

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System
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COST <i>(In Thousands)</i>	FY 2000 Actual	FY 2001 Estimate	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	0	779584						Continuing	Continuing
1010 BMC2	0	0	30792						Continuing	Continuing
1020 Communications	0	0	10000						Continuing	Continuing
1030 Targets & Countermeasures	0	0	96539						Continuing	Continuing
1050 Systems Engineering & Integration	0	0	228663						Continuing	Continuing
1060 Test & Evaluation	0	0	391916						Continuing	Continuing
1090 Program Operations	0	0	21674						Continuing	Continuing

A. Mission Description and Budget Item Justification

The BMD System Program Element (PE) provides the resources to select, test, integrate, and demonstrate the multi-layered Ballistic Missile Defense System (BMDS). System-level activities allow for the combining of mission-oriented BMDS segments (Terminal, Midcourse, Boost, and Sensors) into a single coherent and harmonized missile defense system able to defend the United States, deployed forces, friends, and Allies. The BMD System mission is comprised of five primary activities: Battle Management, Command & Control (BMC2), Communications, Targets & Countermeasures, System Engineering & Integration (SE&I), and Test & Evaluation (T&E). 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 BMC2 project produces the system that provides command and control for the BMDS. This includes the development and allocation of BMC2 specifications necessary to ensure that the Boost, Midcourse, and Terminal Defense Systems and the Sensor Systems are fully interoperable with each other and with other external systems, and provide maximum flexibility to the war fighter.

The Communications project consolidates and refines communication systems that are being developed for the BMDS. BMD System Communications activities are responsible for developing capabilities that will allow all components of the BMDS to exchange data, and to permit command and control orders to be transmitted to the weapons and sensor systems. Communications efforts provide the engineering-based capability to assess and translate allocated requirements into communication system specifications necessary to meet multi-operator needs.

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The Targets and Countermeasures project provides threat credible ballistic missile targets, countermeasures, and target system support. This activity will provide new target and countermeasure development, risk reduction flights, and target characterization. Efforts will maintain the required inventory of major target components (boosters, Reentry Vehicles (RVs), countermeasures). The project provides resources for the operations, replacement, and upgrade of test range instrumentation, other BMDS-level test assets associated with targets and countermeasures efforts, and advanced target development.

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), projects (e.g. Block 2006 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.

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 BMD program-wide T&E infrastructure. T&E activities associated with specific BMDS segment level tests or test resources are captured in the respective BMDS segment. The T&E program also addresses crosscutting BMDS issues related to system lethality, discrimination, and other T&E derived mission critical functions. T&E activities are grouped in terms of Program Wide T&E; Test Support of facilities, ranges, sensors, and test instrumentation; modeling and simulation; and facilities, siting, and environmental efforts.

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.

<u>B. Program Change Summary</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget (<u>FY 2001</u> PB)				
Appropriated Value				
Adjustments to Appropriated Value				
a. Congressional General Reductions				
b. SBIR / STTR				
c. Omnibus or Other Above Threshold Reductions				
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 2001</u> PB				
Current Budget Submit (<u>FY 2002</u> PB)			779584	

Change Summary Explanation:

This is a new Program Element. A detailed crosswalk from the previous PE structure is provided in the Program Overview accompanying this budget submission

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1010
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COST <i>(In Thousands)</i>	FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
1010 BMC2	0	0	30792						Continuing	Continuing

A. Mission Description and Budget Item Justification

The Battle Management, Command & Control (BMC2) Project is responsible for producing the system that provides command and control for the BMDS. This includes the development and allocation of BMC2 specifications necessary to ensure that the Boost, Midcourse, Terminal and Sensor Segments are fully interoperable with each other, other external systems to provide maximum flexibility to the war fighter. These activities formulate and implement policy and procedures to ensure that Department of Defense (DoD) and BMD interoperability requirements support the Services, Allied and Coalition partners. Interfaces to 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 North Atlantic Treaty Organization's Air Command and Control System (NATO ACCS) will be engineered and built to ensure optimum effectiveness of the BMD.

BMC2 leverages on work done by the Ground Based Midcourse System, the Joint Defense Planner (JDP), as well as efforts in BMC2 by TAMD and the Single Integrated Air Picture (SIAP) Engineer. BMC2 is executed in a collaborative environment. BMC2 maintains a close working relationship with the other BMDS segments, the System Engineer, and the BM/C3I Community. Additionally, BMC2 continues to work with the Military Services, U.S. Space Command, Joint Forces Command, and Allies/Coalition partners to ensure full integration of other systems, sensors, and command and control centers that contribute to BMD.

FY 2000 Accomplishments:

- 0 Project was funded under Program Elements 0603873C (Family of Systems Engineering and Integration and 0603874C (BMD Technical Operations) Previous projects included: 3155 Systems Engineering & Integration and 3261 BM/C4I Procurement.
- Total 0

FY 2001 Planned Program:

- 0 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

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1010
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FY 2002 Planned Program:

- 30792 Develop the initial architecture for the BMC2. Allocate requirements from the Systems Engineering to the BMC2 components (engagement coordination, fire control, situational awareness, planning tools and infrastructure). Develop specifications for the BMC2 components. Analyze requirements for interfaces to other segments, to external systems including TAMD and Allies/Coalition partners. Develop interface design documents, including specifications. Develop a Risk Management Plan and initiate a risk mitigation program. Establish test requirements for the segment. An initial proof-of-concept system will be built in FY2002 using the Ground Based Midcourse System framework and plugging in actual or modeled components such as Ground Based Terminal System and Airborne Boost System. This increment 0 demonstrator will be used to familiarize operators with the concept. A laboratory capability will be established at the Joint National Test Facility (JNTF) to be used for integration, demonstrations and operator interaction. Continue development of the Joint Defense Planner. Conduct tests on the POC BMC2, both to ascertain performance as well as to conduct operator in the loop experiments. Analyze results to feed back for design of the ensuing increments of BMC2. Develop detailed test plan for BMC2 increments. Plan for and initiate operator interaction process, to enable the development of BMDS operation concepts. Develop objectives for war game activities.

