MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	0	807993	1065982	1208546	1157025	1139885	1176979	Continuing	Continuing
BM/C2	0	30792	112816	122520	123688	120991	123076	Continuing	Continuing
1020 Communications	0	9845	11955	13000	13000	14000	24000	Continuing	Continuing
1030 Targets & Countermeasures	0	95055	128180	171702	173062	155712	143040	Continuing	Continuing
1050 Systems Engineering & Integration	0	201917	371149	401803	368636	359438	359965	Continuing	Continuing
1060 Test & Evaluation	0	423708	382044	435519	413869	424742	464202	Continuing	Continuing
1070 Producibility & Manufacturing Technology	0	16732	21916	22000	22000	22000	22000	Continuing	Continuing
1090 Program Operations	0	29944	37922	42002	42770	43002	40696	Continuing	Continuing

A. Mission Description and Budget Item Justification

The missile defense program has transitioned from an element-centric to a system-centric focus, and from a requirements-based to a capability-based, Block delivery approach. The objective of this new approach is to acquire a single, integrated layered Ballistic Missile Defense System (BMDS) that provides multiple engagement opportunities along the entire flight path of threat ballistic missiles. The advantage of this single, integrated layered system approach is that it provides engineers significant opportunity for synergy and trade space to exploit the inherent capabilities of all system elements and their components while optimizing aggregate performance, resulting in operational flexibility and robustness to protect the U.S., deployed forces, friends and Allies around the world. This allows the BMDS to evolve over time employing different combinations of sensor suites, weapons, battle management and command, control, and communications elements as an overarching, integrated capability. The development of this layered BMDS requires a collaborative enterprise comprised of the best and most experienced people from Industry and Government. This collaboration will be accomplished through the employment of the Missile Defense National Team (MDNT). The MDNT will develop and verify BMDS level designs and products for all ground, sea, air and space based elements through the use of models and the BMDS Test Bed. The flow down of BMD System Capability Specifications resulting from MDNT efforts in Systems Engineering & Integration (SE&I) and Battle Management and Command & Control (BM/C2) will guide the integration of elements into the BMD System, the BMDS BM/C2 architecture, and the BMDS Test Bed.

The BMDS provides initial capabilities and enhances these capabilities over time (block upgrades) by developing and testing defenses that employ complementary sensors, weapons, and communications/decision support systems to engage threats in the boost, mid-course, and terminal phases of flight. Blocks are synergistic sets of validated capability with military utility as demonstrated via the BMDS Test Bed. Each Block is comprised of selected BMDS elements which are able to operate

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autonomously or provide enhanced capability participating as part of the integrated BMDS Block configuration. Each subsequent Block will build on the predecessor Block. This block approach allows the Missile Defense Agency (MDA) to put the best, most capable technologies "in play" sooner than would otherwise be possible. MDA has designed a comprehensive, but flexible RDT&E program to both integrate and expand existing element capabilities, and to examine and integrate the widest possible range of promising technologies into the block upgrades. The first BMDS Block is planned for the FY 2004 timeframe. Once demonstrated, Block capability is available for emergency use, if directed, and transition to the services for procurement, operation and support.

The Ballistic Missile Defense (BMD) System Program Element (PE) provides the resources to define, integrate, test, demonstrate and evolve the multi-layered BMDS capable of defending the United States, deployed forces, friends, and allies. The BMD System mission is comprised of six primary projects: BM/C2, Communications, Targets & Countermeasures, SE&I, Test & Evaluation (T&E), and Producibility & Manufacturing Technology. Successful performance of these activities is necessary for fielding a multi-layered, evolutionary system for defense in depth against the full spectrum of ballistic missile threats.

The BMDS BM/C2 will substantially enhance BMDS effectiveness beyond that achievable by stand-alone systems and provides a flexible, integrated architecture to plan, direct, control and monitor missile defense activities. The BM/C2 project produces the system that provides battle management, command and control for the BMDS. This includes the development and allocation of a BM/C2 Architecture and related System Specifications necessary to ensure that the BMDS elements and components are fully integrated and interoperable with each other and with other external systems, and provide maximum flexibility to the war fighter. The BM/C2 Project is also responsible for developing the Communication Architecture and Specifications that will support BM/C2 Architecture and System Specifications, and allocating those specifications to the appropriate element(s).

The Communications Project consolidates, refines requirements, and develops upgrades to existing communication systems (hardware and software) that are being developed for the BMDS – it is the key, and critical enabler to integration of the BMDS BM/C2. BMD System Communications activities are responsible for developing capabilities that allow all components of the BMDS to implement the timely, reliable and secure exchange of information, and to permit command and control orders to be transmitted to the weapons and sensor systems.

The Targets and Countermeasures project provides capability-based ballistic missile targets, countermeasures, and target system support. This project funds targets and countermeasures activity such as target booster development, target risk reduction flights, and target characterization in support of BMD programs. Major efforts include: maintaining a required inventory of major target components such as boosters, Re-Entry Vehicles (RV's), and countermeasures; providing resources for non-mission costs such as ground handling and support equipment; refurbishing launch site stools as needed; managing and planning Foreign Material Acquisition (FMA) activities; developing advanced targets and Long Range Air Launched Targets; developing capability-based threat payloads; and developing and incorporating countermeasures into targets for testing against BMD programs.

The SE&I project provides the overall systems engineering development and integration of the BMDS. The SE&I mission is to define and manage the layered BMD system, providing the collaborative, layered, and detailed systems engineering and integration required across the entire spectrum of BMDS war fighter capabilities. The SE&I program scope spans the development of individual components (e.g. boosters), elements (e.g. Block 2006 Theater High Altitude Area Defense (THAAD)), BMD segments (e.g. midcourse), and the fully integrated BMD System. SE&I activities provide the engineering core competency, modeling facilities, and integrative engineering development efforts needed to technically manage and field the capability-based BMDS.

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The T&E project provides consolidated BMDS-wide T&E capabilities and resources required to allow for cohesive facilitation, management, and execution of test activities. T&E efforts include the development, operation, maintenance, and modernization of the T&E infrastructure supporting both the testing of BMDS Elements and System Level testing. It includes resources for the development, maintenance, and configuration management of credible core analytical tools used commonly by all BMDS Elements and for the engineering and testing of integration and interoperability across the BMDS. And the project funds the BMDS System –Wide test and assessment program which includes critical measurements, integration tests, and supporting technology experiments. T&E activities associated with specific BMDS Elements are captured in the respective BMDS Element. T&E activities are grouped in terms of System-Wide T&E; Test Resources of facilities, ranges, sensors, and test instrumentation; Modeling and Simulation (M&S); and Facilities, Siting, and Environmental (FS&E) efforts.

Producibility and Manufacturing Technology provides manufacturing technologies and implementation strategies that benefit the BMDS. These include near term technology insertion programs that demonstrate capabilities for multiple applications across the BMDS (encompassing cost reduction/avoidance, performance enhancement and risk reduction). These programs are identified by utilizing systems engineering, analyses and assessments as a basis for offering potential remediation of a BMDS problem area. Producibility and Manufacturing Technology provides tools, strategies for improving the technology insertion processes in support of the spiral development for the BMDS to meet block upgrade goals.

Program Operations funding includes the required personnel and management support for developing an integrated BMDS. This infrastructure includes items such as: travel; personnel and related facility support costs; statutory and fiscal requirements, and support service contracts.

B. Program Change Summary	FY 2001	FY 2002	FY 2003
Previous President's Budget (FY 2002 PB)		779584	
Congressional Adjustments		39500	
Appropriated Value		819084	
Adjustments to Appropriated Value			
a. Congressional General Reductions		-11091	
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since FY 2002 PB		28409	1065982
Current Budget Submit (FY 2003 Budget Estimates)		807993	1065982

Change Summary Explanation:

- FY 2003 Funding was not included during the FY 2002 Amended President's Budget Submission.

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COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
1010 BM/C2	0	30792	112816	122520	123688	120991	123076	Continuing	Continuing

A. Mission Description and Budget Item Justification

The composite Ballistic Missile Defense System (BMDS) Battle Management (BM), Command and Control (C2), and Communications is the integrating function across all BMDS elements.

Missile Defense Agency (MDA) is establishing a Missile Defense National Team BM/C2/Comm (MDNTB) construct to deliver an integrated BMDS BM/C2 system. This effort requires a collaborative enterprise comprised of the best and most experienced minds of Industry and Government. The MDNTB is composed of major defense contractors, Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), and Scientific Engineering and Technical Assistance (SETA) providers. The concept of operations for the MDNTB is as follows: the Government provides the overall management of the BMDS program and participates within the MDNTB; and the MDNTB is responsible for the engineering, design, development and delivery of an executable BMDS BM/C2/Comm Architecture, BMDS BM/C2/Comm Block capability specifications, and the integration of BMDS Elements into the BMDS BM/C2/Comm Architecture.

The BMDS BM will substantially enhance BMDS effectiveness beyond that achievable by stand-alone systems. The BM component integrates kill chain functions (surveillance, detect/track/classify, engage and assess) across the layered defenses (boost, mid-course and terminal) and evolves with the BMDS elements. Initially, BM will deliver the hardware/software (HW/SW) necessary to provide the means for executing pre-planned responses by integrating available information to provide the user with increased automation capability and ability to integrate information from increasingly diverse resources. BM will eventually provide a highly flexible and configurable framework for real time, adaptive coordination of missile defense assets, while also supporting the incorporation of new elements. Block 2004 BM architecture currently plans to integrate Ground Based Missile Defense System (GBMDS), Theater High Altitude Air Defense (THAAD), Airborne Laser (ABL), Patriot 3 (PAC-3) Interceptor, Marine Corps Tactical Air Operations Module (TAOM), Sea-Based Midcourse (SBM), Space-Based Infrared System (SBIRS), Defense Support Program (DSP), and Air Force Control and Reporting Centers (CRC). This may change as a result of annual Block capability reviews.

The BMDS C2 provides a flexible, integrated architecture to plan, direct, control and monitor missile defense activities. C2 sets the framework for all subordinate commands' actions, including decisions concerning the defense course of actions, force lay down, consistent shot doctrine, etc. In addition, it provides the means to quickly re-plan and adapt to changing mission requirements. C2 develops the operational war fighting aids required for the command structure to formulate and implement informed decisions. BMDS C2 integrates, where applicable, new capabilities into Global Command and Control System (GCCS), Theater Battle Management Core Systems (TBMCS), North American Air Defense/US Commander-In-Chief Space Command Warfighter Support System (N/UWSS), Joint Data Planner (JDP) and other relevant C2 mission applications. The BMDS C2 also integrates the Unified Commanders-In-Chief (CINCs), North American Treaty Organization (NATO) and other allies, friends, and other external systems to which BMDS C2 will connect. Block 2004 C2 architecture currently plans to integrate the following: Cheyenne Mountain Operations Center (CMOC), North American Air Defense Command (NORAD), US Strategic Command (USSTRATCOM), US Space

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Command (USSPACECOM), Unified CINCs, Area Air Defense Commander (AADC), and alternate continental US Command Centers. This may change as a result of annual Block capability reviews.

