MDA Exhibit R-2 RDT&E Budget Item Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

COST ($ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost	151,217	225,268	204,320	199,468	246,291	286,286	305,365
6010 Advanced Technology Development	148,348	0	0	0	0	0	0
0502 Advanced Technology Development	0	198,381	199,970	195,074	241,173	280,293	298,692
0503 Laser/LADAR Technology	0	22,253	0	0	0	0	0
6090 Program-Wide Support	2,869	0	0	0	0	0	0
0602 Program-Wide Support	0	4,634	4,350	4,394	5,118	5,993	6,673

Note: Beginning in FY 2004, the BMD Technology Program Element (PE) projects change, as follows:
-Project 6010 changes to 0502
-Project 6090 changes to 0602
All projects will continue to employ their previous names. Project numbers more accurately reflect the Missile Defense Agency's (MDA's) desired management structure.

A. Mission Description and Budget Item Justification

Our goal is to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight. By the beginning of FY 2005, we will put the BMDS on alert and, for the first time, we will have a capability to defeat a ballistic missile threatening the United States. In FY 2005 and the remainder of the FYDP, we will increase the breadth and depth of our defense by adding forward-deployed, networked sensors, by adding interceptors at sea and on land, and by adding layers of increasingly capable weapons and sensors. Throughout this documentation, therefore, every activity can be tied to one of our four objectives: complete, verify and test the Initial Defensive Capability; put the Ballistic Missile Defense System on alert; develop procedures and logistics to perform and sustain concurrent testing and operations; and enhance the BMDS capability.

The Ballistic Missile Defense System (BMDS) requires constantly improving technology and new concepts in order to implement its strategy of Block-by-Block capability improvements on two-year cycles. The Program Element (PE) 0603175C serves two major roles in this strategy. It funds component technologies that feed into larger systems, thereby delivering product improvement technologies for deployed systems. Additionally, the PE funds the initial demonstration of innovative new concepts that, if successful, can enhance the BMDS in a particular Block improvement.

Many of today's baseline BMD projects are viable due to previous investments in technology research, development, and maturation. Examples include: the Lightweight Exoatmospheric Projectile (LEAP) for Sea-Based Midcourse Defense, indium antimonide and mercury cadmium telluride focal plane arrays, used (respectively) on the Theater High Altitude Area Defense (THAAD) and Space Tracking and Surveillance Systems (STSS), among other systems; 32-bit radiation-hardened Reduced Instruction Set Computer (RISC) processors for image analysis; composite materials for lightweight aerospace vehicle structures; cooled window capability for seekers; interferometric fiber optic gyroscopes for miniaturized guidance and control; master frequency generator for PAC-3 RF seeker and solid-state gallium arsenide transmitter/receivers for advanced missile defense (XBR, THAAD, AEGIS); and dual wavelength passive imagery for BMD test missions and future elements. There is increased emphasis in the BMD Technology program on laser and electro-optical technologies for missile detection, tracking, imaging, and other applications. Electro-optical systems for missile defense provide a significant opportunity for a large return on investment while complementing radar systems.

MDA Advanced Systems has co-responsibility for the Enhancement Plan (EP) with the Systems Engineering and Integration and Test & Assessment organizations. A System Evolution Plan (SEP) produced by Systems Engineering, charts the Block-by-Block improvements in the BMDS. The EP serves as a companion document to the SEP by describing the mix of new concepts and technologies that feed into these enhancements. The EP links the advanced concepts in development and is used to measure technology execution against technology vision of future BMDS Block enhancements. This PE funds those new concepts and technologies.

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MDA has defined the optimum content of Blocks 2004 and 2006. The MDA Systems Engineer has produced a Block 2006 Gaps Analysis which describes residual unfilled capabilities at the end of Block 2006. Every project in PE number 0603175C fills at least one of those gaps in capability.

The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in Battle Management Command Control plus Systems Engineering & Integration now guides the integration of new technology into the BMD System and Test Bed. The FY 2005 MDA Technology budget reflects an integrated strategy to provide new and better technologies to the BMD System when and where they are most needed. Focused by MDA's architectural and engineering processes, the program enhances MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The program seeks to identify high-payoff technologies with a risk level commensurate to the payoff.

Program Operations under this project covers personnel and related support costs, statutory and fiscal requirements. It may also include funding for government civilians performing program-wide oversight functions such as contracting, program integration, safety, quality and mission assurance at Missile Defense Agency (MDA); cost estimating; audit; technology integration across all MDA projects; and assessment of schedule, cost and performance, documentation of related programmatic issues and, foreign currency fluctuations on limited number of foreign contracts. It also includes funding for charges on canceled appropriations in accordance with Public Law 101-510.

B. Program Change Summary	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2004 PB)	151,130	240,820	205,791
Current President's Budget (FY 2005 PB)	151,217	225,268	204,320
Total Adjustments	87	-15,552	-1,471
Congressional Specific Program Adjustments	0	-13,000	0
Congressional Undistributed Adjustments	0	-2,552	0
Reprogrammings	3,228	0	-1,471
SBIR/STTR Transfer	-3,141	0	0

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

COST ($ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
6010 Advanced Technology Development	148,348	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: The efforts contained in project 6010 in FY 2003 are moved to project 0503 in FY 2004 and out. This move was made to more appropriately align the PE with MDA goals.

A. Mission Description and Budget Item Justification

The Advanced Technology Development program develops technology to counter missiles in all phases of flight by investing in technologies according to engineering discipline: Sensor Systems, Engagement Systems, High Altitude Airships, and Innovative Technologies.

