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Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Missile Defense Agency **Date:** March 2014

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>
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COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
Total Program Element	-	-	29.642	45.110	-	45.110	59.278	60.054	62.897	21.051	Continuing	Continuing
MC95: <i>Cyber Operations</i>	-	-	0.168	0.250	-	0.250	0.252	0.255	0.257	0.260	Continuing	Continuing
MD95: <i>Discrimination Sensor Technology</i>	-	-	29.474	42.553	-	42.553	55.748	56.270	57.713	18.886	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	-	-	-	2.307	-	2.307	3.278	3.529	4.927	1.905	Continuing	Continuing

MDAP/MAIS Code: 362

The FY 2015 OCO Request will be submitted at a later date.

Note

Beginning in FY 2014, the Discrimination Sensor Technology effort was transferred from the Ballistic Missile Defense Technology Program Element (0603175C) to the Discrimination Sensor Technology Program Element 0603177C, per the FY 2014 Consolidated Appropriations Act (Public Law 113-76).

A. Mission Description and Budget Item Justification

The Discrimination Sensor Technology program matures technology with proven tactical applications and applies those plus other emerging technology to the missile defense mission area. Discrimination Sensor Technology develops solutions to improve identifying, acquiring, tracking and discriminating incoming threats, specifically addressing shortfalls in the Prioritized Capabilities List. Areas of concentration include advanced detectors, infrared sensors, focal planes and algorithms for passive and active ground, sea, air and space systems. Sensor technology enhances the Ballistic Missile Defense System (BMDS) capability to develop precision tracks for engagement significantly quicker than current radar and discriminate increasing numbers of objects by an order of magnitude.

This technology has the potential to significantly enhance/enable the following capabilities while decreasing the cost of the BMDS:

- Precision track of multiple objects to exceed engage-on-remote requirements
- Discriminating lethal objects from countermeasures
- End-to-end correlation of sensor track and discrimination data
- Timely and accurate kill assessment
- Enhanced probability of kill
- Future discriminating weapon and space sensors

Discrimination Sensor Technology contributions to the Prioritized Capabilities List include: Persistent Surveillance - improve birth-to-death tracking, identification and targeting.

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B. Program Change Summary (\$ in Millions)	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015 Base</u>	<u>FY 2015 OCO</u>	<u>FY 2015 Total</u>
Previous President's Budget	-	-	-	-	-
Current President's Budget	-	29.642	45.110	-	45.110
Total Adjustments	-	29.642	45.110	-	45.110
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	29.642			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustment	-	-	45.110	-	45.110

Change Summary Explanation

The FY 2014 and FY 2015 increases reflect the transfer of the Discrimination Sensor Technology effort from the Ballistic Missile Defense Technology Program Element (0603175C) to the Discrimination Sensor Technology Program Element, per the FY 2014 Consolidated Appropriations Act (Public Law 113-76).

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Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency										Date: March 2014		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>				Project (Number/Name) MC95 / <i>Cyber Operations</i>			
COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
MC95: <i>Cyber Operations</i>	-	-	0.168	0.250	-	0.250	0.252	0.255	0.257	0.260	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

Note

Project MC95 is a new Defensive Cyber Operations Project established in this Program Element (PE) for PB 2015. Funds were previously reported in Project MD25 of PE 0603175C, Ballistic Missile Defense Technology in the Discrimination Sensor Technology section.

A. Mission Description and Budget Item Justification

The funding in this project sustains the Missile Defense Agency (MDA) DoD Information Assurance Certification and Accreditation Program (DIACAP) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for the MDA Discrimination Sensor Technology mission systems. It maintains the Certification and Accreditation (C&A) data repository, capturing the DIACAP documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and POA&M on all MDA information systems.

This project supports the monitoring and tracking of Cybersecurity mitigations detailed in Information Technology security POA&Ms. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Senior Information Assurance Officer (SIAO)/Certification Authority (CA) and DAA. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).

