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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Missile Defense Agency **Date:** February 2016

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603179C / <i>Advanced C4ISR</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	12.809	13.061	9.876	3.626	-	3.626	0.000	0.000	0.000	0.000	0	39.372
MD73: <i>Advanced C4ISR</i>	12.809	12.382	9.412	3.462	-	3.462	0.000	0.000	0.000	0.000	0	38.065
MD40: <i>Program-Wide Support</i>	-	0.679	0.464	0.164	-	0.164	0.000	0.000	0.000	0.000	0	1.307

Program MDAP/MAIS Code: 362

Note

The decrease in FY 2017 is due to the completion of technology development efforts.

A. Mission Description and Budget Item Justification

The Advanced Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Program Element develops future BMDS capabilities to out-pace emerging and evolving threats and identifies, develops, and readies for transition the technical solutions that address 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 the need for near-term solutions to enhance existing BMDS capability.

This Program Element includes support for discrimination improvement efforts, which aim to develop and field an integrated set of Element capabilities to improve BMDS effectiveness and resilience against the evolving threat. The end result will be a BMDS architecture more capable of discriminating and destroying a re-entry vehicle with a high degree of confidence, improving Warfighter shot doctrine and preserving inventory. This effort encompasses Near-term, Mid-term, and Far-term discrimination capability fielding. The discrimination improvements require a coordinated effort between Systems Engineering (PE 0603890C), Ground-based Midcourse Defense (PE 0603882C), BMD Sensors (PE 0603884C), C2BMC (PE 0603896C), Aegis BMD, and Advanced C4ISR (PE 0603179C)

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

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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	13.284	9.876	3.723	-	3.723
Current President's Budget	13.061	9.876	3.626	-	3.626
Total Adjustments	-0.223	0.000	-0.097	-	-0.097
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.223	0.000			
• Other Adjustment	0.000	0.000	-0.097	-	-0.097

Change Summary Explanation

The FY 2017 decrease reflects realignment of Department of Defense priorities.

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603179C / <i>Advanced C4ISR</i>	Project (Number/Name) MD73 / <i>Advanced C4ISR</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
MD73: <i>Advanced C4ISR</i>	12.809	12.382	9.412	3.462	-	3.462	0.000	0.000	0.000	0.000	0	38.065

Note
The decrease in FY 2017 is due to the completion of technology development efforts.

A. Mission Description and Budget Item Justification

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

This Program Element also included support for C2BMC centric discrimination improvements for Near-Term and Mid-Term capability fielding. For FY18 and beyond, the discrimination technologies developed under this PE have been transitioned to the Ballistic Missile Defense Sensors (0603884C) Program Element for further refinement and implementation.

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

	FY 2015	FY 2016	FY 2017
Title: Advanced X-Band Radar Capabilities	12.382	9.412	3.462
Description: N/A			
FY 2015 Accomplishments: -Developed advanced X-band radar target acquisition and discrimination capabilities against threats launched over extended geographical regions on wide range of flight trajectories. Selected new algorithms and developed plan for incorporation into future XBR software program.			
FY 2016 Plans: -Begin incorporation of advanced discrimination algorithms into XBR and AN/TPY-2 radars, planned for completion in FY 2017			
FY 2017 Plans: -The decrease in FY 2017 is due to the completion of technology development efforts -Complete development of advanced discrimination algorithms for XBR and AN/TPY-2 radars -Complete transition of technology to the BMD Sensors (0603884C) program element. Mid-term discrimination improvements are planned to field in FY 2019			
Accomplishments/Planned Programs Subtotals	12.382	9.412	3.462

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

Line Item	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
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	260.347	228.392	230.077	-	230.077	144.893	141.815	171.644	158.421	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	420.516	429.853	439.617	-	439.617	413.198	432.763	454.601	462.065	Continuing	Continuing
• 0603898C: <i>Ballistic Missile Defense Joint Warfighter Support</i>	44.220	47.898	47.776	-	47.776	49.621	50.564	53.151	54.042	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	53.972	47.939	54.750	-	54.750	53.894	55.524	58.100	59.029	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	64.610	71.266	68.787	-	68.787	73.329	70.423	85.881	74.189	Continuing	Continuing

Remarks

D. Acquisition Strategy

Advanced X-Band Radar Capabilities follow the MDA 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 BMDS X-Band Radars.

The Radar Sustainment Contract (RSC) will be used for both advanced technology development and for transition of technology to systems. The RSC is an Indefinite Delivery/Indefinite Quantity (IDIQ) task order contract awarded in 2012 to sustain all the BMDS X-Band Radars. The contract provides sustainment of previously developed X-Band radar products, such as:

- Software maintenance of existing software developed to support the X-Band Radars
- Models & Simulation: development, maintenance, and verification of high fidelity models, support for war games and exercises, and support for performance assessment events
- 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
- 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).

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E. Performance Metrics

N/A

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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	-	0.679	0.464	0.164	-	0.164	0.000	0.000	0.000	0.000	0	1.307

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. 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, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS 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 Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).