The Sensing Systems Technology area focuses on EO/IR Active Sensors, EO/IR Passive Sensors, Radar Systems Technology, Early Launch Detection and Tracking, and Microsatellites.

- The EO/IR Active Sensors task, under the Advanced Discriminating LADAR Technology (ADLT) program, is developing advanced laser radar technology for insertion in future kinetic kill vehicle systems. LADAR technology will improve discrimination performance against advanced threats and increase the Probability of Engagement Success for advanced kill vehicles.

- The EO/IR Passive Sensors task develops basic technologies in components and materials focused on enhancing the capabilities of the BMDS. Examples include:
  -- Multi-color focal plane arrays
  -- High-power semi-conductors
  -- Radiation-hardened electronic components
  -- VLWIR Sensors

- The Radar Systems Technology (formerly: Advanced Radar Technology) program integrates and tests next-generation transmitters, receivers, antennas, signal processors, and software to demonstrate new concepts and technologies to insert in future BMDS Blocks. These technologies will be available for insertion into Blocks 08 through 12.

- The Early Launch Detection Technology (ELDT) program develops, integrates, and tests optical and radio-frequency concepts for detecting and tracking missile launches through clouds. These technologies support earlier commitment of interceptors.

- The Microsatellite program is investigating small satellite concepts, payloads, and applications for future BMDS technology demonstrations and test assets.

The Engagement Systems Technology area consists of: Advanced Discrimination Initiative (ADI), Long Range Atmospheric Defense and Multiple Kill Vehicles (MKVs).

- The MKV program develops multiple, lightweight, sophisticated, and lethal interceptors on a single-carrier vehicle that is compatible with existing launch systems.

- The ADI effort provides scientific and technical expertise, laboratory hardware testing, data analysis, and mission planning to support the development of engineering specifications. ADI also investigates the fundamental limits of advanced discrimination weapons, sensors, and engagement strategies to develop new ADI concepts and preliminary designs.

- The Airship program is MDA's participation in the High Altitude Airship (HAA) Advanced Concept Technology Demonstration (ACTD) and supports the development of uninhabited, long-endurance platform to carry a wide range of BMD assets.

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- The Innovative Technology and Analysis (IT&A) area consists of Innovative Science and Technology (IS&T) and technical analysis.

- The SBIR Team oversees the MDA SBIR Evaluation and Debriefing process for all MDA Phase I and Phase II proposals. The Team also manages AS Phase I and Phase II SBIR Contracts.

B. Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
SENSING SYSTEMS TECHNOLOGY	54,641		
RDT&E Articles (Quantity)			

FY 2003 SENSING SYSTEMS ACCOMPLISHMENTS:

- Range Resolved Doppler Imaging (RRDI) Laser Radar (LADAR) - Demonstrated 30 Hz real-time RRDI LADAR proof-of-concept. Completed baseline breadboard for RRDI (TRL4).

- Obtained real-time measurement of RRD imagery for:
  -- Advanced Measurements Optical Range (AMOR) ranges of 60 - 300 km.
  -- Re-entry vehicles (RVs), balloon, and retro-targets.
  -- Spin, precession, tumbling, and closely space object (CSO) cases.

- Advanced Focal Plane Arrays (FPA) - Five FPA efforts were funded during FY 2003. These efforts focused on demonstrating simultaneous multi-waveband infrared FPAs. Leading interceptor application FPA material is Mercury Cadmium Telluride (TRL 2-3).

- Further mature simultaneous two-color and three-color FPAs (TRL 3-4).

- Focal Plane Arrays - Continued Mercury Cadmium Telluride and Silicon Arsenide focal plane arrays for space surveillance applications (TRL 3-4). Continued development in Mercury Cadmium Telluride (HgCdTe) on Silicon to improve HgCdTe FPA operability and producibility. Also continued development in Strained Layer Superlattice (SLS) technology with the goal of achieving longer wavelength response at higher operating temperatures. Demonstrated the first ever SLS imagery with a 256x256 Type II GaSb/InAs detector. (TRL3)

- Developed large format dual-band Focal Plane Arrays (FPA) for Boost Phase applications. Demonstrated two-color sandwich IRFPA camera on successful HALO I mission resulting in the impending retirement of a heritage system. The retirement results in enhanced data collection capabilities and substantial cost avoidance. Initiated integration of a large format Quantum Well Infrared Photodetector (QWIP) FPA into a camera system for flight test. (TRL 3-5).

-Silicon Seeker Focal Plane Cooler Assembly - Initiated the integration of low-temperature (10 Kelvin) superconducting silicon FPA and processor electronics into an interceptor seeker breadboard (TRL 3-4).

- Proof-of-Principle 10-Kelvin Cryocooler - Continued development of a 10-Kelvin cryocooler using pulse tube technology for space surveillance application. Enables extended tracking range for STSS (TRL 3-5).

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

- Continued analysis and development of technologies and algorithms to support Next Generation Radar technology requirements. RST technology thrusts include development of high power Ga:As amplifiers to increase radar sensitivity; advanced digital receivers with higher bandwidth and dynamic range to improve discrimination performance; system engineering and design for transportable X-band radar systems; and development of signal processing and algorithmic techniques to increase robustness against clutter and ECCM. (TRL 3-4).

- Over the horizon radar (OTHR) - Used available OTHR assets to collect data on two Aerial Dispersion Experiments (ADE) scud launches and one target of opportunity launch demonstrating capability to detect and track a missile launch event soon after liftoff (TRL 4). Collected data for a concept exploring the use of bi-static receivers to improve OTHR system performance.