Total 30792

B. Other Program Funding Summary	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To <u>Compl</u>	Total <u>Cost</u>
PE 0603880C, BMD System; Project 1020, Communications			10000						Cont.	Cont.
PE 0603880C, BMD System; Project 1030, Targets & Countermeasures			96539						Cont.	Cont.
PE 0603880C, BMD System; Project 1050 Systems Engineering & Integration			228663						Cont.	Cont.
PE 0603880C, BMD System; Project 1060, Test & Evaluation			391916						Cont.	Cont.
PE 0603880C, BMD System; Project 1090, Program Operations			21674						Cont.	Cont.
PE 0603881C, Terminal Defense Segment			988180						Cont.	Cont.
PE 0603882C, Midcourse Defense Segment			3940534						Cont.	Cont.
PE 0603883C, Boost Defense Segment			685363						Cont.	Cont.
PE 0603884C, Sensors Segment			495600						Cont.	Cont.
PE 0603175C, Technology			112890						Cont.	Cont.
PE 0603873C, Family of Systems-PDRR	145499	227444								
PE 0603874C, BMD Tech. Ops.-PDRR	216910	308415								

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1010
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PE 0603876C, Intelligence Program	21575	22414							
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C. Acquisition Strategy:

A more detailed acquisition plan will be developed, and actions will be taken in FY02, to award a contract for the development of the BMC2. BMC2 will be built upon existing programs. The Ground Based Midcourse System will provide the basic infrastructure for the BMC2. The subsequent increments for BMC2, each scheduled for approximately two years in duration, will provide a detailed plan for development.

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
D. Schedule Profile								
TBMD Enhancements-ongoing effort			4Q					
Integrated System Specification (ISS) Final			1Q					
System Performance Specification Final			1Q					
Develop BMD System Architecture			1Q					
Risk Mitigation Plan			2Q					
GB Midcourse Infrastructure for BMD			2Q					
Establish JNTF BMC2 Lab			2Q					
Acquisition Plan			1Q					
Configuration Management Plan			2Q					
Proof-of-Concept Demonstrator			3Q					
JNTF Wargame			4Q					

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BMDO RDT&E COST ANALYSIS (R-3)											DATE June 2001	
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction						PE NUMBER AND TITLE 0603880C BMD System					PROJECT 1010	
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. BMC2 Development/Integration Contractor	TBD	BMDO, TBD				5280	June 2002				5280	
b. BMDS Integration Cntr		BMDO, JNTF, CO				4100					4100	
c. BMC2 Integration		Services				2600					2600	
d.												
Subtotal Product Development:						11980					11980	
Remark:												
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. BMC2 SE&I Contractor		BMDO, HQ				15312					15312	
b.												
Subtotal Support Costs:						15312					15312	
Remark:												
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Test and Evaluation:												
Remark:												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. BMC2 Management	TBD	BMDO, HQ				3500					3500	

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1010
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b.											
Subtotal Management Services:						3500					3500

Remark:

Project Total Cost:						30792					30792
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Remark:

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1020
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COST (<i>In Thousands</i>)	FY 2000 Actual	FY 2001 Estimate	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	0	10000						Continuing	Continuing

A. Mission Description and Budget Item Justification

The Communication Project consolidates and refines communication systems that are being developed for the BMDS. It is responsible for developing capabilities that will allow all components of BMDS to exchange data, and to permit command and control orders to be transmitted to the weapon and sensor systems. It will be a mechanism for transmitting the information to the command and control to enable a complete, near-real time situational picture to be available. 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.

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 and the communication work undertaken by the Single Integrated Air Picture (SIAP) will be exploited to develop the global Ballistic Missile Defense communication system.

FY 2000 Accomplishments:

- 0 Project was funded under Program Elements 0603873C (Family of Systems Engineering and Integration) and 0603874C (BMD Technical Operations)
Previous projects included: 3155 Systems Engineering & Integration and 3261 BM/C4I Procurement.
- Total 0

FY 2001 Planned Program:

- 0 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

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1020
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FY 2002 Planned Program:

- 10000 Develop an initial architecture (operational, system, and technical) for Communications, leveraging from work being accomplished on the Ground Based Midcourse Defense communication network and the efforts on interoperability for the Joint Planning Network, Joint Data Network (JDN) and the Joint Composite Tracking Network. 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 JRE Application Protocol by designing a layered approach to accommodate global communications. Continue the development of Link-16 and Global Command and Control System interoperability enhancements. Work with the SIAP Engineer to ensure compatibility of the BMDS and the SIAP.

Total 10000

B. Other Program Funding Summary	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To Compl	Total Cost
PE 0603880C, BMD System; Project 1010, BMC2			30792						Cont.	Cont.
PE 0603880C, BMD System; Project 1030, Targets & Countermeasures			96539						Cont.	Cont.
PE 0603880C, BMD System; Project 1050 Systems Engineering & Integration			228663						Cont.	Cont.
PE 0603880C, BMD System; Project 1060, Test & Evaluation			391916						Cont.	Cont.
PE 0603880C, BMD System; Project 1090, Program Operations			21674						Cont.	Cont.
PE 0603881C, Terminal Defense Segment			988180						Cont.	Cont.
PE 0603882C, Midcourse Defense Segment			3940534						Cont.	Cont.
PE 0603883C, Boost Defense Segment			685363						Cont.	Cont.
PE 0603884C, Sensors Segment			495600						Cont.	Cont.
PE 0603175C, Technology			112890						Cont.	Cont.
PE 0603873C, Family of Systems-PDRR	145499	227444								
PE 0603874C, BMD Tech. Ops.-PDRR	216910	308415								
PE 0603876C, Intelligence Program	21575	22414								

C. Acquisition Strategy:

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Communication leverages off existing Ground Based Midcourse Communication Network (Long-Haul)/JDN/JRE efforts and accomplishes supporting tasks to satisfy Systems Engineering performance requirements. Future Satellite based programs may require stand-alone requirements, which will be determined as the Communication project evolves.

D. Schedule Profile	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Comm. Acquisition plan (Draft/Final)			1Q					
JRE Spiral 4 Verification Testing (S4T)			3Q					

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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Communication Integration Contractor	TBD	BMDO, HQ				500	June				500	
b. JNTF		BMDO, CO				1000					1000	
c. Communication Integration	Allot	Services				4500					4500	
d.												
Subtotal Product Development:						6000					6000	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	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&I Contractor						2800					2800	
b.												
Subtotal Support Costs:						2800					2800	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	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 Test and Evaluation:												

Remark:

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1020
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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. BMC2 Management						1200					1200	
b.												
Subtotal Management Services:						1200					1200	

Remark:

Project Total Cost:						10000					10000	
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Remark:

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1030
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COST <i>(In Thousands)</i>	FY 2000 Actual	FY 2001 Estimate	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	0	96539						Continuing	Continuing

A. Mission Description and Budget Item Justification

The Targets & Countermeasures Project will provide threat-credible ballistic missile targets, countermeasures, and target system support. This activity will fund new target and countermeasure development, risk reduction flights, and target characterization, as well as, maintain inventory of major target components (boosters, RVs, countermeasures). Advanced target instrumentation will be developed, and Targets & Countermeasures will provide for aging and surveillance, refurbishment, and reuse of Minuteman and Pershing II hardware. As in years prior, users will continue to fund direct target costs and launch operations.

