assessment report, etc. ETs will be derived from the Emerging Capability and Prototyping Technical Assessment Panels. ***FY 2017 Plans:*** Projects will continue to be used to assess or mature emerging capabilities that support the initiation of a Pre-Engineering and Manufacturing Development Prototypes. Selected efforts will be small, focused, and executable in less than one year and require a concrete deliverable prototype hardware and/or software, integrated subsystem or technology assessment report, etc. ETs will be derived from the Emerging Capability and Prototyping Technical Assessment Panels.			
Title: JCTD Concept Development/Pre-Engineering and Manufacturing Development (Pre-EMD) Prototypes	1.145	31.664	51.290
Description: The JCTD program will develop projects as Pre-EMD prototypes to address broader Defense strategic initiatives in areas such as Electromagnetic Spectrum Agility; Space Capability; Autonomy Systems and Multi-Domain Technologies; Countering Weapons of Mass Destruction; and Force Application. Selected projects will leverage networks within the global research and engineering enterprise to include government labs and integration facilities, depots, academia, as well as traditional and non-traditional providers. Prototypes will utilize best practices to satisfy joint and cross-cutting needs and the EC&P office will work with the Services to identify means to streamline prototype transition into the acquisition systems where appropriate.			

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 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
FY 2015 Accomplishments: Selected prototypes in the areas of Electromagnetic Spectrum Agility; Space Capability Resilience; Autonomy Systems and Multi-Domain Technologies; Countering Weapons of Mass Destruction; and Force Application. ***FY 2016 Plans:*** Conduct advanced prototyping activities focusing on Asymmetric Force Application, Space Capability Resilience, Electromagnetic Spectrum Agility, and Autonomous Systems. Specific projects under final review include: development of an air-launched interceptor to defeat ballistic missiles and high value airborne assets; autonomous low cost cruise missiles to provide a suite of weapons to perform a variety of missions; low cost relays to provide beyond-line-of-sight communications capabilities were satellite communications and airspace have been denied; an affordable alternative to conventional cluster munitions needed to meet the requirements of the 2008 DoD Policy on Cluster Munitions and Unintended Harm to Civilians; and the use of networked swarms of autonomous unmanned air systems that can operate a variety of missions in environments with communications, sensing, and position navigation and timing (PNT). ***FY 2017 Plans:*** Conduct advanced prototyping activities focusing on Asymmetric Force Application, Space Capability Resilience, Electromagnetic Spectrum Agility, and Autonomous Systems. Specific activities may include continued integration, subsystem and system level demonstrations and assessments for multi-vehicle expendable platform/expendable payload concepts working collaboratively to deliver reconfigurable effects using non-traditional delivery methods, deployment of hybrid Radio Frequency-optical tactical communications and protected communications for small unmanned systems, automated and integrated space manufacturing capabilities, reconfigurable self-forming and self-healing space based communication networks, machine cognition to aid human task loading to deploy multiple platforms, sensors, and weapons in complex mission scenarios.			
Title: Joint Multi-Platform Advanced Combat Identification (JMAC)	2.000	2.000	0.500
Description: JMAC will provide government-owned software that can be integrated into any sensor or Command and Control (C2) system to provide real-time identification of air threats, including Unmanned Aerial Systems (UAS), cruise missiles, rotary wing, military jets, and general aviation. JMAC will be integrated into the National Capitol Region-Integrated Air Defense System (NCR-IADS) via upgrades to the Improved-Sentinel radar, the Next Generation Fire Control Radar (i.e. Joint Land Attack Cruise Missile Defense Elevated Netted Sensor (JLENS)), the NCR-IADS network, and the Joint Air Defense Operations Center (JADOC). ***FY 2015 Accomplishments:*** Initiated development of NCR-IADS network architecture updates to support the new JMAC Combat Identification (CID) capability, preliminary Tactics Techniques and Procedures development, integration of JMAC software into the various sensor and C2			