- Passive Coherent Location (PCL) - Collected data on four Aerial Dispersion Experiment (ADE) launches. Demonstrated the ability to develop missile tracks shortly after launch. Evaluated message formatting to provide PCL tracks in Joint Tactical Integrated Data System (JTIDS)/Link-16 format (TRL 3-5).

- Hypertemporal Infrared Sensor (HTI) and First Alert and Cueing (FAC) Sensor - Successfully collected data on 3 of 4 ADE missions. Also had successful collections on the two Advanced Systems Flight Test missions.

	FY 2003	FY 2004	FY 2005
ENGAGEMENT SYSTEMS TECHNOLOGY	43,911		
RDT&E Articles (Quantity)			

FY 2003 ENGAGEMENT SYSTEMS ACCOMPLISHMENTS:

- Conducted system design reviews and kill vehicle preliminary design reviews of three competing contractor teams MKV concepts.

- Conducted laboratory demonstrations of seeker breadboard and divert propulsion system components (TRL3).

- Defined acquisition strategy and released request for proposals for selection of one contractor team to begin system demonstration hardware development.

- Initiated and completed ACN-0040-GMD-DEV-Rev0, Advanced Discrimination, approved by the BMD System Configuration Control Board.

- Initiated Engineering Change Proposal - 0011.

- Initiated ASN-0020-GMD-DEV-Rev0 Kill Vehicle Enhancement Study.

- Initiated Concept Development - Developed concepts for strategic terminal defenses in the upper atmosphere.

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	FY 2003	FY 2004	FY 2005
HIGH ALTITUDE AIRSHIP	7,859		
RDT&E Articles (Quantity)			

FY 2003 HIGH ALTITUDE AIRSHIP ACCOMPLISHMENTS:

- Three contracts were awarded in FY03 for the HAA ACTD Concept Definition, Phase 1 to Lockheed Martin Naval Electronics and Surveillance Systems, McDonnell Douglas Corporation (subsidiary of the Boeing Company), and Aeros Aeronautical Systems Corp. The concepts were evaluated and resulted in a down select to Lockheed Martin to continue into the Design and Risk Reduction, Phase 2.

	FY 2003	FY 2004	FY 2005
INNOVATIVE TECHNOLOGY AND ANALYSIS	6,165		
RDT&E Articles (Quantity)			

FY 2003 INNOVATIVE TECHNOLOGY AND ANALYSIS ACCOMPLISHMENTS:

- Received: Over 330 New Ideas

- Approved: 42 Approved for Execution

- Funded: 12

	FY 2003	FY 2004	FY 2005
STATUTORY AND MANDATED	5,892		
RDT&E Articles (Quantity)			

The SBIR/STTR, Historically Black Colleges and Universities / Minority Institutions (HBCU/MI) and Technology Applications projects are all covered within the BMD Technology PE Statutory and Mandated program.

FY 2003 STATUTORY AND MANDATED ACCOMPLISHMENTS:

- Incrementally funded nine HBCU/MI contracts in the areas of electronics, sensors, materials, and BMC3 selected in FY 2003 competition.

- Several grants go to the same HBCU with different Points of Contacts.

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HBCU/MIs include:
*Norfolk State
*University of Texas, El Paso
*Alabama A&M
*Florida International University
*Fisk University
*City College of CUNY
*North Carolina A&T
*University of New Mexico
*University of Puerto Rico

SBIR/STTR:
- Established 102 Tri-service evaluation teams

- Coordinated the evaluation of > 2000 Phase 1 proposals, resulting in > 6000 evaluations, resulting in 424 MDA Phase 1 contracts

- Coordinated the evaluation of 100's Phase 2 proposal, resulting in > 200 MDA Phase 2 contracts

- Coordinated the development of 21 MDA/AS specific topics, resulting in 88 Phase 1 contracts

- Coordinated the invitation of 42 MDA/AS Phase 2 proposal invitations.

- MDA/AS will be leveraging > $40 million in SBIR/STTR investments by end of this fiscal year.

- Establishing technology roadmaps for SBIR/STTR focused investments in following areas: Photonics, MKV, ADLT, EDLT, ASIC, and others.

- The Technology Applications program assisted 76 MDA-funded companies prepare to commercialize their technologies and 17 MDA-funded company university-based researchers assess and implement their commercialization work plans.

- Published 4 issues of the MDA Update, highlighting 49 MDA research projects; wrote 44 new technology spin-off articles for the website.

- Published two new reports highlighting 24 research projects.

- Exhibited at 5 conferences.

- Improved and expanded mda.technology.net website as well as MDALink.

- Program support for the administration of the SBIR/STTR Program.

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	FY 2003	FY 2004	FY 2005
DIRECTED INTEREST	29,880		
RDT&E Articles (Quantity)			

FY 2003 DIRECTED INTEREST ACCOMPLISHMENTS:
- Bottom Anti-reflective Coating
- Massively Parallel Optical Interconnects
- Wide Bandgap Silicon Carbide Semiconductor Research
- Gallium Nitride High Power Microwave
- Improved Materials for Optical Memories
- Thick Film Silicon Coatings
- High Data Rate Communications
- Advanced RF Technical Development
- AEOS MWIR Adaptive Optics
- Wafer Scale Planarization
- High Resolution Color Imaging

C. Other Program Funding Summary

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603884C Ballistic Missile Defense Sensors	327,013	425,421	591,957	790,265	1,453,679	1,122,189	1,232,893	Continuing	Continuing

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	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing

D. Acquisition Strategy

BMD Technology does not have any major performers that qualify for this category based on the Financial Management Regulations.