FY 2000 Accomplishments:

- 0 Project was funded under Program Elements 0603874C (BMD Technical Operations), 0603873C (Family of Systems Engineering and Integration), 0603173C (Support and Technologies- Advanced Technology Development). Previous project was 3354, Targets.
- Total 0

FY 2001 Planned Program:

- 0 Project was funded under Program Elements 0603874C (BMD Technical Operations), 0603873C (Family of Systems Engineering and Integration), 0603173C (Support and Technologies- Advanced Technology Development). Previous project was 3354, Targets.
- Total 0

FY 2002 Planned Program:

- 22239 Provide for Target Logistics, Inventory and Range Coordination.
 - 12100 Provide for Target Integration and Launch Services.
 - 40700 Provide for Targets Booster Development.
 - 6500 Provide for Target Payloads.
 - 15000 Provide for Development of Target Countermeasures.
- Total 96539

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B. Other Program Funding Summary	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>To Compl</u>	<u>Total Cost</u>
PE 0603880C, BMD System; Project 1010, BMC2			30792						Cont.	Cont.
PE 0603880C, BMD System; Project 1020, Communications			10000						Cont.	Cont.
PE 0603880C, BMD System; Project 1050, System Engineering & Integration			228663						Cont.	Cont.
PE 0603880C, BMD System; Project 1060, Test & Evaluation			391916						Cont.	Cont.
PE 0603880C, BMD System; Project 1090, Program Operations			21674						Cont.	Cont.
PE 0603881C, Terminal Defense Segment			988180						Cont.	Cont.
PE 0603882C, Midcourse Defense Segment			3940534						Cont.	Cont.
PE 0603883C, Boost Defense Segment			685363						Cont.	Cont.
PE 0603884C, Sensors Segment			495600						Cont.	Cont.
PE 0603175C, Technology			112890						Cont.	Cont.
PE 0603873C, Family of Systems-PDRR	145499	227444								
PE 0603874C, BMD Tech. Ops.-PDRR	216910	308415								
PE 0603876C, Intelligence Program	21575	22414								

C. Acquisition Strategy:

Short and medium range ballistic missile targets are being developed by the U.S. Army Space and Missile Defense Command and Air Force Space and Missile Command. Short-range air launched target systems, being developed by Coleman Research, are being procured under the Consolidated Theater Target Systems (CTTS) contract. A medium range ballistic missile target is being developed by Orbital Sciences Corp under a contract with SMC. The development of a long-range air launched ballistic target system is being managed by USASMDC, Theater Targets Project Office with SMC as the contracting agency. A liquid fueled target development program was initiated in FY00 to design a liquid fueled booster for ballistic missile defense testing. In FY02 a down select to two contractors will be made to continue booster development over a two-year period. FMA target support will be competed under the CTTS contract. Development of target countermeasures, instrumentation and characterization will be executed under contracts at SMDC, SMC and BMDO.

D. Schedule Profile	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Target Infrastructure Sustainment			1-4Q					
LRALT Development			1-4Q					
Liquid Fueled Target Development			1-4Q					

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Threat Representative RV Development			1-4Q					
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BMDO RDT&E COST ANALYSIS (R-3)											DATE June 2001	
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	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> 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	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> 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	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Target Logistics, Inventory and Range Coordination	Allot	USASMDC Huntsville, AL				7200	1 Oct 2001				7200	
b. Target Logistics, Inventory and Range Coordination	Multiple	BMDO, Various				12200	TBD				12200	
c. Target Integration and Launch Services	Allot	USASMDC Huntsville, AL				1400	1 Oct 2001				1400	
d. Target Integration and Launch Services	Multiple	BMDO, Various				10700	TBD				10700	
e. Target Boosters	Allot	USASMDC Huntsville, AL				6100	1 Oct 2001				6100	
Project 1030			Page 16 of 40 Pages					Exhibit R-3 (PE 0603880C)				

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BMDO RDT&E COST ANALYSIS (R-3)											DATE June 2001	
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction						PE NUMBER AND TITLE 0603880C BMD System					PROJECT 1030	
f. Target Boosters	Allot	USAFSMC Los Angeles, CA				12600	1 Oct 2001				12600	
g. Target Boosters	Multiple	BMDO, Various				22000	TBD				22000	
h. Target Payloads	Multiple	BMDO, Various				6500	TBD				6500	
i. Development of Target Countermeasures	Multiple	BMDO, Various				15000	TBD				15000	
Subtotal Test and Evaluation:						93700					93700	
Remark:												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Gov't Project Per & Supt	Allot	USASMDC Huntsville, AL				2671	1 Oct 2001				2671	
b. Targets Mgmt Support	Government	BMDO, Washington DC				168	TBD				168	
Subtotal Management Services:						2839					2839	
Remark:												
Project Total Cost:						96539					96539	
Remark:												

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1050
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COST <i>(In Thousands)</i>	FY 2000 Actual	FY 2001 Estimate	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	0	228663						Continuing	Continuing

A. Mission Description and Budget Item Justification

The Systems Engineering & Integration (SE&I) project provides the overall connective engineering development and integration of the BMDS. The SE&I mission is to define and manage the layered BMD System 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 spans the development of individual components (e.g. boosters), projects (e.g. Block 2006 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. SE&I activities include System Engineering and Architecture Development, Threat Systems Engineering (TSE), Project Hercules, Intelligence System Threat, Joint Warfighter Support, and Joint National Test Facility (JNTF) efforts.