The Joint National Integration Center (JNIC), formerly known as the Joint National Test Facility (JNTF), operates as the field operating agency for the Missile Defense Agency. A state-of-the-art Development and Integration Environment Laboratory will be established to support BM/C2/Comm Architecture and Systems Specification development; develop, test and evaluate prototype BM/C2/Comm components; and support other critical BMDS BM/C2/Comm efforts with the goal of fully integrating the war fighters, systems engineers, and BMDS Elements capabilities developers and testers. The MDNTB will perform most of the BMDS BM/C2/Comm Architecture, System Specification and Elements assessment, integration, testing and validation work at the JNIC.

FY 2001 Accomplishments:

- Project was funded under Program Elements 0603873C (Family of Systems Engineering and Integration and 0603874C (BMD Technical Operations) Previous project was 3155 Systems Engineering & Integration.

Total 0

FY 2002 Planned Program:

- 27792
  - Design an evolutionary BM/C2/Comm Architecture that describes how the various BMDS Elements will be integrated into an overarching composite BM/C2/Comm Architecture. It is derived from the Government's Technical Objectives and Goals, Operational Concepts, Operational Architecture with associated Information Exchange Requirements (IER), and the BMDS System Capabilities Specifications (SCS).
  - Develop BM/C2/Comm System Specifications derived from the BM/C2/Comm Architecture. Articulate strategy on how the BM/C2/Comm components of the BMDS Elements and other non-BMDS DoD BM/C2/Comm assets integrate.
  - Host Technical Interchange Meetings with Services, Agencies and Program Offices to develop overall BM/C2/Comm Architecture, BM/C2/Comm System Specifications. Finalize Block 2004 BM/C2/Comm System Specifications.
  - Develop Block 2004 implementation plan addressing deployment of Interface Control Documents and IERs across BMDS Elements.
  - Continue development and expand the Benchmark Tool to a Sensor-Netting Tool. The BMD Benchmark tool is currently used to test tracker algorithms in an all-inclusive environment on a desktop computer.
  - Explore with Defense Information Systems Agency best approach for BMDS C2 Global Command and Control System (GCCS) Integration.
  - Establish metrics to assess BM/C2/Comm Engineering Capabilities Baseline (ECB) of BMDS Elements and external interface systems. Maintain the ECB with support from Services, Agencies and relevant Program Offices.
  - Develop list of BM/C2/Comm issues and risks, and a resulting risk mitigation plan, based on the ECB study, with emphasis on Block 2004 issues.
  - Establish and maintain a BM/C2/Comm Integrated Management Plan (IMP).
  - Establish and maintain BM/C2/Comm level Integrated Master Schedule (IMS) that implements the IMP in a block-build structure.
  - Develop a composite BM/C2/Comm integration and testing plan that utilizes as much as possible the existing facilities and infrastructure at the Joint National Integration Center.
  - Initiate Block 2006 Engineering Capabilities Baseline Study.
  - Transition existing BM/C2/Comm-SE&I contractor and tasks to new MDNTB.

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	3000	• Implement BMDS BM/C2/Comm Integration and Testing Plan (ITP) designed to investigate the capabilities and interoperability of the BM/C2/Comm components. The ITP should allow developers to develop, test and evaluate prototype BM/C2/Comm system components, and evaluate Human-Machine Interface issues. • Develop Block 2004 BM/C2 test requirements. • Establish a BM/C2 Element Development and Integration Laboratory to support developers in their development, testing, and evaluation of prototype and subsequent version BM/C2/Comm hardware and software components. In support of the JNIC as the BMDS integrating environment, this laboratory will also be used to evaluate the interoperability of BM/C2/Comm components with each other as well as other BMDS elements. • Block Capability Definition and Refinement Support: Existing modeling and simulation software will be modified and used to further refine BM/C2 capabilities for the developer. Existing planning processes and tools will be examined to refine the command and control capabilities required for Block 1 and succeeding incremental block deliveries. • Initiate program to assess suitability of Commercial-off-the-Shelf (COTS) and Government-off-the-Shelf (GOTS) products for BMDS BM/C2 Block-build applications.
Total	30792	

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FY 2003 Planned Program:

- 102816
  - Deploy composite BM/C2/Comm System Specifications across planned BMDS BM Elements as identified in Block 2004 Implementation Plan.
  - Develop and deploy BM hardware/software (HW/SW) products needed to integrate BMDS BM Elements into the planned BMDS BM/C2 Architecture.
  - Deploy composite BM/C2/Comm System Specifications across planned BMDS C2 Elements as identified in Block 2004 Implementation Plan.
  - Develop and deploy C2 hardware/software (HW/SW) products needed to integrate BMDS C2 Elements into the planned BMDS BM/C2 Architecture.
  - Conduct Block 2004 design reviews for testing the Pre-Engagement, Engagement, and Post-Engagement (PEP) Operations component.
  - Host Technical Interchange Meetings with Services, Agencies and Program Offices to continue to track and correct Block 2004 BM/C2/Comm Architecture and System Specifications implementation issues.
  - Continue development and expansion of the Sensor-Netting Tool. The BMDS Sensor Netting Tool is used to test tracker algorithms in an all-inclusive environment on a desktop computer.
  - Maintain/update Engineering Capabilities Baseline with support from the Services, Agencies and relevant Program Offices.
  - Maintain list of BM/C2/Comm issues and risks based on the Engineering Capabilities Baseline study, with emphasis on Block 2004 issues.
  - Implement Risk Mitigation Plan addressing high-risk items identified in the Engineering Capabilities Baseline study, with emphasis on Block 2004 risks.
  - Update BM/C2/Comm Integrated Management Plan that describes all efforts to be performed in implementing the BM/C2/Comm System Architecture.
  - Maintain BM/C2/Comm level Integrated Master Schedule that implements the Integrated Management Plan in a block-build structure.
  - Host Technical Interchange Meetings with Services, Agencies and Program Offices to identify Block 2006 BMDS Elements' BM/C2/Comm Architecture and System Specifications.
  - Initiate operational requirements, and functional requirements development for the BM and the C2 designs for Block 2006 and Block 2008.
  - Prepare request for proposal for the Block 2006 & Block 2008 BM/C2 elements.
  - Continue development of the Joint Data Planner (JDP).
  - Continue development of Early Warning (EW) and Early Shared Warning (ESW).

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•	10000	• Increased support of the BM/C2 Element Development and Integration Laboratory as initial developer prototypes are delivered to the JNIC for developmental and integration testing. • Increased use of modeling and simulation tools to support refinement of BM/C2 block requirements. • Startup of BM/C2 developmental evaluation and rapid prototyping activity as NTB development efforts get underway • Continue to implement BMDS BM/C2/Comm Integration & Testing Plans to investigate the capabilities and interoperability of the BM/C2 components. • Continue to assess COTS/GOTS products for BMDS BM/C2 Block-build applicabilities. • Continue to develop capability to test BMDS BM/C2 systems. • Test BMDS BM/C2 prototype systems. • Develop simulations & war games to support BM/C2 system development and testing. • Conduct integration testing of BM and C2 software and perform software validation and verification. • Provide post deployment software support and maintenance. • Continue development of BM/C2/Comm Development and Integration Environment Laboratory at the JNIC.
Total	112816	

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603881C, Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont.	Cont.
PE 0603882C, Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	Cont.	Cont.
PE 0603883C, Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont.	Cont.
PE 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0603873C, Family of Systems Engineering and Integration (FoS) - Dem/Val	227965							Compl.	Compl.
PE 0603874C, BMD Technical Operations - Dem/Val	307859							Compl.	Compl.
PE 0603876C, Intelligence Program (Threat & Countermeasures)	25853							Compl.	Compl.

C. Acquisition Strategy:

BM/C2 will follow the MDA's capability-based acquisition strategy that emphasize testing, spiral-development, and evolutionary acquisition through the use of two-year capability blocks.

The design and development of a BMDS Battle Management, Command and Control, and Communication (BM/C2/Comm) Architecture and System Specifications is a collaborative effort, and the strategy is to acquire the Missile Defense National Team BM/C2/Comm (MDNTB) to perform the engineering and delivery of an executable

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BM/C2/Comm Architecture, BM/C2/Comm Block capability specifications, design specifications and interface control documents for the BMDS. The MDNTB will be composed of major defense contractors, engineers from Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC) and System Engineering and Technical Assistance (SETA) defense contractor(s), and the government.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Integrated System Specification (ISS) 1.0 Final		1Q						
Transition BM/C2/Comm-SE&I Contract and Tasks		2Q						
BMDS Element Capability Baseline		2Q-3Q						
Define Block 2004 BM/C2/Comm Architecture		2Q						
Block 2004 BM/C2/COMM Architecture Review		3Q						
Draft BM/C2/Comm Interface Control Documents		3Q						
Define Block 2004 BM/C2/C System Specifications		2Q-4Q						
BM/C2 Risk Mitigation Plan		4Q						
BM/C2 GCCS Integration Plan		2Q						
BMDS Block 2004 Implementation Plan		4Q						
BM/C2 Acquisition Plan		3Q						
BM/C2 Configuration Management Plan		3Q						
BM/C2 Integrated Management Plan and Master Schedule		3Q-4Q						
Commence development of BM/C2 Integration & Development Environment at JNIC		4Q						
Requirements Scrubber – BM/C2 Reqt's Exploration (JNIC)		2Q-4Q						
Assess HW/SW Infrastructure Reuse (JNIC)		2Q-3Q						
Define BMDS Elements' BM/C2 Specificatons			1Q-4Q					
Deploy Block 2004 BMDS Elements' BM/C2 Products			2Q-4Q	1Q-4Q				
Maintain/Update Block 2004 ECB			1Q-4Q					
Maintain/Update BM/C2 IMP, IMS & Risk Mgmt. Plan			1Q-4Q					
Continue to implement BMDS BM/C2/Comm ITP to investigate the capabilities and interoperability of the BM/C2/Comm components			1Q-4Q					
Continue to assess COTS/GOTS products – Focus Block 2006 Build			1Q-4Q					
Continue to develop capability to test BMDS BM/C2 systems			1Q-4Q					
Test BMDS BM/C2 /systems			1Q-4Q					
Develop simulations & war games to support BM/C2 system development and testing			1Q-4Q					

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Conduct BMDS C2 war games			1Q-4Q					
Conduct integration testing of BM and C2 software and perform software validation and verification			1Q-4Q					
Provide post deployment software support and maintenance			1Q-4Q					
Continue development of BM/C2/Comm Development and Integration Environment at the JNIC			1Q-4Q					
Block 2006 Engineering Capabilities Baseline Study				1Q-4Q	1Q-4Q			
Develop Block 2006 BM/C2 System Specs				2Q-4Q	1Q-4Q	1Q		
Block 2006 BM/C2 System Integration Testing					2Q-4Q	1Q		
Block 2008 Engineering Capabilities Baseline Study						1Q-4Q	1Q-4Q	
Develop Block 2008 BM/C2 System Specs						2Q-4Q	1Q-4Q	1Q
Block 2008 BM/C2 System Integration Testing							2Q-4Q	1Q