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COST ($ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
0502 Advanced Technology Development	0	198,381	199,970	195,074	241,173	280,293	298,692
RDT&E Articles Qty	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Advanced Technology Development program develops technology to counter missiles in all phases of flight by investing in technologies according to engineering discipline: Sensor Systems, Engagement Systems, High Altitude Airships, and Innovative Technologies.

The Sensing Systems Technology area focuses on EO/IR Active Sensors, EO/IR Passive Sensors Radar Systems Technology, Early Launch Detection and Tracking, and Microsatellites. Sensing Systems has two core missions: Concept Development and Demonstration, and Technology Development and Maturation. The Concept Development and Demonstration task performs system development and testing for concepts with High Technology Maturity Levels. Current efforts include the Airborne Infrared Surveillance (AIRS) and Unconventional Radar Concepts such as Passive Coherent Location and Hybrid Over-the Horizon Radar. The Technology Development and Maturation task develops technologies such as the Advanced Discriminating Ladar, EO/IR Focal Plane Arrays and Sensor Components, and advanced Radar System Technologies for insertion into BMDS elements and future element upgrades.

- The EO/IR Active Sensors task, under the Advanced Discriminating LADAR Technology (ADLT) program, is developing advanced laser radar technology for insertion in future kinetic kill vehicle systems. LADAR technology will improve discrimination performance against advanced threats and increase the Probability of Engagement Success for advanced kill vehicles.

- EO/IR Passive Sensors task develops basic technologies in components and materials focused on enhancing the capabilities of the BMDS. Examples include:
  -- Multi-color focal plane arrays
  -- High-power semi-conductors
  -- Radiation-hardened electronic components
  -- VLWIR Sensors

- The Radar Systems Technology (formerly: Advanced Radar Technology) program integrates and tests next-generation transmitters, receivers, antennas, signal processors, and software to demonstrate new concepts and technologies to insert in future BMDS Blocks. These technologies will be available for insertion into Blocks 08 through 12.

- The Early Launch Detection Technology (ELDT) program develops, integrates, and tests optical and radio-frequency concepts for detecting and tracking missile launches through clouds. These technologies support earlier commitment of interceptors.

- The Microsatellite program is investigating small satellite concepts, payloads, and applications for future BMDS technology demonstrations and test assets.

The Engagement Systems Technology area consists of: Advanced Discrimination Initiative (ADI) and Multiple Kill Vehicles (MKVs).

- The MKV program develops multiple, lightweight, sophisticated, and lethal interceptors on a single-carrier vehicle that is compatible with existing launch systems. The MKV project is on pace for insertion in Block 10.

- The ADI is a cross-Agency effort to modify BMD System weapons and sensors to defeat adversary countermeasures and increase overall system effectiveness in the midcourse phase. The Initiative also develops command-control strategies and prototype mission software to control engagement sequences that invoke advanced discrimination. The ADI effort provides scientific and

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technical expertise, laboratory hardware testing, data analysis, and mission planning to support the development of engineering specifications. ADI also investigates the fundamental limits of advanced discrimination weapons, sensors, and engagement strategies to develop new ADI concepts and preliminary designs. The Ground-based Midcourse Defense element is the transition agent for ADI. Under the ADI, MDA will conduct a series of ground tests in FY 2004 - FY 2005.

- The Airship program is MDA's participation in the High Altitude Airship (HAA) Advanced Concept Technology Demonstration (ACTD) and supports the development of uninhabited, long-endurance platform to carry a wide range of BMD assets.

- The Innovative Technology and Analysis (IT&A) area consists of the Advanced Systems Innovation Cell (ASIC), Innovative Science and Technology (IS&T) and technical analysis.

- The SBIR Team oversees the MDA SBIR Evaluation and Debriefing process for all MDA Phase I and Phase II proposals. The Team also monitors AS Phase I and Phase II SBIR Contracts.

B. Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
SENSING SYSTEMS TECHNOLOGY	0	59,219	72,067
RDT&E Articles (Quantity)			

FY 2004 SENSING SYSTEMS PLANNED PROGRAM:

- Upgrade range-resolved Doppler imaging LADAR to full power and other discriminating seeker capabilities (TRL 3-5).

- An infrared dual-band camera will continue development and participate in 3-4 flight tests in FY04.

- Further mature simultaneous two-color and three-color FPAs (TRL 3-4).

- Continue limited development of space-based surveillance FPAs and cryocoolers for Space Tracking and Surveillance System (STSS) applications (TRL 4-7). Delivering two different Quantum Well Infrared Photodetector (QWIP) cameras to Airborne Laser program for improved infrared search and track capability.

- Proof-of-principle 10-Kelvin Cryocooler - Continue development of a 10-Kevlin cryocooler using pulse tube technology for space surveillance application. Enables extended tracking range for SBIRs-Low (TRL 3-5).

- The Radar Systems Technology (formerly: Advanced Radar Technology) program integrates and tests next-generation transmitters, receivers, antennas, signal processors, and software to demonstrate new concepts and technologies to insert in future BMDS Blocks.

-- Continue design and technical analysis on advanced antenna technologies; perform distributed aperture coherence tests; deliver high voltage S-Band Ga:As high power amplifier chips; perform demonstration of wideband digital receiver technology.

-- Develop cohere-on-transmit distributed aperture algorithms and demonstrate in X-band laboratory tests.

-- Develop prototype low power density phased array panel demonstrating proof-of-concept of affordable high-performance scaleable phased array architecture.

-- Demonstrate and deliver producible and reliable high voltage X-band GaAs amplifiers providing improved sensitivity, efficiency, and bandwidth for BMDS radars.

-- Demonstrate and deliver advanced digital receiver exciter technology supporting wide bandwidth digital beam forming architectures and countermeasures mitigation.