Systems Engineering and Architecture (SE&A) is responsible for the overall development and integration of the BMDS. This requires collaborative, detailed Systems Engineering be performed across the entire spectrum of activities from the development of individual components (e.g. boosters), projects (e.g. Block 2006 THAAD) to BMD segments (e.g. midcourse) to the fully integrated BMDS. Specifically, SE&A is responsible for the development, configuration control, and execution of a set of time-phased technical goals that enable the evolutionary development and delivery of incremental capability. Functional analysis and decomposition of BMD System level goals are performed to establish and allocate technical capabilities to individual segments, components, and project developers. 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 BMC2 and communications projects, and conducts trade studies to support overall BMDS evolution. These trade studies include alternatives involving potential coalition partners that explore interoperability concepts, BMC2 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 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. SE&A is responsible for the implementation of Quality, Reliability and Manufacturing Technology (ManTech) associated with BMD component development. This includes applying Systems Engineering principles and resources to initiate or expand research, development, prototype construction, cost saving/cost reduction demonstrations, and other activities identified by systems analyses and assessments as offering potential remediation of a BMDO BMD problem area. SE&A develops requirements for and participates in T&E activities. SE&A is also 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. Finally, SE&A works with the Services to smoothly transition developed capabilities to procurement.

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1050
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Threat Systems Engineering develops, maintains, and provides configuration control of the detailed threat characterizations necessary to support BMD design, development, and testing. Using inputs from the Intelligence Community, TSE develops and maintains the BMD Design-to-Threat (DTT) to provide a common, stable, configuration controlled threat specification for use across all BMD System activities. TSE conducts engineering analyses to define technologically feasible changes in the threat and develops a parametric Reference Threat Document (RTD) to support 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 projects such as Project Hercules.

Project Hercules is a specifically focused national systems engineering effort to develop the BMDO Corporate Countermeasure/Counter-Countermeasure (CM/CCM) Program and robust adaptive algorithms to counter off-nominal and evolving missile threats, across multiple BMD evolutionary system capabilities. The CM/CCM program provides a systematic approach to identify, prioritize, characterize and develop countermeasures and identify, develop, and test associated counter-countermeasures.

Intelligence Threat serves as BMDO’s liaison with the Intelligence Community and provides current and projected intelligence information to support all BMDO activities. The BMDO Directorate of Intelligence defines potential adversary military force missile threats. To accomplish this mission, BMDO has a threat definition program, which is based on intelligence community projections and is traceable to quantifiable analysis. This project produces the Intelligence Community-Validated threat descriptions and associated capstone threat and countermeasure. The threat is divided into four major categories under this task: Operational Threat Environment, Targets, System Specific Threats (SST), and Reactive Threats. The Operational Threat Environment includes assessments of the operational and technological environments and projects the effects of developments and trends on BMD mission capability. The Targets category includes a projection of foreign missile systems and countermeasures that enhance their performance. This includes force structure, performance characteristics, and sample signatures. SST addresses threats to the BMD System including reconnaissance, surveillance, and target acquisition; lethal and non-lethal threats; and regional integrated SST assessments. The Reactive Threats category includes those that an adversary may develop as a result of deployment BMD.

Joint TMD Warfighter support and assessment program allows CINCs to perform assessments of their Concepts of Operations (CONOPS) and Tactics Techniques and Procedures (TT&P) as part of their regular exercises to ensure BMDO programs provide systems that meet the warfighters requirements. These assessments provide valuable feedback needed to support BMD System evolution and the associated system engineering. This program also provides funds to support the BMDO role in the Joint Theater Air and Missile Defense (JTAMD) process in the development of the JTAMD Master Plan and assessment of associated system architectures and integration.

The JNTF is BMDO’s premiere modeling, simulation and test capability for evaluating the interoperability of BMD functions. It is staffed by the military services with a focus on Interoperability for BMD systems in both Joint and Combined environments. In evaluating systems interoperability, the JNTF measures the integrated effects of systems and architectures, using both actual and simulated systems, and the capability to demonstrate effective information exchange within a prescribed scenario. In

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1050
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addition to conducting tests on systems of systems, JNTF also provides one-on-one support to BMD service developers for technical insertion and upgrade programs. JNTF also actively participates in CINC-sponsored TMD Exercises and Experiments supporting simulation and connectivity requirements, as well as collecting field interoperability data / information to assist in validating models and simulations. BMD Battle Management capabilities are exercised and evaluated at the JNTF. The JNTF provides inter-service computational capabilities and wide area network communication networks with Service facilities

FY 2000 Accomplishments:

- 0 Project was funded under Program Elements: 0603173C (Support Tech - (Advanced Technology Development), 0603861C (THAAD System), 0603871C (NMD), 0603868C (Navy Theater Wide), 0603872C (Joint TMD), 0603873C (Family of Systems Engineering and Integration), 0603874C (BMD Technical Operations), and 0603876C (Intelligence Program). Previous projects included: 1180 Surveillance Technology, 1266 Navy Theater Wide, 2260 Theater High Altitude Defense, 3153 Systems Architecture and Engineering, 3155 Systems Engineering and Integration, 3270 Threat and Countermeasures Program, 3353 JNTF, 3359 Test, Evaluation & Assessment, and 4000 Operational Support.

Total 0

FY 2001 Planned Program:

- 0 Project was funded under Program Elements: 0603868C (Navy Theater Wide), 0603871C (NMD), 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

FY 2002 Planned Program:

- 87802 System Engineering and Architecture (SE&A) funds the core BMD System level engineering capability necessary to develop the integrated BMDS.

Systems Engineering will establish overall BMDS capabilities and allocate capability specifications to the individual projects and components. Develop Operational Concept(s) for the BMDS. Develop the BMD Systems Capabilities Specification Version 1.0 (SCS V1.0) and place it under configuration control. Fully implement the BMDS Configuration Control Board (CCB). Develop new/alternative concepts and conducts trade studies to support System evolution and risk mitigation. Specifically, support trade studies to further define boost phase projects and components. Develop integration standards and orchestrate integration activities across all BMDS projects 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, but provide an increased focus on crosscutting risk areas and expand activities to include risks associated with the industrial base needed to support BMD System development and manufacturing. Continue to execute the Corporate Lethality Program to support effective intercepts and establish collateral effects. Conduct force-on-force level and

