Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Missile Defense Agency												Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 6: *RDT&E Management Support*					R-1 Program Element (Number/Name) PE 0605502C / *Small Business Innovative Research - MDA*							
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	-	68.858	-	-	-	-	-	-	-	-	-	68.858
MD45: *Small Business Innovative Research*	-	68.858	-	-	-	-	-	-	-	-	-	68.858
MDAP/MAIS Code: 362												

The FY 2015 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 technology that can be commercialized. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs will develop new dual-use technology for possible future Missile Defense Agency (MDA) Ballistic Missile Defense Systems (BMDS) needs. Dual-use means that the technology will be judged on the potential for future private sector investment both as a vehicle for reducing development time and cost, unit costs of new MDA BMDS technology, and as a route to national economic growth through new commercial products. MDA will conduct the competition, 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 capability and supports fielding of an integrated and effective capability to the Warfighter.
-Advanced Technology: Develops cost and operationally effective capability; explores and develops technology to counter future threats.

Small Business Innovation Research topic areas for FY 2013 included:
-Intelligent adaptive needs characterization for modeling & simulation (M&S)Systems Engineering
-Radio Frequency (RF) transparent composite airdrop platform for MDA airborne target applications
-Real-time Ladar scene rendering and projection component technology
-Development of high-fidelity techniques to model impact flash and post-impact thermal signature prediction and support kill assessment
-Hypervelocity intercept modeling with first-principle, physics-based tools

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Missile Defense Agency	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605502C *I Small Business Innovative Research - MDA*

-Improved manufacturing processes for propulsion technology
-Debris assessment from spectrally diverse sensors and air sample to aid post-intercept weapons typing
-Interceptor avionics
-Space component miniaturization
-Global missile defense battle management
-Tin Whisker mitigation technology for SN-based surface finishes on electronic assemblies and microelectronic devices
-Improved packaging and thermal management for high power electronics and solid state lasers
-Advanced Divert and Attitude Control
-Advanced synergistic structures for interceptor kill vehicles
-Photonic multi-beam receive arrays
-Large format space focal plane array technology
-Resource optimization for battle management
-Direct electrically pumped high energy flowing media laser technology
-Develop and demonstrate high performance infrared focal plane arrays with advanced quantum structures
-Smart infrared focal plane arrays and advanced electronics
-Interceptor seekers and passive sensors
-Methodologies for accurate scene generation of complex target plume characteristics
-Methodologies for developing extremely large infrared (IR) scene projectors
-Acquisition, tracking and pointing technology
-Development of line-narrowed diode pumps sources for Diode Pumped Alkali Laser (DPAL) systems
-Development of optical quality thin-film coatings for DPAL windows
-Innovative signature exploitation for long range object discrimination
-Sensor resource management
-Light weight Divert and Attitude Control Systems for missile defense interceptors
-Anti-Tamper technology for missile defense
-Composite structures for lightweight missile components
-Hot gas components for lightweight missile components
-Advanced power storage systems for interceptors
-Innovative propulsion technology for missile defense interceptors
-Characterization and Incorporation of Vernier engines within the Plume Modeling Process
-Advanced particle treatment in modeling rocket exhaust plumes
-Improved techniques for optimistic modeling
-Mitigation of the effects of the ionosphere on Upgraded Early Warning Radar (UEWR)
-Methodology for accurate assessment of target characteristics
-Telemetry impact reduction for target objects

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Missile Defense Agency	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605502C *I Small Business Innovative Research - MDA*

-Techniques for anchoring debris models
-Dual S & C-band telemetry transmitter system for missile testing
-Novel planning algorithms for hybrid land and sea platform sensor coordination
-Asset pairing for battle management
-Radio Frequency (RF)- Infrared (IR) data fusion for track and data correlation
-Techniques for performing warhead characterization
-Innovative tests and techniques for modeling detonation probability and debris characterization of high explosive submunition warheads
-RF material property characterization
-Advanced techniques for lossless compression of target vehicle telemetry
-Modular hypergolic leak detector
-Acquisition, tracking and pointing technology for high energy laser applications
-Optics and coatings for high energy laser applications
-Atmospheric characterization for Directed Energy applications
-Light weight rubidium-metal vapor circulating system
-Lightweight communication equipment for interceptor communications
-Miniature extendable nozzles or actuating nozzles for improved specific impulse (Isp) of Divert Attitude Control System (DACS) thrusters
-Powdered propellant rocket motor
-Waste heat recovery of rocket motors for reduction of battery weight
-Origin marking of components for avoidance of counterfeit parts
-Thermal isolation of nozzle exit cone insulators
-Anchoring post-intercept debris prediction tools
-Innovative designs for reliable electro-explosive ordinance devices
-Cost effective, reliable service life extension testing of Ordinance Devices
-Correlation identification and evaluation of new technology or methodology to accurately measure inertial movement in a stressing flight environment

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Missile Defense Agency	Date: March 2014
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B. Program Change Summary ($ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total
Previous President's Budget	-	-	-	-	-
Current President's Budget	68.858	-	-	-	-
Total Adjustments	68.858	-	-	-	-
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	68.858	-			
• Other Adjustment	-	-	-	-	-

Change Summary Explanation

FY 2013 funds were transferred to Small Business Innovation Research/Small Business Technology Transfer from other Program Elements

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency			Date: March 2014
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502C / *Small Business Innovative Research - MDA*	Project (Number/Name) MD45 / *Small Business Innovative Research*	

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
MD45: *Small Business Innovative Research*	-	68.858	-	-	-	-	-	-	-	-	-	68.858
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

Note

N/A

A. Mission Description and Budget Item Justification

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-Test: Characterizes ballistic missile defense capability and supports fielding of an integrated and effective capability to the Warfighter.
-Advanced Technology: Develops cost and operationally effective capability; explores and develops technology to counter future threats.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
Title: Small Business Innovative Research	68.858	-	-
Articles:	-	-	-
Description: N/A			
FY 2013 Accomplishments: Awarded 142 Phase Is ($88K average award) in the following 9 research areas:			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency		Date: March 2014
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605502C / *Small Business Innovative Research - MDA*	**Project (Number/Name)** MD45 / *Small Business Innovative Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
--Advanced Technology --Aegis BMD --Anti-Tamper --Battle Management and Communications --Directed Energy --Modeling Simulation and Phenomenology --Targets & Countermeasures --QS-Quality, Safety & Mission Assurance --Radar -Awarded 105 Phase IIs, including modifications to existing Phase IIs ($867K average award), in the following 9 research areas: --Advanced Technology --Aegis BMD --Anti-Tamper --Battle Management and Communications --Directed Energy --Future Capability --Modeling Simulation and Phenomenology --Targets & Countermeasures --Test Instrumentation ***FY 2014 Plans:*** N/A ***FY 2015 Plans:*** N/A			
Accomplishments/Planned Programs Subtotals	68.858	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency		Date: March 2014
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605502C / *Small Business Innovative Research - MDA*	**Project (Number/Name)** MD45 / *Small Business Innovative Research*

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A