- Continue development and test of promising ELDT capabilities including flight tests (TRL 4-6). Collect Hypertemporal Infrared (HTI) and First Alert and Cueing (FAC) sensor data against static rocket firings.

- Over-the-horizon radar (OTHR) - Use available OTHR assets to collect data on target of opportunity launches demonstrating capability to detect and track a missile launch event soon after liftoff (TRL 4). Collect data for continuing to advance a concept exploring the use of bi-static receivers to improve OTHR system performance.

- Develop new antennas and employ enhanced signal processors to improve PCL performance. Develop higher sensitivity, larger FOV sensors for HTI and FAC.

- Microsatellite - Commence analysis and design of microsatellite concept demonstration experiments. Perform concept selection and mature design efforts to Preliminary Design Review (PDR) status during FY04.

FY 2005 SENSING SYSTEMS PLANNED PROGRAM:

- Mature Range-Resolved Doppler Imaging LADAR to full power brassboard design (TRL 5).

- Further mature simultaneous two-color and three-color Focal Plane Arrays (FPAs) and pursue MDA flight test opportunities (TRL 3-5).

- Continue development of space-based surveillance FPAs and cryocoolers for Space Tracking and Surveillance System applications (TRL 4-7).

- Develop new antennas and employ enhanced signal processors to improve passive radar performance. Develop higher sensitivity, larger FOV sensors for HTI and FAC.

- Demonstrate cohere-on-transmit distributed aperture algorithms in field tests at Reagan Test Site (RST).

- Develop prototype low power density phased array panel demonstrating proof-of-concept of an affordable high-performance scaleable phased array architecture.

- Demonstrate and deliver producible and reliable high voltage X-band Gallium Arsenide (GaAs) amplifiers providing improved sensitivity, efficiency, and bandwidth for BMDS radars.

- Demonstrate and deliver advanced digital receiver exciter technology supporting wide bandwidth digital beam forming architectures and countermeasures mitigation.

- Demonstrate and deliver photonic time delay unit technology providing stable, affordable wideband capability for in-service and future radar architectures.

- Continue design and technical analysis on advanced antenna technologies; perform distributed aperture coherence tests; deliver high voltage X-Band GaAs high power amplifier chips; perform demonstration of wideband digital receiver technology; continue technology spiral for advanced transportable antenna arrays.

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- Initiate a classified radar program, MkR, between various elements of MDA and other agencies which has the goal of improving the tracking capability of the BMDS.

- Mature microsatellite concept demonstration designs to Critical Design Review (CDR) level.

	FY 2003	FY 2004	FY 2005
ENGAGEMENT SYSTEMS TECHNOLOGY	0	35,646	85,355
RDT&E Articles (Quantity)			

FY 2004 ENGAGEMENT SYSTEMS PLANNED PROGRAM:

- Select one contractor team to begin Multiple Kill Vehicle (MKV) system development.

- Conduct critical kill vehicle seeker, divert propulsion, and avionics component and subsystem demonstrations (TRL 4).

- Conduct kill vehicle critical design review.

- Purchase long lead items for integrated kill vehicle hover test in FY 2005.

- Conduct second system design review to ensure kill vehicle and carrier vehicle compatibility.

- Perform advanced studies and engineering tests to improve ADI and related concepts, and develop other advanced counter-countermeasure capabilities.

- Prepare and Conduct Advanced Study Notices, Advanced Change Notices, and Engineering Change Proposals for review by the CCB.

- Complete an Engineering Change Proposal for insertion of Advanced Discrimination into the Ground Based Midcourse Defense System.

- Perform Ground Testing of Advanced Discrimination.

- Conduct a Concept Design Review for ADI, Block 2008/2010 capability in BMDS.

FY 2005 ENGAGEMENT SYSTEMS PLANNED PROGRAM:

- Conduct integrated kill vehicle hover tests in FY 2005 (TRL 5).

- Conduct system control and weapon-to-target assignment software development.

- Continue execution of Strategic Illuminator, Compact Laser Radar Amplifier, Advanced Inertial Reference Unit, Advanced Detectors, and Angle-Angle-Range Doppler Imaging LADAR through prototype demonstration to termination.

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

- Select one to three technology base projects in FY 2005 for execution in FY 2006.

- Complete disposition of Capistrano Test Site equipment from the former Spaced Based Laser program in FY 2005.

- Conduct carrier vehicle preliminary design review.

- Purchase long lead items to support kill vehicle flight testing starting in FY 2006.

- Conduct initial kill vehicle control and sensor flight test in FY 2006. (TRL 5).

- Initiate Proof of principle flight-testing program.

- Complete early engineering planning and design and initiate major work to install Concept A into the BMD System.

	FY 2003	FY 2004	FY 2005
HIGH ALTITUDE AIRSHIP	0	54,885	24,074
RDT&E Articles (Quantity)			

FY 2004 HIGH ALTITUDE AIRSHIP PLANNED PROGRAM:

- Executing Agent for High Altitude Airship ACTD scheduled for FY 2006 demonstration (TRL 4-7). The objective of this ACTD is to demonstrate the engineering feasibility and potential military utility of an unmanned, untethered, gas filled, solar powered airship that can fly at 65,000 feet. The prototype airship developed under this effort will be capable of continuous flight for up to a month while carrying a multi-mission payload. The prototype airship will demonstrate all enabling technologies that will be required for one year or more of continuous flight. Prototype airship design and risk reduction phase will culminate with a Critical Design Review 3Q FY04. Airship engineering feasibility studies and CONOPS will be defined and reviewed, preparing the way for demo flight testing in FY 2006.