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY	June 2001	
4 - Program Definition and Risk Reduction	0603880C BMD System	
87802	System Engineering and Architecture (SE&A) funds the core BMD System level engineering capability necessary to develop the integrated BMDS.	
	<p>Systems Engineering will establish overall BMDS capabilities and allocate capability specifications to the individual projects and components. Develop Operational Concept(s) for the BMDS. Develop the BMD Systems Capabilities Specification Version 1.0 (SCS V1.0) and place it under configuration control. Fully implement the BMDS Configuration Control Board (CCB). Develop new/alternative concepts and conducts trade studies to support System evolution and risk mitigation. Specifically, support trade studies to further define boost phase projects and components. Develop integration standards and orchestrate integration activities across all BMDS projects 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, but provide an increased focus on crosscutting risk areas and expand activities to include risks associated with the industrial base needed to support BMD System development and manufacturing. Continue to execute the Corporate Lethality Program to support effective intercepts and establish collateral effects. Conduct force-on-force level and detailed project level analyses to assess System effectiveness, ensure robust performance, and establish expected capabilities. Supports analysis of System alternatives involving potential coalition partners that explore interoperability concepts, BMC2 alternatives, and associated engineering requirements. Establish requirements for and provide engineering support to System and verification and testing.</p> <p>SE&A includes Quality, Reliability, & Manufacturing Technology (ManTech) assessments and programs to implement technologies that address reliability and manufacturing technologies. These manufacturing technology programs focus areas include sensors, propulsion, electronics and materials that support cost reduction activities, technology insertion and increased producibility for all BMD programs.</p> <p>System Architecture provides 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 BMC2 and communications segments. Architectural goals are documented in the Technical Goals Document (TGD), which provides the overarching and unifying goals for the BMD system expressed in terms of segments, connections, constraints, and their interrelationships. To support architecture definition analyses, a process has been established to examine architecture alternatives and their associated capabilities against potential threat capabilities. This task also supports analysis of architecture alternatives involving potential coalition partners that explore interoperability concepts, BMC2 alternatives, and associated engineering requirements.</p> <p>SE&A is also 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.</p>	

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1050
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- 7200 This funds the TSE effort that develops and maintains configuration control of the detailed threat characterizations necessary to support System design, development, and testing. TSE will develop and update the baseline Design-to-Threat (DTT) from Version 2.0 to Version 3.0 and begin the transition to the more capabilities based Reference Threat Document (RTD). Provide threat risk assessment and countermeasures engineering support to Project Hercules. Initiate engineering efforts to develop parametric threat data and provide needed engineering detail for SBIRS and boost phase development. Complete Countermeasures Hands-On Program (CHOP) Skunkworks Mission 16 (SM-16) and integrate results into the Hercules efforts. Update the BMD System Reference Threat scenarios. Model, simulate, and produce digital threat data to support analyses. Continue to update and maintain the Threat Systems Engineering Library (TSEL).

- 59400 Hercules - Project Hercules is the BMDO corporate CM/CCM program; addresses issues to implement capability-based acquisitions in the BMD systems; and provides a national effort to develop algorithms enabling continued system improvement through spiral development.

- 10533 Intelligence Threat will continue to serve as BMDO's liaison with the Intelligence Community and provide current and projected intelligence information to support all BMDO activities. Intelligence will produce the Capstone Systems Threat Assessment Report (STAR), specialty threats, targets analyses, operational threat environment intelligence assessments, and provide management and planning support.

- 17802 Joint TMD Warfighter Support - This effort funds BMDO's Commanders In Chiefs (CINCs') Assessment Program. This program uses experiments, technology demonstrations, and theater-level exercises to help ensure the joint interoperability and successful fielding of Theater Air and Missile Defense (TAMD) Family of Systems (FoS) to the warfighting customers. In addition, it supports the development of joint interoperability TAMD doctrine, Concepts of Operations (CONOPS), and Tactics, Techniques, and Procedures (TTPs); and provides Joint/Coalition/Allied TAMD interoperability data.

- 45926 The JNTF - The JNTF is BMDO's premiere modeling, simulation and test capability for evaluating the interoperability of BMD system functions. It focuses on Theater and Global missile defense Interoperability. The JNTF measures the integrated effects of systems and architectures, using both actual and simulated systems, and the capability to demonstrate effective information exchange within a prescribed scenario. In addition to conducting tests on systems of systems, JNTF also provides one-on-one support to BMD service developers for technical insertion and upgrade programs. JNTF also actively participates in CINC-sponsored TMD Exercises and Experiments supporting simulation and connectivity requirements, as well as collecting field interoperability data / information to assist in validating models and simulations. Both Theater and Global Battle Management capabilities are exercised and evaluated at the JNTF. The JNTF provides inter-service computational capabilities and wide area network communication networks with Service facilities.

Total 228663

B. Other Program Funding Summary	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To <u>Compl</u>	Total <u>Cost</u>
PE 0603880C, BMD System; Project 1010, BMC2			30792						Cont.	Cont

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BUDGET ACTIVITY	PE NUMBER AND TITLE					PROJECT	
4 - Program Definition and Risk Reduction	0603880C BMD System					1050	
PE 0603880C, BMD System; Project 1020, Communications			10000			Cont.	Cont.
PE 0603880C, BMD System; Project 1030, Targets & Countermeasures			96539			Cont.	Cont.
PE 0603880C, BMD System; Project 1060, Test & Evaluation			391916			Cont.	Cont.
PE 0603880C, BMD System; Project 1090, Program Operations			21674			Cont.	Cont.
PE 0603881C, Terminal Defense Segment			988180			Cont.	Cont.
PE 0603882C, Midcourse Defense Segment			3940534			Cont.	Cont.
PE 0603883C, Boost Defense Segment			685363			Cont.	Cont.
PE 0603884C, Sensors Segment			495600			Cont.	Cont.
PE 0603175C, Technology			112890			Cont.	Cont.
PE 0603873C, Family of Systems-PDRR	145499	227444					
PE 0603874C, BMD Tech. Ops.-PDRR	216910	308415					
PE 0603876C, Intelligence Program	21575	22414					

C. Acquisition Strategy:

Systems Engineering and Architecture is a collaborative effort and the strategy is to acquire a SE&A Team to perform the BMD System level engineering and leverage engineering efforts performed at the BMD segment and project levels. The SE&A Team will be composed of engineers from Federally Funded Research and Development Centers (FFRDCs), defense contractor(s), and BMDO. Threat Systems Engineering and Intelligence Threat will be conducted by the Threat Systems Engineering and Intelligence Support Contractors and leverage efforts conducted by the Intelligence Community, National Laboratories, and Military Services.