MDA RDT&E COST ANALYSIS (R-3)

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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. MDNTB	LOE	MDNTB HQ, VA	N/A	22992	2Q	76522	1Q	Continue	99514	
b. BM/C2 Products	Various	MDNTB HQ, VA	N/A	1900	2Q	23849	1Q	Continue	25749	
c.										
Subtotal Product Development:				24892		100371			125263	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. SETA	LOE	MDA HQ, VA	N/A	2900	1Q	2445	1Q	Continue	5345	
Subtotal Support Costs:				2900		2445			5345	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. JNIC	Allot	JNIC, CO	N/A	3000	1Q-2Q	10000	1Q-2Q	Continue	13000	
b.										
Subtotal Test and Evaluation:				3000		10000			13000	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.										
b.										
Subtotal Management Services:										

Remark:

Project Total Cost:				30792		112816			143608	

Remark:

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COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
1020 Communications	0	9845	11955	13000	13000	14000	24000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Missile Defense Agency (MDA) is establishing a Missile Defense National Team (MDNTB) Battle Management Command, Control and Communication (BM/C2/Comm) construct to deliver an integrated Ballistic Missile Defense System Battle Management Command and Control (BMDS BM/C2) system. This effort requires a collaborative enterprise comprised of the best and most experienced minds of Industry and Government. The MDNTB is composed of major defense contractors, Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), and Scientific Engineering and Technical Assistance (SETA) providers. The concept of operations for the MDNTB is as follows: the Government provides the overall management of the BMDS program and participates within the MDNTB; and the MDNTB is responsible for the engineering, design, development and delivery of an executable BMDS BM/C2/Comm Architecture, BMDS BM/C2/Comm Block capability specifications, and the integration of BMDS Elements into the BMDS BM/C2/Comm Architecture.

The Communications Project consolidates, refines requirements, and develops upgrades to existing communication systems that are being developed for the BMDS – it is the key, and critical enabler to integration of the BMDS BM/C2. The goal of BMDS communication is to provide robust network(s) that manage the dissemination of the information necessary to perform the BM and C2 objectives. It is responsible for developing capabilities that will allow all components of BMDS to exchange data, and to permit C2 orders to be transmitted to the weapon and sensor systems. Delivery of the Joint Range Extension (JRE) long-haul communications capability during the FY 2002 and FY 2003 timeframe will fill a critical, and timely, warfighter need in this area. Communication between BMDS and external sensors, to a wide range of command systems, and to other defense systems such as the Theater Air and Missile Defense (TAMD) and the NATO ACCS will be engineered and built to ensure the optimum effectiveness for Ballistic Missile Defense. The communication network(s) will seamlessly connect BMDS assets and link them with other applicable DoD networks and assets as required. In addition, the communication network(s) will also be able to link to other non-DoD networks and assets as required. The network infrastructure will make optimal use of existing data and information conduits and protocols.

Communication provides the engineering capability to assess allocated requirements and translate them into communication system specifications necessary to meet operator needs. This includes the development and allocation of communication specifications for transmission, for switches, relays and connection point hardware. Communication will use as a starting point the backbone system being developed by the Ground Based Midcourse System, a hybrid system of fiber optics and satellite systems. To meet the requirements of the other BMDS layers, it will be necessary to augment the Ground Based Midcourse System. On-going efforts such as the Joint Range Extension (JRE) program will be exploited to develop the global Ballistic Missile Defense (BMD) communication system.

The Joint National Integration Center (JNIC), formerly known as the Joint National Test Facility (JNTF), operates as the field operating agency for the Missile Defense Agency. A state-of-the-art Development and Integration Environment Laboratory will be established to support BM/C2/Comm Architecture and Systems Specification development; develop, test and evaluate prototype BM/C2/Comm components; and support other critical BMDS BM/C2/Comm efforts with the goal of fully integrating the war fighters, systems engineers, and BMDS Elements capabilities developers and testers. The MDNTB will perform most of the BMDS Communications Architecture, System Specification and Elements assessment, integration, testing and validation work at the JNIC.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE: 0603880C BMD System / PROJECT: 1020

FY 2001 Accomplishments:

- Project was funded under Program Elements 0603873C (Family of Systems Engineering and Integration) and 0603874C (BMD Technical Operations) Previous project was 3155 Systems Engineering & Integration.

Total 0

FY 2002 Planned Program:

- 8745
  - Based on the BM/C2/Comm Architecture developed under Project 1010, develop a detailed design (operational, system, and technical) for communications, leveraging work being accomplished on the Ground Base Mid Course Defense System (GBMDS) communication network and on the interoperability efforts for the Joint Planning Network (JPN), the Joint Data Network (JDN) and the Joint Composite Tracking Network (JCTN). The design will also include interfaces to the Defense Information System Network (DISN), and other existing and planned networks as appropriate.
  - Develop Block 2004 Implementation Plan.
  - Allocate system and test requirements generated by the System Engineer to the appropriate components (i.e., transmission, entry points, switches, relays).
  - Develop the detailed specifications for these Communication components.
  - Analyze requirements for communication interfaces to other BMD segments, and to external systems including TAMD and allies/coalition.
  - Establish a Communication risk management process that will define the risk mitigation program to be employed.
  - Refine the Joint Range Extension Application Protocol (JREAP) by designing a layered approach to accommodate global communications**.**
  - Continue the development of Link-16 and Global Command and Control System (GCCS) interoperability enhancements.
  - Prepare the Incremental Development of Communications.
  - Develop and maintain a Configuration Management process and a process for documentation control.
  - Develop an acquisition plan to ensure that the right resources will be used for BMDS communications.
  - Continue software development for the JRE prototype. (Spiral 3&4).
  - Initiate support planning for required logistic support for Communication. Assess survivability requirements for Communications.

- 1100
  - Participate in Commander and Chief (CINC)/Service experiments, tests, and demos using the Joint Range Extension prototype at Reception, Staging, Operation & Force Integration (RSOI) 02 and System Integration Test Phase 2 (SIT II).
  - Perform Test and Evaluation of proposed Block 2004 communications architecture at JNIC.

Total 9845

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System
	PROJECT 1020

FY 2003 Planned Program:

- 11955
  - Execute Block 2004 Implementation Plan.
  - Initiate development plan for Block 2006.
  - Initiate and complete Spiral 4 Validation and Test.
  - Continue to implement fixes and upgrades to the JDN network to accommodate the BMDS communication connectivity.
  - Continue System-of-Systems communication integration and interfaces for the Joint Data Network, Joint Planning Network, Joint Continuous Acquisition Lifecycle Support (CALS) Test Network (CTN), and other operational, system, and technical architecture development.
  - Continue to analyze requirements for communication interfaces to other BMD segments.
  - Refine the Communication risk mitigation program.
  - Define engineering specifications for Joint Range Extension (JRE) transport of non-Link16 messages (e.g. VMF).
  - Continue the Joint Range Extension Application Protocol (JREAP) layered global communications component.
  - Initiate engineering change process to modify the interim JRE Mil-Std based on user feedback and lessons learned.
  - Charter a Configuration Control Board to manage the JRE Application Protocol Interface software.
  - Develop a communications Integrated Logistic System (ILS) plan.
  - Develop a communications Transition plan.
  - Implement requirements identified in the Communications Risk Mitigation Plan.

Total 11955

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603881C, Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont.	Cont.
PE 0603882C, Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	Cont.	Cont.
PE 0603883C, Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont.	Cont.
PE 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0603873C, Family of Systems Engineering and Integration (FoS) - Dem/Val	227965							Compl.	Compl.
PE 0603874C, BMD Technical Operations - Dem/Val	307859							Compl.	Compl.
PE 0603876C, Intelligence Program (Threat & Countermeasures)	25853							Compl.	Compl.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE: 0603880C BMD System / PROJECT: 1020

C. Acquisition Strategy:

Communications will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral-development, and evolutionary acquisition through the use of two-year capability blocks.

The design and development of a BMDS Battle Management, Command and Control, and Communications (BM/C2/Comm) Architecture and System Specifications is a collaborative effort, and the strategy is to have the Missile Defense National Team BM/C2/Comm (MDNTB) perform the engineering and delivery of an executable BM/C2/Comm Architecture, BM/C2/Comm block capability specifications, design specifications and interface control documents for the BMDS. The MDNTB will be composed of major defense contractors, engineers from Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC) and System Engineering and Technical Assistance (SETA) defense contractor(s), and the government.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
BM/C2 Communications Acquisition plan (Draft/Final)		2Q	1Q					
BM/C2 Communications Detailed Specifications		3Q	2Q					
BM/C2 Communications Risk Mgmt Process & Program		2Q	1Q					
Block 2004 Implementation Plan		4Q						
Joint Range Extension Application Protocol Layered Protocol Mil-Std (Interim/Final)		3Q	1Q					
Joint Range Extension Spiral 3 Verification Testing (S3VT)		2Q						
Joint Range Extension Spiral 4 Verification Testing (S4VT)			1Q					
Communications Integrated Logistics and Support Plan			2Q					
Communications Transition Plan			2Q					
Develop Block 2006 Communications System Specs				2Q-4Q	1Q-4Q	1Q		
Block 2006 Communications System Integration Testing					2Q-4Q	1Q		
Develop Block 2008 Communications System Specs						2Q-4Q	1Q-4Q	1Q
Block 2008 Communications System Integration Testing							2Q-4Q	1Q

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

PROJECT: 1020

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Comm Products	Various	MDA HQ, VA	N/A	7245	2Q	11000	1Q	Continue	18245	
b.										
a.										
Subtotal Product Development:				7245		11000			18245	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. SETA	LOE	MDA HQ, VA.	N/A	1500	1Q-2Q	955	2Q	Continue	2455	
Subtotal Support Costs:				1500		955			2455	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. JNIC	Allot	JNIC, CO	N/A	1100	1Q-2Q			Continue	1100	
b.										
Subtotal Test and Evaluation:				1100					1100	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.										
Subtotal Management Services:										

Remark:

Project Total Cost:				9845		11955			21800	

Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System PROJECT 1030

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
1030 Targets & Countermeasures	0	95055	128180	171702	173062	155712	143040	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Targets & Countermeasures project will provide capability-based ballistic missile full up target systems to include target subsystems (such as boosters, re-entry vehicles (RV) guidance and control), payloads (sensor packages, countermeasures), and target support systems in support of the Ballistic Missile Defense System (BMDS) Block concept. This activity will fund new target and countermeasure development, risk reduction flights, and target characterization, as well as procure and maintain an inventory of major target components. Advanced target instrumentation and Long Range Air Launched Targets (LRALT) will be developed, and aging, surveillance, refurbishment, and reuse of existing inventory such as Minuteman II and Pershing II hardware will be accomplished. As in prior years, users will continue to fund direct target costs and launch operations.

FY 2001 Accomplishments:

- Project was funded under Program Elements 0603874C (Ballistic Missile Defense (BMD) Technical Operations) and 0603173C (Support and Technologies- Advanced Technology Development). Previous project was 3354, Targets. Included ongoing development of Short Range Air Launched Targets (SRALT), LRALT targets, and successful development of refurbishment procedures and demonstration flights of Lance Target missile system.

Total 0

FY 2002 Planned Program:

- 5081 Target Logistics / Range Coordination: Continues target and target-related engineering and technical assistance, and Missile Defense Targets Joint Program Office (MDTJPO) core and mission support to the BMD programs.
- 1200 Target Integration and Launch Services: Provides for storage, surveillance, and launch services of Foreign Material Acquisition (FMA) assets.
- 38668 Targets Booster Development / Logistics: Provides for: maintaining boosters (i.e., the Minuteman booster stacks) for use in BMD target systems; refurbishing Minuteman and Lance hardware to produce BMD targets; development of LRALT booster systems and Liquid Fuel booster program in support of BMD testing; and, maintenance and handling of short-range and long-range missiles to support all BMD flight test programs.
- 6500 Target Payloads: Continue the development of capability-based payloads to match threat characteristics and their integration into target systems. Additionally, this effort supports the development of a Fly Along Sensor Package, which will provide critical infrared imagery for missile defense seeker performance risk reduction and algorithm evaluation.
- 13141 Target Countermeasures: Continues development and integration of realistic countermeasures into BMD targets, to include the development and characterization of countermeasures and penetration aids. This includes an inventory of countermeasures for quick turnaround use.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System
	PROJECT 1030

- 11023 Target Inventory: Initiates a risk reduction initiative designed to ensure the availability of capability-based targets for BMD flight test programs. Additionally, provides an inventory of target modules that will be procured in economic quantities and stored for testing the BMD system as well as individual elements. These modules include capability-based re-entry vehicles, inter-stages, and booster related hardware. Upon definition and approval of a BMD target requirement, the modules will be provided to a target integrator who will ensure successful integration and flight readiness.
- 7500 Advanced Target Development: Continue support for advanced target development relating to the support of booster / target systems for BMD targets.
- 11942 Program Support: Provides for government personnel, project costs, and targets program management support.

Total 95055

FY 2003 Planned Program:

- 4475 Target Logistics / Range Coordination: Continue target and target-related engineering and technical assistance, and MDTJPO core and mission support to the BMD programs.
- 1600 Target Integration and Launch Services: Provides for storage, surveillance, and launch services of FMA assets.
- 43832 Targets Booster Development/Logistics: Provides for: maintaining boosters (i.e., the Minuteman booster stacks) for use in BMD target systems; refurbishing Minuteman and Lance hardware to produce BMD targets; development of LRALT booster systems and Liquid Fuel booster program in support of BMD testing; and, maintenance and handling of short-range and long-range missiles to support all BMD flight test programs.
- 7165 Target Payloads: Continues the development of capability-based payloads to match threat characteristics and their integration into target systems. Additionally, this effort supports the development of a Fly Along Sensor Package, which will provide critical infrared imagery for missile defense seeker performance risk reduction and algorithm evaluation.
- 24518 Target Countermeasures: Continues the development and integration of realistic countermeasures into BMD targets, to include the development and characterization of countermeasures and penetration aids. This includes an inventory of countermeasures for quick turnaround use.
- 22072 Target Inventory: Continues a risk reduction initiative designed to ensure the availability of capability-based targets for BMD flight test programs. Additionally, provides an inventory of target modules that will be procured in economic quantities and stored for testing the BMD system as well as individual elements. These modules include capability-based re-entry vehicles, inter-stages, and booster related hardware. Upon definition and approval of a BMD target requirement, the modules will be provided to a target integrator who will ensure successful integration and flight readiness.
- 10000 Advanced Target Development: Continues an early concept development and prototyping of advanced systems or subsystems for BMD targets, including boosters, payloads, instrumentation, or re-entry vehicles.
- 14518 Program Support: Provides for government personnel, project costs, and targets program management support.

Total 128180

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603881C, Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont.	Cont.
PE 0603882C, Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	Cont.	Cont.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1030

PE 0603883C, Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont.	Cont.
PE 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0603873C, Family of Systems Engineering and Integration (FoS) - Dem/Val	227965							Compl.	Compl.
PE 0603874C, BMD Technical Operations - Dem/Val	307859							Compl.	Compl.
PE 0603876C, Intelligence Program (Threat & Countermeasures)	25853							Compl.	Compl.
PE 0604861C, THAAD-EMD		866530	934681	714679	830204	920988	1131109	Cont.	Cont.
PE 0604865C, PAC-3 EMD		128199						Cont.	Cont.

C. Acquisition Strategy:

The Targets and Countermeasures program will support the Missile Defense Agency's (MDA) capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition. The targets and countermeasures program to develops capability-based target systems utilizing both existing Government Furnished Equipment (GFE) to achieve maximum cost savings and new target systems that meet target specifications detailed in BMD system and technical requirements documents. Existing GFE hardware used in BMD target system development includes modified Lance, Minute Man II, Pershing II, and STARS launch systems. SRALT and FMA target support are being procured and managed by the MDTJPO in Huntsville, Alabama. A medium-range ballistic missile target is being developed under a contract managed by United States Air Force/Space Missile Center (USAF/SMC). The development of a long-range air launched ballistic target system is also being performed and executed by USAF/SMC. A liquid fueled target development program was initiated in September 2001 to design a liquid fueled booster to support the emerging BMDS Block capabilities to counter short range threats. Development of target countermeasures, instrumentation, and characterization will be executed under contracts at the MDTJPO, SMC and the MDA.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Long Range Air Launched Target (LRALT) Contract Award	4Q						
Enhanced Target Delivery System (ETDS)							
Phase I Award		2Q					
Liquid Fuel Booster							
Contract Award	4Q						
Static Tests			3Q				
Demonstration				3Q			
Countermeasures Development		1-4Q	1-4Q				

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

PROJECT: 1030

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Foreign Material Acquisition	C/CPFF	TBD	N/A	1200	2Q	1600	2Q	Cont	2800	
b. Advanced Target Development	TBD	TBD	N/A	7500	2Q	10000	2Q	TBD	17500	
c. Target Booster Dev Liquid Fuel Development	C/CPFF	Orbital (AZ) / TRW (CA)	N/A	15000	2Q	20692	2Q	Cont	35692	
d. Target Booster Dev LRALT Development	C/CPFF	Coleman (FL)	N/A	16878	2Q	17046	2Q	Cont	33924	
e. Capability Based Payload Development	TBD	TBD	N/A	6500	2Q	7165	2Q	TBD	13665	
f. Countermeasures Development	Various	Various	N/A	13141	2Q	24518	2Q	Cont	37659	
Subtotal Product Development:				60219		81021			141240	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. MDTJPO Core Support	Various	MDTJPO - Huntsville, AL	N/A	1820	2Q-3Q	2000	2Q-3Q	Cont	3820	
b. SMC Core Support	Various	SMC - Kirtland, AFB	N/A	2131	2Q-3Q	1104	2Q-3Q	Cont	3235	
c. Travel	N/A	Washington, DC	N/A	200	1Q-4Q	206	1Q-4Q	Cont	406	
Subtotal Support Costs:				4151		3310			7461	

Remark:

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

PROJECT: 1030

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Target Inventory	Various	Various	N/A	11023	2Q-3Q	22072	2Q-3Q	Cont	33095	
b. Target Booster Dev Costs (MMII, PershingII, GFE)	Various	Various	N/A	6790	2Q-3Q	6094	2Q-3Q	Cont	12884	
c. Range Infrastructure Support	MIPR	WSMR,NM PMRF,HI	N/A	930	2Q	1165	2Q	Cont	2095	
Subtotal Test and Evaluation:				18743		29331			48074	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. MDTJPO Gov't Project Per & Supt	Allot	MDTJPO - Huntsville, AL	N/A	2671	N/A	4630	N/A	Cont	7301	
b. Targets Mgmt Supt	Various	Wash, DC	N/A	2500	2Q-4Q	2575	2Q-4Q	Cont	5075	
c. MDTJPO Mgt Support	Various	MDTJPO - Huntsville, AL	N/A	5800	2Q-4Q	6413	2Q-4Q	Cont	12213	
d. SMC Mgt Support	MIPR	Kirtland, AFB	N/A	971	2Q-4Q	900	2Q-4Q	Cont	1871	
Subtotal Management Services:				11942		14518			26460	

Remark:

Project Total Cost:				95055		128180			223235	

Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System PROJECT 1050

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
1050 Systems Engineering & Integration	0	201917	371149	401803	368636	359438	359965	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Systems Engineering and Integration (SE & I) project provides the overall engineering development focused on integration of the Ballistic Missile Defense System (BMDS). The increase from FY 2002 to FY 2003 is a realignment of Missile Defense Agency (MDA) systems engineering funds from boost, midcourse, terminal, and Sensors Program Elements. The SE & I mission is to define and manage the layered BMDS and provide the collaborative, layered, and detailed system engineering and integration required across the entire spectrum of BMDS warfighter capabilities. The SE & I program scope requires interaction with activities that span the development of individual components (e.g. boosters), elements (e.g. Block 2006 Theater High Altitude Area Defense (THAAD)), Ballistic Missile Defense (BMD) segments (e.g. boost-phase, midcourse, terminal), and the fully integrated BMDS. SE & I activities provide the engineering core competency, modeling facilities, and integrative engineering development efforts needed to technically integrate, manage and field the capability-based BMDS. SE & I activities include System Engineering and Architecture (SE&A), Threat Systems Engineering (TSE), Advanced Concept, Intelligence System Threat, Joint Warfighter Support, Joint National Integration Center, Cooperative Programs and Allied Support, and BMD Information Management efforts.

System Engineering and Architecture (SE&A), comprised of a Missile Defense National Team for System Engineering and Integration (MDNTS), designs and integrates the BMD elements into a single, integrated and layered BMDS architecture. Utilizing a two-year block strategy, SE&A defines and develops the BMDS Block Plans, validates BMDS Block performance and verifies the integration of each of the BMDS blocks based on capability requirements. Specifically, SE&A develops, controls configuration, and executes a set of time-phased technical goals and objectives that enable the evolutionary development and delivery of incremental capability. SE&A documents these goals in the BMDS Technical Objectives and Goals (TOG) document, a high-level acquisition document which guides the decision process for BMDS development. Functional analysis and decomposition of BMDS level goals are performed to establish and allocate technical capabilities to components, and project developers. This allocation of capabilities is documented in the System Capabilities Specification (SCS), which serves as the technical baseline and allocates technical guidance and expectations to component and element developers. MDNTS will define the evolutionary BMDS blocks, based on the TOG and SCS. This block definition shall provide resulting BMDS capability, BMDS Information Architecture, integration, and interoperability requirements. SE&A also conducts both force-on-force level and detailed project level analyses to assess system effectiveness and establish expected capabilities. Particular focus is placed on tracking technical progress and system performance to identify and minimize/mitigate risks. Risk mitigation activities include the development of requirements and associated technical performance measures that quantify and drive technology development and insertion. Taking advantage of research, development, and technology efforts, SE&A develops new/alternative concepts, emphasizing multiple layers including boost, mid-course, and terminal intercept capabilities and employing multiple sensors integrated by Battle Management and Command and Control (BM/C2) and Communications projects, and conducts trade studies to support overall BMDS evolution. These trade studies include alternatives involving potential coalition partners and explore interoperability concepts BM/C2 alternatives, and associated engineering specifications. To eliminate duplication, engineering analyses are performed on crosscutting issues such as Lethality, Kill Assessment, and Phenomenology to provide a common understanding across all System activities. SE&A develops requirements for and participates in Test and Evaluation activities. Finally, SE&A conducts the Corporate Countermeasures/Counter-Countermeasures (i.e. Red-White-Blue) Program.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System
PROJECT 1050	

Threat Systems Engineering (TSE) as part of the MDNTS develops, maintains, and provides configuration control of the detailed threat characterizations necessary to support BMD design, development, and testing. TSE conducts engineering analyses to define technologically feasible changes in the threat and develops a parametric Adversary Capability Document to support BMDS development and evaluation of System robustness to unexpected developments. This activity includes the investigation of failure modes to examine unintended consequences of off-nominal performance of foreign systems. TSE also identifies potential countermeasures and determines their technical feasibility and the associated level of difficulty in design, development, manufacture, integration, and employment through analyses and tests. TSE develops and maintains a series of Reference Threat scenarios that illustrate the application of threat systems to support System analyses. This task includes the modeling and simulation of threat systems to provide data in both text and digital form. Finally, TSE employs its "adversary perspective" and experience in technologically feasible countermeasures to conduct analysis and perform risk assessments to support focused BMD efforts such as Project Hercules, Targets and Countermeasures, and the Countermeasures/Counter-Countermeasures Program.

The Advanced Concepts leads a national effort to assess and pursue innovative concepts and develop algorithms to improve BMDS capability. The Innovative Concepts process evaluates all internally and externally generated advanced concepts to prove their viability and maintains cognizance over leading edge concepts that could contribute to evolutionary and revolutionary BMD capability enhancements. Advanced Concepts also leads the BMDS Small Business & Innovative Research evaluation process. Project Hercules provides a national effort to develop, improve, and test decision and discrimination algorithms supporting the BMDS enabling continued system improvement through spiral development; develops a decision architecture for the next generation BMDS BM/C2; defines and leads the BMDS Battlefield Learning Adaptation to respond to unexpected battlefield events; and addresses issues to implement capability-based acquisition of BMDS elements.

Intelligence System Threat's primary mission is to serve as the principal advisor to the MDA Director and staff on all intelligence matters. To accomplish this mission, a current and projected intelligence program, which is based on intelligence community projections, that are traceable to quantifiable analysis. This program defines and documents potential adversary military systems and forces, principally theater and strategic missiles, which BMD systems could confront. This program produces intelligence community-validated threat descriptions and associated capstone threat and countermeasure information. Functional areas include current intelligence, intel assessments, scenarios, wargaming, asymmetric threat, and foreign material acquisition/exploitation.

Joint Warfighter Support ensures that war-fighter operational perspectives and concerns are reflected in the development of BMD capabilities. As these capabilities mature, the program works with BMD stakeholders to manage their transition to Service product lines and fielded systems, including contingency capabilities. The program also supports interaction with the Commanders in Chief, the Services and with the Joint Staff.

The Joint National Integration Center (JNIC), formerly the Joint National Test Facility, operates as the field operating agency of MDA and maintains a world class research, development, test and evaluation and rapid prototyping center. The center consists of a highly secure consolidated research and development building and a support building totaling almost a million square feet. It provides MDA with a high performance computing capability with worldwide secure communications connectivity throughout the missile defense community. A highly skilled and dedicated core technical workforce of engineers and scientists reside at the JNIC with detailed missile defense knowledge and extensive experience. The JNIC is a premier modeling and simulation and software development center for missile defense.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System
	PROJECT 1050

Cooperative Program and Allied Support is responsible for directing the development and execution of MDA international acquisition programs. These efforts include programs, projects and activities with U.S. industry, allied governments and foreign industry. Cooperative Program and Allied Support manages and directs international acquisition plans and programs. Additionally activities include conceptualization of new programmatic initiatives and development and execution of the Multinational BMD Conference.

Information Management System is responsible for the development, implementation, and operation of the BMD Information Management System, which includes decision support and collaboration tools, for both mission and business areas of the BMD enterprise.

FY 2001 Accomplishments:

- Project was funded under Program Elements: 0603868C (Navy Theater Wide), 0603871C (National Missile Defense), 0603873C (Family of Systems Engineering and Integration), 0603874C (BMD Technical Operations), and 0603876C (Intelligence Program). Previous projects included: 1266 Navy Theater Wide, 3153 Systems Architecture and Engineering, 3155 Systems Engineering and Integration, 3270 Threat and Countermeasures Program, 3353 JNTF, and 4000 Operational Support.

Total 0

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System PROJECT 1050

FY 2002 Planned Program:

- 54451 **SE&A/TSE** - The MDNTS will:
  - Establish overall BMDS capabilities and allocate capability specifications to the individual elements and components.
  - Define and develop the BMDS Block Plans.
  - Develop the BMDS TOG and SCS Version 1.0 and place it under configuration control.
  - Fully support the implementation of the BMDS Configuration Control Board.
  - Develop new/alternative concepts and conducts trade studies to support System evolution and risk mitigation.
  - Develop standards and orchestrate activities across all BMDS elements to ensure System integration.
  - Continue the establishment of BMDS level Technical Performance Measures (TPMs) and conduct technical reviews to assess progress, identify risks, support selection of alternatives, establish capability increments, and ensure integration.
  - Continue risk mitigation activities.
  - Continue to execute the Corporate Lethality to support effective intercepts and establish collateral effects.
  - Conduct force-on-force level and detailed element level analyses to assess System effectiveness, ensure robust performance, and establish expected capabilities.
  - Support analysis of System alternatives involving potential coalition partners that explore interoperability concepts, BM/C2 alternatives, and associated engineering requirements.
  - Establish requirements for and provide engineering support to System and verification and testing.
  - Provide for the development and analysis of the BMD system architecture with multiple layers including boost, mid-course, and terminal intercept capabilities and employing multiple sensors integrated by BM/C2 and Communications segments.
  - Conduct the Corporate Countermeasures/Counter-Counter measures (i.e. Red-White-Blue) program.
  - Establish an Adversary Capability Document definition necessary to support BMD design, development, and testing.
  - Develop a number of reference scenarios illustrative of the threat space, for use in assessment of BMDS capabilities.
  - Perform threat modeling and simulation to characterize the threat, providing digital data to support BMDS analyses.
  - Update modeling and simulation capability and provide threat media to support analyses.
  - Produce quick reaction assessments for the Director of potential impacts to BMDS capabilities.
  - Support focused BMD efforts such as Project Hercules and Targets and Countermeasures.
- 55506 **Advanced Concepts** – Assess, pursue, and develop advanced concepts to prove their viability and maintain cognizance over leading edge concepts that could contribute to evolutionary and revolutionary BMD capability enhancements. Lead the BMDS Small Business and Innovative Research evaluation process. Provide a national effort to develop, improve, and test decision and discrimination algorithms supporting the BMDS enabling continued system improvement through spiral development. Develop a decision architecture for the next generation BMDS BM/C2. Define and lead the BMDS Battlefield Learning Adaptation to respond to unexpected battlefield events. Address issues to implement capability-based acquisition of BMDS elements.

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- 10372 **Intelligence Systems Threat** – Serve as MDA's liaison to the intelligence community and provide current and projected intelligence information to support all MDA activities. Produce the BMD Threat Assessment, specialty threats, targets analyses, operational threat environment intelligence assessments, and provide management and planning support.
- 17520 **Joint Warfighter Support** – Provide BMD expertise to the Commanders in Chiefs, bring joint/combined/coalition lessons learned to the developer, coordinate block contingency deployment plans, engage Commanders in Chiefs in Command and Control development, facilitate intra/inter theater CONOPS developments, facilitate program transition to services, maintain interaction with the transitioned programs, and support Commanders in Chief BMD exercises, wargames, and tabletops.
- 45272 **Joint National Integration Center** – Provide operational support, a core capability, and limited modernization of its infrastructure. Operations support costs include: personnel, facility maintenance, security, computer and communications, software and hardware, contractor program management support, supplies, equipment, and utilities. Provide a core of personnel and equipment that maintains the corporate knowledge and the ability to quickly respond to customer tasking through subject matter experts. Limited core capability provided in Air and Missile Defense Analysis, wargames, Wargame 2000, Exercise Support, and the new efforts of the Integration Center and BM and Command and Control development. Modernization provides for minor infrastructure upgrades and limited upgrades to selected information technology capabilities throughout the JNIC.
- 985 **Cooperative Program and Allied Support** - Provide the forum to introduce countries and international organizations to the value-added of missile defense in cooperative programs and capabilities by providing protection to their selected critical assets as well as potentially providing support to the international community. These efforts include development and evaluation of non-U.S. operational concepts created in conjunction with supported country as well as evaluation of system and architecture performance. Efforts include but are not limited to bilateral, unilateral and multi-lateral examinations of U.S. and foreign assets in extended air defense scenarios. Provide the basis for developing potential foreign military sales opportunities. Specific work includes working aspects of the NATO feasibility study, Taiwan BM study (sponsored by OSD) and Turkey missile defense study.
- 17811 **Information Management System** - Develop, implement, and operate the MDA Information Management System. Includes decision support and collaboration tools for both mission and business areas of the MDA enterprise.

Total 201917

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FY 2003 Planned Program:

- 192307 **SE&A/TSE** - The MDNTS will:
  - Update the BMDS TOG and SCS.
  - Continue to define and develop the BMDS Block Plans.
  - Continue to develop new/alternative concepts and conduct trade studies to support system evolution and risk mitigation.
  - Update standards and orchestrate activities across all BMDS elements to ensure System integration.
  - Continue the establishment of BMDS level TPMs and conduct technical reviews to assess progress, identify risks, support selection of alternatives, establish capability increments, and ensure integration.
  - Maintain risk mitigation activities.
  - Continue to execute the Corporate Lethality to support effective intercepts and establish collateral effects.
  - Conduct force-on-force level and detailed element level analyses to assess System effectiveness, ensure robust performance, and establish expected capabilities.
  - Support analysis of System alternatives involving potential coalition partners that explore interoperability concepts, BM/C2 alternatives, and associated engineering requirements.
  - Continue to establish requirements for and provide engineering support to System and verification and testing.
  - Provide for the development and analysis of the BMD system architecture with multiple layers including boost, mid-course, and terminal intercept capabilities and employing multiple sensors integrated by BM/C2 and Communications segments.
  - Conduct the Corporate Countermeasures/Counter-Counter measures (i.e. Red-White-Blue) program.
  - Maintain an Adversary Capability Document definition necessary to support BMD design, development, and testing.
  - Maintain a number of reference scenarios illustrative of the threat space, for use in assessment of BMDS capabilities.
  - Perform threat modeling and simulation to characterize the threat, providing digital data to support BMDS analyses.
  - Update modeling and simulation capability and provide threat media to support analyses.
  - Produce quick reaction assessments for the Director of potential impacts to BMDS capabilities.
  - Support focused BMD efforts such as Project Hercules and Targets and Countermeasures.
- 79501 **Advanced Concept** - Assess, pursue, and develop advanced concepts to prove their viability and maintain cognizance over leading edge concepts that could contribute to evolutionary and revolutionary BMD capability enhancements. Lead the BMDS Small Business and Innovative Research evaluation process. Provide a national effort to develop, improve, and test decision and discrimination algorithms supporting the BMDS enabling continued system improvement through spiral development. Promulgate results from successful algorithm research to systems engineers for the major system elements. Develop a decision architecture for the next generation BMDS BM/C2. Define and lead the BMDS Battlefield Learning Adaptation to respond to unexpected battlefield events. Address issues to implement capability-based acquisition of BMDS elements. Additionally, these funds support Project Hercules' increased focus on RF and IR countermeasure mitigation and to establish additional decision algorithm capabilities earlier.
- 12615 **Intelligence Systems Threat** - Serve as MDA's liaison to the intelligence community and provide current and projected intelligence information to support all MDA activities. Produce the BMD Threat Assessment, specialty threats, targets analyses, operational threat environment intelligence assessments, and provide management and planning support

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- 16407 **Joint Warfighter Support** – Provide BMD expertise to the Commanders in Chiefs, bring joint/combined/coalition lessons learned to the developer, coordinate block contingency deployment plans, engage Commanders in Chiefs in Command and Control development, facilitate intra/inter theater CONOPS developments, facilitate program transition to services, maintain interaction with the transitioned programs, and support Commanders in Chief BMD exercises, wargames, and tabletops.
- 47937 **Joint National Integration Center** - Continue to provide operational support, a core capability, and limited modernization of its infrastructure. Operations Support costs include: personnel, facility maintenance, security, computer and communications, software and hardware, contractor program management support, supplies, equipment, and utilities. Provide a core of personnel and equipment that maintains the corporate knowledge and the ability to quickly respond to customer tasking through subject matter experts. Limited core capability provided in Air and Missile Defense Analysis, wargames, Wargame 2000, Exercise Support, and the new efforts of the Integration Center and BM and Command and Control development. Modernization provides for minor infrastructure upgrades and limited upgrades to selected information technology capabilities throughout the JNIC.
- 1435 **Cooperative Program and Allied Support** - Continue work to provide the forum to introduce countries and international organizations to the value-added of missile defense in cooperative programs and capabilities by providing protection to their selected critical assets as well as potentially providing support to the international community. Develop and evaluate of non-U.S. operational concepts created in conjunction with supported country as well as evaluation of system and architecture performance. Tasks include but are not limited to bilateral, unilateral and multi-lateral examinations of US and foreign assets in extended air defense scenarios. Provide the basis for developing potential foreign military sales opportunities. Specific work includes working aspects of the NATO feasibility study, Taiwan BM study (sponsored by OSD) and Turkey missile defense study.
- 20947 **Information Management System** - Develop, implement, and operate the MDA Information Management System. Includes decision support and collaboration tools, for both mission and business areas of the MDA enterprise.

Total 371149

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603881C, Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont.	Cont.
PE 0603882C, Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	Cont.	Cont.
PE 0603883C, Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont.	Cont.
PE 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0603873C, Family of Systems Engineering and Integration (FoS) - Dem/Val	227965							Compl.	Compl.
PE 0603874C, BMD Technical Operations - Dem/Val	307859							Compl.	Compl.
PE 0603876C, Intelligence Program (Threat & Countermeasures)	25853							Compl.	Compl.

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C. Acquisition Strategy:

To bring about the transition to a BMDS, MDA is creating a Missile Defense National Team System Engineering & Integration (MDNTS). This requires a collaborative enterprise comprised of the best and the brightest minds of Industry and Government. The MDNTS will be composed of Government, Federally Funded Research and Development Centers (FFRDCs), System Engineering and Technical Assistance (SETA) providers, and major defense contractors. The MDNTS Industry Team is under the leadership of a single contractor. The MDA Director is responsible for total System Performance Responsibility.

SE & I will implement the MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
System Engineering and Architecture							
BMDS TOG		2Q	1Q	1Q	1Q	1Q	1Q
Block BMDS Capability Assessments		3Q	3Q	3Q	3Q	3Q	3Q
Block BMDS SCS		3Q	1Q	1Q	1Q	1Q	1Q
BMD Block Plans		3Q	3Q	3Q	3Q	3Q	3Q
Block System Design Reviews		4Q	4Q	4Q	4Q	4Q	4Q
Adversary Capability Document/Updates		2Q	2Q	2Q	2Q	2Q	2Q
Advanced Concept							
Algorithm Handover Meetings (quarterly)		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
BMDS Model (biannually)		2Q & 4Q	2Q & 4Q	2Q & 4Q	2Q & 4Q	2Q & 4Q	2Q & 4Q
Decision Architecture reviews (biannually)		1Q & 4Q	1Q & 4Q	1Q & 4Q	1Q & 4Q	1Q & 4Q	1Q & 4Q
BMDS Fusion Toolbox reviews (quarterly)		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Post-Flight Test Data Analysis (biannually)		2Q & 4Q	2Q & 4Q	2Q & 4Q	2Q & 4Q	2Q & 4Q	2Q & 4Q
Advanced Concepts Program Review (annually)		4Q	4Q	4Q	4Q	4Q	4Q
Battlefield Learning Adaptation (biannually)		1Q & 3Q	2Q & 3Q	2Q & 4Q	1Q & 3Q	2Q & 3Q	2Q & 4Q
Intelligence System Threat							
BMD Threat Assessment		3Q	3Q	3Q	3Q	3Q	3Q
Joint Warfighter							
Commanders in Chief Experiments		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
TAMD Master Plan		1Q	1Q	1Q	1Q	1Q	1Q

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JNIC							
Commanders in Chief Exercises		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Wargame 2000 Model Block Releases		2Q-4Q	2Q-4Q	2Q-4Q	2Q-4Q	2Q-4Q	2Q-4Q
Wargames		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Msl Defense Integration Center Established at JNIC		1Q					
Cooperative Programs & Allied Support							
Quarterly Program Reviews		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Establish New Program Exchanges		As Rqd					
Information Management System							
Initial Enterprise Information Management System		2Q					
Integrating Contractor selection for Enterprise Information Mgmt/Knowledge Mgmt System		2Q-3Q					
Initial Enterprise Knowledge Management System			3Q-4Q				
Information Assurance Operations Center Definition and Deployment		1Q-4Q	1Q-4Q	1Q-4Q			
WAN Architecture Development		1Q-4Q	1Q-4Q	1Q-4Q			

MDA RDT&E COST ANALYSIS (R-3)

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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Advanced Concept Dev	Various	LMMC/Sparta/SMDC		30506	2Q	49501	2Q	Cont.	80007	
Subtotal Product Development:				30506		49501			80007	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. SE & A										
b. MDNTS	Various	Various	N/A	7846	2Q	123624	2Q	Cont.	131470	
c. Advanced Concept Dev	Various	Various	N/A	20000	2Q	25000	2Q	Cont.	45000	
d. **Intelligence**										
e. Army Intel Support	MIPR	AFRL, NM	N/A	1540	2Q	1855	2Q	Cont.	3395	
f. Air Force Intel Support	Allot	IDA, SMDC	N/A	735	2Q	885	2Q	Cont.	1620	
g. Program Support	Sub-allocation	SMDC, AL	N/A	3794	2Q	4499	2Q	Cont.	8293	
h. App Support	Sub-allocation	Air Force, CO	N/A	2215	2Q	2668	2Q	Cont.	4883	
i. Scenario Production	Allot	MDA, VA	N/A	1840	2Q	2308	2Q	Cont.	4148	
j. Wargaming Support	Allot	MDA, VA	N/A	248	2Q	400	2Q-4Q	Cont.	648	
k. **Joint Warfighter**										
l. JTAMDO	Sub-allocation	Joint Staff	N/A	1330	1Q	0	2Q	Cont.	1330	
m. **CF** Program Support	CPFF / GSA	SPARTA, CA /various	N/A	735	2Q	991	2Q	Cont.	1726	
n. **Information Management System** - BMD Information Management System	Various	Various	N/A	16518	2Q	19213	2Q	Cont.	35731	
Subtotal Support Costs				56801		181443			238244	

Remark:

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III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. **Joint Warfighter** - Commanders in Chief Experiments	Sub-allocation	Theater Commanders in Chiefs	N/A	14075	1Q	14270	2Q	Cont.	28345	
c. Joint National Integration Center										
d. JNIC	C/CPAF	TRW, VA	N/A	34638	2Q	36863	2Q	Cont.	71501	
Subtotal Test and Evaluation:				48713		51133			99846	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. SE & A										
b. MDNTS	MIPR	FFRDC/POET	N/A	17815	2Q	26028	2Q	Cont.	43843	
c. MDNTS SETA Support	CP	Sparta, VA	N/A	4665	2Q	13348	2Q	Cont.	18013	
d. MDNTS SETA Support	CP	CSC, VA	N/A	4665	2Q	13348	2Q	Cont.	18013	
e. MDNTS SETA Support	CP	VRI, VA	N/A	1500	2Q	1493	2Q	Cont.	2993	
f. MDNTS Mgmt Support	Allot	WHS, Washington DC	N/A	6439	2Q	3912	2Q	Cont.	10351	
g. MDNTS Mgmt Support	MIPR	Various	N/A	500	2Q	600	2Q	Cont.	1100	
h. Threat Engineering	CPFF	SPARTA, VA	N/A	1000	2Q	0	2Q	Cont.	1000	
i. Threat Engineering & Analysis	MIPR	MIT/LL, MA	N/A	1656	2Q	1742	2Q	Cont.	3398	
j. Threat Engineering & Analysis	MIPR	SNL, NM	N/A	924	2Q	1095	2Q	Cont.	2019	
k. Threat Engineering	Various	Various	N/A	7441	2Q	7117	2Q	Cont.	14558	
l. Advanced Concept	Various	CSC, SMDC	N/A	5000	2Q	5000	2Q	Cont.	10000	
m. **JNIC**										
n. JNIC	Allot	JNIC, CO	N/A	3794	2Q	3946	2Q	Cont.	7740	
o. JNIC	Allot	USN NRL	N/A	900	2Q	936	2Q	Cont.	1836	
p. JNIC	MIPR	LLNL, Livermore, CA	N/A	200	2Q	208	2Q	Cont.	408	
r. JNIC	C/CPAF	Vanguard	N/A	3660	2Q	3618	2Q	Cont.	7278	

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q. JNIC	MIPR	FFRDC	N/A	2080	2Q	2366	2Q	Cont.	4446	
r. **Joint Warfighter** Support Contracts	MIPR	CSC, Vanguard, & SPARTA, VA	N/A	2115	1Q	2137	2Q	Cont.	4252	
s. **CF** SETA Support	CPFF/GSA	SPARTA, CA	N/A	250	2Q	444	2Q	Cont.	694	
t. **Information Management System -** BMD IM/IT Plans, Policies & Analyses	Various	Various	N/A	1293	2Q	1734	2Q	Cont.	3027	
Subtotal Management Services:				65897		89072			154969	

Remark:

Project Total Cost:				201917		371149			573066	

Remark:

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COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
1060 Test & Evaluation	0	423708	382044	435519	413869	424742	464202	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Test & Evaluation Project consolidates all System-wide Test & Evaluation resources. This allows for the more cohesive facilitation, management and execution of these test activities for a single, integrated BMD System. This activity provides the resources needed for the test infrastructure and analytical tools needed by the Missile Defense Agency (MDA) to execute a System-Wide Test Program. Specific Test & Evaluation costs are captured in the respective BMDS element.

The T&E Project provides the resources for the development, operation, maintenance and modernization of the test and evaluation infrastructure components of the BMDS Test Bed. These include ground test facilities at various locations across the country; range assets to include launch facilities, instrumentation, telemetry, range safety, and communications systems; mobile sensor and data collection platforms; and computational facilities.

The project also includes the resources for BMDS core models and simulations (M&S), including their development, sustainment, and upgrade. BMDS core models include the engineering and phenomenology tools in common and general use across all elements of the BMDS. They also include those M&S that are used for engineering, development, and test of BMDS integration and interoperability. This project also funds the development of applicable standards, assurance of compliance with those standards, implementation of the High Level Architecture, and verification, validation, and accreditation activities to ensure credibility of the analytical tools. Programs such as a Russian Cooperative Modeling and Simulation program are also resourced within this project.

As MDA has testing needs that go beyond those of the individual BMDS elements, this activity also resources a System-Wide Test & Assessment Program. This program is intended to address crosscutting issues such as lethality, kill assessment, and discrimination, to perform critical counter-measure characterization and phenomenology measurements, and to support the development of the integrated BMD System. The cornerstones of the System-Wide Test & Assessment Program are the Critical Measurements Program (CMP), the Missile Defense System Exercises, and the System Integration Tests (SITs) , either in the form of dedicated events or overlays on other tests and exercises. Resources are used for planning, execution, data analysis and reporting.

FY 2001 Accomplishments:

- Project was funded under Program Elements: 0603873C (Family of Systems Engineering and Integration) and 0603874C (BMD Technical Operations). Previous projects included: 3352 Modeling & Simulation, 3357 Facilities, Siting & Environmental, 3359 Test, Evaluation & Assessment, and 3360 Test Resources

Total 0

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	PROJECT 1060

FY 2002 Planned Program:

- 92683 **Modeling & Simulation** – develops and maintains a validated set of Core models and simulations (M&S) and M&S support activities, the Advanced Research Center/Simulation Center (ARC/SC), and the MDA Data Centers, in direct support of the System-Wide Test Program, System Engineering Program, BMD Architecture development, Project Hercules, Joint Warfighter wargame support and cooperative international coalition efforts.
- 130691 **System-Wide Test & Evaluation** - provides test expertise to the Director, MDA and Programs to support development of Missile Defense Systems; executes flight and ground test & assessment events to reduce developmental risks and support BMDS data collection and analysis, including threat signature, countermeasures, and lethality/kill assessment; tests and assesses BMDS integration and interoperability; and sponsors International test and evaluation programs.
- 194819 **Test Resources** - provides for MDA planning, oversight and coordination of integrated test and evaluation infrastructure. This includes provision of common ground test facilities, ranges, sensors & other related instrumentation, as well as components of the BMDS Test Bed. This supports both BMDS element testing as well as System-Level testing. Individual BMDS elements pay only the direct costs associated with their specific testing efforts at these mission critical facilities. The DD Form 1391, attached in the RDT&E Construction section of this MDA FY 2003 Budget Estimates submission, identifies $5.400M of this amount for FY 2002 in support of the BMDS Test Bed; these funds support the development of element-common resources.
- 5515 **Facilities, Siting & Environmental** (FS&E) - provides environmental program guidance, environmental impact analyses and documentation, real property facility siting, acquisition, and facility operational support for the MDA's BMDS.

Total 423708

FY 2003 Planned Program:

- 102497 **Modeling & Simulation** – develops and maintains a validated set of Core models and simulations (M&S) and M&S support activities, the Advanced Research Center/Simulation Center (ARC/SC), and the MDA Data Centers, in direct support of the System-Wide Test Program, System Engineering Program, BMD Architecture development, Project Hercules, Joint Warfighter wargame support and cooperative international coalition efforts
- 140594 **System-Wide Test & Evaluation** - provides test expertise to the Director, MDA and Programs to support development of Missile Defense Systems; executes flight and ground test & assessment events to reduce developmental risks and support BMDS data collection and analysis, including threat signature, countermeasures, and lethality/kill assessment; tests and assesses BMDS integration and interoperability; and sponsors International test and evaluation programs
- 135053 **Test Resources** - provides for MDA planning, oversight and coordination of integrated test and evaluation facilities. This includes provision of common ground test facilities, ranges, sensors & other related instrumentation, as well as components of the BMDS Test Bed. This supports both BMDS element testing as well as System-Level testing. Individual BMDS elements pay only the direct costs associated with their specific testing efforts at these mission critical facilities. Individual BMDS elements pay only the direct costs associated with their specific testing efforts at these mission critical facilities. The DD Form 1391, attached in the RDT&E Construction section of this MDA FY 2003 Budget Estimates submission, identifies $0.976M of this amount for FY 2003 in support of the BMDS Test Bed; these funds support the development of element-common resources.
- 3900 **Facilities, Siting & Environmental** (FS&E) - provides environmental program guidance, environmental impact analyses and documentation, real property facility siting, acquisition, and facility operational support for the MDA's BMDS.

Total 382044

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B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603881C, Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont.	Cont.
PE 0603882C, Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	Cont.	Cont.
PE 0603883C, Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont.	Cont.
PE 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0603873C, Family of Systems Engineering and Integration (FoS) - Dem/Val	227965							Compl.	Compl.
PE 0603874C, BMD Technical Operations - Dem/Val	307859							Compl.	Compl.
PE 0603876C, Intelligence Program (Threat & Countermeasures)	25853							Compl.	Compl.
PE 0603880C, BMD System MILCON		7419		7605	6628	5701	5776	Cont.	Cont.
PE 0603881C, Terminal Defense System MILCON		750	23400	12255	13390			Cont.	Cont.
PE 0603882C, Midcourse Defense System MILCON				2000				Cont.	Cont.

C. Acquisition Strategy:

Test & Evaluation Program will support the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition.

Test and Infrastructure programs will be executed utilizing a diverse acquisition strategy to take advantage of private industry competitive forces and existing DoD agency, FFRDCs, and international coalition partner capabilities. Examples of participants in this acquisition strategy include the U.S. Army Space and Missile Defense Command, Air Force Space and Missile Command, and the U.S. Navy Research Lab.

Test programs will be executed utilizing a consolidated targets development, test resource, facilities, siting and environmental, and system-wide test program strategy. BMD management requirements will be met through MDA and other DoD agency personnel. BMD technical and program management services will be competitively procured from industry to provide the required infrastructure, engineering, programmatic, test and evaluation, and system specific expertise required to develop BMDS programs.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

PROJECT: 1060

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Missile Defense System Testing at 7V/10V		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at Tunnel 9		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at Range G		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
IR Sensor Program(s) testing at NIST		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Airborne Data Collection		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Airborne Data Collection Upgrades		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at NHTF		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at HHSTT		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at AOEC		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at AMOR		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at KHILS		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at WSMR		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at KMR		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Missile Defense System Testing at PMRF		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Critical Measurements Program		3-4Q	1-3Q	1-4Q	1-4Q	1-4Q	1-4Q
Ground Test Events		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
System Integration Flight Tests		3Q	4Q	1Q, 2Q	4Q	1Q, 2Q	4Q
War Game 2000		3Q-4Q	3Q-4Q	3Q-4Q	3Q-4Q	3Q-4Q	3Q-4Q
Blue Velvet Testing		4Q					

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

PROJECT: 1060

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.										
Subtotal Product Development:										

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.										
Subtotal Support Costs:										

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. **Modeling and Simulation**										
b. International Coop M&S	Allot	Various	N/A	8505	1Q	9000	1Q	TBD	17505	
c. BMD System M & S	Allot & MIPR	Various	N/A	36582	1Q	35800	1Q	TBD	72382	
d. Campaign BMDS Interop	Allot & MIPR	Various	N/A	24436	2Q	31354	1Q	TBD	55790	
e. System Model Program Support	Allot & MIPR	Various	N/A	5068	2Q	8214	1Q	TBD	13282	
f. Advanced Research Center & Simulation Center	Allot	USASMDC, Huntsville, AL	N/A	11809	1Q	12000	1Q	TBD	23809	
g. Modeling & Simulation	Allot & MIPR	Various	N/A	0	N/A	0	1Q	TBD		
h. System-Wide Test and Evaluation							1Q			
i. Program Wide Flight Test	Allot	Various	N/A	39988	1Q	47711	1Q	TBD	87699	
j. Test Planning	Allot	Various	N/A	804	2Q	802	1Q	TBD	1606	
k. Program Wide Interop Ground	Allot	Various	N/A	12399	1Q	13100	1Q	TBD	25499	
l. Special Program Tests	Allot	Various	N/A	9842	1Q	4000	1Q	TBD	13842	
m. Radar Exploitation	Allot	Various	N/A	2460	1Q	2600	1Q	TBD	5060	
n. Corporate Data Collect & Analysis	Allot	Various	N/A	3436	2Q	6980	1Q	TBD	10416	
o. Optical Data Analysis	Allot	Various	N/A	7412	1Q	7600	1Q	TBD	15012	
p. RCS Data Analysis	Allot & MIPR	Various	N/A	4642	1Q	4950	1Q	TBD	9592	

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

PROJECT: 1060

q.	Advanced Concepts Support	Allot	Various	N/A	28541	1Q	30000		TBD	58541	
r.	BMDS Wargames	Allot	Various	N/A	1476	1Q	1750	1Q	TBD	3226	
s.	Lethality	Allot	Various	N/A	2952	2Q	3000	1Q	TBD	5952	
t.	Kill Assessment	Allot	Various	N/A	2953	2Q	3368	1Q	TBD	6321	
u.	Arrow – TMDSE	Allot	Various	N/A	1970	2Q	3000	1Q	TBD	4970	
v.	International Prgs	Allot	Various	N/A	1368	2Q	1139	1Q	TBD	2507	
w.	**Test Resources**										
x.	Ground Test Facilities	Allot	Various	N/A	23292	1Q	24400	1Q	TBD	47692	
y.	Ranges & Instrumentation	Allot	Various	N/A	62432	2Q	71003	1Q	TBD	133435	
z.	Airborne Sensors	Allot	Various	N/A	55533	1Q	28008	1Q	TBD	83541	
aa.	Targets Certification & Requirements	Allot	Various	N/A	2894	2Q	3000	1Q	TBD	5894	
bb.	RDT&E Construction	Allot	Various	N/A	5315	3Q	980	1Q	TBD	6295	
cc.	Test Resources	Allot	Various	N/A	978	3Q	992	1Q	TBD	1970	
dd.	Congressional Adds	Allot	Various	N/A	36215	2Q-3Q	0	1Q	TBD	36215	
ee.	**Facilities Siting & Environment**										
ff.	Facilities Siting Programs	Allot	Various	N/A	278	2Q	559	1Q	TBD	837	
gg.	Environmental Safety and Health Programs	Allot	Various	N/A	268	2Q	730	1Q	TBD	998	
hh.	Congressional Adds	Allot	Various	N/A	1674	2Q-3Q	0		TBD	1674	
	Subtotal Test & Evaluation				395522		356040			751562	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. **Modeling and Simulation**: Gov Project Per & Supt	Allot	USASMDC Huntsville, AL	N/A	1555	1Q	1546	1Q	TBD	3101	
b. **Modeling and Simulation** Support Contracts	Various Contract Types	MDA, Multiple	N/A	4728	1Q	4583	1Q	TBD	9311	

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

PROJECT: 1060

c.	**System-wide T&E:** Gov't Project Per & Supt	Allot	USASMDC Huntsville, AL	N/A	2627	1Q	2554	1Q	TBD	5181	
d.	**System-wide T&E** Support Contracts	Various Contract Types	MDA, Multiple	N/A	7289	1Q-2Q	7508	1Q	TBD	14797	
e.	**Test Resources**: Support Contracts	Various Contract Types	MDA, Multiple	N/A	6141	1Q-2Q	6126	1Q	TBD	12267	
f.	**Test Resources**: Gov't Project Per & Supt	Allot	USASMDC Huntsville, AL	N/A	2019	1Q	544	1Q	TBD	2563	
g.	**Facilities Siting and Environment** Support Contracts	Various Contract Types	MDA, Multiple	N/A	3295	1Q	2611	1Q	TBD	5906	
h.	**T & E Travel**	Government	MDA, Multiple	N/A	532	1Q-4Q	532	1Q-4Q	TBD	1064	
	Subtotal Management Services:				28186		26004			54190	

Remark:

	Project Total Cost:				423708		382044			805752	

Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System PROJECT 1070

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
1070 Producibility & Manufacturing Technology	0	16732	21916	22000	22000	22000	22000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Producibility and Manufacturing Technology provides manufacturing technologies and implementation strategies that benefit the Ballistic Missile Defense System (BMDS). These include near term technology insertion programs that demonstrate capabilities for multiple applications across the BMDS encompassing cost reduction/avoidance, performance enhancement and risk reduction. These programs are identified by utilizing systems engineering, analyses and assessments as a basis for offering potential remediation of a BMDS problem area. Producibility and Manufacturing Technology provides tools, strategies for improving the technology insertion processes in support of the spiral development for the BMDS to meet block upgrade goals.

Producibility and Manufacturing Technology provides industrial base analyses and serves as Missile Defense Agency's (MDA) source for industrial reliability, manufacturing, producibility and capability assessments. Producibility and Manufacturing Technology completes assessments and reports to the Director key industrial base issues associated with developing and acquiring missile defense to include identifying gaps in industrial capabilities for component production. Producibility and Manufacturing Technology supports Program Directors/Program Managers in accomplishing manufacturing and industrial investment strategies for system affordability and technology insertion opportunities including utilization of commercial practices and technologies. Producibility and Manufacturing Technology efforts include working with the services, industry (Systems Integration Contractor to subsystem vendors) and other government agencies to leverage current and future projects that will lead to more reliable and affordable components to benefit the BMDS.

FY 2001 Accomplishments:

-

Total 0

FY 2002 Planned Program:

- 12550 **Technology Insertion -** Producibility and Manufacturing Technology identifies and funds projects that address reliability and manufacturing technologies for near term insertion in the BMDS. This includes sensors, propulsion, electronics and materials that support cost reduction activities, reliability and increased producibility for the BMDS.
- 2150 **Manufacturing Technology/Title III –** Producibility and Manufacturing Technology leverages BMDS and Service manufacturing technology programs that will be utilized by the BMDS, to improve manufacturing processes that increase quality and producibility as well as reducing production time and risk.
- 2032 **Management Services** – This task funds the Scientific Engineering Technical Assistance support for MDA/Producibility and Manufacturing Technology, to include management oversight of individual projects, tasks, and subtasks.

Total 16732

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System
	PROJECT 1070

FY 2003 Planned Program:

- 16700 **Technology Insertion** – Programs initiated in FY 2002 that meet the success criteria established by MDA/Producibility and Manufacturing Technology will continue to the next phase. FY 2003 milestones on these projects include proof of production processes for advanced optical processor, demonstration of hardware for Very Long Wave Infrared focal plan array, Hardware-in-the-loop testing for the two color focal plane array initial tests for the Angle-angle-range Laser Detection and Ranging (LADAR) at White Sands Missile Range, design and component test risk reduction midcourse Divert and Attitude Control System. Producibility and Manufacturing Technology will continue to identify and assess new projects that address reliability and manufacturing technologies for near term insertion in the BMDS.
- 3000 **Manufacturing Technology/Title III –** Producibility and Manufacturing Technology leverages BMDS and Service manufacturing technology programs, that will be utilized by the BMDS, to improve manufacturing processes, increase quality and producibility, as well as reducing production time and ballistic missile system risk.
- 2216 **Management Services –** This task funds the Scientific Engineering Technical Assistance support for MDA/Producibility and Manufacturing Technology, to include management oversight of individual projects, tasks, and subtasks.

Total 21916

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603881C, Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont.	Cont.
PE 0603882C, Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	Cont.	Cont.
PE 0603883C, Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont.	Cont.
PE 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0603873C, Family of Systems Engineering and Integration (FoS) - Dem/Val	227965							Compl.	Compl.
PE 0603874C, BMD Technical Operations - Dem/Val	307859							Compl.	Compl.
PE 0603876C, Intelligence Program (Threat & Countermeasures)	25853							Compl.	Compl.

C. Acquisition Strategy:

Producibility and Manufacturing Technology leverages existing industry and government efforts to include the missile defense elements. This is accomplished by assessing baseline systems identifying high-risk areas and performing analyses to recommend to the Director what the proper course of action is to improve quality and reliability. Producibility and Manufacturing Technology will follow the MDA's capability-based Acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

PROJECT: 1070

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Technology Insertion							
Advanced Optical Processor Hardware-in-the-loop test report		4Q	4Q				
1 or 2 GHz Advanced Optical Processor design ready for Critical design review		4Q					
1 or 2 GHz Advanced Optical Processor for insertion into MIT/LL radar Test Bed			2Q				
Insertion plan for 1 GHz Advanced Optical Processor into MDA program				2Q			
128x128 Focal Plane Array Validation Test Plan			2Q				
Focal Plane Array producibility trade study				2Q			
256x256 Prototype 2-color Focal Plane Array		4Q					
Test report from independent test facility on competing Focal Plane Array's			1Q				
Two Color Focal Plane Array Hardware-in-the-loop Test Report				4Q			
Angle-angle-range LADAR Test at NASA/Goddard		2Q					
Integrate Passive optics and Active LADAR				3Q			
Solid Divert and Altitude Control System hot fire test with electronic controls 400lbF		2Q					
Flight Test report for Boost Phase Divert and Altitude Control System				4Q			
Manufacturing Technology/Title III							
Systems Engineering study phase II to define Family of Systems operational requirements for Multiband-Radio Frequency Data Link			4Q				
Wide band gap materials Industrial Capability Assessment			4Q				
Wide band gap Device Insertion Plan				2Q			
Reliability Test Report for Wide band gap devices					4Q		
Composite Prototype Electronics Enclosure with test plan		4Q					

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE: February 2002
BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE: 0603880C BMD System	PROJECT: 1070

Final Report on Manufacturing Affordable Hi-performance Electronics Modules program efforts		4Q					
Scaled-up production methods report for airborne laser window		4Q					
Establish Engineering Manufacturing Readiness Levels			2Q				

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603880C BMD System

PROJECT: 1070

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.										
Subtotal Product Development:										

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Technology Insertion	Various	Services, TBD	N/A	12550	2Q	16700	2Q	TBD	29250	
b.										
Subtotal Support Costs:				12550		16700			29250	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Manufacturing Technology/Title III	Various	Various test facilities	N/A	2150	2Q	3000	2Q	TBD	5150	
b.										
Subtotal Test and Evaluation:				2150		3000			5150	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Management Services	CPAF/GSA	SPARTA, VA Andrulis, VA	N/A	2032	2Q	2216	2Q	TBD	4248	
b.										
Subtotal Management Services:				2032		2216			4248	

Remark:

BMDO RDT&E COST ANALYSIS (R-3)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System

Project Total Cost:				16732		21916			38648	

Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System PROJECT 1090

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
1090 Program Operations	0	29944	37922	42002	42770	43002	40696	Continuing	Continuing

A. Mission Description and Budget Item Justification

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

Personnel covers government civilians performing program-wide oversight functions such as financial management, contracting, security, information systems support, and legal services at the Missile Defense Agency's (MDA's) 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, US Air Force and the Joint National Integration Center. Related facility costs include rents, utilities, supplies, ADP equipment, and all the associated operation and maintenance activities.

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.

Assistance required to support Ballistic Missile Defense (BMD) program-wide management functions is also contained in this project. This assistance ranges from operational contracts to support functions such as ADP operations, Access control offices and graphics support, to efforts required to supplement MDA and Executing Agent government personnel. Typical efforts include cost estimating; security management; information management; 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.

FY 2001 Accomplishments:

- Project was funded under Program Elements: 0603873C (Family of Systems Engineering and Integration) and 0603874C (BMD Technical Operations). Previous projects included: 4000

Total 0

FY 2002 Planned Program:

- 29944 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities, and supplies.

Total 29944

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System
	PROJECT 1090

FY 2003 Planned Program:

- 37922 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities, and supplies.

Total 37922

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
N/A									

C. Acquisition Strategy:

N/A

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
N/A							