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Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
platforms, and expansion of the JMAC database to support NCR. Conducted Technical Demonstration One and preparing for Field Demonstration One at Black Dart exercise in 2015. ***FY 2016 Plans:*** Refine messaging architecture; develop stop, stare, and track mode interface; continue algorithm refinement and integrate sidecar processors. Integrate the Enhanced Regional Situation Awareness (ERSA) sensor to address Counter-Unmanned Air Systems problem in the National Capitol Region. Conduct Field Demo 2 and 3. Develop system integration and assessment plans. Refine concept of employment and tactics, techniques, and procedures. ***FY 2017 Plans:*** Conduct multiple technical and operational demonstrations to ensure successful integration of software and test identification reliability of the algorithm. Begin transition of JMAC capability into the NCR-IADS Program of Record. Complete the JCTD.			
Title: Low Cost Missile Defeat (LCMD) ***Description:*** Low Cost Missile Defeat (LCMD) is a ballistic missile defense system designed to counter current and emerging Weapons of Mass Destruction (WMD) and Anti-Access/Area Denial (A2/AD) threats. LCMD program execution has been structured using a building block approach; the FY2015 step was a technology demonstration effort under the Deputy Assistant Secretary of Defense, Emerging Capability & Prototyping (DASD (EC&P)) to accelerate technology maturation. The Concept of Operations (CONOPS) for the system has been formulated to integrate LCMD into the existing National Ballistic Missile Defense (BMD) architecture and will prioritize the use of existing components and systems already fielded. LCMD is not designed as a replacement to existing BMD systems, but rather as a lower cost complementary/augmentative component to forward-deployed BMD assets. The LCMD capability will augment current BMD systems and mitigate threat vulnerabilities to U.S. personnel and strategic assets. ***FY 2015 Accomplishments:*** System Design, Performance and Cost/Value Trade Studies were conducted according to the LCMD Analysis Plan to refine and validate the system concept and assess the maturity of the required technology. High fidelity simulations and engineering analyses were developed to characterize detailed mission performance, integration interfaces with existing BMD infrastructure, and the system's ability to address validated capability gaps. In addition, the maturity of the three critical technology areas, booster design, seeker design, and thrust-vector control design was advanced through additional detailed design work, coupon and component level testing. A detailed production unit cost analysis was conducted to validate that the LCMD missile met the goal of less than $1.000 million per round. The studies concluded the LCMD concept presents a promising approach to lowering threat ballistic missile engagement costs. ***FY 2016 Plans:***	14.000	18.000	50.000

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Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
The project will produce detailed designs for a LCMD prototype as well as the key interfaces to the BMD test infrastructure necessary to support a full-scale flight demonstration. In addition, high fidelity mission and architecture analyses will be conducted to continue to refine the concept. Pending successful reviews and development, future phases of the project will fabricate prototype interceptors in a demonstration to engage realistic threat targets. ***FY 2017 Plans:*** The project will continue to complete detailed designs for the LCMD prototype and progress to fabrication of critical and long lead components. Integration, assembly, and development testing will be conducted as well leading up to a Critical Design Review (CDR) for the prototype demonstration system. Pending successful development and reviews, the project will initiate fabrication, assembly and testing of flight demonstration prototypes.			
Title: Military Application of the Space Environment (MASE) ***Description:*** MASE prototype demonstrations mature space environment technology to improve combat operations. The prototype will provide weapons system specific visualizations that will be integrated into Operational Plans and Tactics, Techniques, and Procedures as decision aids to assess their utility for mission operations. Products will be evaluated using quantitative standard measures of performance, effectiveness, and outcome against theater operational requirements. A leave behind capability will provide residual capability at the conclusion of the prototype demonstration while a program of record is established. ***FY 2015 Accomplishments:*** Determined user tool requirements and software identification and integration efforts. Identified visualization tools for coverage areas while integrating comprehensive and empirical weather data. Worked an extensive software reuse effort to determine which software tools could be used to develop application tools for various high frequency propagation applications. ***FY 2016 Plans:*** Conduct end-to-end system/mission engineering to include sensor-to-shooter data flow/work flow, component technologies (model, applications and system effects), interfaces, and data exchanges. Generate user friendly mission planning tool with multiple effects and vetted graphical product suite, sensor laydown and types of data. Conduct multiple demonstrations. ***FY 2017 Plans:*** Finish end-to-end system/mission engineering and development of mission planning tool. Conduct final demonstration. Transition to Air Force Space Command for an extensive period of testing. Once the phenomenology is tested and well understood, it will transition to Combat Air Forces in Pacific Command. Complete the JCTD.	4.100	2.750	2.150
Title: Port Improvement via Exigent Repair (PIER)	2.358	2.244	1.544

