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Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Missile Defense Agency **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 6: <i>RDT&E Management Support</i>	R-1 ITEM NOMENCLATURE PE 0605502C: <i>Small Business Innovative Research - MDA</i>
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COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 [#]	FY 2014 Base	FY 2014 OCO ^{##}	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
Total Program Element	-	89.963	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	89.963
MD45: <i>Small Business Innovative Research</i>	-	89.963	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	89.963

[#] FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

^{##} The FY 2014 OCO Request will be submitted at a later date

Note

N/A

A. Mission Description and Budget Item Justification

This project explores innovative concepts pursuant to Public Law 106-554 (Small Business Reauthorization Act of 2000) and Public Law 107-50 (Small Business Technology Transfer Program Reauthorization Act of 2001), which mandates a two-phase competition for small businesses with innovative technologies that can also be commercialized. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs will develop new dual-use technologies for possible future Missile Defense Agency (MDA) Ballistic Missile Defense Systems (BMDS) needs. Dual-use means that the technologies will also be judged on their potential for future private sector investment both as a vehicle for reducing development time and cost, unit costs of new MDA BMDS technologies, and as a route to national economic growth through new commercial products. MDA will conduct the competition and will award and manage the contracts.

The Missile Defense Agency's SBIR/STTR investments are divided into 14 Research Areas from 5 MDA Elements:

- Aegis Ballistic Missile Defense (BMD): A hybrid program office (MDA/Navy) that builds BMD Capability for use in multi-mission ships and in Aegis Ashore.
- Command, Control, Communication, Computer Intelligence Surveillance and Reconnaissance (C4ISR): Defines, develops and deploys an integrated Sensor and Command and Control (C2) capability for Missile Defense
- Program and Integration: Supervises the Acquisition Category ID ACAT 1D Ballistic Missile Defense System Program portfolio including element design, development, system integration, and test.
- Test: Characterizes ballistic missile defense capabilities and supports fielding of an integrated and effective capability to the Warfighter.
- Advanced Technology: Develops cost and operationally effective capabilities; explores and develops technology to counter future threats.

Small Business Innovation Research topic areas for FY 2012 included:

- Combined Radio Frequency/Infrared Data Correlation
- Radio Frequency/Infrared Data Fusion
- Innovative Technologies for High Performance Infrared Detectors
- Novel Planning Algorithms for Hybrid Land and Sea Platform Sensor Coordination

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<ul style="list-style-type: none">-Radar Waveforms to Discern Remote Object Attributes-3G and 4G Communication System Interference Remediation Techniques-Asset Pairing for Battle Management-Radio Frequency/Infrared Data Fusion for Track and Data Correlation-Anti-Tamper Technology for Missile Defense-Techniques for Performing Warhead Characterization-Fast-Running Physics-Based Models for Intercept Debris Aero-heating and Aero-thermal Demise-Modeling High Explosive Detonation Response and Resulting Debris/Shrapnel Generation from Submunitions Warheads-Antenna design in the Plasma Environment-Radio Frequency Material Property Characterization-Advanced Techniques for Lossless Compression of Target Vehicle Telemetry-Modular Hypergolic Leak Detector-Acquisition, Tracking and Pointing Technologies for High Energy Laser Applications-Development of Line-narrowed Diode Pump Sources for Diode Pumped Alkali Laser systems-Optics and Coatings for High Energy Laser Applications-Atmospheric Characterization for Directed Energy Applications-Light weight Rubidium-Metal Vapor Circulating System-Solid State High Energy Laser Batteries and Power Sources-Methodologies for Realtime Correction of Water Vapor Effects on an Infrared Scene-Lightweight Communication Equipment for Interceptor Communications-Miniature Extendable Nozzles or Actuating Nozzles for Improved Specific Impulse of Divert and Attitude Control System\Thrusters-Powdered Propellant Rocket Motor-Waste Heat Recovery of Rocket Motors for Reduction of Battery Weight-Affordable Reinforced Polymer Composite Structures with Embedded Electrical Interfaces-Marking of Components for Avoidance of Counterfeit Parts-Thermal Isolation of Nozzle Exit Cone Insulators-Electro-Optic Infrared Debris Management during ascent phase for Command, Control, Battle Management and Communications-Post Intercept Debris Predictions for Electro-Optic Infrared Scene Modeling-Human-in-Control Modeling-Modeling & Simulation Uncertainty Quantification-High energy laser analysis tool with experimental verification of Diode Pumped Alkali Laser rate constants-Improved Target Discrimination of Multiple Targets Using Bulk Filtering for Debris-Anchoring Post-Intercept Debris Prediction Tools-Detailed Lethality Assessments for Flight Test Events-Innovative designs for reliable Electro-Explosive Ordnance Devices		

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- Long-Term Missile Aging Assessment & Reliability Predictions for Polymer Materials and Electronic Parts
- Cost Effective, Reliable Service Life Extension Testing of Ordnance Devices
- Correlation identification and evaluation of new technologies or methodologies to accurately measure inertial movement in a stressing flight environment
- Materials and Life Cycle Sustainability

B. Program Change Summary (\$ in Millions)	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014 Base</u>	<u>FY 2014 OCO</u>	<u>FY 2014 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	89.963	0.000	0.000	-	0.000
Total Adjustments	89.963	0.000	0.000	-	0.000
• 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	89.963	0.000			
• Other Adjustment	0.000	0.000	0.000	-	0.000

Change Summary Explanation

FY 2012 funds were transferred to Small Business Innovation Research/Small Business Technology Transfer from other Program Elements

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COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 [#]	FY 2014 Base	FY 2014 OCO ^{##}	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
MD45: <i>Small Business Innovative Research</i>	-	89.963	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	89.963
Quantity of RDT&E Articles		0	0	0		0	0	0	0	0		

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Note

N/A

A. Mission Description and Budget Item Justification

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2012	FY 2013	FY 2014
Title: Small Business Innovative Research	89.963	0.000	0.000
Articles:	0	0	0
Description: N/A			
FY 2012 Accomplishments:			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
-Awarded 123 Phase Is (\$100K average award) and 91 Phase IIs (including modifications to existing Phase IIs) (\$758K average award). -Phase I Selections were in the following 9 research areas: Command, Control, Battle Management and Communications (C2BMC), Directed Energy, Information Assurance, Interceptor Technology, Manufacturing and Producibility, Modeling Simulation and Phenomenology, Radar Technology, Space Technology, and Innovation Concepts and Special Focus Projects. -Phase II Selections were in the following 9 research areas: Command, Control, Battle Management and Communications (C2BMC), Directed Energy, Information Assurance, Interceptor Technology, Manufacturing and Producibility, Modeling Simulation and Phenomenology, Radar Technology, Space Technology, and Innovation Concepts and Special Focus Projects. FY 2013 Plans: NA FY 2014 Plans: NA			
Accomplishments/Planned Programs Subtotals	89.963	0.000	0.000

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A