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

	FY 2013	FY 2014	FY 2015
Title: Network / System Certification and Accreditation (C&A)	-	0.168	0.250
Description: Project MC95 is a new Defensive Cyber Operations Project established in this Program Element (PE) for PB 2015. Funds were previously reported in Project MD25 of PE 0603175C, Ballistic Missile Defense Technology in the Discrimination Sensor Technology section.			
FY 2013 Accomplishments: N/A			
FY 2014 Plans: - Fund Discrimination Sensor Technology Information Assurance Manager (IAM) civilian salaries - Conduct cyber security / information assurance engineering and architecture planning for Discrimination Sensor Technology information technology systems			

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>	Project (Number/Name) MC95 / <i>Cyber Operations</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2013	FY 2014	FY 2015
<ul style="list-style-type: none"> - Plan and test the information assurance controls for Ballistic Missile Defense System (BMDS) Discrimination Sensor Technology systems - Develop Discrimination Sensor Technology DoD Information Assurance Certification and Accreditation Program (DIACAP) certification and accreditation packages. - Conduct Controls Validation Testing (CVT) for Discrimination Sensor Technology mission systems and provide Plan of Action and Milestones to mitigate information assurance deficiencies - Conduct annual information assurance reviews on the Discrimination Sensor Technology enclaves to assess compliance in implementing and maintaining IA controls. <p>FY 2015 Plans:</p> <ul style="list-style-type: none"> - Fund Discrimination Sensor Technology Information Assurance Manager (IAM) civilian salaries - Conduct cyber security / information assurance engineering and architecture planning for Discrimination Sensor Technology information technology systems - Plan and test the information assurance controls for Ballistic Missile Defense System (BMDS) Discrimination Sensor Technology systems - Develop Discrimination Sensor Technology DoD Information Assurance Certification and Accreditation Program (DIACAP) certification and accreditation packages. - Conduct Controls Validation Testing (CVT) for Discrimination Sensor Technology mission systems and provide Plan of Action and Milestones to mitigate information assurance deficiencies - Conduct annual information assurance reviews on the Discrimination Sensor Technology enclaves to assess compliance in implementing and maintaining IA controls. 				
Accomplishments/Planned Programs Subtotals		-	0.168	0.250
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
The acquisition strategy for Cyber operations consists of using Missile Defense Agency (MDA) civilian employees and the existing Missile Defense Agency Engineering and Support Services (MiDAESS) contract.				
E. Performance Metrics				
N/A				

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>	Project (Number/Name) MD95 / <i>Discrimination Sensor Technology</i>
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COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
<i>MD95: Discrimination Sensor Technology</i>	-	-	29.474	42.553	-	42.553	55.748	56.270	57.713	18.886	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

Note

Beginning in FY 2014, the Discrimination Sensor Technology effort was transferred from the Ballistic Missile Defense Technology Program Element (0603175C) to the Discrimination Sensor Technology Program Element 0603177C, per the FY 2014 Consolidated Appropriations Act (Public Law 113-76).

A. Mission Description and Budget Item Justification

The Discrimination Sensor Technology program develops next-generation sensors and detectors and integrates them into unmanned aerial vehicles (UAVs) to demonstrate improvements in discrimination and address warfighter requirements for missile defense. This program evaluates and researches emerging technology that enables game changing discrimination improvements for incorporation into next generation interceptors and space systems. MDA is pursuing a cost-effective incremental upgrade philosophy that demonstrates airborne precision tracking, improved track performance, simple scene discrimination and then complex scene discrimination. These advanced sensors improve the probability of engagement success for stressing threats, expand the Ballistic Missile Defense (BMD) battle space and increase the ability to negate larger raid sizes. A precise, timely track is required for an interceptor to engage a threat object. In addition, improved object sighting message data is required to discriminate threat objects.

In FY 2015, Discrimination Sensor Technology demonstrates an airborne precision track capability equivalent to an Army/Navy Transportable radar (AN/TPY-2) with the potential to augment Ballistic Missile Defense System (BMDS) radar. The test construct incrementally buys down risk by testing our evolving sensor technology from the ground and then from UAVs and uses repeatable Resident Space Objects (RSOs) before participating in BMDS tests. Discrimination Sensor Technology uses much of the existing BMDS architecture to develop 3-dimensional (3-D) tracks of the ballistic missile sent via Link-16 to Aegis ships. FY 2015 funds final integration and test of the launch of a SM-3 guided missile based on these remote IR tracking sensors.

In parallel, MDA will develop advanced sensors that increase track precision by 150% relative to AN/TPY-2. Initially the MTS-B sensors will be replaced by MTS-Cs using an advanced sensor. Discrimination Sensor test data anchors discrimination models and simulations and informs future interceptor and space sensor decisions.