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Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Description: PIER will deliver a dynamic, agile, cost effective (non-military construction) expeditionary engineering solution to rapidly repair damaged or degraded ports to a minimum level of serviceability after an attack or natural disaster. Agility is achieved through a smaller footprint, commercial off-the-shelf infusion, and quick reaction of theater-based repair assets (e.g. pre-packaged, pre-positioned). The intent of PIER is to assure continued logistics resiliency and freedom for our U.S. Forces to maneuver and conduct agile strategic sealift and logistics. PIER will allow the Department to address the Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facility, and Policy (DOTMLPF+P) concerns about its ability to conduct rapid port damage repair. ***FY 2015 Accomplishments:*** Conducted engineering design and validated construction materials and techniques for substructure repair: pile jacketing, section splicing, pile bridging, and expedient footings. Conducted two Technical Demonstrations and one Limited Operational Utility Assessment. These pile repair technologies allow for the primary foundation of ports to be restored. The plan is to transition to the U.S. Army (USA) and Defense Logistics Agency (DLA). ***FY 2016 Plans:*** Design and validate superstructure technologies: pile capacity upgrade, pile bracing, pile cap repair, beam replacement, beam and cap upgrade. Conduct two Technical Demonstrations and one Limited Operational Utility Assessment. These technologies allow for secondary components to strengthen the superstructure of the ports, and plan to transition to the USA and DLA. ***FY 2017 Plans:*** Design and validate technologies to repair deck craters and holes and over-bridging of gaps. Conduct two Technical Demonstrations and one Limited Operational Utility Assessment. Transition components to the U.S. Army, U.S. Navy and Defense Logistics Agency (DLA). Complete the JCTD.			
Title: Small Satellite Communications Network (SSCN) ***Description:*** SSCN provides an adaptive, self-healing, full-mesh network for assured communications, using a proliferated constellations of low-earth orbit small satellites and advanced software defined radios. ***FY 2015 Accomplishments:*** Conducted Preliminary Design Review and Critical Design Review. Down selected to three vendors for which proposals were solicited. ***FY 2016 Plans:***	5.000	14.000	5.000

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 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Begin ground testing of selected designs. Down-select to a single design and begin final development and plan for execution of an on-orbit test. ***FY 2017 Plans:*** Finish ground testing of selected designs. Conduct on-orbit test with single design and final demonstration. The classified user will continue to use the system until it is no longer functional to explore large small satellites constellations for utility, resilience, reconstitution, and technology adaptation. Complete project.			
Title: Low Power Module (LPM) ***Description:*** Emerging Capability & Prototyping is combining efforts with Navy in developing a low-power modular counter-electro-optical-infra red (C/EO-IR) sensor capability to counter intelligence, reconnaissance, surveillance and targeting (ISRT) systems. (Details are Classified) ***FY 2015 Accomplishments:*** Developed concept of operations (CONOP) and associated tactics, techniques and procedures (TTPs). (Details are Classified) ***FY 2016 Plans:*** Conduct effects testing and operational plan (OPLAN) analyses. (Details are Classified)	0.950	1.100	-
Title: Ravenscraig ***Description:*** Ravenscraig will provide technical and operational characterization and countermeasures for a class of threat signals. (Details are Classified) ***FY 2015 Accomplishments:*** Conducted phase II testing with controlled platform. (Details are Classified) ***FY 2016 Plans:*** Continue development and demonstration. Conduct phase III testing. (Details are Classified) ***FY 2017 Plans:*** Funds additional enhancements, features and capabilities for experimentation/demonstration. (Details are Classified)	9.000	15.000	3.000
Title: Salty Siren ***Description:*** Salty Siren will develop an indications and warning capability for countering Anti-Access/Area-Denial (A2/AD) missions. (Details are Classified) ***FY 2015 Accomplishments:***	1.000	1.000	-

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Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Refined and tested the engineering reference design to include a notional communication support package. (Details are Classified) ***FY 2016 Plans:*** Operationalize the field unit and conduct end-to-end acceptance testing. (Details are Classified)			
Title: Wasabi ***Description:*** Wasabi will produce a real-time common operational picture of adversary missile and space activity. (Details are Classified) ***FY 2015 Accomplishments:*** Designed data integration and processing infrastructure. (Details are Classified) ***FY 2016 Plans:*** Implement rule sets to enable collaboration with coalition partners. (Details are Classified)	4.200	4.000	-
Title: Analytics-based Tactical Data Fusion (ATDF) ***Description:*** The ATDF system is a hardware agnostic software package that provides real-time multi-sensor target tracking across the entire battle space enhancing air and missile defense as well as anti-access area denial in a low-cost package. It is adaptable across multiple platforms and usable across the military forces of the United States, its allies and its coalition partners. Through its real-time, multi-sensor fusion system, ATDF provides targeting and fire-control capabilities over an extended range to virtually every element in the battle space including aircraft, naval vessels of all sizes, and even ground units. ***FY 2015 Accomplishments:*** Successfully completed evaluation testing and successfully tested with Cooperative Engagement Capabilities. Installed in USS George Washington. Participated in Trident Warrior 15 and Talisman Saber 15. Results indicated a significant increase in track length, and a reduction in track numbers as well as a fire-control quality fusion of raw sensor feeds as well as Link16, Intelligence Broadcasting System, General Command and Control System-Maritime, Joint Range Extension Application Protocol, and Air Defense System Integrator. ATDF is targeted to transition to Navy Program Manager, Aircraft 231 (E2 Hawkeye) and the Multifunction Information Distribution System (MIDS)-Program Office (MPO) PMO/PMW 101 with the goal of integrating the ATDF into the Multifunction Information Distribution System-Joint Tactical Radio System upgrade.	2.137	-	-
Title: Paramount ***Description:*** Paramount Prototype is an electronic countermeasure system designed to address specific threats to U.S. Forces. The Paramount effort delivers a Size/Weight and Power (SWaP) assessment, laboratory Electromagnetic Interference/	10.000	-	-

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Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Compatibility (EMI/EMC) analysis, and final Engineering Manufacturing Design (EMD) drawings of a verified and validated system. (Details are Classified) ***FY 2015 Accomplishments:*** Completed Size/Weight and Power assessment and component laboratory EMC/EMI analysis. Conducted site analysis for system deployment and drafted concept of operations (CONOP) and system requirement document. (Details are Classified)			
Title: India Science and Technology Focus Area ***Description:*** The India Science and Technology (S&T) Focus Area is designed to deepen and streamline defense cooperation between the U.S. and India. By sharing research resources, capabilities, and expertise, the United States and India can jointly develop technological innovations needed to enable our defense industrial bases to support our militaries now and in the future. Further, development of vibrant S&T cooperation is a key step in building an enduring partnership. ***FY 2015 Accomplishments:*** Identified topic areas for cooperative S&T including autonomy, cognitive science, and directed energy science. Example projects include: Improving Cognitive & Artificial Cognition Models; Testing, Evaluation, Verification, and Validation for Autonomous Systems; Small, Intelligent Autonomous System for Situational Awareness; High Altitude Fatigue Management and Performance Sustainment; Experimental and Computational Studies of Blast & Blunt Traumatic Brain Injury; Cognitive Tools for Target Detection System; Atmospheric Propagation of High Energy Lasers; Bio-Effects of Laser and High-Power Microwave Sources; and Advanced Cathode Research for Accelerator Applications. ***FY 2016 Plans:*** Continue to develop and execute cooperative S&T projects initiated in FY 2015. Additional cooperative S&T areas targeted include: munitions development, advanced manufacturing, micro-power grids, and other identified project areas. ***FY 2017 Plans:*** Continue to widen, deepen and streamline defense S&T cooperation between the U.S. and India.	10.000	10.000	10.000
Title: Low Cost Attritable Airframe Technology (LCAAT) ***Description:*** LCAAT will develop and demonstrate technologies that enable rapid design, manufacturing, test and deployment of very low cost (essentially expendable) airframes. The strategic objective is to challenge the cost paradigm associated with current airframe manufacturing. LCAAT will conclude with a demonstration of an aircraft capable of 1000 nautical mile flight range and costing less than $3.00 million. This will be realized through a number of innovative prototyping and experimentation approaches that include new manufacturing technologies, very low cost life cycle control measures in the airframe design (i.e. reliability as needed, modelling and simulation for advance performance testing, etc). The effort will also include use of Engineered Resilient	4.600	6.300	-

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Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Systems (ERS) technology to develop fixed-wing trade space analysis tools to allow for rapid optimization and manufacturing of future systems. ***FY 2015 Accomplishments:*** Program planning and execution meetings were conducted. Identified airframe trade space analysis tool requirements and initiated development. ***FY 2016 Plans:*** Demonstration of suitable manufacturing technique to control production and life cycle costs, development and demonstration of ERS system to inform trade space of airframe design choices, prototype initial airframe subsystems and test for reliability. Prototype final airframe and integration subsystem components to ready for flight demonstration. Conduct flight demonstration, validate ERS design trade space analysis tool			
Accomplishments/Planned Programs Subtotals	116.234	132.258	148.184

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Successful JCTDs can transition to acquisition via one of several methods:
- The JCTD addresses a documented capability gap in an existing Program of Record (POR). The existing POR can acquire, further develop, sustain, and provide the capability under existing program documentation.
- The capabilities address capability gaps that naturally fit with an existing POR, but program documentation addressing the new capabilities does not exist. In these cases, existing POR documentation (such as the Capabilities Development Document or Capabilities Production Document) is revised to include the new capabilities from the JCTD, and the JCTD capabilities transition to the POR.
- The capabilities address a current operational need without requiring POR changes. In these cases, the JCTD capabilities may transition directly to operational use, with sustainment (operations and maintenance) funding arranged through the gaining command.
- The capabilities may be widely applicable commodity products, useful to many commands. In these cases, the commodity products listed on General Services Administration schedule, and made available for purchase by any commands needing the capability, using procurement funds.
- Results of JCTD are used to inform the research and engineering, acquisition, or requirements process.
- JCTD demonstrates the art-of-possible and results are put on the shelf to meet future threats and operational needs.

E. Performance Metrics

Strategic Goals Supported:

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 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** P648 / *Joint Capability Technology Demonstration (JCTD)*

- Develop and demonstrate a prototype that fills a capability gap
- Demonstrate a capability to address a DoD key strategic gap
- Develop a prototype that informs the acquisition and requirements process
- Independent Assessment Capability
- Successful Military Utility Assessment (MUA)

The majority of funding from this program element is forwarded to the Services/Defense Agencies that execute the individual JCTD projects.

MEASURABLE OUTCOMES:
• JCTDs will demonstrate capability objectives within 24-48 months:
• The JCTD program will continue to achieve high transition rates. In FY 2015, 100 percent of completed JCTDs successfully transitioned. Seven of nine completed JCTDs transitioned to a new or existing Program(s) of Record, two of nine transitioned to fieldable-prototypes (residual capabilities) sustained by non-JCTD funds in direct support of operations in theater.