FY 2005 HIGH ALTITUDE AIRSHIP PLANNED PROGRAM:

- Airship prototype development, build and demo continues through FY 2005 when flight tests will demonstrate remote C2 link connectivity, sensor and communications package utilization, and flight / payload integration capability.

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

	FY 2003	FY 2004	FY 2005
INNOVATIVE TECHNOLOGY AND ANALYSIS	0	5,732	15,290
RDT&E Articles (Quantity)			

FY 2004 INNOVATIVE TECHNOLOGY AND ANALYSIS PLANNED PROGRAM:

-The Advanced Systems Innovation Cell (ASIC) is the focal point for review of all internally and externally generated new ideas submitted to MDA. This team of experts (government, industry and academic) evaluates new ballistic missile defense concepts and technologies determining their technical feasibility, initial capability, and maintains cognizance over leading edge concepts. The team seeks new and innovative concepts via a Federal Business Opportunities Broad Agency Announcement (BAA) for integrated systems and for technical improvements in boost, midcourse, and terminal phases of missile defense.

FY 2005 INNOVATIVE TECHNOLOGY AND ANALYSIS PLANNED PROGRAM:

- Continue to execute ASIC planned program. Fund additional ideas.

- Missile Defense Science, Technology and Research (MSTAR): MSTAR is MDA'S University Research Program. It seeks to incorporate innovative research at the University level into ballistic missile defense, as well as to provide training for future missile defense scientists and engineers. MSTAR seeks new and innovative concepts via a Federal Business Opportunities Broad Agency Announcement (BAA) for research and for technical improvements in boost, midcourse, and terminal phases of missile defense.

- Initiate MSTAR program with 6-9 new awards

	FY 2003	FY 2004	FY 2005
STATUTORY AND MANDATED	0	3,659	3,184
RDT&E Articles (Quantity)			

The SBIR/STTR, Historically Black Colleges and Universities / Minority Institutions (HBCU/MI) and Technology Applications projects are all covered within the BMD Technology PE Statutory and Mandated program.

FY 2004 STATUTORY AND MANDATORY PLANNED PROGRAM:

- Continue to fund HBCU/MI.

- Continue providing technology maturation techniques, such as commercialization reviews and outreach, which help leverage outside resources and provide a strong foundation essential for scaling up MDA-funded technology to address system capabilities.

- Continue program support for the administration of the SBIR/STTR Program.

- Establish investment strategy and formulation of SBIR/STTR Technology Roadmaps

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

FY 2005 STATUTORY AND MANDATED PLANNED PROGRAM:

- Continue to fund HBCU/MI.

- Continue providing technology maturation techniques, such as commercialization reviews and outreach, which help leverage outside resources and provide a strong foundation essential for scaling up MDA-funded technology to address system capabilities.

- Continue program support for the administration of the SBIR/STTR Program.

	FY 2003	FY 2004	FY 2005
DIRECTED INTEREST	0	39,240	
RDT&E Articles (Quantity)			

FY 2004 DIRECTED INTEREST PLANNED PROGRAM:

- Massively Parallel Optical Interconnects for Microsatellites
- Silicon Carbide Wide Bandgap Research
- Wide Bandgap Optoelectronics
- AEOS MWIR Adaptive Optics
- Advanced RF Technology Development
- SiC Mirrors
- Pourous Silicon
- Tulane Center for Missile Defense
- Extended FootPrint Program
- Advanced Metalized Gelled Propellants
- Chemical Vapor Deposition of Organic Materials
- Center for Optical Devices
- Improved Materials for Optical Memories
- Multiple Target Tracking Optical Sensor Array Technology

C. Other Program Funding Summary

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603884C Ballistic Missile Defense Sensors	327,013	425,421	591,957	790,265	1,453,679	1,122,189	1,232,893	Continuing	Continuing

D. Acquisition Strategy

HAA has awarded Lockheed Martin a Design and Risk Reduction, Phase 2 contract for $40 million. A Critical Design Review is scheduled for June 2004.

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

COST ($ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
0503 Laser/LADAR Technology	0	22,253	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Laser Technology program focuses on developing lasers and related component technology for low power applications including tracking, weapon guidance, and imaging, while investing in high-energy laser technologies that could lead to future ABL improvements. The emphasis on low-power systems is driven by their considerable potential to improve and support MDA's hit-to-kill weapons. Having selected concepts and awarded contracts for four focused technology projects in FY 2003, the Agency will continue these through FY 2004, and initiate new projects in FY 2005. The projects will be drawn from proposals solicited from the laser and electro-optics industry and supported by BMDS element evolutionary block upgrades.

Selected programs include:
-Strategic Illuminator for rugged long-range tracking and wavefront sensing device to support Airborne Laser upgrades and strategic surveillance applications.
-Compact laser radar (LADAR) amplifier for kill vehicles to enhance target discrimination at extended range.
-Advanced inertial reference unit for precision pointing knowledge for acquisition, tracking, and pointing applications.
-Advanced low-noise, fast detectors for tracking, ranging, imaging, and laser wavefront sensing.

B. Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Laser Technology		22,253	0
RDT&E Articles (Quantity)			

FY 2003 ACCOMPLISHMENTS:

All projects below were selected in FY 2003 and are planned for continuation through FY 2006. Funding levels are approximately $10 million/year for major projects and $2.5 million/year for technology base projects.

The major project is:

- Strategic Illuminator - A multi-kilowatt brassboard illuminator system that will significantly advance the state of the art in high-power LADAR illuminator brightness, reliability, and packaging. Contracts were awarded in April 2003 on the basis of a BAA to three responsive contractors for a four month concept development phase (Phase I). Following a Conceptual Design Review, Phase II for brassboard design was exercised in September 2003 providing continued funding to Northrop Grumman for 18 months of effort.