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

	FY 2013	FY 2014	FY 2015
Title: Discrimination Sensor Technology	-	29.474	42.553
Description: Beginning in FY 2014, the Discrimination Sensor Technology effort was transferred from the Ballistic Missile Defense Technology Program Element (0603175C) to the Discrimination Sensor Technology Program Element 0603177C, per the FY 2014 Consolidated Appropriations Act (Public Law 113-76).			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2013	FY 2014	FY 2015
<p><i>FY 2013 Accomplishments:</i> FY 2013 accomplishments are captured in the Discrimination Sensor Technology Program Element, 0604886C.</p> <p><i>FY 2014 Plans:</i></p> <ul style="list-style-type: none"> - Evaluate and research discrimination requirements and identify technology that significantly increase the ability of the current BMDS to identify lethal and non-lethal threat objects - Evaluate and research emerging technology that enable game changing discrimination improvements for incorporation into next generation interceptors and space systems - Assess and characterize sensor components and sensor systems capable of precision tracking and advanced discrimination through laboratory, ground, and flight tests - Incorporate discrimination sensor field test measurements into models and simulations to anchor capability improvements <p><i>FY 2015 Plans:</i></p> <ul style="list-style-type: none"> - Flight test 2 UAV-borne Multi-Spectral Targeting System (MTS)-B sensors - Demonstrate that Airborne Electro-Optical (EO) / Infrared (IR) precision tracking exceeds Aegis Launch-on/Engage-on Remote track requirements - Ground test an advanced EO / IR sensor integrated into MTS-Cs against resident space objects and BMDS targets of opportunity - Modify the Reaper, processor and ground control station with MTS-C and demonstrate 30% improved track performance and discrimination capability - Initiate development of next-generation EO / IR sensor upgrades that increase precision and range by 150% 			
Accomplishments/Planned Programs Subtotals	-	29.474	42.553

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
• 0603175C: <i>Ballistic Missile Defense Technology</i>	69.438	9.321	38.800	-	38.800	76.400	52.000	112.800	178.000	-	536.759
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	-	6.919	8.470	-	8.470	10.683	10.867	11.687	11.994	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	-	46.708	14.068	-	14.068	36.494	46.026	56.037	83.722	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	-	36.500	15.329	-	15.329	10.389	3.942	-	-	-	66.160
• 0603180C: <i>Advanced Research</i>	-	19.188	16.584	-	16.584	16.715	16.924	18.336	18.723	Continuing	Continuing

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>	Project (Number/Name) MD95 / <i>Discrimination Sensor Technology</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u> <u>Base</u>	<u>FY 2015</u> <u>OCO</u>	<u>FY 2015</u> <u>Total</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603294C: <i>Common Kill Vehicle Technology</i>	-	70.000	25.639	-	25.639	33.171	37.348	38.454	54.256	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	306.896	366.590	392.893	-	392.893	462.030	448.763	403.272	368.125	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	958.506	909.928	929.208	-	929.208	955.825	911.095	866.678	721.426	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	344.431	405.319	443.484	-	443.484	456.182	462.525	452.937	465.638	Continuing	Continuing

Remarks

D. Acquisition Strategy

The acquisition strategy for Discrimination Sensor Technology consists of partnering with Federally Funded Research and Development Centers and University Affiliated Research Centers. MDA will leverage Agency and partner subject matter experts and use government model based assessments to inform Better Buying Power philosophy acquisition decisions. The Missile Defense Agency will then award contracts to industry and universities via the Advanced Technology Innovation Broad Agency Announcement and competitive procurements to develop and demonstrate promising components and integrated systems in realistic test environments. Discrimination Sensor Technology shapes future Ballistic Missile Defense System (BMDS) acquisition decisions by advancing and documenting the technology readiness levels of emerging and developing technology, while simultaneously assessing the performance and contributions of the technology to the Ballistic Missile Defense System architecture.

E. Performance Metrics

N/A

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
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COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	-	-	-	2.307	-	2.307	3.278	3.529	4.927	1.905	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

Note

Transferred from Technology Program Element beginning in FY 2015 in accordance with the FY 2014 Consolidated Appropriations Act (P.L. 113-76).

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 Service, and Federally Funded Research and Development Center (FFRDC) providing integrity and oversight of the BMDS as well as, supporting MDA in enabling the development and evaluation of technologies that will respond to the changing threat. In addition, includes Global Deployment personnel and support performing deployment site preparation and activation. Other costs included provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, 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. Also includes legal settlements. In keeping with congressional intent, Program Wide Support is allocated on a pro-rata basis and therefore, fluctuates by year based on the total MDA budget.

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

	FY 2013	FY 2014	FY 2015
Title: Program Wide Support	-	-	2.307
Description: See paragraph A: Mission Description and Budget Item Justification			
FY 2013 Accomplishments: N/A			
FY 2014 Plans: N/A			
FY 2015 Plans: See paragraph A: Mission Description and Budget Item Justification			
Accomplishments/Planned Programs Subtotals	-	-	2.307

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

N/A

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

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

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A