D. Schedule Profile	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
System Engineering and Architecture								
BMD Technical Goals Document			1Q					
BMD Systems Architecture Performance Assessment			1Q					
BMD Systems Requirements Document			1Q					
QRM Mantech Program Update			4Q					
Threat System Engineering								
Complete CHOP Mission 16			2Q					
Update the Threat Systems Engineering Library			4Q					
DTT/RTD baseline Maintenance and update			2Q					

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1050
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Hercules								
Identify, design, and assess Countermeasures through Hercules Red Team			1Q-4Q					
Identify, assess, and implement Counter-Countermeasure through the Hercules Blue Team			1Q-4Q					
Algorithm Development and Testing			1Q-4Q					
Intel & System Threat								
NMD STAR			3Q					
TMD Capstone STAR			3Q					
Joint Warfighter								
CINC Experiments			1Q-4Q					
TAMD Master Plan			1Q					

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1050
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Project Hercules	Various	LMMC/Sparta/SMDC				34400					34400	
b.												
Subtotal Product Development:						34400					34400	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. System Engineering	Various	Services, Various				14106					14106	
b. System Architecture	CPAF	SPARTA, VA				11285	1Q				11285	
c. QRM Engineering		Services				12000					12000	
d. BMD Information Management System	Various	Various				24458					24458	
e. Threat Characterization	MIPR	AFRL, NM				500					500	
f. Project Hercules	Various	IDA, SMDC				20000					20000	
g. IN Army Intel Support		SMDC, AL				1540					1540	
h. IN Air Force Intel Support		Air Force, CO				735					735	
i. IN Program Support		BMDO, VA				3794					3794	
j. IN App Support		BMDO, VA				2216					2216	
k. IN Scenario Production		JNTF, CO				1842					1842	
l. IN Wargaming Support		JNTF, CO				248					248	
m. AP Army Analysis	Suballocation	DAMO/FDE				375	1Q02			Continue	375	
n. Navy Analysis	Suballocation	PMS/456				375	1Q02			Continue	375	
o. Air Force Analysis Support	Suballocation	SAF/AQPT				375	1Q02			Continue	375	
p. Marine Corps Analysis Support	Suballocation	MARCORSSCOM				125	1Q02			Continue	125	

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1060
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COST <i>(In Thousands)</i>	FY 2000 Actual	FY 2001 Estimate	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	0	391916						Continuing	Continuing

A. Mission Description and Budget Item Justification

The Test & Evaluation Project consolidates all Program-wide Test & Evaluation resources. This allows for the more cohesive facilitation, management and execution of these test activities for a single BMD System. This activity provides the resources needed for the test infrastructure and analytical tools needed by the BMD program and to execute a Program-Wide Test Program. Test & Evaluation costs associated with a specific BMDS segment level tests or test resources are captured in the respective BMDS segment.

The T&E Project also provides the resources for the development, operation, maintenance and modernization of BMD program-wide test and evaluation infrastructure. These include ground test facilities, range assets, instrumentation, data collection platforms, and computational facilities. The project also resources BMD core models and simulations (M&S), including their development, sustainment, upgrade, 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, the Advanced Research Center and Simulation Center (ARC/SC) are also resourced within this project.

As BMDO has testing needs that go beyond those of the individual BMDS segments, this activity also resources a Program-Wide Test Program. This program is intended to address crosscutting issues such as lethality and discrimination, to perform critical characterization and phenomenology measurements, to support the development of other BMD System activities. The cornerstones of the Program-Wide Test Program are the Critical Measurements Program (CMP), the Hardware-in-the-Loop Tests (HWILT), and the System Integration Test (SIT) overlays on other tests and exercises.

FY 2000 Accomplishments:

- 0 Project was funded under Program Elements: 0603872C (Joint TMD), 0603873C (Family of Systems Engineering and Integration) and 0603874C (BMD Technical Operations). Previous projects included: 1155 Discrimination, 3352 Modeling & Simulation, 3357 Facilities, Siting & Environmental, 3359 Test, Evaluation & Assessment, and 3360 Test Resources.
- Total 0

FY 2001 Planned Program:

- 0 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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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1060
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FY 2002 Planned Program:

- 132206 Program Wide Test & Evaluation - provides test expertise to the Director, BMDO and Programs to support development of Missile Defense Systems; executes flight and ground test events to reduce developmental risks and support BMDO data collection and analysis, including threat signature, countermeasures, and lethality/kill assessment; tests and assesses Family of Systems integration and interoperability; and sponsors International test and evaluation programs.
 - 161125 Test Support - provides for BMDO planning, oversight and coordination of integrated test and evaluation facilities. This includes inter-project as well as inter-service test and evaluation efforts, and provides for common ground test facilities, ranges, sensors and other related instrumentation. This supports those test resources mutually supporting BMDO's Missile Defense program. Individual BMDO programs 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 BMDO FY02 APB submission, identifies \$5.4M of this amount for FY02 in support of the Missile Defense Test System Test Bed at Kodiak.
 - 88153 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 BMDO Data Centers, in direct support of the Program-Wide Test Program, System Engineering Program, BMD Architecture development, Project Hercules, Joint Warfighter wargame support and cooperative international coalition efforts.
 - 6000 Russian Cooperative Modeling & Simulation program.
 - 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 BMDO's Missile Defense Systems.
 - 532 Provides travel funding for T&E personnel.
- Total 391916

B. Other Program Funding Summary	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To <u>Compl</u>	Total <u>Cost</u>
PE 0603880C, BMD System; Project 1010, BMC2			30792						Cont.	Cont
PE 0603880C, BMD System; Project 1020, Communications			10000						Cont.	Cont
PE 0603880C, BMD System; Project 1030, Targets & Countermeasures			96539						Cont.	Cont
PE 0603880C, BMD System; Project 1050, System Engineering & Integration			228663						Cont.	Cont
PE 0603880C, BMD System; Project 1090, Program Operations			21674						Cont.	Cont
PE 0603881C, Terminal Defense Segment			988180						Cont.	Cont
PE 0603882C, Midcourse Defense Segment			3940534						Cont.	Cont

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1060
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PE 0603883C, Boost Defense Segment			685363						Cont.	Cont
PE 0603884C, Sensors Segment			495600						Cont.	Cont
PE 0603175C, Technology			112890						Cont.	Cont
PE 0603873C, Family of Systems-PDRR	145499	227444								
PE 0603874C, BMD Tech. Ops.-PDRR	216910	308415								
PE 0603876C, Threat & Countermeasures	21575	22414								

C. Acquisition Strategy:

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. Samples of existing and possible industry participants include organizations such as Coleman Aerospace Corporation, Orbital Sciences Corporation, Lockheed Martin Missile Systems, TRW, and Computer Science Corporation.