The technology base projects are:

- Compact Laser Radar Amplifier - A powerful small laser transmitter (hundreds of watts) suitable for insertion on a missile defense platform with tight weight and volume constraints. Contracts were awarded in May 2003 on the basis of a BAA to two responsive contractors, Northrop Grumman and Coherent Technologies Inc., for a 12 month concept development phase (Phase I).

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

- Advanced Inertial Reference Unit - A device for highly accurate laser pointing and tracking. Contract was awarded in April 2003 on the basis of a BAA to Applied Technology Associates for a 12 month concept development and gyro survey phase (Phase I).

- Advanced Detectors - Improved detectors for laser radars, with increased sensitivity and bandwidth. Contract was awarded in May 2003 on the basis of a BAA to four responsive contractors (Raytheon, SAIC, Sensors Unlimited, and VOXTEL) for a 6 month concept development phase (Basic contract) of a wave front sensor/tracker and a ranging camera.

- Capistrano Test Site - Initiated the decommissioning of the site. The requirement to shut down the Capistrano Test Site was levied on the Laser Technology program when it replaced the cancelled Space Based Laser Program.

FY 2004 PLANNED PROGRAM:

- Strategic Illuminator - The contractor will design a densely packaged, rugged, high radiance, solid-state laser. Tasks include breadboarding the electronics, developing a light weight power supply and designing a blowdown chiller that all fit together in a compact volume.

- Compact Laser Radar Amplifier - Following Preliminary and Critical Design Reviews (in 1QFY04 and 3QFY04, respectively), Phase II for breadboard fabrication will be exercised providing funding for one contractor to continue with this 12 month effort.

- Advanced Inertial Reference Unit - Following Preliminary and Critical Design Reviews (in 1QFY04 and 4QFY04, respectively), Phase II for breadboard fabrication of a prototype device will be exercised providing funds to one contractor to continue this 12 month effort.

- Advanced Detectors - Following Critical Design Review in November 2003, Option I will be exercised providing continued funding to two contractors for 12 month efforts to produce a wave front sensor/tracker and a ranging camera.

- Angle-Angle-Range Resolved Doppler Imager - Design and experiments on a revolutionary photon-counting laser radar capable of both direct detect and Doppler measurements.

- Advanced Chemical Oxygen-Iodine Laser (COIL) Technology - Theory and experiments to increase specific power (watts/kg) of COIL devices for future Airborne Laser blocks.

- One to three technology base projects are anticipated for selection in FY 2004 for execution in FY 2005. In addition to these projects, in FY 2004, approximately $7.4 million is planned to cover costs associated with Capistrano Test Site deactivation.

FY 2005 PLANNED PROGRAM:
(Note: In FY 2005, Laser Technology will be moved into the Advanced Technology Development PE)

PLEASE SEE THE ENGAGEMENT SYSTEMS IN PROJECT 0502 FOR FY 2005 PLANNED PROGRAM

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

C. Other Program Funding Summary

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603884C Ballistic Missile Defense Sensors	327,013	425,421	591,957	790,265	1,453,679	1,122,189	1,232,893	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
Continuing									

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

D. Acquisition Strategy

Program Information for the Laser Technology Program

The MDA Director designated the Deputy of Advanced Systems (MDA/AS) as the official responsible for planning, programming, and directing the MDA Laser Technology Program (LTP), and appointed the Airborne Laser (ABL) Program Director (MDA/AL) as the executing agent (EA). The goal of LTP is promoting research and development to provide a general advancement in laser technology benefiting multiple MDA programs.

The intent is to fund one to three, $10 million Major Projects for up to three years, two to four, $2.5 million Technology Base Projects for two to three years, and a small number of $250 thousand Technology Feasibility Studies for one year. Broad Agency Announcements (BAAs) were chosen as the contract vehicle to provide maximum flexibility. Each contract awarded will be for one year with two (2) option years. In the event that some options are not exercised and funding is made available, additional projects can be started. Any remaining funds would be used on additional projects to continue to promote a general advancement in Laser Technology.

Contract oversight will be ongoing. Projects will have two reviews a year. The reviews will include a mid-year review and an end-of-year review unless the project phase lengths require reviews at different times. MDA/AS, in consultation with the COR and the EA, will decide whether to exercise an option and provide funding for the next year based on the results of the previous year. Only in special cases will a project be funded for more than three years.

Additional projects, selected in future fiscal years, will be briefed to MDA/AL (delegable to MDA/ALK) and will require approval prior to a new BAA release. The brief will be considered a delta ASP that adds the projects being selected that fiscal year.

Business Considerations

Full and open competition will be used with BAAs as the publicizing/solicitation tool. The contracts will be Research & Development contracts for the advancement of general laser technology. There will be no platform specific requirements only technical goals with multiple future applications. BAAs will allow maximum flexibility for Research and Development projects like those anticipated. Evaluation will be in accordance with FARS 35.016. Technical proposals will be evaluated using the following factors in descending order of importance based on scientific peer review: (a) technical: to include technical quality, scientific merit of the proposed technical approach and program plan, and capabilities and related experience, facilities, techniques or unique combinations of these which are an integral factor for achieving proposal objectives (b) Importance to MDA programs and (c) Fund availability to include cost realism. Oral presentations will not be used. Anticipate that CPFF will be the standard contract type for the duration of this program.

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

COST ($ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
6090 Program-Wide Support	2,869	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: Fiscal Year 2003 is reflected in Project 6090 and Fiscal Years 2004 and out are in Project 0602.

