Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Missile Defense Agency											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 0603179C / *Advanced C4ISR*							
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	-	35.421	13.284	9.876	-	9.876	3.723	-	-	-	-	62.304
MD01: *Command & Control, Battle Management, Communications (C2BMC)*	-	22.612	-	-	-	-	-	-	-	-	-	22.612
MD73: *Advanced C4ISR*	-	12.809	12.605	9.412	-	9.412	3.538	-	-	-	-	38.364
MD40: *Program-Wide Support*	-	-	0.679	0.464	-	0.464	0.185	-	-	-	-	1.328
Program MDAP/MAIS Code: 362												

Note

Beginning in FY 2014, the Advanced Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) effort transferred from the Ballistic Missile Defense Technology Program Element 0603175C to the Advanced C4ISR Program Element 0603179C, per the FY 2014 Consolidated Appropriations Act (P.L. 113-76).

A. Mission Description and Budget Item Justification

The Advanced C4ISR Program Element develops future Ballistic Missile Defense System (BMDS) capabilities to out-pace emerging and evolving threats. Advanced C4ISR identifies, develops, and readies for transition in association with Missile Defense Agency (MDA) Engineering the technical solutions that meet BMDS shortfalls identified by the Combatant Commanders. MDA uses the Prioritized Capabilities List (PCL) and the Agency's Achievable Capabilities List (ACL) to prioritize technology investments including Advanced C4ISR. MDA's investments balance the pursuit of promising next generation technology with near-term solutions to enhance existing BMDS capability.

MD01 consisted of support for development and maturation of technologies which enable rapid and exponential capability increases in our C2BMC and existing sensor networks. In FY14, C2BMC developed and matured advanced C2BMC C4ISR technology, software and algorithms which have the potential to increase battlespace for all BMDS interceptors including the Terminal High Altitude Area Defense and Ground-based Interceptors. This Program Element also included support for C2BMC centric DIHD Near-Term and Mid-Term capability fieldings. For FY15 and beyond, the developed technologies developed under this PE have been transitioned to the C2BMC (0603896C) Program Element for further refinement and implementation.
MD73 consists of support to develop and field an integrated set of Element (Advanced X-Band Radar) capabilities to improve BMDS reliability, lethality, and discrimination. The end result will be deployed within a future BMDS architecture which improves Warfighter shot doctrine and, consequently, optimizes inventory management. This effort supports DIHD Mid-Term capability fielding.

MD40 Program-Wide Support (PWS) consists of essential non-headquarters management efforts providing integrated and efficient support to the MDA functions and activities across the entire Ballistic Missile Defense System (BMDS).

Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Missile Defense Agency					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 0603179C / *Advanced C4ISR*		
B. Program Change Summary ($ in Millions)	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**
Previous President's Budget	36.500	15.329	10.389	-	10.389
Current President's Budget	35.421	13.284	9.876	-	9.876
Total Adjustments	-1.079	-2.045	-0.513	-	-0.513
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.045			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.579	-			
• Other Adjustment	-0.500	-	-0.513	-	-0.513

Change Summary Explanation

FY 2015 change reflects Public Law 113-235, FY2015 Omnibus; Consolidated and Further Continuing Appropriations Act.

For FY15 and beyond, the developed technologies developed under this PE have been transitioned to the C2BMC (0603896C) Program Element for further refinement and implementation. The FY 2016 MD73 funding was adjusted to align with current Department of Defense priorities and account for transition to the C2BMC (0603896C) Program Element for further refinement and implementation .

Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603179C / *Advanced C4ISR*	Project (Number/Name) MD01 / *Command & Control, Battle Management, Communications (C2BMC)*	

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
MD01: *Command & Control, Battle Management, Communications (C2BMC)*	-	22.612	-	-	-	-	-	-	-	-	-	22.612

Note

Beginning in FY 2014, the Advanced Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) effort transferred from the Ballistic Missile Defense Technology Program Element 0603175C to the Advanced C4ISR Program Element 0603179C, per the FY 2014 Consolidated Appropriations Act (P.L. 113-76).

A. Mission Description and Budget Item Justification

In FY14, Advanced Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) developed and matured technology which will enable rapid and exponential capability increases in our command, control, battle management and communications (C2BMC) and existing sensor networks yielding an increase in battlespace for all BMDS interceptors including the Terminal High Altitude Area Defense and Ground-based Interceptors. Specifically, research and development focused on methodologies, software and algorithms which facilitated integration of the Service's command and control networks into the BMDS and initiated DIHD Near-Term and Mid-Term capability development activities. For FY15 and beyond, the C2BMC developed technologies have been transitioned to the C2BMC (0603896C) Program Element for further refinement and implementation.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: Advanced Command and Control System Integration	22.612	-	-
Description: N/A			
FY 2014 Accomplishments: -Developed and matured Ballistic Missile Defense System Capability Planning Specification, System and Element Specifications and multiple interface control documents -Developed and installed C2BMC Spiral 8.2 Test Lab for Integration testing with Service C2 systems -Analyzed BMDS and Service C2 Planning Systems for data exchange compliance -Conducted Terminal High Altitude Air Defense Fire Control integration study with future Army C2 Systems -Developed the capability in the sensor resource management system to fully utilize the AN/TPY-2 sensors in support of Discrimination Improvements for Homeland Defense (DIHD) Near-term improvements -Participated in ground test campaign requirement development for DIHD Near-term improvements -Matured a planned DIHD Mid-term discrimination technology, Simultaneous Correlation of Unambiguous Tracks (SCOUT), including prototyping and simulated and flight test data analysis			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603179C / *Advanced C4ISR*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
-Transitioned developed C2BMC technologies to the C2BMC (0603896C) Program Element for further refinement and implementation ***FY 2015 Plans:*** N/A ***FY 2016 Plans:*** N/A			
Accomplishments/Planned Programs Subtotals	22.612	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• 0603884C: *SENSORS MILCON*	33.504	-	-	-	-	116.821	109.112	59.194	-	-	318.631
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	390.207	428.277	450.085	-	450.085	461.759	423.843	442.926	460.112	Continuing	Continuing
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	41.051	46.387	49.570	-	49.570	50.533	51.363	52.217	54.247	Continuing	Continuing
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	50.271	58.503	49.211	-	49.211	58.074	53.655	55.194	57.162	Continuing	Continuing
• 0603907C: *Sea Based X-Band Radar (SBX)*	70.336	64.409	72.866	-	72.866	71.267	75.760	72.319	87.058	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Command and Control, Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ended 1st quarter FY 2012. A sole source C2BMC follow-on contract to Lockheed Martin for Spiral Development, Operation and Sustainment, and Testing was awarded 1st quarter FY 2012 for an ordering period of 2nd quarter 2012 through 1st quarter 2017. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and

Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603179C / *Advanced C4ISR*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center, and Contract Support Services personnel are also fully integrated as part of the Prime contractor`s team to function in an Integrated Product Team environment.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603179C / *Advanced C4ISR*	Project (Number/Name) MD73 / *Advanced C4ISR*	

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
MD73: *Advanced C4ISR*	-	12.809	12.605	9.412	-	9.412	3.538	-	-	-	-	38.364

Note

Beginning in FY 2014, the Advanced Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) effort transferred from the Ballistic Missile Defense Technology Program Element 0603175C to the Advanced C4ISR Program Element 0603179C, per the FY 2014 Consolidated Appropriations Act (P.L. 113-76).

A. Mission Description and Budget Item Justification

Advanced Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) enables rapid and exponential capability increases in our command, control, battle management and communications (C2BMC) and existing sensor networks. We will develop and mature technology, software and algorithms which facilitate integration of the Services command and sensor network approaches into the Ballistic Missile Defense System.

The Discrimination Improvements for Homeland Defense (DIHD) effort will develop and field integrated Element capabilities to improve BMD System ability to identify lethal and non-lethal objects. The Advanced C4ISR project will contribute to this effort through the development of advanced discrimination technologies to support the mid-term phase. This technology is planned to transition to the Ballistic Missile Defense Sensors (0603884C) Program Element in FY 2017.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: Advanced X-Band Radar Capabilities	12.809	12.605	9.412
Description: N/A			
FY 2014 Accomplishments: -Developed and matured technology for integrated track processing and battlefield decision aids to facilitate integration of the Services command and sensor networks into the Ballistic Missile Defense System (BMDS) -Structured a cyclical development strategy for initiating, prototyping, experimenting, and transitioning advanced X-band radar capabilities leading to fielded improvements within existing radars -Developed advanced X-band radar target acquisition and discrimination capabilities against threats launched over extended geographical regions on wide range of flight trajectories, incorporated into Experimental XBR Builds 3.2.1 and 3.3.0 for future fielding, yielding improved performance against threats launched over extended geographical regions with a wide range of flight trajectories -Successfully supported experimentation through HWIL testing of C2BMC capabilities to task an X-band radar utilizing a cue from overhead sensors from the C2BMC experimental laboratory (X-Lab) and passing the resulting tracks back to all BMDS weapon systems. Performed during preparations for live test during FTX-20.			
FY 2015 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603179C / *Advanced C4ISR*	**Project (Number/Name)** MD73 / *Advanced C4ISR*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
-Develop advanced X-band radar target acquisition and discrimination capabilities against threats launched over extended geographical regions on wide range of flight trajectories ***FY 2016 Plans:*** -Begin incorporation of advanced discrimination algorithms into XBR and AN/TPY-2 radars, planned for completion in FY 2017 -The decrease in FY 2016 is due to the transition and implementation of technology in to the BMD Sensors (0603884C) program element			
Accomplishments/Planned Programs Subtotals	12.809	12.605	9.412

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• 0603884C: *Ballistic Missile Defense Sensors*	340.391	270.901	233.588	-	233.588	228.437	142.363	140.740	141.733	Continuing	Continuing
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	390.207	428.277	450.085	-	450.085	461.759	423.843	442.926	460.112	Continuing	Continuing
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	41.051	46.387	49.570	-	49.570	50.533	51.363	52.217	54.247	Continuing	Continuing
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	50.271	58.503	49.211	-	49.211	58.074	53.655	55.194	57.162	Continuing	Continuing
• 0603907C: *Sea Based X-Band Radar (SBX)*	70.336	64.409	72.866	-	72.866	71.267	75.760	72.319	87.058	Continuing	Continuing

Remarks

D. Acquisition Strategy

Advanced X-Band Radar Capabilities follows the Missile Defense Agency`s capability-based acquisition strategy that emphasizes testing, development and evolutionary acquisition. The advanced technology development will include development of target acquisition and discrimination algorithms and assessment of performance. Performance assessment and transition risk reduction will use modeling, simulation, and online or offline assessment of live tracking opportunities. When ready, technology will transition to appropriate program elements for advanced component development and integration into Ballistic Missile Defense System X-Band Radars.

Acquisition will follow the acquisition strategy for radar sustainment and development. The Radar Sustainment Contract (RSC) will be used for both advanced technology development and for transition of technology to systems. The RSC was awarded in 2012 to sustain all the BMDS X-Band Radars. The contract provides

Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603179C / *Advanced C4ISR*	**Project (Number/Name)** MD73 / *Advanced C4ISR*

sustainment of previously developed X-Band radar products, such as: 1) Software -maintenance of existing software developed to support the X-Band Radars; 2) Models & Simulation; (a) development, maintenance, and verification of high fidelity models, (b) support for war games and exercises, (c) support for performance assessment events; 3) Engineering Services -engineering support for deployed radars to facilitate maintenance efforts which may include but are not limited to hardware obsolescence studies, hardware redesign, technology insertion, and refurbishment efforts; 4) BMDS Test Planning, Execution, and Analysis -planning, execution and analysis of BMDS test requirements for previously developed hardware and software in accordance with the MDA Integrated Master Test Plan (IMTP). The contract is an Indefinite Delivery/Indefinite Quantity (IDIQ) task order contract.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603179C / *Advanced C4ISR*	Project (Number/Name) MD40 / *Program-Wide Support*	

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
MD40: *Program-Wide Support*	-	-	0.679	0.464	-	0.464	0.185	-	-	-	-	1.328

A. Mission Description and Budget Item Justification

Program-Wide Support (PWS) contains non-headquarters management costs in support of Missile Defense Agency (MDA) functions and activities across the entire Ballistic Missile Defense System (BMDS). It Includes Government Civilians, Contract Support Services, and Federally Funded Research and Development Center (FFRDC) support. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office and equipment leases; utilities; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. Program Wide Support is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes:0305103C Cyber Security Initiative, 0603274C Special Program, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).