Test programs will be executed utilizing a consolidated targets development, test resource, facilities, siting and environmental, and program-wide test program strategy. BMD management requirements will be met through BMDO 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.

D. Schedule Profile	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
7V/10V – GBI: Raytheon			1-4Q					
Missile Defense System Testing at Tunnel 9			1-4Q					
Missile Defense System Testing at Range G			1-4Q					
IR Sensor Program(s) testing at NIST			1-4Q					
Airborne Data Collection			1-4Q					
Airborne Data Collection Upgrades			1-4Q					
Missile Defense System Testing at NHTF			1-4Q					
Missile Defense System Testing at HHSTT			1-4Q					
Missile Defense System Testing at AOEC			1-4Q					
Missile Defense System Testing at AMOR			1-4Q					
Missile Defense System Testing at KHILS			1-4Q					
Missile Defense System Testing at WSMR			1-4Q					
Missile Defense System Testing at KMR			1-4Q					
Missile Defense System Testing at PMRF			1-4Q					

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System
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Critical Measurements Program			2Q					
Hardware-In-the-Loop-Testing			1Q, 3Q					

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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	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> 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	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> 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	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.	Russian Cooperative Modeling and Simulation	Allotment & MIPR				6000	1 Oct 2001				6000	
b.	Campaign/ FoF Model Development	Allotment & MIPR				7100	1 Oct 2001				7100	
c.	FoS Model Interoperability	Allotment & MIPR				9300	1 Oct 2001				9300	
d.	Engineering Model Development	Allotment & MIPR				11445	1 Oct 2001				11445	
e.	Core Model V & V	Allotment & MIPR				6055	1 Oct 2001				6055	
f.	Campaign /FoF Model Maintenance	Allotment & MIPR				3400	1 Oct 2001				3400	
Project 1060												
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										June 2001		
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT		
4 - Program Definition and Risk Reduction					0603880C BMD System					1060		
g.	FoS Model Maintenance	Allotment & MIPR	Multiple EAs				6300	1 Oct 2001			6300	
h.	Engineering Model Maintenance	Allotment & MIPR	Multiple EAs				6900	1 Oct 2001			6900	
i.	Scene Generation	Allotment & MIPR	Multiple EAs				4000	1 Oct 2001			4000	
j.	Algorithm Code/ Testing	Allotment & MIPR	Multiple EAs				3000	1 Oct 2001			3000	
k.	Modeling Advanced Sensors	Allotment & MIPR	Multiple EAs				2000	1 Oct 2001			2000	
l.	Lethality Models	Allotment & MIPR	Multiple EAs				1000	1 Oct 2001			1000	
m.	Israeli Interoperability	Allotment & MIPR	Multiple EAs				3000	1 Oct 2001			3000	
n.	ARC DEVELOPMENT & OPERATIONS	Allot	USASMDC Huntsville, AL				12000	1 Oct 2001			12000	
o.	Core M&S Support (BoC, IV&V, HLA)	Allotment & MIPR	Multiple EAs				4765	1 Oct 2001			4765	
p.	Legacy Data Recovery	Allotment & MIPR	Multiple EAs				500	1 Oct 2001			500	
q.	Data Center Disaster Recovery	Allotment & MIPR	Multiple EAs				200	1 Oct 2001			200	
r.	SSC Support	Allotment & MIPR	Multiple EAs				829	1 Oct 2001			829	
s.	Army TMD Facility/ Environmental Programs Development	Allot	Army PEO Huntsville, AL				104	1 Oct 2001			104	
t.	Navy TMD Facility/ Environmental Programs Development	Allot	Navy PEO TSC Arlington, VA				101	1 Oct 2001			101	
u.	Air Force TMD Facility/Environmental Programs Development	Allot	Air Force SMC, Los Angeles, CA				77	1 Oct 2001			77	
v.	Army SMDC Fac/Envir Prog Development	Allot	Army SMDC, Huntsville, AL				254	1 Oct 2001			254	

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BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT		
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w.	Facility Acquisition Life-Cycle Management	MIPR	U.S. Army Corps of Engineers Huntsville,AL				85	1 Oct 2001			85	
x.	Army PAX Support	MIPR	U.S. Army Corps of Engineering, Washington, DC				23	1 Oct 2001			23	
y.	Critical Measurements Program	Allot	USASMDC Huntsville, AL				26090	1 Oct 2001			26090	
z.	SIT II	Allot	USASMDC Huntsville, AL				4713	1 Oct 2001			4713	
aa.	SIT II	MIPR	BMDO Multiple				9827	TBD			9827	
bb.	Test Planning	MIPR	BMDO Multiple				820	TBD			820	
cc.	Program Wide Interop Ground Testing	Allot	Multiple EA's				12600	1 Oct 2001			12600	
dd.	Special Program Tests	Allot	USASMDC Huntsville, AL				7425	1 Oct 2001			7425	
ee.	Special Program Tests	MIPR	BMDO Multiple				2575	TBD			2575	
ff.	Radar Exploitation	Allot	USASMDC Huntsville, AL				1500	1 Oct 2001			1500	
gg.	Corp Data Collect & Analyze	Allot	USAF, Multiple				150	1 Oct 2001			150	
hh.	Corp Data Collect & Analyze	Allot					300	1 Oct 2001			300	
ii.	Corp Data Collect & Analyze	MIPR	BMDO Multiple				3040	TBD			3040	
jj.	Optical Data Analysis	Allot	USASMDC Huntsville, AL				2702	1 Oct 2001			2702	
kk.	Optical Data Analysis	Allot	USAF, Multiple				50	1 Oct 2001			50	
ll.	Optical Data Analysis	Allot	USN, Multiple				50	1 Oct 2001			50	
mm.	RCS Data Analysis	Allot	USASMDC Huntsville, AL				2260	1 Oct 2001			2260	
nn.	RCS Data Analysis	Allot	USAF, Multiple				25	1 Oct 2001			25	
oo.	RCS Data Analysis	Allot	USN, Multiple				25	1 Oct 2001			25	

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pp. Data Analysis	Allot	Multiple EA's				11330	1 Oct 2001				11330	
qq. International Program	Allot	USASMDC Huntsville, AL				24	1 Oct 2001				24	
rr. International Program	Allot	USAF, Multiple				24	1 Oct 2001				24	
ss. International Program	Allot	USN, Multiple				24	1 Oct 2001				24	
tt. International Program	MIPR	BMDO Multiple				1316	TBD				1316	
uu. Program Wide Support CM/CCM	Allot	Multiple EA's				27683	1 Oct 2001				27683	
vv. Interoperability	Allot	Multiple EA's				5500	1 Oct 2001				5500	
ww. Lethality (TREx)/ Kill Assessment	Allot	Multiple EA's				6120	1 Oct 2001				6120	
xx. Ground Test Facilities	Allot	USASMDC Huntsville, AL				3250	1 Oct 2001				3250	
yy. Ground Test Facilities	Allot	USAF, Multiple				18100	1 Oct 2001				18100	
zz. Ground Test Facilities	MIPR	BMDO, Multiple				2800	TBD				2800	
aaa. Ranges & Instrumentation	Allot	USASMDC Huntsville, AL				11941	1 Oct 2001				11941	
bbb. Ranges & Instrumentation	Allot	USN, Multiple				5500	1 Oct 2001				5500	
ccc. Ranges & Instrumentation	MIPR	BMDO, Multiple				58150	TBD				58150	
ddd. Airborne Sensors	Allot	USASMDC Huntsville, AL				50807	1 Oct 2001				50807	
eee. Targets Certification & Requirements	MIPR	BMDO, Multiple				3000	TBD				3000	
fff. Test Support	MIPR	BMDO, Multiple				993	TBD				993	
Subtotal Test & Evaluation:						369152					369152	

Remark:

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1060
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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. GOV Project Per & Supt	Allot	USASMDC Huntsville, AL				1555	1 Oct 2001				1555	
b. Support Contracts	Various Contract Types	BMDO, Multiple				4804	TBD				4804	
c. GOV PROJ PERS & SUPT	Allot	Multiple EA's				2627	1 Oct 2001				2627	
d. Support Contracts	Various Contract Types	BMDO, Multiple				3406	TBD				3406	
e. TE Mgmt Support	Government	BMDO, Multiple				532	1 Oct 2001				532	
f. System Engineering and Technical Support (BMDO)	CPFF	SciComm, Inc. Bethesda, MD				3256	1 Oct 2001				3256	
g. Support Contracts	Various Contract Types	BMDO, Multiple				6018	TBD				6018	
h. SMDC Gov't Salaries Sensors	Allot	USASMDC Huntsville, AL				566	1 Oct 2001				566	
Subtotal Management Services:						22764					22764	

Remark:

Project Total Cost:						391916					391916	
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Remark:

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1090
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COST (In Thousands)	FY 2000 Actual	FY 2001 Estimate	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	0	21674						Continuing	Continuing

A. Mission Description and Budget Item Justification

This project covers personnel and related facility support costs, statutory and fiscal requirements, support service contracts and the BMDO data Center Programs.

Personnel covers government civilians performing program-wide oversight functions such as financial management, contracting, security, information systems support, and legal services at the Ballistic Missile Defense Organization located within the Washington D.C. area, as well as BMDO's Executing Agents within the US Army Space & Missile Defense Command, US Army PEO Air and Missile Defense, US Navy PEO for Theater Surface Combatants, US Air Force and the Joint National Test Facility. Related facility costs include rents, utilities, supplies, ADP equipment, and all the associated operation and maintenance activities.

Fiscal Requirements include reimbursable services 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. BMDO has additional requirements to provide for foreign currency fluctuations on its limited number of foreign contracts. Statutory requirements include funding for charges to canceled appropriations in accordance with Public Law 101-510.

Assistance required to support 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 BMDO and Executing Agent government personnel. Typical efforts include cost estimating, security management, information management, technology integration across BMDO 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.

This project also includes the BMDO Data Centers Programs. The BMDO Data Centers Information System Program Manager provides management, oversight, technical assistance, and expertise for the BMDO Data Centers Program. The BMDO Data Centers Program archives, manages, and develops data products, distributes and provides remote access to all relevant BMD data. Operation and management of Data Center activities is accomplished at several sites, each site specializing in a particular discipline. Taskings include providing assessments for technical/programmatic issues and data center performance, coordinating segment customer program/data management requirements, and cooperative partnership requirements.

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BUDGET ACTIVITY								June 2001		
4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE						
				0603880C BMD System						
FY 2000 Accomplishments:										
<ul style="list-style-type: none"> 0 Project was funded under Program Elements: 0603872C (Joint TMD), 0603873C (Family of Systems Engineering and Integration) and 0603874C (BMD Technical Operations). Previous projects included: 4000 										
Total 0										
FY 2001 Planned Program:										
<ul style="list-style-type: none"> 0 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:										
<ul style="list-style-type: none"> 21674 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rent & utilities, supplies and the data centers programs. 										
Total 21674										
B. Other Program Funding Summary										
	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>To Compl</u>	<u>Total Cost</u>
PE 0603880C, BMD System; Project 1010, BMC2			30792						Cont.	Cont.
PE 0603880C, BMD System; Project 1020, Communications			10000						Cont.	Cont.
PE 0603880C, BMD System; Project 1030, Targets & Countermeasures			96539						Cont.	Cont.
PE 0603880C, BMD System; Project 1050, System Engineering & Integration			228663						Cont.	Cont.
PE 0603880C, BMD System; Project 1060, Test & Evaluation			391916						Cont.	Cont.
PE 0603881C, Terminal Defense Segment			988180						Cont.	Cont.
PE 0603882C, Midcourse Defense Segment			3940534						Cont.	Cont.
PE 0603883C, Boost Defense Segment			685363						Cont.	Cont.
PE 0603884C, Sensors Segment			495600						Cont.	Cont.
PE 0603175C, Technology			112890						Cont.	Cont.
PE 0603873C, Family of Systems-PDRR	145499	227444								

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PE 0603874C, BMD Tech. Ops.-PDRR	216910	308415							
PE 0603876C, Threat & Countermeasures	21575	22414							

C. Acquisition Strategy:

D. <u>Schedule Profile</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1090
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	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 2001 Cost	FY 2001 Award Date	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 2001 Cost	FY 2001 Award Date	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 Test and Evaluation:												

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	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:												
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Remark:
Project 1090