A. Mission Description and Budget Item Justification

This project covers personnel and related support costs, statutory and fiscal requirements.

Personnel covers government civilians performing program-wide oversight functions such as contracting, program integration, safety, quality and mission assurance at Missile Defense Agency (MDA), Executing Agents within the US Army Space & Missile Defense Command, US Army Program Executive Officer (PEO) Air and Missile Defense, US Navy PEO for Theater Surface Combatants, Office of Naval Research, and US Air Force.

Assistance required to support Missile Defense Agency program-wide management functions is also contained in this project. Typical efforts include cost estimating; audit; technology integration across MDA projects; and assessment of schedule, cost and performance, with attendant documentation of the many related programmatic issues. The requirements for this area are based on most economical and efficient utilization of contractors versus government personnel.

Fiscal Requirements include reimbursable services acquired through the Defense Working Capital Fund (DWCF) such as accounting services provided by the Defense Finance and Accounting Services (DFAS); reserves for special termination costs on designated contracts; and provisions for terminating other programs as required. MDA has additional requirements to provide for foreign currency fluctuations on its limited number of foreign contracts. Also includes funding for charges to canceled appropriations in accordance with Public Law 101-510.

Note that these funds are allocated across multiple Program Elements (PE) in accordance with the Fiscal Year 1996 Authorization Act, which directed these funds be allocated to the programs being supported rather than managed from a single source. This structure often makes it difficult to level-fund all PEs while maintaining an orderly fiscal structure for executing the individual Program-Wide Support efforts.

B. Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Civilian Salaries and Support	2,869	0	0
RDT&E Articles (Quantity)			

Personnel:
Provides funding for government salaries and benefits at the Missile Defense Agency that are associated with program-wide support.

Management Support:
Funds the contract SETA support costs directly associated with Missile Defense Agency program-wide support organizations. This effort provides the funding for the Missile Defense Agency's executing agents (Army Space and Missile Defense Command, Army PEO-AMD, Air Force, and Navy) including government salaries & benefits, SETA support, and various management/overhead costs.

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

Fiscal Requirements:
This effort funds various requirements at the Missile Defense Agency, to include accounting services, special termination costs foreign currency fluctuations, and charges from cancelled appropriations.

IM/IT Operations:
This effort pays for Information Management/Information Technology requirements within the Missile Defense Agency. These requirements are moved to the Management Headquarters Program Element in Fiscal Years 2004-2009.

C. Other Program Funding Summary

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603884C Ballistic Missile Defense Sensors	327,013	425,421	591,957	790,265	1,453,679	1,122,189	1,232,893	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research – MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters – MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

COST ($ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
0602 Program-Wide Support	0	4,634	4,350	4,394	5,118	5,993	6,673
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: Fiscal Year 2003 is reflected in Project 6090 and Fiscal Years 2004 and out are in Project 0602.

A. Mission Description and Budget Item Justification

This project covers personnel and related support costs, statutory and fiscal requirements.

Personnel covers government civilians performing program-wide oversight functions such as contracting, program integration, safety, quality and mission assurance at Missile Defense Agency (MDA), Executing Agents within the US Army Space & Missile Defense Command, US Army Program Executive Officer (PEO) Air and Missile Defense, US Navy PEO for Theater Surface Combatants, Office of Naval Research, and US Air Force.

Assistance required to support Missile Defense Agency program-wide management functions is also contained in this project. Typical efforts include cost estimating; audit; technology integration across MDA projects; and assessment of schedule, cost and performance, with attendant documentation of the many related programmatic issues. The requirements for this area are based on most economical and efficient utilization of contractors versus government personnel.

Fiscal Requirements include reimbursable services acquired through the Defense Working Capital Fund (DWCF) such as accounting services provided by the Defense Finance and Accounting Services (DFAS); reserves for special termination costs on designated contracts; and provisions for terminating other programs as required. MDA has additional requirements to provide for foreign currency fluctuations on its limited number of foreign contracts. Also includes funding for charges to canceled appropriations in accordance with Public Law 101-510.

Note that these funds are allocated across multiple Program Elements (PE) in accordance with the Fiscal Year 1996 Authorization Act, which directed these funds be allocated to the programs being supported rather than managed from a single source. This structure often makes it difficult to level-fund all PEs while maintaining an orderly fiscal structure for executing the individual Program-Wide Support efforts.

B. Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Civilian Salaries and Support	0	4,634	4,350
RDT&E Articles (Quantity)			

Personnel:
Provides funding for government salaries and benefits at the Missile Defense Agency that are associated with program-wide support.

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

Management Support:
Funds the contract SETA support costs directly associated with Missile Defense Agency program-wide support organizations. This effort provides the funding for the Missile Defense Agency's executing agents (Army Space and Missile Defense Command, Army PEO-AMD, Air Force, and Navy) including government salaries & benefits, SETA support, and various management/overhead costs.

Fiscal Requirements:
This effort funds various requirements at the Missile Defense Agency, to include accounting services, special termination costs foreign currency fluctuations, and charges from cancelled appropriations.

IM/IT Operations:
This effort pays for Information Management/Information Technology requirements within the Missile Defense Agency. These requirements are moved to the Management Headquarters Program Element in Fiscal Years 2004-2009.

C. Other Program Funding Summary

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0603869C Meads Concepts – Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603884C Ballistic Missile Defense Sensors	327,013	425,421	591,957	790,265	1,453,679	1,122,189	1,232,893	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing

MDA Exhibit R-2A RDT&E Project Justification	Date: February 2004
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology**

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters – MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing