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# **Department of Defense FY 2003 Budget Estimate**

**February 2002**



**RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE-WIDE**

**Volume 2 Missile Defense Agency**

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# MISSILE DEFENSE AGENCY

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 2002	
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602173C Support Tech - Applied Research					
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	31219	0	0	0	0	0	0	TBD	TBD
1461 BMC4I	15291	0	0	0	0	0	0	TBD	TBD
1651 Innovative Science and Technology (IS&T)	10383	0	0	0	0	0	0	TBD	TBD
1660 Statutory and Mandated Programs	5545	0	0	0	0	0	0	TBD	TBD

The Ballistic Missile Defense (BMD) Program and resulting FY 2002 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY 2002, funding from this Program Element is moved to the Missile Defense Agency (MDA) Program Element 0603175C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.

**A. Mission Description and Budget Item Justification**

This program element provides the only applied research projects in the Department of Defense which focus specifically on future Ballistic Missile Defense Organization (BMDO) technical requirements. To prepare to meet critical future active defense needs, the program element invests in an aggressive program of high-leverage technologies that yield markedly improved capabilities across a selected range of boost phase methods and terminal defense interceptors, advanced target sensors, and innovative science. Program investments are to provide 1) component technologies that offer improved performance or reduced costs for BMDO acquisition programs, 2) better understanding of the material characteristics and physics for processes that form the basis of technologies, and 3) technical solution options to mitigate far-term and unpredicted threats.

The Innovative Science and Technology (IS&T) project invests seed money in high-risk technologies that could significantly change how BMDO develops future systems. Specific technology includes: 1) sensing, imaging, ranging, and discrimination, 2) phenomenology studies and boost phase intercept handover, 3) electronic and photonic materials and devices and wide band gap technology, 4) information processing and computing technologies, 5) directed energy, non-linear optical devices and processes, 6) Miniature Interceptor Technology (MIT) propulsion and kill enhancement and, 7) power generation and conditioning and thermal management. This project conducts proof-of-concept research and matures novel technologies for transition to advanced development. Other Applied Research projects more closely aligned with existing BMDO Surveillance, and Battle Management, Command, Control, Communications, Computers and Intelligence (BMC4I) technology efforts are managed under these projects respectively.

Small Business Innovation Research (SBIR) and the Small Business Technology Transfer (STTR) programs are managed under project 1660. Pursuant to PL 102-564, a two-phased competition for small businesses with innovative technologies is conducted, focusing on relevant BMDO technologies with an emphasis on technologies with commercial application potential. Per Office of the Secretary of Defense (OSD) Program Budget Decision implemented in the FY 2001 President's Budget

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>2 - Applied Research</b>	<b>PE NUMBER AND TITLE</b> <b>0602173C Support Tech - Applied Research</b>	
<p>Submission, mandatory SBIR/STTR programs are not budgeted (FY 2002-2007). Required SBIR/STTR programs are funded during the year of execution from internal BMDO resources.</p> <p>The program objective of the Technology Applications (TA) Program (managed under project 1660), established in 1986, is to develop and support the transfer of BMD-derived technology to other Department of Defense agencies as well as other federal, state, and local government institutions, laboratories, universities, and industry. Incorporation of technology applications by the private sector and other government agencies can result in reduced unit costs and further improvements to future BMDO applications.</p> <p>The Historically Black Colleges and Universities/Minority Institutions (HBCU/MI) program is also managed in project 1660 under this program element. The HBCU/MI program increases and improves the participation of minority colleges and institutions in BMDO programs. The program responds to Section 832 of Public Law (PL) 101-510, which establishes a five percent goal for minority research grants. The program introduces HBCUs and MIs to BMDO technology areas and the BMDO procurement process.</p> <p>Many of today's baseline technologies incorporated into BMDO systems like Theater High Altitude Area Defense (THAAD), Patriot Advanced Capability (PAC3), and Ground Based Radar (GBR) are viable due to the wise investment in innovative technologies some ten or more years ago. Examples include: indium antimonide and mercury cadmium telluride ultra-sensitive infrared detectors; 32-bit radiation hardened Reduced Instruction Set Computer (RISC) processors for image analysis; composite materials for lightweight satellite structures; interferometric fiber-optic gyroscopes for miniaturized guidance and control systems; and solid-state gallium arsenide transmitter/receivers for advanced BMDO radars; and dual wave passive imaging for BMD test missions.</p> <p><u>Acquisition Strategy:</u> The IS&amp;T program solicits proposals by an annual Broad Agency Announcement (BAA) of research opportunities. Proposals received are competitively judged according to BMD innovation, relevance, cost, and capabilities of the offeror. The HBCU/MI program also receives proposals in response to a biannual BAA. For the SBIR and STTR programs, strong emphasis is placed on the commercial nature of the proposed effort. BMDO conducts an annual SBIR/STTR solicitation and competition, and the executing agents award and manage the contracts. BMDO employs government executing agents, called Science and Technology Agents (STAs) from the Army, Navy, Air Force, and NASA, with each STA responsible for a specific technical area.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 10383 IS&amp;T (1651): Continued innovative applied research tasks. Prepared for the flight (4<sup>th</sup> Quarter) of the Dual Mode Experiment on Bowshock Interactions (DEBI) to compare results to existing phenomenology model. Continued plume phenomenology investigations for discrimination, typing, and hardbody handover. Continued development of innovative sensor technology including the computer tomographic spectrometer, antenna-coupled micro-bolometers, and multiwavelength imagers. Continued development of ultrafast switches and wavelength multiplexed transmitters for advanced communications systems. Continued development of advanced neural networks and other technologies for on-board autonomous navigation and control. Continued development of advanced miniature interceptor technology, propellant technology, and kill enhancement technologies. Continued development of active sensing technology and phenomenology for hypersonic interceptors. Continued to provide test bed for advanced sensor demonstrations and to provide coverage for national missions.</li> </ul>		
<i>Page 2 of 3 Pages</i>		Exhibit R-2 (PE 0602173C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>2 - Applied Research</b>	<b>PE NUMBER AND TITLE</b> <b>0602173C Support Tech - Applied Research</b>
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- 1532 Technology Applications (1660): TA Database: Maintained up-to-date information on potential BMD programs that have commercial applications. Updated graphics and interactive modes into national information infrastructure on BMD sponsored technologies. Panel Reviews: Provided assistance to large, medium, and small businesses wishing to bring BMD supported technology to the commercial market. Outreach: Developed assistance publications, brochures and target articles for journals and newspapers, quarterly newsletters, conference exhibits, and advertisements in reports on MDA technology. Networking: Expanded results of technology transfer by working with other Federal technology transfer organizations and activities such as the OSD DDR&E Director, Office of Technology Transition, NASA and Department of Energy (DOE). Interacted with professional/technical associations and societies involved with technology transfer and commercialization.
  - 15291 BMC4I (1461): Investigated photoconduction on active pixel sensors; initiate and begin joint effort with US Air Force (USAF) and NASA in laser communications networking between platforms of the Unmanned Aerial Vehicle, Low Earth Orbit satellite and ground station; initiate shipboard high precision Lidar system work with U.S. Navy at Pacific Missile Range Facility. Continued Bottom Anti-Reflective Coatings research based on successful SBIR efforts.
  - SBIR/STTR (1660): Awarded an estimated 200 Phase I SBIR Awards to 150 firms and 70 Phase II SBIR awards to 65 firms.
  - 1210 HBCU/MI (1660): Conducted competition and incrementally fund an estimated 10 contracts in the areas of electronics, sensors, materials, and BMC3.
  - 2803 Civilian Salaries (1660): Executing Agents for management of SBIR/STTR programs.
- Total 31219

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget (FY 2002 PB)	37747		
Congressional Adjustments	18500		
Appropriated Value	56247		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-516		
b. SBIR / STTR	-24895		
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming	383		
e. Rescissions			
Adjustments to Budget Years Since FY 2002 PB	-6528		
Current Budget Submit (FY 2003 Budget Estimates)	31219		

**Change Summary Explanation:**

Significant FY 2001 increase due to Congressional Action. Beginning in FY 2002, funding from this Program Element is moved to the Ballistic Missile Defense Organization Program Element 0603175C.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>3 - Advanced Technology Development</b>	<b>PE NUMBER AND TITLE</b> <b>0603173C Support Tech - Adv Tech Dev</b>
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COST <i>(In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	130716	0	0	0	0	0	0	TBD	TBD
1180 Surveillance Technologies	41578	0	0	0	0	0	0	TBD	TBD
1280 Interceptor Technologies	43323	0	0	0	0	0	0	TBD	TBD
1461 BMC4I	6222	0	0	0	0	0	0	TBD	TBD
1651 Innovative Science and Technology (IS&T)	8998	0	0	0	0	0	0	TBD	TBD
1660 Statutory and Mandated Programs	2898	0	0	0	0	0	0	TBD	TBD
3354 Targets	7066	0	0	0	0	0	0	TBD	TBD
3360 Test Resources	2613	0	0	0	0	0	0	TBD	TBD
4000 Operational Support	18018	0	0	0	0	0	0	TBD	TBD

The Ballistic Missile Defense (BMD) Program and resulting FY 2002 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY 2002, funding from this Program Element is moved to the Missile Defense Agency (MDA) Program Element 0603175C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.

**A. Mission Description and Budget Item Justification**

To prepare for critical future missile defense needs, BMDO will conduct a balanced program of high-leverage technologies, including international cooperative efforts, that yield improved capabilities across a selected range of advanced interceptor, sensor, and battle management technologies as well as advances in innovative science. The objectives of these investments are components and subsystems with improved performance and reduced costs for acquisition programs.

The BMD technology program is designed to resolve many key Research & Development (R&D) issues for future Theater and National Missile Defense (TMD/NMD) systems. BMDO crafts the program as a component of the overall Department technology plan. Efforts include:

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BUDGET ACTIVITY <b>3 - Advanced Technology Development</b>	PE NUMBER AND TITLE <b>0603173C Support Tech - Adv Tech Dev</b>	
<ul style="list-style-type: none"> <li>• Advanced active and passive sensor technology development, which is needed to detect, track, discriminate, and intercept advanced BMD threats. This includes the detection and tracking of low observable targets and other high-leverage sensor technologies. Force and systems level planning and analysis to identify promising technology for insertion into MDAP technical roadmaps and to assess their utility in meeting the ballistic missile defense future architecture vision (Project 1180).</li> <li>• Development and integration of critical technologies for performing hypervelocity hit-to-kill intercepts of ballistic missiles within and outside the atmosphere. Development and demonstration of advanced interceptor sensor processing and power components; interceptor guidance and divert subsystems, multifunctional materials and structures; low-cost interceptor composite manufacturing processes; and low-cost flight test demonstrations (Project 1280).</li> <li>• BMD Battle Management Command, Control, Communications, Computers and Intelligence (BMC4I) advanced technology programs to develop kill assessment, high-speed computing, secure &amp; reliable communications, sensor fusion, and interoperability technologies for NMD and TMD programs (Project 1461).</li> <li>• Continued development of low-cost ballistic missile launch vehicle alternatives (Project 3354).</li> <li>• Use of the new Infrared (IR) data collection capabilities provided by the High Altitude Observatory (HALO) upgrade and fuse IR data with Radio Frequency (RF) data collected on targets (Project 3360).</li> <li>• Required manpower aligned with the performance of these programs (Project 4000).</li> </ul> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 41578 Surveillance Technologies (1180): Completed analysis of Midcourse Space Experiment (MSX) data in support of Space-Based Infrared System (SBIRS) and NMD/Ground-Based Interceptors (GBI) programs. Continued research development and evaluation of radar technologies in the areas of Transmitter/Waveform Generators, Antennas, Threats/Environments, Receiver/Signal Processors, Controller/Data Processors, and Electro-Mechanical Support used by MDAPs. Refine the MDAP technology transition framework for sufficiently matured radar technologies. Launched Space Technology Research Vehicle (STRV) 1c/d experiments 1Q01. Continued STRV-2 on-orbit space experiments and continue analysis of experiment data.</li> <li>• 43323 Interceptor Technologies (1280): Completed Jet Interaction model validation. Deliver prototypes for Strapdown IR Seeker (SIS) and Solid Divert Attitude Control System (SDACS). Delivered Master Frequency Generator (MFG) to PAC-3. Completed test equipment and fused-sensor system for DITP. Reinstated work on range resolved Doppler radar. Grounded test Discriminating Interceptor Technology Program (DITP) hardware. Began design of advanced multi-functional interceptor structure. Continued development of advanced technology components for future interceptor systems.</li> <li>• 6222 BMC4I (1461): Investigated development of advanced interoperability messaging and translation protocols to improve communications. Investigated development of pre-planning and adaptive battle management tools to improve real-time battle status assessment. Continued development in low temperature deposition processes for thick silicon coatings on various substrates for optics; especially on large mirror surfaces needed in directed-energy weapon systems.</li> <li>• 8998 Innovative Science and Technology (1651): Initiated Wide Band Gap (WBG) semiconductor effort to integrate material and device development of gallium-indium-aluminum-nitride quaternary compound.</li> <li>• 7066 Targets – EXCALIBUR (3354): Continued development of low-cost ballistic missile launch vehicle alternatives. Funded supports the Phase III SBIR effort to build a liquid fueled target based on the EXCALIBUR design engine for a short duration test firing and to conduct additional design studies/prototype development for vehicle subsystems.</li> <li>• 2898 Civilian Salaries for BMDO (1660).</li> </ul>		
<i>Page 2 of 3 Pages</i>		Exhibit R-2 (PE 0603173C)



<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>3 - Advanced Technology Development</b>	<b>PE NUMBER AND TITLE</b> <b>0603173C Support Tech - Adv Tech Dev</b>
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- 2613 Test Resources (3360): RF/IR Data Fusion Testbed activity will provided a hardware development test bed matched to the real-time signal processor developed for the HALO upgrade. Test bed exploited the HALO upgrade, Optical Data Analysis activity, Radar Data Analysis activity, and the Missile Defense Data Center for historical data sets. Hardware test bed served multiple purposes including a software development role for surveillance asset development and advanced algorithm development.
  - 18018 Operational Support (4000): Continued providing management and support for BMDO overhead/indirect fixed costs, and continued to provide management and analysis support to the technology program in areas such as cost/schedule/performance assessment, cost estimating and analysis, budget analysis and formulation, program planning and control, and contract management.
- Total      130716

<b><u>B. Program Change Summary</u></b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002</u> PB)	93249		
Congressional Adjustments	38800		
Appropriated Value	132049		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-1212		
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions	-121		
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since <u>FY 2002</u> PB	37467		
Current Budget Submit ( <u>FY 2003</u> Budget Estimates)	130716		

Change Summary Explanation:  
Significant FY 2001 increase due to Congressional action.

Beginning in FY 2002, funding from this Program Element moved to the Missile Defense Agency Program Element 0603175C.

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<b>BUDGET ACTIVITY</b> <b>3 - Advanced Technology Development</b>	<b>PE NUMBER AND TITLE</b> <b>0603174C Space Based Laser</b>	<b>PROJECT</b> <b>1360</b>
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COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
1360 Directed Energy Program	69595	0	0	0	0	0	0	0	

The Ballistic Missile Defense (BMD) Program and resulting FY 2002 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY 2002, funding from this Program Element (PE) is moved to the Ballistic Missile Defense Organization (BMDO) PE 0603883C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.

**A. Mission Description and Budget Item Justification**

**Introduction:**

- This program element (0603174C, formerly part of PE 0603173C), the Space Based Laser (SBL) project, project number 1360, and the companion Air Force (AF) program element (0603876F) fund technology development efforts for the boost phase intercept concept that can provide national missile defense and operate in all theaters, regardless of size, geometry, or weather conditions.
- FY 2001 will be the first year under the new PE 0603174C. FY 2000 funding for the SBL project from BMDO PE 0603173C and from AF PE 0603876F are identified in Section C.
- A constellation of 20 to 40 SBL platforms would provide overlapping continuous, global coverage against missile threats. An SBL system could defend against missiles without putting the lives of US military personnel at risk. With its long range and speed-of-light engagement capability, it accomplishes boost phase intercept at the earliest possible moment, offering the highest probability that intercepted missile fragments (possibly containing active chemical/biological or nuclear materials) will fall within the attackers territory, not on defended assets. Each SBL platform would be provided with an initial fuel load and on-orbit refueling capability.
- The SBL project was structured to address the key critical technical issues:
  1. Can a chemical laser be built powerful enough to destroy a missile at militarily useful ranges? (Alpha program)
  2. Can mirrors and optics be built large enough and easily enough? (Large Advanced Mirror Program (LAMP) and Large Optical Segment (LOS))
  3. Can the high power beam be controlled adequately? (Large Optics Demonstration Experiment, (LODE))
  4. Can the high power components of a Space Based Laser be integrated on the ground and operated as a system? (Alpha LAMP Integration (ALI))
  5. Can missile targets be acquired and tracked from space and can a laser be pointed and fired accurately enough? (Acquisition, Tracking, Pointing, and Fire Control (ATP/FC))
  6. Can these key components be integrated into a functional unit suitable for space flight and remote operation? (Space Based Laser integrated ground demonstration known as the Integrated Test Unit (ITU))
  7. Can the fully integrated system operate adequately on-orbit? (SBL Integrated Flight Experiment (IFX)).

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>3 - Advanced Technology Development</b>	PE NUMBER AND TITLE <b>0603174C Space Based Laser</b>	PROJECT <b>1360</b>
<p><b>Progress To Date:</b></p> <ul style="list-style-type: none"> <li>• The Project demonstrated the answers to questions 1 through 4 (and partially 5) and has built devices to perform the respective functions.             <ol style="list-style-type: none"> <li>1. The Alpha program high-energy chemical laser achieved weapons-class power in 1991.</li> <li>2. LAMP and LOS demonstrated the ability to build optics of the required dimensions with the successful fabrication of a 4-meter segmented mirror in 1989 and a key segment of an 11 meter mirror in 1993.</li> <li>3. The Large Optics Demonstration Experiment (LODE) demonstrated the ability to control the projected (or outgoing) beam in low power laser experiments in 1987.</li> <li>4. The Alpha LAMP Integration (ALI) experiment demonstrated integrated open loop and closed loop fast steering mirror (FSM) and deformable mirror (DM) system operation in 1997.</li> <li>5. The basic technologies of acquiring and tracking missiles and pointing a high power laser beam from ground and space were demonstrated by a number of programs. The necessary ATP/FC technologies (sensors, optics, processors, etc.) were demonstrated at or near performance levels required for the SBL system. Stable low power laser beam pointing from a space platform was demonstrated at the precision level required for an operational SBL in 1991 during the flight of the Relay Mirror Experiment (RME).</li> </ol> </li> <li>• The high power components of an SBL payload were integrated at the Capistrano Test Site (CTS) and successfully achieved project objectives, thereby validating the SBL beam generation and control concepts. The ALI experiment successfully achieved all of its objectives:             <ol style="list-style-type: none"> <li>6. The integration of the Alpha high power laser with a LODE-derived beam control system and a beam expanded using the LAMP 4 meter mirror</li> <li>7. The use of uncooled optics in a high power beam train; and 3) the high power operation of the integrated hardware (LAMP with Holographic Optical Elements (HOEs), Outgoing Wavefront Sensor (OWS) behind the secondary mirror, and FSM and DM control optics). On 20 Feb 1997, the first integrated high power test of SBL technologies was successfully conducted at CTS. The second high power test was completed on 16 Jul 1997, with the OWS controlling the steering of the high power beam through the 4-meter LAMP mirror. The third, and final, high power test of the ALI experiment was completed on 22 October 1997, with the OWS controlling the steering and wavefront error of the high power beam through the 4 meter LAMP mirror. The water-cooled deformable mirror was replaced by an uncooled deformable mirror, and it performed successfully during a high power test on 9 June 1998.</li> </ol> </li> <li>• By previous guidance in PBD 224C (28 Dec 1998) the BMDO and United States Air Force SBL project is pursuing an integrated ground demonstration. It is known as the ITU. Additional guidance was provided by the Under Secretary of Defense for Acquisition, Technology and Logistics (USD (AT&amp;L)) memorandum to BMDO Director dated 25 Feb 1999) to structure a project plan leading to an SBL IFX in FY 2012/2013. Furthermore, the SBL project has been designated as a Pre-Major Defense Acquisition Program (MDAP) by the Under Secretary of Defense for Acquisition and Technology. A contract was awarded 8 February 1999 conveying total system authority (TSA) on a Joint Venture (JV) Team comprised of Lockheed Martin, TRW, and Boeing. Under TSA the government specifies broad objectives, and the JV is responsible for the content of the SBL IFX, including the ITU.</li> <li>• Stennis Space Center was selected as the site for the Performance Test Facility in January 2001.</li> <li>• Testing of a linear array of hypersonic low temperature (HYLTE) gain generator nozzles with the potential for more efficient laser operation was successful. Testing continues, and fabrication techniques for a cylindrical gain generator are being demonstrated. Phase conjugation is being explored for application to an advanced, possibly upgraded, operational system.</li> </ul> <p><b>Current Status:</b></p>		
Project 1360	<i>Page 2 of 4 Pages</i>	Exhibit R-2 (PE 0603174C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>3 - Advanced Technology Development</b>	PE NUMBER AND TITLE <b>0603174C Space Based Laser</b>	PROJECT <b>1360</b>
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- In FY 1999-2000, a space high energy laser (HEL) affordability and architecture study (A&AS) was conducted to determine if technically- or mission-derived constraints have changed sufficiently such that the SBL concept is no longer the most cost effective solution as determined by similar studies in the past.

**FY 2001 Accomplishments:**

- 56917 SBL Integrated Flight Experiment – Conduct IFX System Requirements Review (SRR); Continued fabrication, risk reduction, and design validation efforts for the laser, beam control system, beam expander, and ATP/FC.
- 5923 Mission Definition and Requirements Analysis – Continued operational system concept definition and alternate technology roadmap development; Updated the operational system baseline minimum technical data set; Continued operations concept and objectives development with AF Space Command; Continued lethality and system effectiveness assessments.
- 6755 Government IFX Support-provided programmatic support. Interface with IFX contractors, AF Space Command, and other participants in the SBL program.

Total 69595

**FY 2002 Planned Program:**

Beginning in FY 2002, funding from this Program Element is moved to the Missile Defense Agency (MDA) Program Element 0603883C – see corresponding R-documents for FY 2002 Planned Program.

<b><u>B. Program Change Summary</u></b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget (FY 2002, PB)	74537		
Appropriated Value	74537		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-825		
b. SBIR / STTR	-1624		
c. Internal Realignment	-2493		
Adjustments to Budget Years Since FY 2002 PB			
Current Budget Submit (FY 2003 Budge Estimates)	69595		

Change Summary Explanation:

BMDO funded its half of the joint AF / BMDO SBL Project from PE 0603174C "Space Based Laser" during FY 2001. BMDO transferred all SBL Project funding from PE 0603174C to BMDO PE 0603883C "Boost Defense Segment" beginning in FY 2002.

**MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)** DATE **February 2002**

BUDGET ACTIVITY  
**3 - Advanced Technology Development**

PE NUMBER AND TITLE  
**0603174C Space Based Laser**

PROJECT  
**1360**

**C. Other Program Funding Summary (\$ in Thousands)**

	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>Cost to Complete</u>	<u>Total Cost</u>
Space Based Laser, AF PE 0603876F	67414								

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>3 - Advanced Technology Development</b>	<b>PE NUMBER AND TITLE</b> <b>0603175C BMD Technology</b>
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COST <i>(In Thousands)</i>	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	139340	121751	155056	130299	142785	147457	Continuing	Continuing
6010 Advanced Technology Development	0	136561	118884	151421	125973	138348	139989	Continuing	Continuing
6090 Program Operations	0	2779	2867	3635	4326	4437	7468	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The flow down of BMD System (BMDS) capability specifications resulting from Missile Defense National Team efforts in BM/C2 and Systems Engineering & Integration will guide the integration of Ballistic Missile Defense (BMD) Technology into the BMD System, the BMDS BM/C2 architecture, and the BMDS testbed. By investing in innovation, advanced technology development enhances the Missile Defense Agency (MDA)'s capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

BMD Technology program is established to develop components, subsystems and new concepts needed to keep pace with the constantly evolving ballistic missile threat. Investments provide new capabilities for block upgrades to current BMDS elements as well as develop the enabling technology for new concepts and BMDS elements.

Many of today's baseline BMD projects are viable due to the wise investment in technology research, development and maturation. Examples include: the Lightweight Exoatmospheric Projectile (LEAP), indium antimonide and mercury cadmium telluride ultra-sensitive infrared detectors; 32-bit radiation hardened Reduced Instruction Set Computer (RISC) processors for image analysis; composite materials for lightweight satellite structures; interferometric fiber-optic gyroscopes for miniaturized guidance and control projects; and solid-state gallium arsenide transmitter/receivers for advanced missile defense radars; and dual wavelength passive imaging for BMD test missions.

Advanced technology development is organized around five main thrusts, four of which are oriented to the BMDS segments. The thrusts cluster technology tasks that have a synergistic effect in the three phases of a ballistic missile's flight as well as pushing for an ever-greater geographic coverage of the BMD system for maximum military utility and cost optimization. The first thrust, Terminal Missile Defense, continues investment in atmospheric interceptor technology needs for terminal missile defenses and introduces a novel concept for long range atmospheric defense. The second thrust, Midcourse Counter-Countermeasures, builds on the previous program of developing an interceptor seeker using fused active and passive sensors for defeating sophisticated penetration aids anticipated in future threats. It adds new projects to discriminate between pen aids and targets by improved ground-based radar projects, directly perturbing the objects and attacking multiple objects in midcourse by using miniature kill vehicles. The third thrust, Boost-Phase Intercept (BPI), provides a modest investment in novel early launch detection concepts and advanced high energy laser projects as risk reduction to the technical challenges of detecting and engaging a missile launch as early in its trajectory as possible. The final thrust, Global Defense, seeks to enhance the ability to provide continuous, global surveillance and precise tracking over very long ranges. Passive surveillance from space, that can quickly detect launches under all conditions and establish precise tracking, are crucial for boost phase and early midcourse intercepts.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>3 - Advanced Technology Development</b>	<b>PE NUMBER AND TITLE</b> <b>0603175C BMD Technology</b>	
<p>A number of technology activities, grouped in the Enabling Technology Support thrust, provide technology outputs that are applicable across multiple technology thrust areas. These activities are essential for robust, effective missile defense projects. Enabling Technology Support includes advanced technology development efforts in the multi-application areas of radar; focal plane arrays; materials, structures and power; space experiments; and engineering analysis. Enabling Technology Support also provides the only applied research efforts in the DoD which focus specifically on future BMD technical requirements. To prepare to meet critical future active defense needs, the efforts include an aggressive program of high-leverage technologies that yield markedly improved capabilities across a selected range of boost, midcourse, and terminal defense interceptors, advanced sensors, and innovative science. The Innovative Science and Technology (IS&amp;T) activity invests seed money in high-risk technologies that could significantly change BMD development. This activity conducts proof-of-concept research and matures novel technologies for transition to advanced technology development. The objective of the Technology Applications (TA) Program is to develop and support the transfer of BMD-derived technology to other DoD agencies as well as other federal, state, and local government institutions, laboratories, universities, and industry. Incorporation of technology applications by the private sector and other government agencies can result in reduced unit costs, accelerated technology maturity and reliability and further improvements to future MDA applications.</p> <p>Incrementally fund Historically Black Colleges and Universities / Minority Institutions (HBCU/MI) contracts in the areas of electronics, sensors, materials, and BMC3.</p> <p>This project executes directed interest activities that complement the baseline advanced technology development program, but are not sufficiently relevant to be included in that program.</p> <p>Program Operations: Covers government civilians performing program-wide oversight functions such as financial management, contracting, security, information systems support, and legal services at MDA's Executing Agents within the US Army Space &amp; Missile Defense Command, US Army 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. Also, includes reimbursable services acquired through the Defense Working Capital Fund (DWCF) such as accounting services provided by the Defense Finance and Accounting Services (DFAS), as well as funding for charges to canceled appropriations in accordance with Public Law 101-510.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 0 Prior efforts funding in 0602173C and 0603173C PEs</li> </ul> <p>Total 0</p> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 6205 Terminal Missile Defense: Initiate advanced development of advanced technology interceptor component addressing: extending the footprint for upper-tier BMD systems.</li> <li>• 55291 Midcourse Counter-Countermeasures: Initiate advanced development of discriminating seeker components including multicolor focal plane arrays and laser radars. Initiate advanced development of transportable discriminating radar and miniature kill vehicle concepts.</li> <li>• 4964 Boost-Phase Intercept: Initiate advanced development of early launch detection concepts and enhanced boost phase high energy laser systems.</li> </ul>		
<i>Page 2 of 4 Pages</i>		Exhibit R-2 (PE 0603175C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>3 - Advanced Technology Development</b>	PE NUMBER AND TITLE <b>0603175C BMD Technology</b>	
<ul style="list-style-type: none"> <li>• 11170 Global Defense: Continue advanced development of space-based passive surveillance component technologies. Initiate development of advanced concepts for airborne sensors and weapons.</li> <li>• 26777 Enabling Technology Support: Initiate advanced development and applied research of radar, focal plane arrays, MS&amp;P analysis; and other enabling technologies, concepts and processes. Use leveraging of commercial investment to advance the development and maturity of technologies to be used by BMD systems.</li> <li>• 3954 Incrementally fund an estimated 10 Historically Black Colleges and Universities / Minority Institutions (HBCU/MI) contracts in the areas of electronics, sensors, materials, and BMC3 selected in FY01 competition. Continue to provide assistance to large, medium, and small businesses bringing BMD supported technology to the commercial market through the TA program and other mechanisms.</li> <li>• 28200 Directed interest activities.</li> <li>• 2779 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents &amp; utilities, and supplies.</li> </ul> <p>Total 139340</p> <p><b>FY 2003 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 7092 Terminal Missile Defense: Continue with the advanced development of advanced technology interceptor component addressing: extending the footprint for upper-tier BMD systems.</li> <li>• 60279 Midcourse Counter-Countermeasures: Continue with the advanced development of discriminating seeker components including multicolor focal plane arrays and laser radars. Continue with the advanced development of transportable discriminating radar, miniature kill vehicle, and interactive discrimination concepts.</li> <li>• 8274 Boost-Phase Intercept: Continue with the advanced development of early launch detection concepts and enhanced boost phase high energy laser systems.</li> <li>• 14183 Global Defense: Continue with the advanced development of space-based passive surveillance component technologies. Continue development of advanced concepts for airborne sensors and weapons.</li> <li>• 25299 Enabling Technology Support: Continue with the advanced development and applied research of radar, focal plane arrays, MS&amp;P analysis; and other enabling technologies, and concepts</li> <li>• 3757 Incrementally fund an estimated 10 Historically Black Colleges and Universities / Minority Institutions (HBCU/MI) contracts in the areas of electronics, sensors, materials, and BMC3 selected in FY2001 competition. Continue to provide assistance to large, medium, and small businesses bringing BMD supported technology to the commercial market through the TA program and other mechanisms.</li> <li>• 2867 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents &amp; utilities, and supplies.</li> </ul> <p>Total 121751</p>		
<b>B. Program Change Summary</b>		
	<u>FY 2001</u>	<u>FY 2002</u>
Previous President's Budget (FY 2002 PB)	112890	112890
Appropriated Value	112890	28200
Adjustments to Appropriated Value	28200	



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>3 - Advanced Technology Development</b>	PE NUMBER AND TITLE <b>0603175C BMD Technology</b>
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a. Congressional General Reductions		-1750	
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since FY 2002 PB			121751
Current Budget Submit (FY 2003 Budget Estimates)		139340	121751

<b>C. Other Program Funding Summary</b>	<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
0603173C – Advanced Technology Development		0						CONT	CONT
0602173C – Applied Research		0						CONT	CONT
0603880C - BMD System		807993	1065982	1208546	1157025	1139885	1176979	CONT	CONT
0603881C - Terminal Defense Segment		200119	169974	200171	234318	228443	367744	CONT	CONT
0603882C - Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	CONT	CONT
0603883C - Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	CONT	CONT
0603884C – Sensors Segment		335338	373447	489181	1145680	899806	1007660	CONT	CONT

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603868C Navy Theater Wide - DEM/VAL				PROJECT 1266		
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
1266	Navy Theater Wide	440930	0	0	0	0	0	0	Continuing	Continuing
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>FY 2002 the Navy Theater Wide Program transferred to Program Element (PE) 0603882C, Mid-Course Defense System. This budget is prepared accordingly.</p> <p>The requirement for the Navy Theater Wide (NTW) Theater Ballistic Missile Defense (TBMD) system is to provide protection to U.S. and allied forces against medium to long range theater ballistic missiles (TBMs), which may be equipped with Weapons of Mass Destruction (WMD). This protection includes those political and military assets designated as vital to U.S. interests. NTW will provide an effective defense when the ship is positioned near the enemy TBM launcher to effect ascent phase intercepts; along the TBM trajectory as the TBM passes over water, or inland along the coast to effect midcourse intercepts; and, near the defended area to provide descent phase intercepts and achieve an additional layer of defense for lower-tier TBMD systems.</p> <p>The NTW system builds upon the existing AEGIS Weapon Systems (AWS) and the STANDARD Missile (SM) infrastructure as a further evolution to the Navy Area TBMD system. The AWS (as modified for Navy Area TBMD) will be evolved to support exoatmospheric ascent, midcourse, and descent phase TBM engagements. The Navy SM-2 Block IV has been modified to accommodate a new third stage propulsion system, a fourth stage kinetic warhead (KW), and associated exoatmospheric guidance. The new variant of the SM is the SM-3. The NTW AEGIS LEAP Intercept (ALI) Flight Demonstration Program (FDP) consists of a series of near-term flight tests with the primary objective of demonstrating that Lightweight Exoatmospheric Projectile (LEAP) technologies can be integrated with a modified SM-2 Block IV and AWS to hit a TBM target in the exoatmosphere.</p> <p>In April 1999, the NTW Program was reviewed by the Defense Acquisition Board (DAB) and on 4 May 1999 the Department issued an Acquisition Decision Memorandum (ADM). As part of the revised Upper Tier strategy, the Department directed the Navy to expand the ADM approved evolutionary acquisition approach to incrementally deliver Block I capabilities. From an acquisition viewpoint, the Department has directed the Navy to continue this evolutionary Block approach, through an initial system flight test program (AEGIS LEAP Intercept (ALI)), followed by developmental increments of the Block I system. These increments provide the warfighter with ascent-phase capability and provide the basis to evolve to the objective system using a spiral evolution acquisition strategy. The NTW program can deliver a warfighting capability by successive capability deliveries leading to a full ORD compliant NTW Block I system.</p> <p>In August 2000 Program Decision Memorandum (PDM) directed BMDO, in coordination with PA&amp;E and the Navy, to conduct a comprehensive study of the NTW program, including the radar, funding requirements, and missile procurement. The study was directed to reevaluate the Block I requirements; define Block II, including requirements and schedule; develop potential alternative solutions to fulfill NTW requirements; and, assess the implications of its findings on the appropriate course for Block I and II for the on-going U.S./Japan cooperative effort. Based on PDM study results that recommend skipping Block I development after ALI testing and progressing directly to Block II.</p>										
Project 1266		Page 1 of 6 Pages				Exhibit R-2 (PE 0603868C)				

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603868C Navy Theater Wide - DEM/VAL</b>	PROJECT <b>1266</b>

**NOTE:** In FY 2001 \$15,790K of the funding for NTW is for cooperative development efforts with the Government of Japan for NTW Block II technologies.

**FY 2001 Accomplishments:**

- 404772 Continued execution of the ALI FDP, FTR-1A and planning for FM-2, FM-3, and FM-4 test events. In January 2001 FTR-1A was successfully launched demonstrating SM-3 third stage airframe stability and control through nominal kinetic warhead (KW) ejection, and Third Stage Rocket Motor (TSRM) performance. Performed SM-3 SDACS qualification activities, including the successful SDACS KW Strapdown Integration Test (SIT) conducted in July 2001 and Qualification Test One (Q-1), a hot fire static test, successfully performed in August 2001. Participated in the Theater Critical Measurements Program-3B (TCMP-3B) flight test in February 2001 which enabled the collection of ascent phase TBMD data NTW sensors for end-to-end simulation validation using high-range resolution (HRR) radar, and SM-3 Captive Carry on board the Airborne Surveillance Testbed (AST); full CORAL TALON II Link architecture was established and interoperability objectives were accomplished. Participated in the successful launch of the Quick Reaction Launch Vehicle One (QLRV-1) in March 2001. Successfully tracked the QLRV-1 target and conducted simulated ascent phase intercept engagement using the ALI computer program; success of this test enabled the NTW program to meet its Threat Representative Flight Test Program (DT-1B) risk reduction objectives. Continued the development and manufacturing of ALI FTRs and associated ground hardware and test equipment. Continued AWS development engineering to support the ALI program. Concluded studies of alternate DACS. Continued work on Advanced Kill Vehicle pump-propulsion technology development and perform a liquid fuel handling and safety assessment. Continued Block II associated radar improvements competition. Continued design, development, and manufacturing of Block I FTRs. Continued Block I AWS development engineering. Continued Block I AWS development engineering, including common signal processor prototyping. Continued Block I systems engineering and program planning efforts.
  - 6258 Continued lethality requirement definition support and lethality performance testing of NTW KW.
  - 5934 Continued targets procurement to support NTW test and evaluation.
  - 15033 Continued Requirements, Analysis and Design (RA&D) cooperative development efforts with the Government of Japan on selected NTW Block II technologies.
  - 8933 Provided support for continued development of adaptive algorithms with BMDO.
- Total 440930

**FY 2002 Planned Program: In FY 2002 the NTW program transferred to PE 0603882C, Midcourse Defense System**

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget (FY 2002 PB)	382671		
Adjustments to Appropriated Value	+80000		
Appropriated Value	462671		
a. Congressional General Reductions	-4227		
b. SBIR / STTR	-10058		

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603868C Navy Theater Wide - DEM/VAL</b>	<b>PROJECT</b> <b>1266</b>
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c. Omnibus or Other Above Threshold Reductions					
d. Below Threshold Reprogramming	-5384				
e. Rescissions	-2072				
Adjustments to Budget Years Since <u>FY 2002</u> PB					
Current Budget Submit ( <u>FY 2003</u> Budget Estimates)	440930				

**Change Summary Explanation:**

FY2001: Increase \$80M Congressional add for NTW acceleration and advanced radar competition. Congressional General Reductions and Section 8126 reduction (\$5.296M). Rescission (\$1.003M) .

<b>C. <u>Other Program Funding Summary</u></b>	<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 0604867C Navy Area	267453	99302							

**D. Acquisition Strategy:**

The Navy strategy for NTW TBMD development calls for the evolution of the existing AWS, SM Vertical Launching System (VLS), and Battle Management Command, Control, Communications, Computers, and Intelligence (BMC<sup>4</sup>I) systems. This evolutionary approach leverages previous investments and takes advantage of already existing trained crews, industrial capability, engineering support, and previously developed assets such as the LEAP.

<b>E. <u>Schedule Profile</u></b>	<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>FY 2008</u>
Flight Test Round 1A	2Q							

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603868C Navy Theater Wide - DEM/VAL**

**PROJECT**  
**1266**

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. Missile Development	CPAF	Raytheon	1250688						1250688	
b. AWS & VLS Dev	CPAF	Lockheed Martin	432701						432701	
c. Radar Development	845	Lockheed Martin	59121						59121	
d. Radar Development	CPAF	Raytheon	59121						59121	
e. VLS Development	CPAF	United Defense	23734						23734	
f. Missile Dev / System Engineering	CPFF	JHU/APL	134353						134353	
g. System Engineering	CPFF	TSC	13813						13813	
h. AWS & Missile Dev / System Engineering	WR	NSWC Dahlgren	151070						151070	
i. AWS & Missile Dev / System Engineering	WR	NAWC China Lake	31674						31674	
j. System Engineering / RRA	MIPR	MIT/LL	50478						50478	
k. Alternate DACS Dev	MIPR	LLNL	8500						8500	
l. Alternate DACS Dev	CPFF	Aerojet	3000						3000	
m. Alternate DACS Dev		BMDO	500						500	
n. Alternate DACS Dev		Various	2000						2000	
o. Various		BMDO	111266						111266	
p. Various		Misc	37589						37589	
Subtotal Product Development:			2369608						2369608	

Remark:

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603868C Navy Theater Wide - DEM/VAL**

**PROJECT**  
**1266**

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. Engineering Support	CPFF	Anteon	8792						8792	
b. Engineering Support	CPAF	Marconi	6519						6519	
c. Engineering Support	CPFF	SSI/PSI	4207						4207	
d. Engineering Support	CPFF	SPA	1681						1681	
e. Mgmt & Prof Supt Svcs		Misc	1621						1621	
Subtotal Support Costs:			22820						22820	

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. DT&E	CPAF	Lockheed Martin	3554						3554	
b. DT&E	CPAF	Raytheon	3717						3717	
c. DT&E	CPFF	JHU/APL	10816						10816	
d. DT&E	WR	NAC Point Magu	5354						5354	
e. Lethality / DT&E	WR	NSWC Dahlgren	30793						30793	
f. DT&E	WR	NSWC Port Hueneme	10184						10184	
g. DT&E	MIPR	NAIC	7671						7671	
h. DT&E	MIPR	Nat'l Assess Group	2785						2785	
i. DT&E	WR	PMRF	23115						23115	
j. Targets	MIPR	SMDC Army	67663						67663	
k. DT&E	MIPR	SMDC Army	3884						3884	
l. DT&E		Misc	23938						23938	
m. Facilities	MIPR	NHTF	2501						2501	
Subtotal Test and Evaluation:			195975						195975	

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603868C Navy Theater Wide - DEM/VAL**

**PROJECT**  
**1266**

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Internal Operating	WR	NAVSEA	13096						13096	
b. Program Management	CPFF	Anteon	25194						25194	
c. Program Management	CPAF	Marconi	4860						4860	
d. Program Management	CPFF	SSI?PSI	5138						5138	
e. Program Management	WR	NSWC Dahlgren	34425						34425	
f. Program Management	WR	NRL	6188						6188	
g. Program Management	WR	NAWC China Lake	18361						18361	
h. Program Management	WR	MWAD	5304						5304	
i. Program Management	WR	NSWC Indian Head	5238						5238	
j. Program Management		Misc	4009						4009	
k. Program Management		Misc	4165						4165	
Subtotal Management Services:			125978						125978	

Remark:

Project Total Cost:			2714381						2714381	
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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 2002	
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603869C MEADS - DEM/VAL (PD-V)				PROJECT 1262	
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
1262 Medium Extended Air Defense System (MEADS)	49700	0	0	0	0	0	0	Continuing	Continuing
<p><b>A. <u>Mission Description and Budget Item Justification</u></b>                      The MEADS program (PE0603869C) to include programmatics and funding will transfer to PE 0603881C, Terminal Defense Segment, FY 2002.</p> <p>The Medium Extended Air Defense System (MEADS) is an objective force system. It is an international cooperative program essential to fulfill the requirements of the U.S. Army and the U.S. Marine Corps for a low-medium air defense system in the 21<sup>st</sup> century. MEADS will offer a significant improvement in tactical mobility and strategic deployability over comparable missile systems. It will defend the maneuver force and other critical forward-deployed assets against short and medium range Theater Ballistic Missiles (TBMs), cruise missiles and other air-breathing threats throughout all phases of tactical operations. MEADS will operate both in an enclave with upper-tier systems in areas of debarkation and assembly and provide continuous coverage alone or with Short-Range Air Defense Systems (SHORAD) in the division area of the battlefield during movement to contact and decisive operations. MEADS will be interoperable with other airborne and ground-based sensors and utilize a netted and distributed architecture and modularly-configurable battle elements to provide a robust, 360-degree defense against short and medium range TBMs, cruise-missiles, unmanned-aerial-vehicles, tactical air to surface missiles, rotary-wing and fixed-wing threats.</p> <p>The MEADS program has been restructured to leverage the interceptor from the PATRIOT Advanced Capability – 3 (PAC-3) program and to extend the Program Definition/Validation (PD/V) phase with a three-year Risk Reduction Effort (RRE) that focuses on developing the critical technologies required for maneuver force protection and overall risk reduction. Pending formal approval of the International Memorandum of Understanding (MOU), a U.S. funded bridging effort commenced on 14 August 2000 to begin work on the highest risk and long-lead items in the RRE Scope of Work.</p> <p>There remains a critical void in maneuver force defense against short and medium range TBMs, cruise missiles, and low-to-medium altitude advanced air-breathing threats. This program will meet this challenge by integrating the PAC-3 missile and developing the critical technologies required for maneuver force protection, including development of a prototype lightweight launcher, 360-degree radar and tactical operation center. Concepts will be validated through proof-of-principle testing capitalizing on the already programmed Air-Directed Surface-to-Air Missile (ADSAM) demonstration efforts. The PAC-3 missile is the baseline interceptor for MEADS. Sensor and battle management software technology from both U.S. and international programs will be examined to enhance and augment organic-equipment functions, reducing development cost and risk. Improvements will be balanced against costs and the projected threat to develop a U.S. and allied capability to counter the maneuver force threat. This approach emphasizes prototyping of system-specific and surrogate hardware in key areas of Battle Management/Command, Control, Communications, Computers, and Intelligence (BM/C4I), fire control radar, and light weight launcher to satisfy mobility, strategic deployability and interoperability requirements. Cost as an Independent Variable (CAIV) analysis will be applied to the currently defined requirements. The Ballistic Missile Defense Organization (BMDO) is responsible for overall program management and direction. The U.S. Army Program Executive Officer for Air and Missile Defense and the MEADS National Product Office execute the program for BMDO.</p>									
Project 1262			Page 1 of 5 Pages			Exhibit R-2 (PE 0603869C)			



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603869C MEADS - DEM/VAL (PD-V)</b>	PROJECT <b>1262</b>
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**FY 2001 Accomplishments:**

- 35518 Continued U.S. contribution to the NATO MEADS Management Agency (NAMEADSMA) International Program Office operational and administrative budgets for the MEADS RRE contract and continued development of digital end-to-end simulation, development of prototype launcher, fire control and BM/C4I hardware and associated software and test planning.
  - 3000 Conducted program integration efforts that will examine Department of Defense (DoD) Joint Vision and Army transformation objective force mix and integration issues; support MEADS in the test and evaluation of Air and Missile Defense (AMD) task force interoperability and BMDS system integration; support development and maintenance of Joint Data Network Interface requirements and planning and appropriate planning of MEADS manpower, training, human factor and safety issues.
  - 7182 Continued funding for government agencies and support contracts to provide technical analysis and tools in specialty areas of lethality, BM/C4I and system simulations, as well as support of conducting independent evaluations of contractor trades and analysis.
  - 4000 Continued MEADS program management, support and salaries for both the national and international program offices. Includes U.S. efforts tied to national support of executing the replanned program and OSD directed documentation plan.
- Total 49700

**FY 2002 Planned Program:**

- 0 Reported under Terminal Defense Segment, Program Element 0603881C.
- Total 0

<b>B. Program Change Summary</b>	<u>FY2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget (FY 2002 PB)	63175		
Congressional Adjustments	53475		
Appropriated Value			
BMDO Adjustments			
Adjustments to Appropriated Value			
a. Congressional Reductions	-716		
b. SBIR/STTR	-1160		
c. OSD Reductions			
d. Gov't wide Realignment (OSD)			
e. Rescissions	-116		
Adjustments to Budget Years Since <u>FY 2002 PB</u>	-1783		
Current Budget Submit ( <u>FY 2003</u> Budget Estimates)	49700		

Change Summary Explanation:

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603869C MEADS - DEM/VAL (PD-V)</b>
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FY2001 -\$3775K:  
 -\$372K for .7% general reduction  
 -\$344K for section 8116 reduction  
 -\$1160K for SBIR reduction  
 -\$116K FY01 congressional rescission  
 -\$1783K BMDO reductions

<b>C. <u>Other Program Funding Summary</u></b>	<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>
N/A									

**Acquisition Strategy:** The MEADS acquisition strategy included competition between two transatlantic industrial teams in the PD-V phase. These two international entities prepared and competed for the PD/V phases. As the Department of Defense and partner nations restructured the program, the PD/V phase was extended with the selection of a single contractor team to conduct a three-year RRE. In August 2000, the Defense Acquisition Executive (DAE) approved entry in the RRE. In this phase, technology from Germany, Italy and the United States, including the PAC-3 missile, will be leveraged to define the most cost-effective solution to meet the MEADS operational requirements. The MEADS Product Office is also pursuing integration of MEADS BMC4I with the Project Manager, Air & Missile Defense Command and Control Systems (AMDCCS), to take advantage of other Army developments that can be incorporated into the MEADS program.

<b>E. <u>Schedule Profile</u></b>	<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>
RRE Contract Award	4Q						

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603869C MEADS - DEM/VAL (PD-V)</b>	PROJECT <b>1262</b>
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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. International Teaming	FFP	LM/H&R Teams, AL	9605						9605	
b. Proj Def-Val (PD/V)	FFP	NAMEADSMA, AL	101672						101672	
c. Risk Reduction (RRE)	CPFF	LMMC, FL	6612						6612	
d. Bridging Effort	CPFF	NAMEADSMA, AL	12000						12000	
e. Implement TPRP	CPFF	LMMC, FL	3000						3000	
f. Multi-Spectra RF Datalink	CPFF	LMMC, TX	3000						3000	
g. Risk Reduction	CPFF	NAMEADSMA, AL	52580						52580	
h.										
Subtotal Product Development:			188469						188469	

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. Int'l Program Office	LOE	NAMEADSMA, AL	6046						6046	
b. U.S. Anal of Alternatives	LOE/MIPR	MEADS Product Office, AL	2298						2298	
c. U.S. Contracts	LOE	MEADS Product Office, AL	8400						8400	
d. U.S. OGAs	MIPR	MEADS Product Office, AL	11160						11160	
e.										
Subtotal Support Costs:			27904						27904	

Remark:

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603869C MEADS - DEM/VAL (PD-V)</b>	PROJECT <b>1262</b>
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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	TBD
a. Redstone Tech Test Ctr	MIPR	Huntsville, AL	253						253	
b. ADSAM		SMDC, AL	9915						9915	
c.										
Subtotal Test and Evaluation:			10168						10168	

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. Internal Operating	In-House	MEADS Prod Office /NAMEADSMA, AL	14606						14606	
b.										
Subtotal Management Services:			14606						14606	

Remark:

Project Total Cost:			241147						241147	
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Remark:

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603871C NMD</b>	<b>PROJECT</b> <b>2400</b>
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COST ( <i>In Thousands</i> )	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
2400 National Missile Defense	1823723								

**THE PROGRAM REPRESENTED IN THIS R-2 HAS BEEN RESTRUCTURED FOR FY2002 AND BEYOND AND IS CAPTURED IN PE 0603882C, MIDCOURSE DEFENSE SEGMENT (MDS).**

**A. Mission Description and Budget Item Justification**

The National Missile Defense (NMD) program is designed to protect the nation against long range ballistic missile threats. The Program contributes to each of the three components of the nation’s broad strategy to deal with proliferation; preventing and reducing the threat, deterring the threat, and defending against the threat.

The Program is to assess the technical feasibility, schedule, and cost associated with maintaining a system development path that supports an accelerated, evolutionary acquisition strategy to design, develop, integrate, and test the entire system a systems capability to counter more complex threats. Department of Defense (DoD) conducted a Deployment Readiness Review (DRR) in August 2000. On 1 September 2000, the President decided to continue development and testing and defer the deployment decision.

To execute the program, Boeing North America was competitively awarded the Lead System Integrator (LSI) contract in April 1998. Under that contract, Boeing was required to meet performance requirements. The original contract was closed out in December 2000 and the Boeing Company was awarded a new contract, as the NMD Prime, to continue program development with options to support deployment.

The key NMD system element includes 1). Ground Based Interceptor (GBI) (consisting of a kill vehicle and booster, and GBI support equipment including Command and Launch Equipment (CLE); 2). Ground and space-based sensors, and 3). A Battle Management, Command, Control, and Communication (BM/C3) system. The ground-based sensors include development of an X-Band Radar (XBR) and the upgrade of existing Early Warning Radars (EWR). The BM/C3 system includes command and control and engagement planning capabilities, a communication network, and a communication system to transmit data to and from the interceptor while in flight. The NMD system will also use space-based assets for threat detection and tracking, such as the Air Force’s Defense Support Program (DSP), and eventually the Air Force’s Space Based Infrared System (SBIRS). SBIRS is an integral part of enhancing future NMD capabilities.

NMD DEVELOPMENT/INTEGRATION provides for the Prime Contractor to develop and integrate the individual NMD elements into a cohesive system. In FY 1998, the BM/C3 contract transitioned to Boeing, under the LSI contract. In FY 1999, the Exoatmospheric Kill Vehicle (EKV), Payload Launch Vehicle (PLV) and Integrated System Test Capability (ISTC) contracts were assumed by Boeing. At the end of FY 2000, the last of the NMD legacy contracts, the Ground Based Radar Prototype (GBR-P) contract transitioned to Boeing. The Prime Contractor will validate system performance and perform the necessary system-level trade studies to appropriately allocate element requirements with full consideration of Cost as an Independent Variable (CAIV). The Prime Contractor will operate and maintain NMD models and simulations to include ISTC, system Hardware in the Loop (HWIL), and LSI Integrated Distributed Simulation (LIDS). Until booster development is

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603871C NMD</b>	<b>PROJECT</b> <b>2400</b>
<p>complete, EKV flight tests will be flown on the PLV ( a booster, comprised of Minuteman (MM) II second and third stages). Development of the Commercial Off-the-Shelf (COTS) booster consists of integrating a Gemini-40 first stage and Orbus-1A second and third stages. The booster will be tested during two verification flights in 3Q and 4Q, FY 2001. BM/C3 incremental prototypes will be integrated and demonstrated in a distributed fashion at multiple locations, and assessed with user participation to refine and focus the BM/C3 development and system behavior. Government leads/PM provide oversight of Prime Contractor counterpart Integrated Product Team (IPT).</p> <p>SENSOR TECHNOLOGY includes research and development efforts for critical sensor components, which support infrared surveillance, acquisition, tracking, and discrimination functions for use in the SBIRS Low system. Projects in radiation hardened electronics and spacecraft computers, focal plane arrays (FPAs), long-life cryogenic coolers, signal/data processing and optics are developing state-of-the-art technologies essential to operating in a space environment and viewing targets against the earth limb and space backgrounds. The projects provide mission enabling, risk and production cost reduction technologies for SBIRS Low.</p> <p>THE GBI contracts (EKV, PLV and ISTC) transitioned to the Prime Contractor in FY 1999. EKV sensor flight tests were successfully accomplished in 3Q, FY 1997 and 2Q, FY 1999. COTS booster development began in FY 1998. The PM GBI performs oversight of NMD Prime Contractor GBI development, integration and test, and deployment planning activities, manages and provides specific Government Furnished Equipment (GFE) to include transportation, testing, and facilities maintenance. Additionally, this office will conduct Independent Verification and Validation (IV&amp;V) of Prime Contractor GBI hardware and software efforts and other required Independent Performance Assessments. The Prime Contractor is responsible for the booster, test facilities, primary production facilities, Peculiar Support Equipment (PSE), Command Launch Equipment (CLE), EKV subcontractors and the integration and test of the GBI element.</p> <p>THE BM/C3 functional area will provide technical oversight of all BM/C3 development activities of the NMD Prime Contractor, BM/C3 software models and simulations, IV&amp;V and Verification, Validation and Accreditation (VV&amp;A), provision of the Joint National Test Facility (JNTF) BM/C3 Element Support Center and BM/C3 Element Laboratory to support BM/C3 development and system test, and technical oversight of the procurement of the NMD Communications Network (NCN).</p> <p>THE XBR is the NMD sensor responsible for acquisition, tracking, discrimination, fire control support, and kill assessment. The Shemya XBR design is being executed by the NMD Prime Contractor. An XBR testbed that leveraged off the Theater Missile Defense Ground Based Radar (TMD-GBR) program (designated GBR-P) has been developed and installed at USAKA, Kwajalein Missile Range (KMR). The GBR-P participates in NMD Risk Reduction Flights (RRF) and Integrated Flight Tests (IFT). Beginning in FY 2001, GBR-P management and upgrades will be combined with the XBR efforts of the Prime Contractor.</p> <p>THE UPGRADED EWR (UEWR) hardware efforts and software upgrades were transitioned to Boeing, under the LSI contract in FY 1998. The UEWRs will detect, count and track the individual objects in a ballistic missile attack early in their trajectory. The data will be used for interceptor commit and XBR cueing. Efforts include IV&amp;V and VV&amp;A along with independent discrimination analysis.</p> <p>SYSTEM ENGINEERING develops the NMD system-level performance and integration requirements as prescribed in the Capstone Requirements Document (CRD) and Operational Requirements Document (ORD), and then flows them down to the individual NMD elements. The System Engineer identifies and mitigates system risk and institutes CAIV and other initiatives to facilitate system affordability. In addition, the System Engineer plans and directs Command and Control Simulations</p>		
Project 2400	Page 2 of 13 Pages	Exhibit R-2 (PE 0603871C)

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603871C NMD	PROJECT 2400
<p>(C2Sims) in which analyses, simulations, and tests are performed. C2Sims evaluates system effectiveness, proposed NMD system architectures, and Concept of Operations (CONOPS) against near and far-term ballistic missile threats. In addition, the System Engineer focuses on system-level balancing, verification, and validation of the integrated NMD system. At the request of the Ballistic Missile Defense Organization (BMDO), as well as the Office of the Secretary of Defense (OSD) and other external agencies, the System Engineer conducts Ad Hoc studies in support of treaty analysis, policy guidance, and other NMD derived missions.</p> <p>DEPLOYMENT &amp; SUSTAINMENT (D&amp;S) comprises development of plans and analysis to support system production, deployment and sustainment to include: Manpower Personnel Training (MPT) analysis; maintenance and supply support planning; site activation/deployment planning; Government Furnished Property/Government Furnished System/Government Furnished Facilities (GFP/GFS/GFF); and Environmental Safety and Health (ESH) activities. The effort includes conducting siting analyses and supporting site selection; preparing statutory National Environmental Policy Act (NEPA) and other ESH compliance analyses and documentation; establishing facilities requirements, assessing existing facilities, and developing MILCON programming and budget documentation.</p> <p>SYSTEM TEST AND EVALUATION activities involve managing and overseeing the NMD test and evaluation program, including execution of the lethality ground and flight test programs, and development of program test documentation such as the Test and Evaluation Master Plan (TEMP). Managerial oversight and execution responsibilities ensure the following are available: (1) test infrastructure (including test ranges and instrumentation); (2) oversight of Prime Contractor Ground-Based Test Models &amp; Simulations; (3) target development for sensor and intercept tests; (4) sensor technology enhancements; (5) revised program strategy changes that include multiple engagements, test range upgrades, and the development of the new target booster; and (6) upgrades to government test facilities for the Prime Contractor. Management activities include detailed test plans, and post-test analysis plans for each ground and flight test. Post-test evaluation, analysis, review and reporting are also provided for under this project. Included in this area is the Discrimination program which provides the U.S. with the capability to generate high confidence target signatures for ballistic missile defenses. This is a critical adjunct to the design and evaluation of NMD system performance across the full spectrum of threats and engagement scenarios. This program provides signature collection sensors for live-fire missions and analysis of the resulting test data. Additionally, predictive models of target signatures are developed, as well as algorithms for the critical functions of discrimination, target handover and aimpoint selection.</p> <p>TEST TRAINING AND EXERCISE CAPABILITY (TTEC) will develop and implement through the Prime Contractor the hardware and software to meet the program management, technical and administrative support requirements of testing, training and conducting exercises. The Operational Support Group (OSG) will over see and facilitate the development of the NMD training program through its interface with the User community. TTEC also provides training development and reviews and assesses NMD System Training Plan.</p> <p>THE TECHNICAL DIRECTOR ensures a totally integrated effort of system engineering, test and evaluation, and production and logistics support over the system life cycle. Includes the process of system definition/baseline development; design engineering; systems engineering; software management; developmental and operational test and evaluation; reliability, availability and maintainability (RAM); standardization and specifications; countermeasures mitigation; and product improvement. Represents the Program Executive Officer in OSD, Joint Staff, congressional staff and international forums.</p> <p>MANAGEMENT AND OPERATIONAL SUPPORT provides personnel and related support common to all NMD projects including support to the Office of the Director, BMDO and his staff located in Washington, DC, as well as BMDO's Executing Agents within the U.S. Army Space and Missile Defense Command, U.S. Army PEO Missile Defense, U.S. Navy PEO for Theater Defense, U.S. Air Force PEO office and the JNTF. This project supports funding for overhead/indirect</p>		
Project 2400	Page 3 of 13 Pages	Exhibit R-2 (PE 0603871C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603871C NMD</b>	<b>PROJECT</b> <b>2400</b>
<p>personnel costs, benefits and infrastructure costs such as rents, utilities and supplies. Additionally, this project maintains NMD Joint Project Office (JPO) operations as well as JPO scientific, engineering and technical assistance contractor support.</p> <p>This project is assigned to the Budget Activity and Program Element codes as identified in this descriptive summary in accordance with existing DoD policy.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 1285134 NMD Development/Integration: Prepared for NMD System CDR. Conducted IFT-6 with all elements in-line. Completed UEWR hardware CDR software Build 2. Conducted BI-2 (BM/C3) Release Review. Continue booster development. Conduct Booster Verification (BV) Pathfinder and Flight Test 2. Initiated Alternate Booster Development Program. Upgraded XBR and EKV algorithms. Closed out the LSI contract and initiated the new NMD Prime contract with Boeing. Restructured NMD development program to a capabilities based block/increment upgrade effort incorporating spiral development concept. Planned for an increased flight test tempo and add multiple simultaneous engagements.</li> <li>• 11586 Sensor Technology: Delivered Lot 3 (final) FPAs of LWIR focal plane program. Initiated a focal plane producibility effort to support fabrication of flight units and reduce manufacturing costs. Continued Silicon FPA program for SBIRS Low. Continued visible array rad hard star tracker program; continued FPA performance testing. Completed cryocooler efforts through life and performance testing. Continued development of cryogenic integration technologies in cooperation with SBIRS Low contractual designs. Continued performance and life testing of cryocoolers. Continue development of cryocooler prototype. Continued development of rad hard electronics components/devices. Flight tested a space optics cleaner prototype and finalized the design. Support continued development of adaptive algorithms.</li> <li>• 38712 GBI: Performed oversight of GBI design development, integration and test, test planning, and deployment planning. Monitored EKV flight unit integration for IFT-6, and pre-mission flight tests. Supported IFT-6, including post test data reduction. Conducted IV&amp;V and VV&amp;A assessments. Monitored Alternate Boost Vehicle development activities. Supported BV Pathfinder and Flight Test 2, and post test data reduction</li> <li>• 29716 BM/C3: Performed oversight of BI-1. Supported IFT-6, and IGT-6. Performed technical oversight of engineering and acquisition activities for NCN. Conducted IV&amp;V and VV&amp;A assessments. Supported initiation of Cheyenne Mountain integration and provide user interaction with United States Space Command (USSPACECOM). Supported BM/C3 participation in C2 Simulations and Battle Planning Exercises.</li> <li>• 20977 XBR: Validated XBR hardware and software design (CDR). Supported system flight and ground test planning, execution, and post-test independent analysis. Supported evaluation of algorithms. Conducted SW IV&amp;V and VV&amp;A assessments</li> <li>• 9431 UEWR: Continued Real Time DII-COE evaluation for UEWR. Supported system flight and ground test planning, execution, and limited post-test independent analysis. Supported evaluation of tracking and object classification algorithms. Conducted hardware CDR. Supported discussion of issues with radars located on foreign soil as well as activities associated with EWR's Environmental Impact Statement (EIS), Radio Frequency Interference (RFI), and Ionospheric Data Collections (IDC).</li> </ul>		
Project 2400	Page 4 of 13 Pages	Exhibit R-2 (PE 0603871C)



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603871C NMD</b>	PROJECT <b>2400</b>
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- 49117 System Engineering: Performed JPO level system engineering and integration activities. Refined NMD SRD. Provided support for NMD system requirements and design reviews, internal and external interface development/implementation cost assessment support, elevation of deployment readiness, and system deployment. Continued mitigation of system risk and implementation of CAIV and other initiatives to facilitate system affordability. Developed and updated Initial Block and Block 1 Increment 1 NMD System CARD and develop Long Term capability annex against technical requirements. Updated the NMD STAR. Developed/updated “design-to” and “analyze-to” parameters and scenarios. Conducted C2Sim exercise and tabletops. Continued integration with the SBIRS Program Office to ensure satisfaction of NMD system requirements. Performed nuclear environment calculations/requirements verification. Conducted data fusion/system discrimination development. Coordinated system VV&A and maintain IV&V capability to perform system VV&A.
  - 44699 Deployment & Sustainment: Continued development of the initial NMD System sustainment program planning to include maintenance and supply support. Completed XBR and GBI facility designs. Completed site-specific designs of IDT. Began design of non-tactical facilities at GBI site. Continued ESH documentation. Completed element RAM and supportability testability data and issue analysis reports. Provided Human System Integration (HSI) domain assessment criteria to service components for review. Developed and issued System Producibility and Manufacturing (P&M) Plans. Implemented the baseline approach to meeting TTEC requirements.
  - 146320 System Test and Evaluation: Supported IGT-6. Updated TEMP. Conduct IFT-6 pre-mission and mission activities. Evaluated post-test results. Monitor RRF 11. Completed VV&A of IFT-8 target. Continued lethality and live fire testing plan. Coordinated test range infrastructure and upgrades to support EKV flight test from KMR. Coordinated test range instrumentation upgrades and provide data collection and analysis for NMD testing. Conducted target launch for IFT-6 from VAFB. Monitored BV Pathfinder and Flight Test 2. Provided ground facility infrastructure and upgrades for NMD testing including: aerothermal testing at Tunnel 9, lethality testing at the Arnold Experimentation and Development Center (AEDC) Range G, and Infra-Red (IR) sensor testing at the 7V/10V Chamber at AEDC and Portable Optical Sensor Tester (POST).
  - 188031 Management and Operational Support: Provided management and operations support.
- Total 1823723

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President’s Budget (FY 2002 PB)	1740238		
Adjustments to Appropriated Value	135000		
Appropriated Value	1875238		
a. Congressional General Reductions	-13098		
b. SBIR/STTR	-28331		
c. Omnibus or Other Above Threshold Reductions	-4075		
d. Below Threshold Reprogramming	-5508		
e. Recissions	-4188		
Adjustments to Budget Year Since FY 2002 PB	3685		

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603871C NMD</b>	<b>PROJECT</b> <b>2400</b>
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Current Budget Submit (FY 2003 Budget Estimates)	1823723	
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Change Summary Explanation: This PE was deleted as part of an approved program restructure starting in FY 2002. The FY 2002 funding and beyond for MDS is included in Projects 3011 and 3012 in Program Element 0603882C.

<b>C. <u>Other Program Funding Summary</u></b>	<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 0603871C NMD MILCON Design	35350								
PE0603871C NMD MINOR MILCON	2000								
PE 0603871C NMD MILCON Construction	9030								
PE 0208871C NMD Procurement	0								

**D. Acquisition Strategy:** The NMD program adopted an evolutionary acquisition strategy using a capability based program process with block upgrade development that can deliver specific levels of system performance. The program adopted a spiral development methodology in recognition of the rapidly changing technology environment and the need to satisfy Government requirements that are defined in general terms within an evolving technology base. This strategy will (1) allow early implementation of a capability while supporting an evolving requirement/threat definition process, (2) minimize the risks of obsolescence posed by the rapid pace of technology development, (3) provide opportunities to update a system to a changing set of standards, and (4) allow informed trades between cost, schedule, and performance while exploring operational possibilities.

<b>E. <u>Schedule Profile</u></b>	<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>FY 2008</u>
<u>Engineering Milestones</u>								
UEWR Hardware CDR	2Q							
<u>Test and Evaluation Milestones</u>								
C2Sim 00	1Q							
IFT-6	4Q							
IGT-6	4Q							
BV-1 Pathfinder	3Q							
BV-2	4Q							
BM/C3 Build Increment 2	3Q							
RRF-10	1Q							
RRF-11	2Q							
TTEC PDR	1/3Q							

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603871C NMD**

**PROJECT**  
**2400**

\* This project this program has been restructured and transitioned to Program Element 0603882C starting in FY 2002.

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
<b>Prime Contractor</b>										
	CPAF	Boeing*	3166443						3166443	
<b>GBI</b>										
	CPFF	Boeing	293194						293194	
	TM	CSC (formerly NRC)	24070						24070	
	CPFF	Sparta	10748						10748	
	TM	Mevatec	16654						16654	
	CPFF	SY TECH	6553						6553	
	TM	TBI (formerly TBE)	29471						29471	
	CPFF	Stone Engineer	5557						5557	
	CPFF	COLSA	10						10	
	FFRDC	MITRE	615						615	
	MIPR	OGA'S	41627						41627	
	N/A	GBI IOB	6045						6045	
	N/A	Misc Contracts	20560						20560	
<b>BM/C3</b>										
	N/A	NWSC	12117						12117	
	CPAF	TRW	20284						20284	
	FFRDC	MITRE Corp.	13104						13104	
	BPA (ITSP)	Sencom (ITSP)	7891						7891	
	CPFF	Sparta	12457						12457	
	TM	NRC	7874						7874	
	MIPR	GFE	3762						3762	
	N/A	Misc Contracts	7667						7667	
	CPAF	CST-HSV	1192						1192	
	MIPR	QRI-HSV	2307						2307	
	CPAF	CSC-HSV	1461						1461	
	MIPR	AMCOM	1467						1467	
	MIPR	USASMDC	3279						3279	
	N/A	DISDA-GFX	9813						9813	

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MDA RDT&E COST ANALYSIS (R-3)							DATE	
BUDGET ACTIVITY							February 2002	
<b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE			PROJECT	
				<b>0603871C NMD</b>			<b>2400</b>	
	CPFF	COLSA	130				130	
	CPAF	Vanguard Res.	1356				1356	
	BPA	TECOLOTE	690				690	
	MIPR	USAF ESC	65				65	
	MIPR	ARL	1300				1300	
<b>XBR</b>								
	CPFF	Raytheon	164361				164361	
	CPAF	TBE	16847				16847	
	CPAF	COLSA	18722				18722	
	CPAF	NRC	8844				8844	
	MIPR	MIT LLNL	15380				15380	
	TM	Ga Tech	5548				5548	
	TM	Mevatec	8029				8029	
	N/A	Misc OGA/IOB	19881				19881	
	N/A	Other Spt	7258				7258	
<b>UEWR</b>								
	PR	MITRE Corp.	2093				2093	
	BPA (ITSP)	SENCOM	8936				8936	
	BPA (ITSP)	TECOLOTE	1481				1481	
	CPR/PR	MIT LLNL	2514				2514	
	CPAF/MIPR	TRW @ JNTF	1433				1433	
	MIPR	GSA (Xontech )	1098				1098	
	MIPR	GSA (AFRL)	340				340	
	N/A	Misc Contracts	6081				6081	
<b>SENSOR TECHNOLOGY</b>								
	N/A	Cubic	365				365	
	CPAF	Ball	50				50	
	CPFF	Raytheon	1309				1309	
	N/A	Phillips	1687				1687	
	MIPR	AFRL	8040				8040	
	CPFF	TRW	428				428	
	CPAF	Dynacs	380				380	
	CPFF	Swales	1172				1172	
	CPAF	Ball	3933				3933	



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MDA RDT&E COST ANALYSIS (R-3)							DATE
BUDGET ACTIVITY							February 2002
<b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE			PROJECT
				<b>0603871C NMD</b>			<b>2400</b>
MIPR	NIST		7263				7263
N/A	USAF/SMC		21215				21215
CPFF	CSC		33005				33005
CPFF	TBD		2610				2610
TBD	Mis Contracts		11983				11983
CPFF	Nichols		4515				4515
CPFF	COLSA		170				170
CPFF	MEVATEC		900				900
MIPR	AMCOM		2359				2359
MIPR	USACE		10846				10846
MIPR	USA War College		464				464
MIPR	USASMDC		7670				7670
MIPR	Schreiver AFB		500				500
MIPR	HQ AFCEE		25				25
MIPR	DOD Joint Spectrum C.		362				362
MIPR	Hill AFB		200				200
MIPR	NSA		277				277
MIPR	USACECOM		50				50
MIPR	ARSPACE		600				600
MIPR	Alaskan Air Comm.		1632				1632
TBD	Site Activation CMD		9575				9575
MIPR	Peterson AFB		50				50
MIPR	Kirtland AFB		350				350
<b>MANAGEMENT AND OPERATIONAL SUPPORT</b>							
	CPAF/CPFF	CSC	190922				190922
	N/A	SFAE-MD/NMD ANAL	88048				88048
	N/A	GOVT PERS (DC)	23570				23570
	N/A	Misc RES.	9790				9790
	N/A	USSPACECOM	4946				4946
	N/A	TSM (SMDC)	28326				28326
	N/A	Operational accounts	251815				251815
	N/A	GOVT PER&SPT (HSV)	28604				28604
	TBD	Special Studies	13000				13000

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603871C NMD</b>	PROJECT <b>2400</b>
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<b>DISCRIMINATION</b>									
	CPFF via NRL	PRA	18332						18332
<b>SYSTEM ARCH AND ENGINEERING</b>									
	N/A	Misc Contracts	13269						13269
<b>THREAT AND COUNTERMEASURE</b>									
	N/A	Misc Contracts	4194						4194
Subtotal Support Costs:			983514						983514

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
<b>TEST AND EVALUATION</b>										
	CPAF/TM	TBE	44912						44912	
	CPFF	COLSA	56457						56457	
	N/A	Dynetics	620						620	
	CPFF	Boeing	11200						11200	
	CPFF	Raytheon	7400						7400	
	CPAF	TRW	246						246	
	CPFF	Raytheon	2900						2900	
	CPAF	SAIC	2331						2331	
	CPAF	Nichols	5126						5126	
	MIPR	USAKA	55942						55942	
	FFRDC/MIPR	Sandia	4442						4442	
	OGA/MIPR	USASMDC	5283						5283	
	OGA/MIPR	JNTF	2284						2284	
	OGA/MIPR	NRL	1971						1971	
	OGA/MIPR	NRC	2059						2059	
	N/A	Misc Contracts	71851						71851	
	MIPR	VAFB	3048						3048	
	TM	MEVATEC	9913						9913	
	MIPR	Space&Msl Cmd	327						327	
	CPFF	Lockheed MMS	3020						3020	





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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603871C NMD</b>	<b>PROJECT</b> <b>2400</b>
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	N/A	USASMDC	1454						1454
	N/A	Various OGA'S	3675						3675
<b>MODELLING AND SIMULATION</b>									
	N/A	USASMDC	3890						3890
<b>TEST RESOURCES</b>									
	N/A	Misc Contracts	15474						15474
<b>Subtotal Test and Evaluation:</b>			640194						640194

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.				0		0				
<b>Subtotal Management Services:</b>										

Remark:

<b>Project Total Cost:</b>			1823723						5685731
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Remark:

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2002		
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE <b>0603873C Family of Systems E &amp; I</b>					
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	227965	0	0	0	0	0	0	TBD	Continuing
3153 Systems Architecture and Engineering	5734	0	0	0	0	0	0	TBD	Continuing
3155 Systems Engineering and Integration	51548	0	0	0	0	0	0	TBD	Continuing
3265 Joint TMD Warfighter Support	12155	0	0	0	0	0	0	TBD	Continuing
3352 Modeling & Simulation	26293	0	0	0	0	0	0	TBD	Continuing
3359 Test, Evaluation and Assessment	52403	0	0	0	0	0	0	TBD	Continuing
3360 Test and Resources	6105	0	0	0	0	0	0	TBD	Continuing
4000 Operational Support	73727	0	0	0	0	0	0	TBD	Continuing
<p>The BMD Program and resulting FY 2002 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY 2002, funding from this Program Element is moved to the Ballistic Missile Defense Organization Program Element 0603880C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.</p> <p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>In FY 2000 the Theater Missile Defense (TMD) program's goal was to develop, maintain and deploy a cost-effective, Anti-Ballistic Missile (ABM) Treaty compliant interoperable system designed to protect deployed forces and areas of operations against the immediate and growing threat from shorter range theater ballistic missiles. The TMD core programs are PATRIOT Advanced Capability (PAC-3), Theater High Altitude Area Defense (THAAD) System, Navy Area Theater Ballistic Missile Defense (TBMD) (formerly Lower Tier), and Navy Theater-Wide TBMD (formally Upper Tier).</p> <p>Family of Systems Engineering and Interoperability (FoS E&amp;I) sought to link the TMD core programs so that they fight as one system and obtain a force multiplier advantage. The projects in the Program Element built FoS interoperability by conducting assessments of joint interoperability to identify weaknesses, defining architectural/engineering solutions to correct the weaknesses, integrating solutions, and testing the FoS fixes. The FoS interoperability effort was focused on near term Joint Data Network interoperability. However, a continuing R&amp;D investment in Joint Composite Tracking Network was maintained to achieve a future single integrated air picture.</p>									
<i>Page 1 of 25 Pages</i>							Exhibit R-2 (PE 0603873C)		

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>
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This PE continued to provide the resources for BMDO’s CINC’s assessments and FoS Assessment Program along with the Modeling and Simulations tools necessary to support engineering validation.

In FY01 this Program Element transitions, within the constraints of the POM, to reflect BMDO’s reorganization and mission execution improvements that capitalize on economy of force and optimization of resources allowing more efficient management of activities. The projects have been realigned within the PE to reflect their new functional tasks and funding levels. This PE funds the BMD architecture and engineering efforts needed to provide a seamless integrated Global Air and Missile Defense capability, which will meet the current and evolving threats of the 21<sup>st</sup> century. These efforts include: providing an interface with the warfighting community in order to identify their requirements to defend against the threat; to develop architectures to defeat the threat; and to assess and ensure systems integration interoperability; and to provide capabilities and expertise in the modeling and simulation, and test and evaluation fields.

<b><u>B. Program Change Summary</u></b>	<b><u>FY 2001</u></b>	<b><u>FY 2002</u></b>	<b><u>FY 2003</u></b>
Previous President’s Budget (FY 2002 PB)	231248		
Congressional Adjustments	0		
Appropriated Value	231248		
Adjustments to Appropriated Value			
a. Congressional Reductions	-2107		
b. SBIR/STTR	0		
c. Omnibus or Other Above Threshold Reductions	-1500		
d. Intl Realign	2021		
e. Rescissions	-1697		
Adjustments to Budget Years Since <u>FY 2002 PB</u>	-3283		
Current Budget Submit ( <u>FY 2003 Budge Estimates</u> )	227965		

Change Summary Explanation:  
Starting in FY 2001, all Family of Systems efforts from the Joint Theater Missile Defense program element (060387C2) will transfer to this program element to maintain adequate visibility into Theater Missile Defense efforts. Beginning in FY 2002, funding from this Program Element is moved to the Ballistic Missile Defense Organization Program Element 0603880C.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3153</b>
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COST <i>(In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3153 Systems Architecture and Engineering	5734	0	0	0	0	0	0	TBD	Continuing

**A. Mission Description and Budget Item Justification**

Beginning in FY 2001, Project 3153 funds activities associated with the BMDO Chief Architect. Tasks within this project had funded the Deputy, Theater Air and Missile Defense (BMDO/AQ) activities prior to FY 2001. The purpose of this project is to provide analysis and support for the development of a joint Theater Air and Missile Defense (TAMD) architecture. Joint Theater Air and Missile Defense (JTAMD) is the integrated capability to detect, classify, intercept, and destroy or negate the effectiveness of enemy aircraft and missiles prior to launch or while in flight, to protect U.S. and coalition forces, selected assets, and population centers within an assigned theater of operations. The TAMD architecture will focus on the integration of theater ballistic missile defense, cruise missile defense, air defense, and attack operations. This program provides funds to support the BMDO role in the Joint Theater Air and Missile Defense (JTAMD) process in the development of the TAMD Master Plan and assessment of associated system architectures and integration. In addition, the Chief Architect conducts quick reaction studies in response to immediate senior decision maker requests and decision support studies for resource allocation and long term planning. This program also supports international studies that explore Coalition interoperability concepts, architectures, and engineering requirements with major allies and coalition partners.

**FY 2001 Planned Program:**

- 2569 TAMD Integration.
  - 3165 Support Contractors
- Total 5734

<b>B. <u>Other Program Funding Summary</u></b>	<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 0603874C	307859								

**C. Acquisition Strategy:** The Theater Air and Missile Defense (TAMD) Integration project acquisition strategy goal is to develop the TAMD Master Plan and the Joint Theater Air and Missile Defense (JTAMD) acquisition strategy through the use of analysis and studies that focus on existing service systems. These studies and analyses will evaluate those systems for JTAMD interoperability and CMD/TBMD capability. The Systems Architecture development process will provide for the joint systems and

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3153</b>
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technical architecture for the JTAMD process as a complement to the operational architecture provided by the Joint Chiefs of Staff through the Joint Theater Air and Missile Defense Organization (JTAMDO). Scientific Engineering and Technical Assistance (SETA) and analysis work in this project is contracted . Funding is provided for Service support to the JTAMD process.

<b>D. Schedule Profile</b>	<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>
TAMD Master Plan 00	1Q						
TAMD Master Plan 01 (draft)	4Q						
US/Turkey BMD Architecture Initiative – NC3A Meeting and Brief	4Q						
Joint Acquisition Roadmap (JAR) update	1-3Q						
Joint US/Israel BMD Architecture Study IPR	2,3Q						
US/German Study IPR	1,2Q						
US/NATO TMD BMC3 Analysis CY 00 Final Review	2Q						
US/NATO TMD BMC3 Analysis IPR	3Q						

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3153</b>
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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.										
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. TAMD Integration Army	Suballocation	DAMO / FDE	374						374	
b. TAMD Integration Navy	Suballocation	PMS / 456	549						549	
c. TAMD Integration Air Force	Suballocation	SAF / AQPT	374						374	
d. TAMD Integration MDA	Suballocation	MARCORSYSCOM	1179						1179	
e. TAMD Integration JNTF	Suballocation	JNTF	93						93	
Subtotal Support Costs:			2569						2569	

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.										
Subtotal Test and Evaluation:										

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. Support Contracts	CPAF	SPARTA (various) / VA	3165						3165	
Subtotal Management Services:			3165						3165	

Remark:

Project Total Cost:			5734						5734	
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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002		
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603873C Family of Systems E & I				PROJECT 3155	
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3155 Systems Engineering and Integration	51548	0	0	0	0	0	0	TBD	Continuing

**A. Mission Description and Budget Item Justification:**

This project is part of a Program Element (PE) currently in a transition phase after BMDO's reorganization. BMDO has realigned its Systems Engineering functional tasks, which had previously been accomplished as a part of a number of projects under this PE and consolidated them under this project (3155).

The Systems Engineer is responsible for producing the BMD Functional Baseline (Systems Architecture Allocated Functional Requirements Document (SAAFRD)), which ensures the technical viability, integrity, and interoperability of the BMD program, to include TAMD, NMD and cruise missile options. Working in conjunction with the Chief Architect, Systems Engineering provides the core engineering capability to assess operational requirements and translates them into system requirements that are allocated to: legacy systems, modifications of legacy systems, and/or new system concepts necessary to meet user needs. This includes the development and allocation of systems requirements necessary to ensure that the Major Defense Acquisition Program (MDAP) systems are fully interoperable and provide maximum flexibility to the warfighter. Battle Management Command, Control, Communication (BM/C3) Systems Engineering provides the warfighter with timely, early warning information through development of a theater missile defense architecture that fosters interoperability and system integration. These activities also develop data standards, conduct studies and analyses, and formulate and implement policy and procedures to ensure that DoD and BMD interoperability requirements support the Services, allied and coalition partners. Working closely with the intelligence community, Systems Engineering establishes and maintains the design-to-threat requirements, funded via PE 0603876C, to ensure consistent threat parameters across the MDAPs.

To ensure the technical viability of BMDO programs, Systems Engineering conducts continuous assessments of systems development to assess progress, determine capability, and identify and mitigate risks, including risks incurred due to the evolving threat environment. Mitigation activities include the generation of technology requirements and identification of opportunities for technology insertion. Systems Engineering maintains an ongoing Corporate Lethality Program to characterize the effectiveness of the BMD architecture, understand post-intercept effects, establish methodologies to allow warhead typing based on impact response, and provide a common end-to-end lethality assessment capability across the MDAPs. Working in conjunction with the test and evaluation community, Systems Engineering develops test requirements and conducts post test analyses to ensure the MDAP systems meet requirements and satisfy warfighter needs. Finally, Systems Engineering executes the BMDO Configuration Control Process and maintains configuration control of TMD and NMD architecture baselines.

Systems Engineering is executed in a collaborative environment. BMDO maintains a close working relationship with the MDAP Program Managers, PEOs and the PEO Systems Engineers, and the BM/C3 Community. Additionally, BMDO continues to work with the Military Services, U.S. Space Command, U.S. Joint Organization to ensure full integration of other systems, sensors, and command and control centers that contribute to BMD.

Project 3155 Page 6 of 25 Pages Exhibit R-2A (PE 0603873C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3155</b>
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- FY 2001 Planned Program:**
- 12275 Systems Arch Engineering (SEE).
  - 5183 FoS SE
  - 2400 Impact 98 - This task is a continuation of the Theater Air & Missile Defense Initiative (TAMDI) ACTD, which began in FY98 and continues through FY03. Impact 98 addresses the value added of the PAC-3/THAAD/CEC/AEGIS composite track, associated identification process and the Engage-On-Remote kill assessment to a common air picture. Efforts concentrate on the interoperability between land and sea based Theater Missile Defenses' BMC3 system platforms.
  - 289 Coop Engagement Capacity
  - 21717 Support the BMDO administration effort; monies to be expended on SMDC salaries.
  - 410 OSD Reserve
  - 9274 GOVT Project personnel and support/SE
- Total 51548

<b>B. Other Program Funding Summary</b>	<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 0208864C	8347								
PE 0603874C	307859								
PE 0603876C	25853								

**C. Acquisition Strategy:** The 3155 Project acquisition strategy leverages existing system acquisition programs (which are subject to milestone decisions and testing) and accomplishes supporting tasks to satisfy Systems Engineering performance requirements. A portion of this project entails systems engineering of separately funded and managed service programs so that all systems will interoperate when fielded.

<b>D. Schedule Profile</b>	<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>
Identify BMC4I Risks	1Q						
Develop./Maintain Risk Mitigation Plans	1Q						
Develop/Maintain Software Engineering	1Q 4Q						



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<b>BUDGET ACTIVITY</b>		<b>PE NUMBER AND TITLE</b>		<b>PROJECT</b>
<b>4 - Program Definition and Risk Reduction</b>		<b>0603873C Family of Systems E &amp; I</b>		<b>3155</b>
Revise BMDO Dir. 3405	2Q			
Coordinate BMDO Software Policy	3Q			
Develop/Revise MD Interop. Plan	1Q			
Develop/Revise Security Architecture	1Q			
Publish BMC4I Analysis Results	4Q			
Publish NATO BMC4 Analysis Final Report	4Q			
Publish US/GE Analysis Final Report	4Q			
Develop MD Technology Roadmap	1Q			
Standards Compliance Lessons Learned Data Base	3Q			
Publish JTA Annual Report	4Q			
Develop Processes JTA MD Subdomain	4Q			
Investigate Joint Tactical Radio System (JTRS)	2Q			
Maintain Control Over Sys. Interf.	Quarterly			
BMC4I Standards Compliance	Quarterly			
Enforce BMDO JTA	Quarterly			
Direct Processes BMC4I Sensor System Engineering	Quarterly			
Final development/fielding of JDP V.2x into GCCS V4.0	3Q			
Final development/fielding of JDP V.2x into TBMCS V2.0	3Q			
TAMD-I ACTD	3Q			
TBMD Enhancements	1Q			
Develop TBMD BMC3 Systems Requirements Document (SRD)	3Q			
Integrated System Specification (ISS) Draft/Final	Quarterly			
System Performance Specification Draft/Final	Quarterly			
Develop JRE Interim Capability	1Q			
Assemble tech viable analysis team to audit technical health of each BMD program	1Q			
Complete initial BMD level TPM's	1Q			
Develop Security Architecture	1Q			
Collect TPM Data to validate selected measures, establish control thresholds	2Q			
Start operational vs system requirements synergies vs disconnect analysis	2Q			
Stand-up CCB and BMD Configuration Management process – Run DTT through the process	2Q			

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3155</b>
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Develop M&S and Test Tool Strategy	3Q						
Complete initial technical viability assessments for BMD program	3Q						
Establish Configuration Control or BMD Baselines to be Managed, Complete Analysis of 1 <sup>st</sup> Iteration of System Architecture Baseline	4Q						
Assess TPM Utility, Relate Requirements to M&S and T&E Activities	4Q						
Operational/System requirements integration	4Q						
JRE Application Protocol	4Q						
Complete expansion of SE World Class Engineering Process briefing into a training manual for new BMDO and contractor engineers	4Q						
Obtain Approval for Initial NMD/TBMD SAAFRS	4Q						
Complete initial integration of operational vs systems requirements	4Q						

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603873C Family of Systems E &amp; I</b>	PROJECT <b>3155</b>
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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
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. Systems Arch Eng (SEE)	Allotment	Services, Various	12275						12275	
b. FoS SE	Allotment	Services, Various	5183						5183	
c. Coop Engagement Capacity	Allotment	Services, Various	289						289	
d. Impact 98/SE	Allotment	Services, Various	2400						2400	
e. OSD Reserve	Allotment	Services, Various	410						410	
Subtotal Product Development			20557						20557	

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.										
Subtotal Test and Evaluation:										

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. Personnel Costs	Allotment	Various EA	9274						9274	
b. Support Contracts			21717						21717	
Subtotal Mgmt Services			30991						30991	

Remark:

Project Total Cost:			51548						51548	
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Remark:

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3265</b>
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COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3265 Joint TMD Warfighter Support	12155	0	0	0	0	0	0	TBD	Continuing

**A. Mission Description and Budget Item Justification**

**CINCs Experiments:** 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..

**FY 2001 Planned Program:**

- 7933 CINC Experiments
  - 4222 Support Contracts
- Total 12155

<b>B. <u>Other Program Funding Summary</u></b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603873C	227965							TBD	TBD

**C. Acquisition Strategy:** The CINC Experiments program is managed and executed through the use of weekly task plans, monthly progress and expenditure reports, quarterly reviews, and semi-annual assessments. Each theater conducts monthly In-process reviews to monitor and manage the preparation for scheduled activities. ORDs/CRDs, CONOPs and TTPs are updated throughout the year.

<b>D. <u>Schedule Profile</u></b>	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
CINC Experiments		1Q-4Q						

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603873C Family of Systems E &amp; I</b>	PROJECT <b>3265</b>
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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.										
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. CINC Experiments	Suballocation	Theater CINCs	7933						7933	
Subtotal Test and Evaluation:			7933						7933	

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. Support Contracts	Allocation	MDA	4222						4222	
Subtotal Management Services:			4222						4222	

Remark:

Project Total Cost:			12155						12155	
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Remark:

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 2002	
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603873C Family of Systems E & I				PROJECT 3352	
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3352 Modeling & Simulation	26293	0	0	0	0	0	0	TBD	Continuing
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project is responsible for the implementation of a comprehensive program that establishes and maintains an affordable and validated set of Core Models and Simulations (M&amp;S). These Core Models and Simulations along with an extensive support structure are required for pre- and post-test evaluation activities that support the Corporate Test Program and Major Defense Acquisition Programs (MDAP) testing events. This project provides for the program management, planning, coordination, and technical oversight of system level M&amp;S.</p> <p>Extended Air Defense Testbed (EADTB) provides for the operations, maintenance and continued enhancement of three Modeling and Simulation (M&amp;S) tools that support the Ballistic Missile Defense Organization (BMDO) system engineering and test and evaluation needs. The simulation tools maintained under this task are EADTB, Extended Air Defense Simulation (EADSIM) and Commanders Analysis and Planning System (CAPS).</p> <p>EADTB will be developed to support the Army Operational Evaluation Command's interoperability demonstration for Patriot PAC-3 Independent Operational Test and Evaluation (IOT&amp;E) and its milestone III decision. EADTB simulation and its models provide capability to do system engineering at the C4ISR architecture level, focusing on warfighter needs for interoperability. EADSIM will support the force on force domain that will focus on mission needs in a theater environment. CAPS is now supporting the Joint Defensive Planning (JDP) capability by providing a simulation with war planning capability for TBMD.</p> <p>This project will provide Specific System Representation (SSR) model development for EADTB and expertise for defining requirements for development of the EADTB, EADSIM, and CAPS simulations. The SSR models will support the Corporate Test Plan and the system engineering process. The modeling and simulation requirements process will focus on support of FoS interoperability integration among MDAPs and among allied systems.</p> <p>This task supports the development and sustainment of the Theater Missile Defense System Exerciser (TMDSE), BMDO's primary Hardware-in-the-Loop (HWIL) test tool for developmental TMD Family of Systems (FoS) interoperability testing. The task effort includes sustainment and required modifications of the TMDSE Build 3.1 system (Build 3.1+), development of Build 4, and future builds planning.</p> <p>This project is conducted in accordance with DoDD 5000.59, DoD Modeling and Simulation (M&amp;S) Management.</p>									
Project 3352			Page 13 of 25 Pages				Exhibit R-2A (PE 0603873C)		

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603873C Family of Systems E &amp; I</b>	PROJECT <b>3352</b>
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- FY 2001 Planned Program:**
- 11123 EADTB
  - 431 Wargame 2000
  - 4499 Modeling and Simulation Development
  - 9697 TMD Systems Exerciser
  - 543 Support Contracts
- Total 26293

<b>B. <u>Other Program Funding Summary</u></b>	<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 0603873C	227965								
PE 0603874C	307859								

**C. Acquisition Strategy:** The work in this project is sourced through full and open competition. Majority of M&S support is performed at the JNTF, ARC/SC, BMD SSC and other test bed facilities. The ARC/SC contractor operates under a Cost Plus Fixed Fee (CPFF) contract first awarded in June of 1989.

<b>D. <u>Schedule Profile</u></b>	<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>
HWILT-01b at JNTF	4Q						
JDN Thinker	2Q						
AWACS	1Q						
HWILT-01a @JNTF- TMDSE B3.1	2Q						
THAAD	3Q						
PAC-3	3Q						
CRC/CRE TPS-75	2Q						
JTAGS	2Q						
Aegis	3Q						
TAOM/ADCP/TPS-59	2Q						

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3352</b>
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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. Wargame 2000	Allotment	JNTF	431						431	
b. EADTB	Allotment	SMDC, Huntsville, AL	11123						11123	
c. TMDSE	Allotment	Multiple	9697						9697	
d. Modeling and Simulation Development	Allotment	Various	4499						4499	
Subtotal Product Development:			25750						25750	

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. Support Contracts			543						543	
Subtotal Support Costs:			543						543	

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.										
Subtotal Test and Evaluation:										

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:			26293						26293	
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Remark:



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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002		
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603873C Family of Systems E & I				PROJECT 3359	
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3359 Test, Evaluation and Assessment	52403	0	0	0	0	0	0	TBD	Continuing
<p><b>A. <u>Mission Description and Budget Item Justification</u></b>            Beginning in FY 2001, this project represents a consolidation of activities previously preformed and funded from multiple projects in the Family of Systems Program Element.</p> <p>This project funds detailed planning, execution and analysis of BMDO's primary corporate test events directed by BMDO/TE and for flight test signature analysis, interoperability support to systems engineering and other test needs reporting across the TBM community. The primary TE-directed test events are flight tests associated with the Critical Measurements Program (CMP). Live Flight Overlays includes the System Integration Test (SIT) II and the Hardware-in-the-Loop testing conducted at the Joint National Test Facility (JNTF) using the Theater Ballistic Missile Defense System Exerciser (TMDSE). In addition to these dedicated test programs, corporate data collection, analysis and reporting is funded across various other data collection events to include CINC TAMD exercises, MDAP flight testing, service testing, and allied TBMD testing as appropriate to meet BMDO test objectives. Specifically, subtasks are further defined as follows:</p> <p>Critical Measurements Program (CMP) - Designs, builds, and flies threat representative test articles in realistic scenarios that address critical BMD system functions and is an integral part of BMDO's Corporate Testing program contributing to the development of robust BMD systems. Includes test planning, execution and analysis associated with the CMP.</p> <p>Test Planning and Management Support - Includes technical analysis, planning and evaluation of Corporate Test opportunities and pre-test predictions with detailed models. Also provides management support for the Director, Program Support and Assessment and his staff.</p> <p>System Integration Test/Live Flight Overlays - SITs/ Overlays are dedicated, controlled live flight test with interceptors and targets to measure FoS interoperability response. This task includes the planning, execution, analysis and reporting from each test.</p> <p>Hardware-in-the-Loop Testing (HWILT) - HWILT combines actual tactical hardware and software to provide cost effective assessments of the latest interoperability software upgrades. Models &amp; Simulations are the only approach of simultaneously representing joint interoperability of all the TAMD weapons, sensors and command centers under a wide variety of operational conditions against the full set of threats in the TMD Capstone Requirements Document.</p> <p>Corporate Data Collection and Analysis - This task funds corporate data collection, analysis and reporting on test events outside of the CMP, SIT/Overlay and HWILT testing programs. It also funds the TSCC, a deployable link data collection and analysis equipment suite, that is fielded in live joint play and testing events.</p>									
Project 3359			Page 16 of 25 Pages			Exhibit R-2A (PE 0603873C)			

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3359</b>
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**FY 2001 Planned Program:**

- 19802 Planning, execution and analysis of CMP3B. Planning for CMP Flight 4 series.
- 22900 Live Flight Overlay
- 5513 Planning, execution and analysis of HWILT 01a and 01b.
- 1956 Corporate data collection, analysis and reporting.
- 100 Test Planning
- 203 Radar Exploitation
- 1929 Support Contracts
- Total 52403

<b>B. Other Program Funding Summary</b>	<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>
3359 System Test and Eval, PE 0603874C	307859							Cont	Cont

C. **Acquisition Strategy:** Corporate testing supports MDAP and interceptor development. Ballistic Missile phenomenology/signature and Family of Systems interoperability data is collected, analyzed and reported to insert in the systems engineering process for product improvement.

<b>D. Schedule Profile</b>	<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>
HWILT 99B	1Q							
HWILT 00A	3Q							
HWILT 01A		2Q						
HWILT 01B		4Q						
TCMP 3A	1Q							
TCMP 3B		2Q						

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603873C Family of Systems E &amp; I</b>	PROJECT <b>3359</b>
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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.										
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. Test Planning	Allotment & MIPR	Various	100						100	
b. HWILT	Allotment & MIPR	Various	5513						5513	
c. CMP	Allotment & MIPR	Various	19802						19802	
d. Corp. Data Collect and Analysis & Reporting	Allotment & MIPR	Various	1956						1956	
e. Live Flight Overlay	Allotment	Other Test Agencies	22900						22900	
f. Radar Exploitation	Allotment	SMDC	203						203	
Subtotal Test and Evaluation:			50474						50474	

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. Support Contracts		MDA	1929						1929	

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603873C Family of Systems E &amp; I</b>	PROJECT <b>3359</b>
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Subtotal Management Services:			1929						1929
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Remark:

Project Total Cost:			52403						52403
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Remark:

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>				<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>				<b>PROJECT</b> <b>3360</b>		
<b>COST (In Thousands)</b>	<b>FY 2001 Actual</b>	<b>FY 2002 Estimate</b>	<b>FY 2003 Estimate</b>	<b>FY 2004 Estimate</b>	<b>FY 2005 Estimate</b>	<b>FY 2006 Estimate</b>	<b>FY 2007 Estimate</b>	<b>Cost to Complete</b>	<b>Total Cost</b>	
3360 Test and Resources	6105	0	0	0	0	0	0	TBD	Continuing	

**A. Mission Description and Budget Item Justification**

This project provides for BMDO planning, oversight and coordination of integrated test and evaluation facilities. The project includes inter-element as well as inter-service test and evaluation efforts, and provides for common ground test facilities, ranges and instrumentation. Project 3360 funds those test resources mutually supporting BMDO's National Missile Defense (NMD), Theater Missile Defense (TMD) and Technology programs. Individual BMDO programs pay only the direct costs associated with their specific testing efforts at these mission critical facilities.

The ground test facilities include:

- Kinetic Kill Vehicle Hardware in the Loop Simulator (KHILS) at Eglin AFB in Fort Walton Beach, FL
- AEDC Hypervelocity Wind Tunnel Number 9 (Tunnel 9) at White Oak, MD
- Infrared and Blackbody Standards at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD.
- Hypervelocity Ballistic Range G Light Gas Gun Von Karman Facilities (VKF) at the Arnold Engineering and Development Center (AEDC) in Tullahoma, TN
- 7V and 10V Space Chambers at AEDC, Tullahoma, TN
- National Hover Test Facility (NHTF) at Edwards AFB, CA
- Army Missile Optical Range (AMOR) at Redstone Arsenal, AL
- Aero-Optic Evaluation Center (AOEC) at Calspan-University of Buffalo Research Center (CUBRC), NY
- Holloman High Speed Test Track (HHSTT) at Holloman AFB, NM

The test range facilities include national ranges such as:

- White Sands Missile Range (WSMR) in Las Cruces, NM including Ft. Wingate Launch Complex near Gallup, NM
- Kwajalein Missile Range (KMR) in the Marshall Islands
- Pacific Missile Range Facility (PMRF) and Kauai Test Facility (KTF) at Kauai, HI
- Wake Island Launch Complex

The range instrumentation special test equipment, data collection assets, and range instrumentation include:

- IR data collection sensors and platforms
- Mobile Range Safety System and Kwajalein Range Safety Control Center Upgrades
- NP-3 Aircraft upgrade for remote area safety support.
- Sea-Lite Beam Director (SLBD), based at White Sands Missile Range, Las Cruces, NM
- Miscellaneous improvements to BMDO infrastructure and support systems

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3360</b>
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These ground test, range and instrumentation assets provide valuable risk reduction and test implementation capability in support of TMD and NMD test and evaluation. The ground test facilities provide a cost-effective method of testing and evaluating applicable component, sub-system and system level technologies. The common range facilities provide a cost-effective method of flight testing missile and target components applicable to the BMD program and TMD Family of Systems (FoS), BMC<sup>3</sup> and interoperability testing. Range instrumentation provides a cost-effective capability to collect missile characteristics, phenomenology data, and target/interceptor diagnostics on flight tests. These facilities and capabilities support systems design, verification and validation of weapon system and target realism, and the evaluation of test results.

This project provides for BMDO planning, oversight and coordination of integrated test and evaluation facilities. The project includes inter-element as well as inter-service test and evaluation efforts, and provides for common ground test facilities, ranges and instrumentation. Project 3360 funds those test resources mutually supporting BMDO's National Missile Defense (NMD), Theater Missile Defense (TMD) and Technology programs. Individual BMDO programs pay only the direct costs associated with their specific testing efforts at these mission critical facilities.

**FY 2001 Accomplishments:**

- 3470 IR Data Collection Upgrades.
  - 2500 IR/CC Support.
  - 135 Support Contracts.
  -
- Total            6105

<b>B. <u>Other Program Funding Summary</u></b>	<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>
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**C. Acquisition Strategy:**

BMDO tasks the Services through Program Management Agreements to perform the required tasks in support of the BMD program, provides monthly reports, and performs quarterly reviews to verify and validate completed tasks.

In providing range and test facilities support to the MDAP Program managers, BMDO implements a process which:

- Maintains perspective of national technical test capabilities relative to all BMD developmental programs,
- Responds to MDAP program requirements,
- Makes maximum use of existing test resources where possible,

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603873C Family of Systems E &amp; I</b>	PROJECT <b>3360</b>
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- Requires full coordination prior to development of new resources,
- Consolidates management of existing resources where possible and practical.

This process is executed through a variety of acquisition methods. Executing Agent Project Managers for the elements and tasks under this project include the three military services and the BMDO. Service Project Manager organizations specifically include the:

- U.S. Army Space and Missile Defense Command (USASMDC)
- U.S. Air Force Materiel Command
- U.S. Navy Office of Naval Research
- Navy Program Executive Officer (Theater Surface Combatants)
- U.S. Air Force Research Laboratory
- U.S. Army Corps of Engineers (USACE)
- U.S. Navy, Naval Facilities Engineering Command (NAVFAC)
- U.S. Army Program Executive Officer-Missile Defense.

<b>D. Schedule Profile</b>	<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>FY 2008</u>

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603873C Family of Systems E &amp; I</b>	<b>PROJECT</b> <b>3360</b>
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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. IR Data Collection Upgrades		SMDC	3470						3470	
b. IR/CC Support		SMDC	2500						2500	
Subtotal Product Development:			5970						5970	

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. Support Contracts		MDA	135						135	
b.										
Subtotal Support Costs:			135						135	

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.										
Subtotal Test and Evaluation:										

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:			6105						6105	
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Remark:



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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603873C Family of Systems E & I				PROJECT 4000		
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost	
4000 Operational Support	73727	0	0	0	0	0	0	TBD	Continuing	
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>Beginning with FY 2001, this program element replaces the Joint Theater Missile Defense (TMD) Dem/Val program element.</p> <p>This project funds three basic areas: personnel and related facility support costs; statutory and fiscal requirements, and support service contracts.</p> <p>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 &amp; Strategic Defense Command, US Army PEO Missile Defense, US Navy PEO for Theater Defense, 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.</p> <p>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. 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.</p> <p>Finally, 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.</p> <p><b>FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 73727 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents &amp; utilities and supplies.</li> </ul> <p>Total 73727</p>										
Project 4000			Page 24 of 25 Pages				Exhibit R-2A (PE 0603873C)			

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603873C Family of Systems E &amp; I</b>	PROJECT <b>4000</b>
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<b>B. <u>Other Program Funding Summary</u></b>	<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>
N/A									

**C. Acquisition Strategy:**  
N/A

<b>D. <u>Schedule Profile</u></b>	<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>
N/A								

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603874C BMD Technical Operations</b>
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COST <i>(In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	307859	0	0	0	0	0	0	Continuing	Continuing
3153 Systems Architecture and Engineering	6935	0	0	0	0	0	0	Continuing	Continuing
3155 Systems Engineering and Integration	22507	0	0	0	0	0	0	Continuing	Continuing
3161 Information Management and Technology	9238	0	0	0	0	0	0	Continuing	Continuing
3352 Modeling and Simulation	44082	0	0	0	0	0	0	Continuing	Continuing
3353 JNTF	45843	0	0	0	0	0	0	Continuing	Continuing
3354 Targets	44660	0	0	0	0	0	0	Continuing	Continuing
3357 Facilities, Siting, and Environment	2795	0	0	0	0	0	0	Continuing	Continuing
3359 Test, Evaluation & Assessment	10007	0	0	0	0	0	0	Continuing	Continuing
3360 Test Resources	107157	0	0	0	0	0	0	Continuing	Continuing
4000 Program Operations	14635	0	0	0	0	0	0	Continuing	Continuing

The BMD Program and resulting FY 2002 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY 2002, funding from this Program Element is moved to the Ballistic Missile Defense Organization Program Element 0603880C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.

**A. Mission Description and Budget Item Justification**

The Ballistic Missile Defense (BMD) Technical Operations Programs are comprised of the centrally managed functional capabilities required to assure the execution of Theater Missile Defense (TMD), Family of Systems Engineering and Integration (FOS E&I), National Missile Defense (NMD), and Technology programs. Functional areas include BMD systems architecting and engineering analysis, test resources and facilities, modeling and simulation, and phenomenology data collection and analysis. These highly specialized BMD-specific investments provide the threat representative data and derived requirements, modeling capabilities, test facilities, and facilities, siting and

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**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603874C BMD Technical Operations**

environmental programs necessary to meet the aggressive development, test, and deployment schedules of the TMD and NMD systems. These centrally managed programs are executed in a manner integrated with BMDO's mission areas.

This project is assigned to the Budget Activity and Program Element codes as identified in this descriptive summary in accordance with existing Department of Defense policy. Further justification of the Budget Activity code assigned to each Program Element is contained within the Brief Description of Element section of each Program Element Summary.

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002 PB</u> )	270718		
Congressional Adjustments	42500		
Appropriated Value	313218		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-2857		
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Intl Realign	-556		
e. Rescissions	-1946		
Adjustments to Budget Years Since <u>FY 2002 PB</u>	37225		
Current Budget Submit ( <u>FY 2003 Budget Estimates</u> )	307859		

**Change Summary Explanation:**

The BMD Program and resulting FY 2002 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY 2002, funding from this Program Element is moved to the Missile Defense Agency's Program Element 0603880C.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603874C BMD Technical Operations</b>	<b>PROJECT</b> <b>3153</b>
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COST ( <i>In Thousands</i> )	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3153 Systems Architecture and Engineering	6935	0	0	0	0	0	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Beginning in FY 2001, Project 3153 funds activities associated with the BMDO Chief Architect (BMDO/CA). Tasks within this project had funded the Chief Architect / Engineering Office (then BMDO/DE) activities prior to FY 2001. These tasks will no longer be active in this project. This project resources architectural development to design an integrated Global Air and Missile Defense capability that meets current evolving threats. The Chief Architect establishes and maintains the Ballistic Missile Defense (BMD) Baseline Architecture. The BMD Baseline Architecture is the overarching and unifying BMD structure expressed in terms of components, connections, constraints, and their interrelationships. The architecture functions include assessing the evolving technical, military, and geopolitical environments, developing and evaluating architecture alternatives to provide suitable BMD capabilities, integrating the selected architecture alternative, and tracking architecture implementation. The BMD Baseline Architecture expressed as a series of time-phased spiral development epochs pacing the threat, serves as the technical basis for systems engineering and acquisition planning. The Chief Architect provides analytical support to the Director, BMDO, and staff through a common analysis framework. The Chief Architect conducts special studies related to alternative and extended missile defense architectures and quick reaction studies in response to immediate senior decision-maker requests.

**FY 2001 Planned Program:**

- 860 Architecture Analysis
  - 6075 Support Contractors
- Total 6935

<b>B. <u>Other Program Funding Summary</u></b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost

**C. Acquisition Strategy:** Systems analysis work in this project is contracted. Expertise of Government, Federally Funded Research & Development Center (FFRDC), and Scientific, Engineering and Technical Assistance (SETA) personnel are leveraged in the execution of project activities, using existing contracts to the maximum extent possible. Additional contractor services will be procured if needed to meet emerging program requirements.

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

DATE **February 2002**

BUDGET ACTIVITY  
**4 - Program Definition and Risk Reduction**

PE NUMBER AND TITLE  
**0603874C BMD Technical Operations**

PROJECT  
**3153**

<b>D. Schedule Profile</b>	<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>
Initiate BMDSAS Iteration 8	1Q						
Final Architecture Description Document (ADD) version 1.0 to Director	1Q						
Initiate BMDSAS Iteration 9	2Q						
Initiate BMDSAS Iteration 10	3Q						
Final ADD Version 2.0 to Director	3Q						

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE **February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603874C BMD Technical Operations**

**PROJECT**  
**3153**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Architecture Analysis		MDA	860						860	
Subtotal Product Development:			860						860	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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 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 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. Support Contracts	CPAF	MDA	6075						6075	
Subtotal Management Services:			6075						6075	

Remark:

Project Total Cost:			6935						<b>6935</b>	
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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 2002	
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603874C BMD Technical Operations				PROJECT 3155	
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3155 Systems Engineering and Integration	22507	0	0	0	0	0	0	Continuing	Continuing
<b>A. <u>Mission Description and Budget Item Justification</u></b>									
<p>This project is part of a Program Element (PE) currently in a transition phase after BMDO's reorganization. BMDO has realigned its Systems Engineering functional tasks, which had previously been accomplished as a part of a number of projects under this PE and consolidated them under this project (3155). Beginning in FY02, the Systems Engineering efforts will reside in the new BMD Architecture and Engineering PE (0603877C).</p> <p>The Systems Engineer is responsible for producing the BMD Functional Baseline (Systems Architecture Allocated Functional Requirements Document (SAAFRD)), which ensures the technical viability, integrity, and interoperability of the BMD program, to include TAMD, NMD and cruise missile options. Working in conjunction with the Chief Architect, Systems Engineering provides the core engineering capability to assess operational requirements and translates them into system requirements that are allocated to: legacy systems, modifications of legacy systems, and/or new system concepts necessary to meet user needs. This includes the development and allocation of systems requirements necessary to ensure that the Major Defense Acquisition Program (MDAP) systems are fully interoperable and provide maximum flexibility to the warfighter. Battle Management Command, Control, Communication (BM/C3) Systems Engineering provides the warfighter with timely, early warning information through development of a theater missile defense architecture that fosters interoperability and system integration. These activities also develop data standards, conduct studies and analyses, and formulate and implement policy and procedures to ensure that DoD and BMD interoperability requirements support the Services, allied and coalition partners. Working closely with the intelligence community, Systems Engineering establishes and maintains the design-to-threat requirements, funded via PE 0603876C, to ensure consistent threat parameters across the MDAPs.</p> <p>To ensure the technical viability of BMDO programs, Systems Engineering conducts continuous assessments of systems development to assess progress, determine capability, and identify and mitigate risks, including risks incurred due to the evolving threat environment. Mitigation activities include the generation of technology requirements and identification of opportunities for technology insertion. Systems Engineering maintains an ongoing Corporate Lethality Program to characterize the effectiveness of the BMD architecture, understand post-intercept effects, establish methodologies to allow warhead typing based on impact response, and provide a common end-to-end lethality assessment capability across the MDAPs. Working in conjunction with the test and evaluation community, Systems Engineering develops test requirements and conducts post test analyses to ensure the MDAP systems meet requirements and satisfy warfighter needs. Finally, Systems Engineering executes the BMDO Configuration Control Process and maintains configuration control of TMD and NMD architecture baselines.</p> <p>Systems Engineering is executed in a collaborative environment. BMDO maintains a close working relationship with the MDAP Program Managers, PEOs and the PEO Systems Engineers, and the BM/C3 Community. Additionally, BMDO continues to work with the Military Services, U.S. Space Command, U.S. Joint Organization to ensure full integration of other systems, sensors, and command and control centers that contribute to BMD.</p>									
Project 3155			Page 6 of 37 Pages				Exhibit R-2A (PE 0603874C)		



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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603874C BMD Technical Operations</b>	<b>PROJECT</b> <b>3155</b>
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**FY 2001 Planned Program:**

- 3375 System Arch Engineering (SEE)
  - 2804 BM/C3 – Initiate development of a TBMD BMC3 System Requirements Document (SRD) to support the overarching Systems Architecture Allocated Functional Requirements Document (SAAFRD) document; develop a Family of Systems (FoS) Integrated System Specification (ISS) to baseline current TBMD performance capabilities; develop an FoS System Performance Specification (SPS) focused on meeting near-term BMC3 interoperability requirements. Develop TBMD Link-16 and Global Command and Control System (GCCS) interoperability enhancements (e.g. Coalition/Ally tactical TBM message exchanges, Joint Range Extension, and integration of joint service force planners such as the Joint Defensive Planner). Develop and maintain a list of BM/C4I risks; monitor and assess BM/C4I CARDS; develop TMD Interface Exchange Requirements (IER); develop a TMD/NMD Interoperability Program Plan and Interoperability Roadmap; and define interoperability test and tool requirements. Conduct interoperability studies and experiments; Missile Defense Interoperability Plan; BMDO annual interoperability and capability report, allied/coalition BM/C3 Analysis (NATO, UK, Israel, etc); Interoperability Analysis of Service’s Joint Planning Network, Joint Data Network and Joint Composite Tracking Network. Provide support to the Ballistic Missile Defense System Architecture Study (BMDSAS) with regard to C4ISR, and DUSD C3I efforts; support Joint Mission Area Analysis (JMAA) and development of Ballistic Missile Information Architecture. Support JTA Compliance and Missile Defense (MD) Annex development, Migration Plans and waivers as required; Data Element Dictionary (DED) for MD; development of BMDO Technical Architecture, and BMDO C4ISR Support Plans.
  
  - 10019 Support Contracts
  - 6309 SET Lethality
- Total 22507

<b>B. <u>Other Program Funding Summary</u></b>	<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>

**C. Acquisition Strategy:** The 3155 Project acquisition strategy leverages existing system acquisition programs (which are subject to milestone decisions and testing) and accomplishes supporting tasks to satisfy Systems Engineering performance requirements. A portion of this project entails systems engineering of separately funded and managed service programs so that all systems will interoperate when fielded.

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)						DATE February 2002	
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>			PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>				PROJECT <b>3155</b>
<b>D. Schedule Profile</b>	<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>
Identify BMC4I Risks	1Q						
Develop./Maintain Risk Mitigation Plans	1Q						
Develop/Maintain Software Engineering	1Q 4Q						
Revise SDIO Dir. 3405	2Q						
Coordinate BMDO Software Policy	3Q						
Develop/Revise MD Interop. Plan	1Q						
Develop/Revise Security Architecture	1Q						
Publish BMC4I Analysis Results	4Q						
Publish NATO BMC4 Analysis Final Report	4Q						
Publish US/GE Analysis Final Report	4Q						
Develop MD Technology Roadmap	1Q						
Standards Compliance Lessons Learned Data Base	3Q						
Publish JTA Annual Report	4Q						
Develop Processes JTA MD Subdomain	4Q						
Investigate Joint Tactical Radio System (JTRS)	2Q						
Maintain Control Over Sys. Interf.	Quarterly						
BMC4I Standards Compliance	Quarterly						
Enforce BMDO JTA	Quarterly						
Direct Processes BMC4I Sensor System Engineering	Quarterly						
Final development/fielding of JDP V.2x into GCCS V4.0	3Q						
Final development/fielding of JDP V.2x into TBMCS V2.0	3Q						
TAMD-I ACTD	3Q						
TBMD Enhancements	1Q						
Develop TBMD BMC3 Systems Requirements Document (SRD)	3Q						
Integrated System Specification (ISS) Draft/Final	Quarterly						
System Performance Specification Draft/Final	Quarterly						
Develop JRE Intrem Capability	1Q						
Assemble tech viable analysis team to audit technical health of each BMD program	1Q						
Complete initial BMD level TPM's	1Q						
Develop Security Architecture	1Q						
Collect TPM Data to validate selected measures, establish control thresholds	2Q						

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603874C BMD Technical Operations</b>	<b>PROJECT</b> <b>3155</b>
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Start operational vs system requirements synergies vs disconnect analysis	2Q						
Stand-up CCB and BMD Configuration Management process – Run DTT through the process	2Q						
Develop M&S and Test Tool Strategy	3Q						
Complete initial technical viability assessments for BMD program	3Q						
Establish Configuration Control or BMD Baselines to be Managed, Complete Analysis of 1 <sup>st</sup> Iteration of System Architecture Baseline	4Q						
Assess TPM Utility, Relate Requirements to M&S and T&E Activities	4Q						
Operational/System requirements integration	4Q						
JRE Application Protocol	4Q						
Complete expansion of SE World Class Engineering Process briefing into a training manual for new BMDO and contractor engineers	4Q						
Obtain Approval for Initial NMD/TBMD SAAFERS	4Q						
Complete initial integration of operational vs systems requirements	4Q						
JRE Protocol Gateway Development	Quarterly						

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>									DATE <b>February 2002</b>	
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>					PROJECT <b>3155</b>	
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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
Subtotal Product Development:										
Remark:										
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. System Arch Eng (SEE)	CPFF	MDA	3375						3375	
b. SE&I BMC3 Interoper	CPAF	Various EA	2804						2804	
c. SET Lethality	CPFF	Various EA	6309						6309	
Subtotal Product Development:			12488						12488	
Remark:										
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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 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. Support Contracts		MDA	10019						10019	
Subtotal Management Services:			10019						10019	
Remark:										
Project Total Cost:			22507						22507	
Remark:										

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 2002																	
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603874C BMD Technical Operations				PROJECT 3161																	
COST (In Thousands)				FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost													
3161 Information Management and Technology				9238	0	0	0	0	0	0	Continuing	Continuing													
<b>A. <u>Mission Description and Budget Item Justification</u></b>																									
<p>This project provides the Support Technology funding for the Ballistic Missile Defense Organization (BMDO) Data Centers Program. The primary responsibility for this project is for the BMDO Data Centers Information System Program Manager to provide management, oversight, technical assistance, and expertise for the BMDO Data Centers Program. The purpose of the BMDO Data Centers Program is to archive, manage, develop data products, distribute and provide remote access to all relevant BMD data. Operation and management of the Data Center activities is accomplished at several sites, each site specializing in a particular discipline. Taskings include providing assessments of technical/programmatic issues and data center performance, coordinating NMD, TMD, and Support Technology customer program/data management requirements and cooperative partnership requirements.</p>																									
<b>FY 2001 Planned Program:</b>																									
<ul style="list-style-type: none"> <li>• 1211 This task provides the Support Technology funding for the BMDO Data Centers Program and Virtual Data Center (VDC) operation and Maintenance (O&amp;M). The primary responsibility under this task is for the BMDO Data Centers Information System Program Manager to provide management, oversight, technical assistance, and expertise for the BMDO Data Centers Program. The purpose of the BMDO Data Centers Program is to archive, manage, develop data products, distribute and provide remote access to all relevant BMD data.</li> <li>• 2951 Provides the U.S. Army with Project Funding to support the Missile Defense Data Center (MDDC), SMDC. The MDDC, as a primary BMDO Data Center will acquire, process, manage, and archive Ballistic Missile Defense (BMD) mission oriented technology. This includes the collection, organization, archiving, protection, processing, analyzing and dissemination of strategic and tactical missile systems (NMD and TMD) data products.</li> <li>• 2433 Provides the U.S. Air Force with Project Funding to support the Advanced Missile Signature Center (AMSC) at AEDC, Arnold AFB, TN, as a primary BMDO Data Center that can process, manage, and archive BMD mission oriented data. AMSC also provides technical support, data cataloging, test/experiment planning, and data product distribution for BMDO-sponsored NMD FoS, CMD and BPI programs.</li> <li>• 2143 Provides the Joint National Test Facility funds for the BMD Simulation Support Center (BMD SSC), as a primary BMDO Data Center that can process, manage and archive M&amp;S, C2SIM and CINC Assessments, BM/C3I, and JEA data; provide technical and data catalog support; and conduct test/experiment planning and data product distribution for BMDO-sponsored programs.</li> <li>• 500 Provides funding for the design, development, engineering, implementation, and operation of the BMDO Wide Area Network (WAN).</li> </ul>																									
<table border="0"> <tr> <td style="width: 100px;">Total</td> <td style="width: 100px;">9238</td> <td colspan="11"></td> </tr> </table>													Total	9238											
Total	9238																								
Project 3161				Page 11 of 37 Pages				Exhibit R-2A (PE 0603874C)																	

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3161</b>
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<b>B. <u>Other Program Funding Summary</u></b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost

**C. Acquisition Strategy:**  
 The work in this project is sourced through full and open competition. Primary Data Center Program support is performed at SMDC, AEDC, and JNTF. The SMDC contractor operates under a Cost Plus Award Fee (CPAF) first awarded in February of 1999. The AEDC contractor operates under a CPAF first awarded in October of 1995.

<b>D. <u>Schedule Profile</u></b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Develop Standard Data Centers Program Cost Business Model	1Q						
Update Data Centers Plan	1Q						
Transition/Realign Data Centers Program with Corporate Information Management Program	3Q						

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE **February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603874C BMD Technical Operations**

**PROJECT**  
**3161**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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 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. Networks	Allotment	MDA	1211						1211	
b. Data Center and Management	Allotment	Various EA	7527						7527	
Subtotal Support Costs:			8738						8738	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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 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 Projects and Per Supt		Army SMDC	500						500	
Subtotal Management Services:			500						500	

Remark:

Project Total Cost:			9238						9238	
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Remark:

**UNCLASSIFIED**

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002		
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603874C BMD Technical Operations				PROJECT 3352	
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3352 Modeling and Simulation	44082	0	0	0	0	0	0	Continuing	Continuing
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project is responsible for the implementation of a comprehensive program that establishes and maintains an affordable and validated set of Core Models and Simulations (M&amp;S). These mission focused Core Models and Simulations are required for pre- and post-test evaluation activities that support the Corporate Test Program and MDAP testing events. This project provides for the program management, planning, coordination, and technical oversight of system level M&amp;S.</p> <p>This mission common task provides computing and networking infrastructure support for the ARC/SC. Specific efforts supported include the concept exploration, development, and test of Theater Air Missile Defense (TAMD) and National Missile Defense (NMD) U.S. Army elements. This task supports the operations and maintenance of computing resources for multiple testbeds within the ARC and supercomputers and local and wide area networking capabilities within both the ARC and SC.</p> <p>Signature Model and Synthetic Scene Generation and Simulation activities provide high confidence signature prediction capability for active and passive EO and RF sensors used in BMD elements and systems. Both empirical and physics-based models and computer codes are developed, verified &amp; validated, maintained, and distributed to provide high-confidence results. These predictions support test planning, test target design, sensor design/development/test, data and systems analysis, operational test and evaluation, and algorithm development.</p> <p>M&amp;S activities also funded by this project include: development, enhancement, and maintenance of the theater test beds and tools for the conduct of wargames that provide the analysis, integration, demonstration, and performance verification for TMD systems. It ensures joint usage of simulation tool resources and supports allied and friendly international participation and cooperation in wargaming exercises. This project focuses M&amp;S support in three major areas: assessments, development/modification, and program management for BMDO and Service M&amp;S programs.</p> <p>The Ballistic Missile Defense Simulation Support Center (BMDSSC) archives and maintains M&amp;S tools which are joint, global and possess multi-level fidelity. The BMD SSC seamlessly links existing and planned simulations of C4I networks, platforms and weapon systems. This activity also includes the operation and maintenance of centralized M&amp;S catalogs of databases that identify current and developing BMDO simulation tools. BMD SSC has been designated as the BMDO Node for models, simulations, and data on the Defense Modeling and Simulation (DMSO) Resource Repository (MSRR).</p> <p>Wargame 2000 is being developed as a BMD simulation to run wargames and exercises at the JNTF for the next 10 years. The requirements are to: design the simulation using an object oriented paradigm, enable "plug and play" of TMD and NMD models, facilitate integrating (BMDO's JNTF) internal and external elements into a flexible real-time simulation suite, incorporate realistic C2 displays, enhance wargaming productivity and responsiveness, and provide for multi-level security.</p>									
Project 3352	Page 14 of 37 Pages					Exhibit R-2A (PE 0603874C)			



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603874C BMD Technical Operations</b>	<b>PROJECT</b> <b>3352</b>
<p>This task includes the "Wide Bandwidth Information Infrastructure Project" (WBII), which is to create a network for geographically distributed ground test facilities for both THAAD and NTW missile defense programs. Specifically, linking the Aegis Weapons System Combat Systems Engineering Development Sites (CSEDS) in Moorestown, NJ, and the Standard Missile-III Systems Integration Laboratory (SIL) in Tucson, AZ using networking and Virtual Private Network (VPN) technology. Both Hardware-in-the-Loop (HWIL) applications will involve information security and interoperability issues. The focus on networking technologies is to meet scaleable national security classification networking architecture requirements to distribute imagery data for seeker and sensor algorithm developers for the Ballistic Missile Defense Organization (BMDO) Project Hercules.</p> <p>In FY00 only, this project also provided acquisition and support services for the design, development, modernization, and control of BMDO Mission Oriented Information Technical Modernization (ITR). The objective for this program is to provide responsive ITR support and services via a flexible, responsive architecture to satisfy validated current and projected user ITR requirements. Specific tasks include processing of Mission Oriented ITR-related service requests, conducting the Mission Oriented ITR Working Group and supporting BMDO Chief Information Officer (CIO) initiatives such as the drafting and implementation of the mission oriented portions of the BMDO Strategic Information Management Plan and BMDO Five Year Information Resources Management Plan (FYIRMP). This project is also responsible for the identification and support of High Performance Computing requirements.</p> <p>Lethality Model activities provide modeling and simulation support for the BMDO Corporate Lethality Program and the lethality community. The Lethality program answers are the primary evaluation tools to determine the success or failure of a threat target intercept. This task supports the maintenance and enhancement of lethality models through the development of standard lethality threat-representative targets, the pre-flight prediction of tests and experiments to obtain lethality data and the incorporation of that data into the interceptor/target lethality models' design.</p> <p>This mission common task includes the government salaries and related support costs (e.g. rent, travel, supplies, etc.) for the Service Executing Agent (EA) government technical personnel, other than the PEO, directly supporting and assigned to the Testbed Product Office and the ARC/SC.</p> <p>This project is conducted in accordance with DoD 5000.59, DoD Modeling and Simulation (M&amp;S) Management.</p> <p><b>FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 16211 ARC/SC Development and Operations</li> <li>• 900 EADTB</li> <li>• 4519 Signature Models</li> <li>• 773 SSC Support</li> <li>• 6981 Wargame 2000</li> <li>• 8664 Bandwith Info Infrastructure</li> <li>• 1233 Lethality Models</li> <li>• 1757 Gov Project Per and Support</li> <li>• 3044 Support Contracts</li> </ul> <p>Total 44082</p>		
Project 3352	<i>Page 15 of 37 Pages</i>	Exhibit R-2A (PE 0603874C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3352</b>
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<b>B. <u>Other Program Funding Summary</u></b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY2006</u>	<u>FY 2007</u>	To <u>Compl</u>	Total <u>Cost</u>
PE 0603873C	227965								

**C. Acquisition Strategy:**  
 The work in this project is sourced through full and open competition. Majority of M&S support is performed at the JNTF, ARC/SC, BMD SSC and other test bed facilities. The ARC/SC contractor operates under a Cost Plus Fixed Fee (CPFF) contract first awarded in June of 1989.

<b>D. <u>Schedule Profile</u></b>	<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>
BMDSSC Version Release (Unclassified)	1Q-4Q						
M-O FYIRMP	4Q						
BMD SSC Version Release (Classified)	1Q,3Q						
C2SIM '00 w/ Wargame 2000	1Q						
Wargame 2000 TAMD FOC (Block 33)	3Q						
M & S Investment Plan	2Q						
PEGEM Version 3.6	1Q						

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603874C BMD Technical Operations**

**PROJECT**  
**3352**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. ARC Development	C/CPAF	Army SMDC	16211						16211	
b. EADTB	Allotment	Army SMDC	900						900	
e. Wargame 2000	Allotment	Multiple	6981						6981	
f. SSC Support	Allotment	Multiple	773						773	
g. Bandwidth Infrastructure	Allotment	Multiple	8664						8664	
h. Signature Models	Allotment	Multiple	4519						4519	
i. Lethality Models	Allotment	Multiple	1233						1233	
Subtotal Product Development:			39281						39281	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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 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:

<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3352</b>
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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
f. GOV Project Per & Supt	Allotment	Army SMDC	1757						1757	
a. Support Contracts	Allotment	MDA	3044						3044	
Subtotal Management Services			4801						4801	

Remark:

Project Total Cost:			44082						44082	
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Remark:

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

DATE  
**February 2002**

<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603874C BMD Technical Operations</b>	<b>PROJECT</b> <b>3353</b>
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COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3353 JNTF	45843	0	0	0	0	0	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The Joint National Test Facility (JNTF) is BMDO's premiere modeling, simulation and test capability for evaluating the interoperability of Theater Missile Defense (TMD) and National Missile Defense (NMD) functions. It is staffed by the military services with a focus on Family of System Interoperability for TMD and NMD 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 addition to conducting tests on systems of systems, JNTF also provides one-on-one support to TMD 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 TMD and NMD 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 2001 Planned Program:**

- 41558 JNTF Development and OPNS
  - 4285 Gov Project per and Supt
- Total 45843

<b>B. <u>Other Program Funding Summary</u></b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY2007	To Compl	Total Cost
PE 0603873C	227965								
PE 0603874C	307859								
PE 0603876C	25853								

**C. Acquisition Strategy:**

The tasks in this project are met through full and open competition. The CRDC contract, currently performed by TRW and its sub-contractors, will be re-competed in FY01 through full and open competition. Formal source selection procedures are envisioned with an estimated award date of 15 October 2001. Contracted Advisory & Assistance Services are provided by Vanguard Research as Cost Plus Award Fee. This contract is being re-competed as a technical and administrative assistance contract for the JNTF Government staff in FY00. Formal source selection procedures are envisioned with an estimated award date of 15 October 2001.

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DATE February 2002

BUDGET ACTIVITY  
4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE  
0603874C BMD Technical Operations

PROJECT  
3353

<b>D. Schedule Profile</b>	<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>
TAMD/CINC Exercises	1-4Q						
TAMD Wargame	2&4Q						
C2 Simulation (NMD)	1Q						
Interoperability Tests	2&4Q						
Wargame 2000 Block 32	1Q						
Wargame 2000 Block 33	2Q						

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3353</b>
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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. N/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 FY99-01	Target Value of Contract
a. GOV Project Per & Supt	Allotment	Various	4285						4285	
			4285						4285	

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. JNTF Development and OPNS	Allotment	JNTF, Colorado Springs, CO	41558						41558	
Subtotal Test and Evaluation:			41558						41558	

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. N/A										
Subtotal Management Services:										

Remark:

Project Total Cost:			45843						45843	
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Remark:

**UNCLASSIFIED**

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002		
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603874C BMD Technical Operations				PROJECT 3354	
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3354 Targets	44660	0	0	0	0	0	0	Continuing	Continuing
<b>A. <u>Mission Description and Budget Item Justification</u></b>									
<p>The PAC-3, Navy Area, THAAD, Navy Theater Wide, and Airborne Laser (ABL) programs require target system support to accomplish their planned test and evaluation programs. The PAC-3 program uses HERA and Storm targets launched from Ft. Wingate into White Sands Missile Range (WSMR) and from Wake Island to Kwajalein Missile Range (KMR). The Navy Area program will use HERA targets from Ft. Wingate into WSMR, Short-Range Air Launched Targets (SRALT) at PMRF for the Linebacker test series, and Navy Theater Wide is using the Minute Man I, M-56 second stage booster for Aegis Leap Intercept testing launched from Pacific Missile Range Facility (PMRF - Barking Sands, Kauai) into open ocean impact areas. Lance missiles have been used for testing with the PAC-3 and the Navy Area programs. U.S. Army Space and Missile Defense Command (USASMDC) and U.S. Air Force Space and Missile Command (USAFSMC) are developing short and long range air launched target (LRALT) capabilities. LRALT will augment the existing target inventory; provide the capability to launch targets at various azimuths and ranges into TMD test ranges; and allow multiple simultaneous engagements.</p> <p>In FY00, this project maintained the Strategic Target System (STARS) motors, components and launch equipment and mission planning support for possible future use as a Theater Missile Defense (TMD) long range target or National Missile Defense (NMD) target. FY01 funding for STARS is in the NMD Technology Program Element (0603871C).</p> <p>In FY01, this project will support the Consolidated Targets Program (CTP), the mission of which is to provide threat-credible ballistic missile targets and target system support to weapon system development and acquisition programs in accomplishment of BMDO's reliance obligations to the Department of Defense (DOD). The major functions of the CTP include: design, development and presentation of Theatre Missile Defense (TMD) targets; management of the Target Certification Process; Verification, Validation and Certification (VV&amp;C) of target assets; modification and reuse of strategic missile hardware; air launched and liquid fueled target development; matching ballistic re-entry vehicle development; proof of concept/risk reduction demonstration flights; the acquisition and management of actual threat targets (Foreign Material Acquisition), and program management. Each target developed for BMD testing will be certified as providing the correct threat representative characteristics to test a system.</p>									
<b>FY 2001 Planned Program:</b>									
•	38988	Target Validation							
•	748	Foreign Material Acquisition							
•	2336	Liquid Fueled Targets							
•	2588	Government Project Per & Support							
Total	44660								
Project 3354			Page 22 of 37 Pages				Exhibit R-2A (PE 0603874C)		



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3354</b>
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<b>B. <u>Other Program Funding Summary</u></b>	<u>FY2001</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>

**C. Acquisition Strategy:**

- The Hera and Storm target systems are being developed by the executing agent: U.S. Army Space and Missile Defense Command (USASMDC), Theater Targets Program Office (SMDC-TJ-TT) in Huntsville, AL. The Hera and Storm target systems are being procured under the Consolidated Theater Target Services (CTTS) contract. Coleman aerospace corporation, Orbital Sciences Corporation, and Lockheed Martin Missile Systems compete for TMD target services. This contract provides increased flexibility to meet MDAP schedules and requirements.
- The development and demonstration of the long range air launched ballistic target system (LRALT) is being managed by the USASMDC/TT&E office with the Air Force Space and Missile Command as the contracting agency.
- With the advent of LRALT STARS is no longer a required TMD target. STARS will continue to be supported in the NMD Technology Program Element (0603871C).
- A liquid fueled target development program was initiated in FY00 to design a liquid-fueled booster for TMD target use. FY01 initiates a design phase with development starting in FY02.

<b>D. <u>Schedule Profile</u></b>	<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>
Navy Area	1-4Q						
Navy Theater	1-4Q						
PAC-3	1-4Q						
Others (Technology Programs)	2Q						

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3354</b>
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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. Target Validation	Allot	USASMDC Huntsville, AL	38988						38988	
b. Liquid Fueled Targets	CPFF	USASMDC Huntsville, AL	2336						2336	
c. Foreign Mat Acquisition	CPFF	USAFSMC Los Angeles, CA	748						748	
Subtotal Product Development:			42072						42072	

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.										
Subtotal Test and Evaluation:										

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. GOV Project Per & Support		Army SMDC	2588						2588	
Subtotal Management Services:			2588						2588	

Remark:

Project Total Cost:			44660						44660	
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Remark:

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3357</b>
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COST ( <i>In Thousands</i> )	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3357 Facilities, Siting, and Environment	2795	0	0	0	0	0	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

In FY01, this project provides environmental program guidance, environmental impact analyses and documentation, real property facility siting, acquisition, and facility operational support for the Ballistic Missile Defense Organization (BMDO) Theater Missile Defense (TMD) and National Missile Defense (NMD) systems. This project plans, programs, budgets, and oversees facility acquisition through the Military Construction (MILCON) and RDT&E construction programs. This project provides guidance and supports BMDO TMD, NMD, and Advanced Technology Environmental Safety and Health (ESH) Programs, including the Environmental Assessment and Environmental Impact Statement process, environmental compliance, pollution prevention, and other environmental efforts.

**FY 2001 Planned Program:**

- 314 Fac & Siting Programs
  - 194 Env Safety and Health Programs
  - 2287 Support Contracts
- Total 2795

**B. Other Program Funding Summary**

	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost

**C. Acquisition Strategy:**

BMDO tasks the Services through Program Management Agreements to perform the required tasks in support of the BMD program and performs quarterly reviews to verify and validate completed tasks.

To provide technical assistance concerning facilities construction, siting, and environmental activities, BMDO implements a process which:

- Maintains perspective of national technical test capabilities relative to all BMD developmental programs,
- Responds to MDAP program requirements,
- Makes maximum use of existing test resources where possible,
- Requires full coordination prior to development of new resources,

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3357</b>
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- Consolidates management of existing resources where possible and practical.

This process is executed through a variety of acquisition methods. Executing Agent Project Managers for the elements and tasks under this project include the three military services and the BMDO. Service Project Manager organizations specifically include the:

- U.S. Army Space and Missile Defense Command (USASMDC)
- U.S. Air Force Materiel Command
- Navy Program Executive Officer (Theater Surface Combatants)
- U.S. Army Corps of Engineers (USACE)
- U.S. Navy, Naval Facilities Engineering Command (NAVFAC)
- U.S. Army Program Executive Officer-Missile Defense

<b>D. Schedule Profile</b>	<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>
Environmental Support for BMDO Programs	1-4Q						
Facility Acquisition Support for BMDO Programs	1-4Q						

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603874C BMD Technical Operations**

**PROJECT**  
**3357**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Fac & Siting Programs	Allot	Various	314						314	
b. Env Safety and Health Programs	Allot	Various	194						194	
Subtotal Product Development:			508						508	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Support Contracts	Various	BMDO	2287						2287	
Subtotal Support Costs:			2287						2287	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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 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 Management Services:										

Remark:

Project Total Cost:			2795						2795	
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Remark:

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>				PROJECT <b>3359</b>		
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost	
3359 Test, Evaluation & Assessment	10007	0	0	0	0	0	0	Continuing	Continuing	
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>FY 2001 Test, Evaluation and Assessment activities in this PE consists of selected activities previously performed under Project 1155, Discrimination.</p> <p>To prepare for critical future defense needs, technical operations will support BMDO programs by conducting several cross cutting programs that will yield improved capabilities across a selected range of boost, midcourse and terminal phase missile defense interceptors, advanced target sensors and innovative science. The ultimate objective is improved performance, reduced costs for acquisition programs and technical solutions options to mitigate evolving threats associated with National and Theatre Ballistic Missile Defense.</p> <p>This program provides the critical BMD signature data collection, analysis and reporting provided to the BMD community necessary for weapon system and interceptor development. Analysis efforts consist of Radar Cross Section analysis and Infrared signature analysis using data collection by assets owned or operated by BMDO or operated by other agencies for use by BMDO.</p> <p>This program also supports BMDO efforts to engage Allied countries in conducting collaborative efforts associated with ballistic missile signature and phenomenology research. Exchanges are conducted to assist Allies in facilitating surveillance, acquisition, track, discrimination and kill assessment through data collection, analysis and reporting.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 247 Provide Funding for Critical Measurements Program</li> <li>• 15 Provide Funding for Test Planning</li> <li>• 456 Provide Funding for Corp Data Collect and Analysis</li> <li>• 2597 Provide Funding for Optical Data Analysis</li> <li>• 2065 Provide Funding for Radar Exploitation</li> <li>• 1624 Provide Funding for RCS Data Analysis</li> <li>• 977 Gov Project Per and Support</li> <li>• 1021 Support Contracts</li> <li>• 1005 Provide Funding for International Programs</li> </ul> <p>Total 10007</p>										
Project 3359			Page 28 of 37 Pages				Exhibit R-2A (PE 0603874C)			

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3359</b>
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<b>B. <u>Other Program Funding Summary</u></b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost

**C. Acquisition Strategy:**  
 This program provides critical optical/IR and RCS signature data and algorithm development for the BMDO MDAPs and is inserted in the systems engineering process for weapon system improvement. International collaborative efforts promote shared ballistic missile defense research and technologies, which will contribute to a stronger ballistic missile defense capability by Allied countries

<b>D. <u>Schedule Profile</u></b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 2002</b>
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>					PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>					PROJECT <b>3359</b>
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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 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 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. Critical Measures (CMP)	Allotment	SMDC Army	247						247	
b. Test Planning	Allotment	MDA	15						15	
c. Corp Data Analysis	Allotment	Various EA	456						456	
d. Optical Data Analysis	Allotment	Various EA	2597						2597	
e. RCS Data Analysis	Allotment	Various EA	2065						2065	
f. Radar Exploitation	Allotment	SMDC Army	1624						1624	
g. International Programs	Allotment	Various EA	1005						1005	
Subtotal Test and Evaluation:			8009						8009	
Remark:										
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Support Contracts	Allotment	MDA	1021						1021	
b. GOV Project Per & Supt	Allotment	SMDC Army	977						977	
Subtotal Management Services:			1998						1998	
Remark:										
Project Total Cost:			10007						10007	
Remark:										



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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3360</b>
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COST ( <i>In Thousands</i> )	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3360 Test Resources	107157	0	0	0	0	0	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project provides for BMDO planning, oversight and coordination of integrated test and evaluation facilities. The project includes inter-element as well as inter-service test and evaluation efforts, and provides for common ground test facilities, ranges and instrumentation. Project 3360 funds those test resources mutually supporting BMDO's National Missile Defense (NMD), Theater Missile Defense (TMD) and Technology programs. Individual BMDO programs pay only the direct costs associated with their specific testing efforts at these mission critical facilities.

The ground test facilities include:

- Kinetic Kill Vehicle Hardware in the Loop Simulator (KHLS) at Eglin AFB in Fort Walton Beach, FL
- AEDC Hypervelocity Wind Tunnel Number 9 (Tunnel 9) at White Oak, MD
- Infrared and Blackbody Standards at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD.
- Hypervelocity Ballistic Range G Light Gas Gun Von Karman Facilities (VKF) at the Arnold Engineering and Development Center (AEDC) in Tullahoma, TN
- 7V and 10V Space Chambers at AEDC, Tullahoma, TN
- National Hover Test Facility (NHTF) at Edwards AFB, CA
- Army Missile Optical Range (AMOR) at Redstone Arsenal, AL
- Aero-Optic Evaluation Center (AOEC) at Calspan-University of Buffalo Research Center (CUBRC), NY
- Holloman High Speed Test Track (HHSTT) at Holloman AFB, NM

The test range facilities include national ranges such as:

- White Sands Missile Range (WSMR) in Las Cruces, NM including Ft. Wingate Launch Complex near Gallup, NM
- Kwajalein Missile Range (KMR) in the Marshall Islands
- Pacific Missile Range Facility (PMRF) and Kauai Test Facility (KTF) at Kauai, HI
- Wake Island Launch Complex

The range instrumentation special test equipment, data collection assets, and range instrumentation include:

- IR data collection sensors and platforms
- Mobile Range Safety System and Kwajalein Range Safety Control Center Upgrades
- NP-3 Aircraft upgrade for remote area safety support.
- Sea-Lite Beam Director (SLBD), based at White Sands Missile Range, Las Cruces, NM

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603874C BMD Technical Operations</b>	<b>PROJECT</b> <b>3360</b>
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Miscellaneous improvements to BMDO infrastructure and support systems

These ground test, range and instrumentation assets provide valuable risk reduction and test implementation capability in support of TMD and NMD test and evaluation. The ground test facilities provide a cost-effective method of testing and evaluating applicable component, sub-system and system level technologies. The common range facilities provide a cost-effective method of flight testing missile and target components applicable to the BMD program and TMD Family of Systems (FoS), BMC<sup>3</sup> and interoperability testing. Range instrumentation provides a cost-effective capability to collect missile characteristics, phenomenology data, and target/interceptor diagnostics on flight tests. These facilities and capabilities support systems design, verification and validation of weapon system and target realism, and the evaluation of test results.

This project provides for BMDO planning, oversight and coordination of integrated test and evaluation facilities. The project includes inter-element as well as inter-service test and evaluation efforts, and provides for common ground test facilities, ranges and instrumentation. Project 3360 funds those test resources mutually supporting BMDO's National Missile Defense (NMD), Theater Missile Defense (TMD) and Technology programs. Individual BMDO programs pay only the direct costs associated with their specific testing efforts at these mission critical facilities.

**FY 2001 Accomplishments:**

- 15220 Provide funding to BMDO common Test Facilities
- 29198 Provide funding to BMDO common Test Ranges
- 16920 Provide funding to BMDO common Sensors
- 5867 Provide funding to Wake Island
- 4673 Provide funding for BMDO common Ranges Improvement and Modernization
- 650 Provide funding for Sea Based Data Collection
- 4782 Provide funding to HALO/Iris
- 17202 Provide funding for IR Data Collection Upgrades
- 1100 Provide funding to BMDO common IR/CC Support
- 3207 Provide funding to support Project Hercules
- 710 OSD Reductions
- 5703 Support Contracts
- 1925 Gov Project Per & Supt

Total 107157

<b>B. Other Program Funding Summary</b>	<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>

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3360</b>
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**C. Acquisition Strategy:**

BMDO tasks the Services through Program Management Agreements to perform the required tasks in support of the BMD program, provides monthly reports, and performs quarterly reviews to verify and validate completed tasks.

In providing range and test facilities support to the MDAP Program managers, BMDO implements a process which:

- Maintains perspective of national technical test capabilities relative to all BMD developmental programs,
- Responds to MDAP program requirements,
- Makes maximum use of existing test resources where possible,
- Requires full coordination prior to development of new resources,
- Consolidates management of existing resources where possible and practical.

This process is executed through a variety of acquisition methods. Executing Agent Project Managers for the elements and tasks under this project include the three military services and the BMDO. Service Project Manager organizations specifically include the:

- U.S. Army Space and Missile Defense Command (USASMDC)
- U.S. Air Force Materiel Command
- U.S. Navy Office of Naval Research
- Navy Program Executive Officer (Theater Surface Combatants)
- U.S. Air Force Research Laboratory
- U.S. Army Corps of Engineers (USACE)
- U.S. Navy, Naval Facilities Engineering Command (NAVFAC)
- U.S. Army Program Executive Officer-Missile Defense

<b>D. <u>Schedule Profile</u></b>	<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>FY 2008</u>

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603874C BMD Technical Operations</b>	<b>PROJECT</b> <b>3360</b>
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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.										
b.										
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.										
b.										
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. Test Facilities	Allotment	Various	15220						15220	
b. Test Ranges	Allotment	Various	29198						29198	
c. Sensors	Allotment	Various	16920						16920	
d. Wake Island	Allotment	Varrious	5867						5867	
e. Ranges Improve and Modernize	Allotment	Various	4673						4673	
f. Sea Based Data Collection	Allotment	Various	650						650	
g. HALO	Allotment	Various	4782						4782	
h. IR Data Collec Upgrades	Allotment	Varrious	17121						17121	
i. COBRA Ball Upgrade	Allotment	Various	81						81	
j. IR/CC Support	Allotment	Various	1100						1100	
k. Hercules	Allotment	Various	3207						3207	
l. OSD Reductions	Allotment	Varrious	710						710	
Subtotal Test and Evaluation:			99529						99529	

Remark:

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603874C BMD Technical Operations</b>	PROJECT <b>3360</b>
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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. Support Contracts	Allotment	MDA	5703						5703	
b. GOV Project Per & Supt	Allotment	SMDC Army	1925						1925	
Subtotal Management Services:			7628						7628	

Remark:

Project Total Cost:			107157						107157	
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Remark:

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603874C BMD Technical Operations</b>	<b>PROJECT</b> <b>4000</b>
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COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
4000 Program Operations	14635	0	0	0	0	0	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project funds three basic areas: 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 Ballistic Missile Defense Organization located within the Washington D.C. area, as well as BMDO's Executing Agents within the US Army Space & Strategic Defense Command, US Army PEO Missile Defense, US Navy PEO for Theater Defense, 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. 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.

Finally, 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.

**FY 2001 Accomplishments:**

- 14635 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies.
- Total 14635

<b>B. <u>Other Program Funding Summary</u></b>	<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>
N/A									

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

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BUDGET ACTIVITY  
**4 - Program Definition and Risk Reduction**

PE NUMBER AND TITLE  
**0603874C BMD Technical Operations**

PROJECT  
**4000**

**C. Acquisition Strategy:**  
N/A

<b>D. Schedule Profile</b>	<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>
N/A							

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603875C International Cooperative Programs</b>
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COST <i>(In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	125805	0	0	0	0	0	0	Continuing	Continuing
1161 Advanced Sensor Technology*	33780	0	0	0	0	0	0	Continuing	Continuing
2259 Israeli Cooperative Project	92025	0	0	0	0	0	0	Continuing	Continuing

Beginning in FY2002, funding from this Program Element (PE) is moved to the MDA Program Elements 0603881C and 0603884C to facilitate Ballistic Missile Defense (BMD) system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.

**A. Mission Description and Budget Item Justification**

This program is in Budget Activity 4 – Demonstration and Validation, Research Category 6.3B. The International Cooperative Program Element (PE) was created at Congressional direction. This PE provides for cooperative efforts with Israel and the Russian Federation. Cooperation with Israel centers around the development of an initial capability for the Arrow Missile Defense system that is interoperable with U.S. missile defense forces. The PE also provides for work with the Russian Federation to demonstrate advanced space-based remote sensor technologies and supports other cooperative research.

<b><u>B. Program Change Summary</u></b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002 PB</u> )	116992		
Congressional Adjustments	14000		
Appropriated Value	130992		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-1201		
b. SBIR / STTR	-2857		
c. Omnibus or Other Above Threshold Reductions			
d. INTL Realignment	-1037		
e. Rescissions	-92		
Adjustments to Budget Years Since <u>FY 2002 PB</u>	8813		
Current Budget Submit ( <u>FY 2003 Budget Estimates</u> )	125805		

Change Summary Explanation:



<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603875C International Cooperative Programs</b>	
<p>Beginning in FY2002, funding from this Program Element is moved to the MDA Program Elements 0603881C, and 0603884C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.</p>		

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603875C International Cooperative Programs</b>	<b>PROJECT</b> <b>1161</b>
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COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
1161 Advanced Sensor Technology*	33780	0	0	0	0	0	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

To prepare for critical future active defense needs, Ballistic Missile Defense Organization (BMDO) will conduct a balanced international cooperative program of high leverage technologies that yield improved capabilities across a selected range of advanced sensors. The objectives of these cooperative investments are subsystems with improved performance and reduced costs for acquisition programs.

Russian-American Cooperative Programs:

- The Russian-American Observation Satellites (RAMOS) program is an innovative U.S.-Russian space-based remote sensor research and development program addressing ballistic missile defense and national security. This program engages Russian developers of early warning satellites in the joint definition and execution of aircraft and space experiments. The program will ultimately design, build, launch, and operate two satellites that will provide stereoscopic observations of the earth's atmosphere and ballistic missile launches in the short wavelength and mid-to-long wavelength infrared bands. Near-term experiments have focused on planning and executing nearly simultaneous observations of Earth features using U.S. and Russian satellites. The final phase of the near-term experiments included the development of U.S. and Russian instruments for proof-of-concept measurements from the Flying Infrared Signatures Technology Aircraft (FISTA).

**FY 2001 Planned Program:**

- 33481 RAMOS
  - 299 OSD Reserve
- Total 33780

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

**C. Acquisition Strategy:**

RAMOS is a cooperative experiment program designed to engage the Russians in early warning and theater missile defense related technologies. The tasks to complete the design, fabrication, launch, and operations of the two-satellite constellation will be completed under three major contracts.

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603875C International Cooperative Programs</b>	PROJECT <b>1161</b>
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The first contract is with Utah State University (USU)/Space Dynamics Laboratory (SDL), a designated University Affiliated Research Center for space sensors. SDL is the current U.S. prime contractor for RAMOS and has a prime/subcontractor relationship with the Russian State Company, Rosvoorouzhenie (now Rosoboronexport), for Russian tasks. This contractual approach will be used for design and development of the RAMOS system through the Preliminary Design Review (PDR) scheduled for 2Q FY 2002. After PDR, USU will remain as the prime U.S. contractor for the sensor development and fabrication as well as mission planning and data reduction.

The second contract will be a direct contract with the Russian State Company, Rosoboronexport (formerly Rosvoorouzhenie.) During FY01, BMDO plans to negotiate a government-to-government agreement with the Russian Federation to govern the RAMOS program. Once this agreement is concluded, BMDO will contract directly with Rosoboronexport for the Russian efforts. Under this contract, Rosoboronexport, through Russian subcontractors, will be responsible for the development and fabrication of the satellite platforms, development and operation of the ground system, and launch services for the two RAMOS satellites.

The third contract is with Ball Aerospace and Technologies Corporation of Boulder, CO. As the Systems Engineering and Integration contractor for BMDO, BATC will be primarily responsible for monitoring the Russian effort and facilitating the integration of U.S. and Russian components. Ball will also support preparation of program documentation for technology protection and security and provide in country administrative, security and technical support of RAMOS Program Office.

<b>D. Schedule Profile</b>	<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>
Award Systems Engineering and Integration Contract	2Q						
Complete Systems Specification	2Q						
Complete Systems Requirements Review	2Q						
Conclude Gov't-to-Gov't agreement	3Q						
Conclude Direct Contract with Russians	3Q						

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603875C International Cooperative Programs</b>	<b>PROJECT</b> <b>1161</b>
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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. RAMOS	Various	Air Force, Colorado Springs, CO	281						281	
b. RAMOS	Various	MDA, Various	33200						33200	
c.										
Subtotal Product Development:			33481						33481	

Remark: Prior to FY 1999, the RAMOS program was in BA3 - Advanced Technology Development, PE 0603173C, Support Technologies – ATD. Funding for Rosoboronexport in FY2001 and prior is as a subcontract to USU/SDI.

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. OSD Reserve	Various	Various	299						299	
Subtotal Support Costs:			299						299	

Remark: Prior to FY 1999, the RAMOS program was in BA3 - Advanced Technology Development, PE 0603173C, Support Technologies – ATD

AFRL technical support will be required in program development, experiment planning and data analysis, with emphasis on earth backgrounds, data certification, technology transfer and surveillance.

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.										
Subtotal Test and Evaluation:										

Remark:

<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603875C International Cooperative Programs</b>	PROJECT <b>1161</b>
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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:										

Project Total Cost:			33780						33780
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Remark: Prior to FY 1999, the RAMOS program was in BA3 - Advanced Technology Development, PE 0603173C, Support Technologies – ATD

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603875C International Cooperative Programs</b>	<b>PROJECT</b> <b>2259</b>
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COST <i>(In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
2259 Israeli Cooperative Project	92025	0	0	0	0	0	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project provides funding for the Arrow Deployability Program (ADP) to include the third Arrow battery and Arrow interoperability with U.S. Theater Missile Defense (TMD) systems, as well as the Arrow System Improvement Program (ASIP), Israeli Test Bed (ITB), and the Israeli System Architecture and Integration (ISA&I). The United States derives considerable benefits from its participation in these projects. The presence of a ballistic missile defense system in Israel developed under this project helps ensure U.S. freedom of action in future contingencies and provides protection against ballistic missile attacks to U.S. forces deployed to the region. The cooperative effort also provides risk reduction and alternative technologies for U.S. ballistic missile defense programs as well as phenomenology and kill assessment data.

The ADP consists of efforts to integrate and test the elements making up a ballistic missile defense system for Israel. Under the ADP, the jointly developed Arrow II interceptor and launcher are being integrated with the Israeli developed Arrow components, to include: fire control radar (Green Pine), battle management center (Citron Tree) and launcher control center (Hazelnut Tree). The ADP is the third phase of the cooperative Arrow program. Phase I consisted of the Arrow Experiments project that cooperatively developed the pre-prototype Arrow I interceptor. It was followed by the Arrow Continuation Experiments (ACES) project which consisted of critical lethality and flight tests using the upgraded Arrow II interceptor. The Arrow II interceptor development, now complete, provided the basis for an informed Government of Israel (GOI) engineering and manufacturing decision to proceed with development of an integrated ballistic missile defense capability. ACES was highly successful and satisfied the Israeli requirement for a ballistic missile interceptor for defense of Israeli critical assets and population centers. The phase II program contributed to the U.S. technology base for new advanced ballistic missile defense technologies that were incorporated into the U.S. TMD systems, and also provided risk reduction technologies in the event that U.S. TMD technical efforts failed to meet expectations.

The third phase is the current ADP, which began in FY 1996. This phase of the program provides for development, test, and deployment of an Arrow User Operational Evaluation System (UOES) to permit the Government of Israel to make a decision regarding its deployment (without financial participation by the United States beyond the Research and Development (R&D) stage). This effort includes integrated system-level flight tests of the total Arrow Weapon System (AWS). The first such integrated intercept flight test was successfully conducted in Israel on November 1, 1999. The Green Pine radar detected a Scud-class ballistic target, and the Citron Tree battle management center commanded the launch of the Arrow II interceptor and communicated with it in-flight to successfully destroy the incoming missile. A second ADP intercept flight test, conducted on September 14, 2000, was the first intercept of an air-launched Black Sparrow ballistic target. In this intercept test, the target was flown toward Israel making this the first Arrow intercept of an incoming target vice past intercept test wherein the target was flown away from Israel.

The International Agreement (IA) between the U.S. and Israel for the ADP will be amended to provide additional funding of \$34M in FY 2002 for the Arrow third battery. In January 1998, Israel requested \$169 million to fund the procurement of a third Arrow battery. Congress provided a plus-up of \$45M in FY98 and a second \$45M plus-up in FY00. DoD requested, and Congress appropriated, third battery funding of \$45M in FY 2001. For each third battery installment, Congress authorized

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603875C International Cooperative Programs</b>	<b>PROJECT</b> <b>2259</b>
<p>the ADP IA to be amended to increase the U.S. cost share and allow Israel to withdraw an equal to acquire components of the third battery. Of the total \$169M requested by Israel in January 1998 for the third Arrow battery, a balance of \$34 M now remains. DoD has programmed that amount in FY 2002 as the final installment, which will then complete the U.S. commitment.</p> <p>Arrow is being made interoperable with U.S. TMD systems using the Joint Tactical Information Distribution Systems (JTIDS)/Link-16 communications architecture and message protocol. An interface has now been developed and delivered in Israel for AWS interoperability. Early proof-of-concept tests using the BMDO-developed TMD System Exerciser (TMDSE) have been conducted via interactive simulation exercises to lay the foundation for future test, assessment, and validation of the JTIDS-based interoperability between the AWS and U.S. TMD systems. The TMDSE experiments, to be largely completed in FY 2001, will assess AWS operability with deployed U.S. TMD systems. The interoperability effort will be funded in FY 2001 by a \$6M Congressional add-on which also pays back Israeli money which funded the effort in FY 2000.</p> <p>An Arrow System Improvement Program (ASIP) feasibility study will be conducted in FY 2001 to explore ways to maintain the Arrow's capability against emerging regional threats, including countermeasures and longer range ballistic missiles. This effort will be funded in FY 2001 by an \$8M Congressional add-on. The United States and Israel will determine, at the conclusion of the feasibility study, whether the ASIP is technically mature to proceed to the next ASIP phase. ASIP, if shown to be feasible, would be conducted in three phases. Phase I, a 9-12 month feasibility study, will be conducted during FY 2001 and will provide a determination concerning feasibility of upgrading the Arrow Weapon System and a detailed plan if shown to be feasible.</p> <p>Since Arrow program initiation in 1988, Israel successfully improved the performance of its pre-prototype Arrow I interceptor to the point that it achieved a successful intercept and target destruction in June 1994. Arrow II design and component testing progressed to the successful demonstration of the new warhead, electro-optical seeker, radar fuse, first stage booster, sustainer booster, launcher canister, and launcher. The ADP IA was signed in March 1996, and Presidential certification was completed in May 1996. Under the ADP agreement, the first flight test of the integrated AWS, a non-intercept fly-out test, was successfully completed on September 14, 1998. This was a combined ACES/ADP flight test, and its success marked the conclusion of the ACES Program. This flight test was the first in which the other elements of the AWS, rather than test range assets, were used to control and communicate in-flight with the Arrow missile. This test demonstrated the technical maturity of the AWS and was followed by a successful integrated system intercept test against a ballistic missile target on November 1, 1999. Following the successful intercept of an incoming Black Sparrow target on September 14, 2000, the Israeli Air Force declared the Arrow Weapon System operational on October 16, 2000.</p> <p>The ITB Program is a medium-to-high fidelity theater missile defense simulation that provides the capability to evaluate potential Israeli missile defenses, aids the Israeli Ministry of Defense (IMoD) in the decision of which defense systems to field, provides insights into command and control in TMD and the role of Human-in-the-Loop (HIL), and trains Israeli Air Force personnel to function in a TMD environment. A structured set of joint U.S./Israeli experiments is being executed to evaluate the role of missile defenses in Middle East theater operations. This funding also provides for a portion of the operation and maintenance of the ITB and for planned enhancements. The implementation of the Distributed Interactive Simulation (DIS) and high level architecture (HLA) technologies enables joint exercise experiments to be conducted both in Israel and across the water between U.S. TMD and Israeli TMD systems, using a combination of such modeling and simulation tools as the Extended Air Defense Simulation (EADSIM), Extended Air Defense Test Bed (EADTB), and the ITB.</p>		
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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603875C International Cooperative Programs</b>	<b>PROJECT</b> <b>2259</b>
<p>ITB experiments are used to validate the performance of the prospective near-term Israeli Theater Missile Defense System and provide valuable insight into the potential role of HIL for a TMD system. The ITB is being used as a tool to assist with the development of Combined Standard Operating Procedures (CSOP) between the U.S. European Command (USEUCOM) and Israel for potential combined TMD operations. Early warfighter activities in developing the CSOP at the ITB were invaluable during U.S. contingency operations in late FY 1998. Further ITB experiments involving the Israeli Air Force and USEUCOM were undertaken in FY 2000 and FY 2001 to finalize combined operating procedures and to begin the integration of the AWS in USEUCOM'S CSOP and Operations Plan (OPLAN).</p> <p>The ISA&amp;I tasks provide ongoing analysis and assessment of the baseline, evolutionary, and responsive threats to support the definition and evaluation of an initial Israeli Reference Missile Architecture (IRMA), a baseline missile configuration from which to assess and evaluate architectural effectiveness. Evolutionary growth paths to enhance the IRMA robustness against future threats are being identified. Critical TMD system architecture issues and technologies are being analyzed, and the conformance to established requirements of various TMD programs, including the Arrow Deployability Program (ADP), Boost Phase Intercept concepts, and the ITB are being conducted. Finally, previously developed simulations and models are being used selectively to address significant TMD issues. Collectively, the tasks conducted under this cooperatively sponsored ISA&amp;I project provide critical insights and technical data to both the U.S. and Israeli governments for improving near-term and evolutionary defenses against ballistic missile threats.</p> <p>The ISA&amp;I project activities have demonstrated that defense of the State of Israel from Theater Ballistic Missile (TBM) attacks is necessary, feasible, and cost-effective. The ISA&amp;I effort analyzed and addressed numerous TMD system issues including HIL, resource allocation, and threat analysis. The United States benefited from the architecture analysis work, including identification and progress toward resolution of critical TMD system issues such as kill assessment and the lethality study of a novel interceptor warhead. The ISA&amp;I is playing a critical role in identifying possible AWS upgrades to preserve system effectiveness as more robust regional ballistic missile threats continue to evolve.</p> <p>The cooperative R&amp;D program supports the advancement of emerging TMD technologies. The IMoD and the BMDO will jointly measure the phenomenology and kinematics of theater ballistic missile systems.</p> <p><b>FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 28806 ARROW DEPLOY PROJ (ADP)</li> <li>• 3079 ADP SUPPORT</li> <li>• 1300 ISRAELI COOP R&amp;D</li> <li>• 2100 ISRAELI TEST BED</li> <li>• 1849 ISRAELI SE&amp;I</li> <li>• 1656 INTEROPERABILITY VALIDATION</li> <li>• 45000 ARROW 3RD BTRY</li> <li>• 100 F/B MTL</li> <li>• 6200 ASIP</li> </ul>		
Project 2259	Page 9 of 12 Pages	Exhibit R-2A (PE 0603875C)



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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603875C International Cooperative Programs</b>
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- 1800 ASIP Support
  - 135 GOV PROJECT PER & SUPT
- Total 92025

<b>B. <u>Other Program Funding Summary</u></b>	<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>
N/A									

**C. Acquisition Strategy:** This is an ongoing cooperative U.S./GOI development program. By completing the Arrow Deployability Program, U.S. TMD programs will be afforded state-of-the-art technical data for program risk reduction and the Government of Israel will have developed a robust AWS to defend against known regional ballistic missile threats. Through the ADP, Link-16-based interoperability between the AWS and U.S. TMD systems will be achieved. The United States and the Government of Israel, under the umbrella of the various Memoranda of Agreements, share project costs. The U.S. share of total funding is based upon the maturity of the development. The ADP will be completed in FY2002. The Government of Israel will continue to fund the acquisition of Arrow Weapon System components beyond FY 2002. The Government of Israel is interested in continuing missile defense cooperation beyond the Arrow Deployability Program. The Arrow System Improvement Program feasibility study was funded via a Congressional \$8M plus-up in FY 2001 and the final results of that study will provide a basis for assessing the viability of a follow-on FY 2002-2007 cooperative missile defense program.

<b>D. <u>Schedule Profile</u></b>	<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>
Arrow Weapon System Flight Tests	3Q						
Conduct TMDSE Proof-Of-Concept Test II	2Q						
Initiate Interoperability Tests w/ U.S. TMDSE	2Q						
Complete ASIP Feasibility Study	4Q						

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603875C International Cooperative Programs</b>	<b>PROJECT</b> <b>2259</b>
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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. ARROW DEPLOY PROJ (ADP)	Various	Various	28806						28806	
b. ISRAELI COOP R&D	Various	Various	1300						1300	
c. ISRAELI TEST BED	Various	Various	2100						2100	
d. ISRAELI SE&I	Various	Various	1849						1849	
e. INTEROPERABLTY VALIDATION	Various	Various	1656						1656	
f. ARROW 3RD BTRY	Various	Various	45000						45000	
g. F/B MTL	Various	Various	100						100	
h. ASIP	Various	Various	6200						6200	
Subtotal Product Development:			87011						87011	

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. ADP SUPPORT	Various	Various	3079						3079	
b. ASIP Support	Various	Various	1800						1800	
c. GOV PROJECT PER & SUPT	Allot	SMDC, Huntsville, Al	135						135	
Subtotal Support Costs:			5014						5014	

Remark:

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603875C International Cooperative Programs</b>	PROJECT <b>2259</b>
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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.										
Subtotal Test and Evaluation:										

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:			92025						92025	
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Remark:

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603876C Intelligence Program</b>
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COST <i>(In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	25853	0	0	0	0	0	0	Continuing	Continuing
3155 Systems Engineering and Integration	8379	0	0	0	0	0	0	Continuing	Continuing
3270 Threat and Countermeasures Program	12974	0	0	0	0	0	0	Continuing	Continuing
3359 Test Evaluation and Assessment	4500	0	0	0	0	0	0	Continuing	Continuing

The BMD Program and resulting FY 2002 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY 2002, funding from this Program Element is moved to the Ballistic Missile Defense (BMD) System Program Element 0603880C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.

**A. Mission Description and Budget Item Justification**

The purpose of this Intelligence program is to define potential adversary military force missile threats. The program consists of two component tasks: Intelligence Program and Intelligence Applications. A new Program Element (PE) was consolidated under project 3155. This provision calls for the establishment of a PE to be referred as the "Systems Engineering and Integration Program." The purpose of this program is to assist Theater Missile Defense (TMD) and National Missile Defense (NMD) acquisition program offices in developing ballistic missile defense systems that are robust to potential countermeasures and are practical and within the means of anticipated adversaries.

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603876C Intelligence Program</b>
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<b><u>B. Program Change Summary</u></b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002 PB</u> )	22621		
Congressional Adjustments	0		
Appropriated Value	22621		
Adjustments to Appropriate Amount			
a. Congressional General Reductions	-207		
b. SBIR/STTR	-491		
c. Omnibus or Other Above Threshold Reductions	0		
d. Intl Realign	3930		
e. Rescissions	0		
Adjustments to Budget Years Since <u>FY 2002 PB</u>	3332		
Current Budget Submit ( <u>FY 2003 Budget Estimates</u> )	25853		

**Change Summary Explanation:**  
 Funding: Funding adjustments made to support revisions in TMD core program schedules and requirements. Beginning in FY 2002, funding from this PE is moved to the BMD System Program Element 0603880C.  
 Schedule: None  
 Technical: None

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603876C Intelligence Program</b>	<b>PROJECT</b> <b>3155</b>
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COST ( <i>In Thousands</i> )	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3155 Systems Engineering and Integration	8379	0	0	0	0	0	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This program is part of the System Engineering and Integration (SE&I) project. BMDO has realigned Systems Engineering functional tasks, previously accomplished under a number of projects. In this PE, Threat Systems Engineering activities are consolidated under this project 3155. This Program Element contains only the Threat Systems Engineering Program. A more complete description of the overall System Engineering and Integration project, can be found in the Mission Description for project 3155 in Program Element 0603873C, Family of Systems E & I and Program Element 0603874C, Ballistic Missile Defense (BMD) Technical Operations.

The Ballistic Missile Defense Organization (BMDO) Threat Systems Engineering Program assists Theater Missile Defense (TMD) and National Missile Defense (NMD) acquisition program offices in developing ballistic missile defense systems that are robust to potential countermeasures and are practical and within the means of anticipated adversaries. Included in this mission are Countermeasures Integration Program (CMIP) support to the TMD and NMD threat development process and advance warning to BMDO system designers. The BMDO CMIP reviews TMD and NMD systems for susceptibilities and identifies potential countermeasures, determines credibility through analyses and tests, characterizes credible countermeasures by providing designs and performance parameters, informs intelligence and system threat developers of potential countermeasures, informs TMD and NMD system designers with advance warning of potential countermeasures, and assists TMD and NMD system designers in developing counter-countermeasures. Providing vulnerability and susceptibility information, or "threat risk assessments", to the system designers early on enables them to build robustness into their designs during the early stages of the system development process, a cost-effective means for providing a flexible high-performance design. The program takes a "rest-of-world" perspective in developing credible, potential countermeasures.

**FY 2001 Planned Program:**

- 5900 Threat Systems Eng Prog
  - 2479 Support Contractors
- Total 8379

<b>B. <u>Other Program Funding Summary</u></b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603873C	227965							Compl.	Compl.
PE 0603874C	307859							Compl.	Compl.

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603876C Intelligence Program</b>
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**C. Acquisition Strategy:**

The 3155 Project acquisition strategy leverages existing system acquisition programs (which are subject to milestone decisions and testing) and accomplishes supporting tasks to satisfy Systems Engineering performance requirements. A portion of this project entails systems engineering of separately funded and managed service programs so that all systems will interoperate when fielded.

<b>D. <u>Schedule Profile</u></b>	<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>
Threat Risk Assessments	X						
Support the CHOP missions	X						
Maintain the Threat Systems Engineering Library	X						
DTT baseline Maintenance and update	X						
Provide Red Team Leadership and support for BMD related Working Groups and Study Teams	X						

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603876C Intelligence Program</b>	<b>PROJECT</b> <b>3155</b>
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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. Threat Systems Eng Prog	Various	Various	5900						5900	
Subtotal Product Development:			5900						5900	

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. Support Contractors	Various	Various	2479						2479	
Subtotal Support Costs:			2479						2479	

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.										
Subtotal Test and Evaluation:										

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:			8379						8379	
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Remark:



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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 2002	
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603876C Intelligence Program				PROJECT 3270	
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3270 Threat and Countermeasures Program	12974	0	0	0	0	0	0	Continuing	Continuing
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>Intelligence Directorate. The Ballistic Missile Defense Organization (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 capstone threat and countermeasure documentation to ensure consistent technical threat definitions across all the Services. It does not duplicate Service-unique activities. The program consists of two component tasks: Intelligence Program and Intelligence Applications; and a secondary task providing funds for an Executing Agent at USASMDC to support the Intelligence Threat task.</p> <p>Intelligence Program Task. The purpose of this task is to provide an Intelligence Community-Validated Theater Missile Defense (TMD) and National Missile Defense (NMD) threat description. 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 TMD and NMD 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 NMD and the TMD "family of systems" 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 of NMD and the TMD "family of systems."</p> <p>Intelligence Applications Task. The accurate specification and characterization of ballistic missiles and the appropriate development and integration of scenarios using these characterizations are critical to the analysis of alternative ballistic missile architectures, the performance assessments of potential technology applications, and the operational performance evaluations of candidate designs. This task provides baseline and excursion scenario descriptions in documentary and digital form for use in analysis of BMD architectures and operational effectiveness. These descriptions are the only approved threat employment portrayals authorized for acceptable BMDO analysis. This task:</p> <ul style="list-style-type: none"> <li>Identifies user needs for threat scenario descriptions.</li> <li>Identifies analyses needed to fully specify and characterize the threat missile systems, penetration aids, tactics, etc., and ensures the analyses are accomplished.</li> <li>Provides the analysis results to all interested agencies for review and comment.</li> <li>Addresses critical threat issues, which arise during the analysis process.</li> <li>Ensures all supporting agencies' views on threat issues are fully aired.</li> <li>Reviews, approves, produces, and distributes all threat scenario descriptions.</li> <li>Produces threat computer digital media (threat tapes) and supporting documentation for use by the development and acquisition communities.</li> </ul>									
Project 3270	Page 6 of 11 Pages						Exhibit R-2A (PE 0603876C)		

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603876C Intelligence Program</b>	<b>PROJECT</b> <b>3270</b>
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**FY 2001 Planned Program:**

- 5697 Intelligence Program:
- 192 GOV PROJECT PER & SUPT
- 3171 Support Contracts
- 51 OSD RESERVE
- 3863 Intelligence Applications

Total 12974

<b>B. Other Program Funding Summary</b> (\$In Thousands)	<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>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>
PE 0603873C	227965							Compl.
PE 0603874C	307859							Compl.

**C. Acquisition Strategy:** Funding is provided to executing agents who accomplish tasks under existing contracts via Military Interdepartmental Purchase Requests (MIPR); Scientific, Engineering, and Technical Assistance (SETA) contracts; and Federally Funded Research and Development Centers (FFRDCs) contracts.

**D. Schedule Profile**

	<u>FY 2001</u>				<u>FY 2002</u>				<u>FY 2003</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
NMD STAR			X									
TMD Capstone STAR			X									
Threat Risk Assessment				X								
NEA III Scenario (Update)			X									
South East Europe Scenario				X								
RT-2 Campaign Scenario		X										

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603876C Intelligence Program</b>	PROJECT <b>3270</b>
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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. Intelligence Program:			5697						5697	
b. Intelligence Application			3863						3863	
Subtotal Product Development:			9560						9560	

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. Support Contracts	Various	Various	3171						3171	
b. OSD RESERVE	Various	Various	51						51	
c. Gov Proj Per & Supt	Allot	SMDC, Huntsville, AL	192						192	
Subtotal Support Costs:			3414						3414	

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.										
Subtotal Test and Evaluation:										

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:			12974						12974	
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Remark:

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603876C Intelligence Program				PROJECT 3359		
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
3359 Test Evaluation and Assessment		4500	0	0	0	0	0	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Beginning in FY 2001, this project represents a consolidation of activities previously preformed and funded from multiple projects in the Family of Systems Program Element.

This project funds detailed planning, execution and analysis of Ballistic Missile Defense Organization's (BMDO) primary corporate test events directed by BMDO/TE and for flight test signature analysis, interoperability support to systems engineering and other test needs reporting across the Theater Ballistic Missile (TBM) community. The primary TE-directed test events are flight tests associated with the Critical Measurements Program (CMP). Live Flight Overlays includes the System Integration Test (SIT) II and the Hardware-in-the-Loop testing conducted at the Joint National Test Facility (JNTF) using the Theater Ballistic Missile Defense System Exerciser (TMDSE). In addition to these dedicated test programs, corporate data collection, analysis and reporting is funded across various other data collection events to include CINC TAMD exercises, MDAP flight testing, service testing, and allied TBMD testing as appropriate to meet BMDO test objectives. Specifically, subtasks are further defined as follows:

Critical Measurements Program (CMP) - Designs, builds, and flies threat representative test articles in realistic scenarios that address critical Ballistic Missile Defense (BMD) system functions and is an integral part of BMDO's Corporate Testing program contributing to the development of robust BMD systems. Includes test planning, execution and analysis associated with the CMP.

Test Planning and Management Support - Includes technical analysis, planning and evaluation of Corporate Test opportunities and pre-test predictions with detailed models. Also provides management support for the Director, Program Support and Assessment and his staff.

System Integration Test (SIT)/Live Flight Overlays - SITs/ Overlays are dedicated, controlled live flight test with interceptors and targets to measure FoS interoperability response. This task includes the planning, execution, analysis and reporting from each test.

Hardware-in-the-Loop Testing (HWILT) - HWILT combines actual tactical hardware and software to provide cost effective assessments of the latest interoperability software upgrades. Models & Simulations are the only approach of simultaneously representing joint interoperability of all the TAMD weapons, sensors and command centers under a wide variety of operational conditions against the full set of threats in the TMD Capstone Requirements Document.

Corporate Data Collection and Analysis - This task funds corporate data collection, analysis and reporting on test events outside of the CMP, SIT/Overlay and HWILT testing programs. It also funds the TSCC, a deployable link data collection and analysis equipment suite, that is fielded in live joint play and testing events.

Project 3359 Page 9 of 11 Pages Exhibit R-2A (PE 0603876C)

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603876C Intelligence Program</b>	PROJECT <b>3359</b>
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**FY 2001 Accomplishments:**

- 4500 Provides funding for the Critical Measurements Program (CMP) which designs, builds, and flies threat representative test articles in realistic scenarios that address critical BMD system functions and is an integral part of BMDO's Corporate Testing program contributing to the development of robust BMD systems. Includes test planning, execution and analysis associated with the CMP.
  -
- Total 4500

<b>B. <u>Other Program Funding Summary</u></b>	<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 0603873C	227965							Compl.	Compl.
PE 0603874C	307859							Compl.	Compl.

**C. Acquisition Strategy:**

Corporate testing supports MDAP and interceptor development. Ballistic Missile phenomenology/signature and Family of Systems interoperability data is collected, analyzed and reported to insert in the systems engineering process for product improvement.

<b>D. <u>Schedule Profile</u></b>	<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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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603876C Intelligence Program</b>	<b>PROJECT</b> <b>3359</b>
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Critical Measure Program (CMP)	Allot	SMDC, Huntsville, AL	4500					TBD	4500	TBD
Subtotal Product Development:			4500						4500	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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 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 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 Management Services:										

Remark:

<b>Project Total Cost:</b>			4500						4500	
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Remark:

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>
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COST <i>(In Thousands)</i>	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

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 2002
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	
<p>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&amp;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.</p> <p>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 &amp; Countermeasures, SE&amp;I, Test &amp; Evaluation (T&amp;E), and Producibility &amp; 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.</p> <p>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).</p> <p>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.</p> <p>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.</p> <p>The SE&amp;I project provides the overall systems engineering development and integration of the BMDS. The SE&amp;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&amp;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&amp;I activities provide the engineering core competency, modeling facilities, and integrative engineering development efforts needed to technically manage and field the capability-based BMDS.</p>		
<i>Page 2 of 48 Pages</i>		Exhibit R-2 (PE 0603880C)



## MDA RDT&amp;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**

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>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002</u> 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 <u>FY 2002</u> PB		28409	1065982
Current Budget Submit ( <u>FY 2003</u> 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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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 1010	
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
<b>A. <u>Mission Description and Budget Item Justification</u></b>									
<p>The composite Ballistic Missile Defense System (BMDS) Battle Management (BM), Command and Control (C2), and Communications is the integrating function across all BMDS elements.</p> <p>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.</p> <p>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.</p> <p>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</p>									
Project 1010			Page 4 of 48 Pages			Exhibit R-2A (PE 0603880C)			

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1010</b>
<p>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.</p> <p>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.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Project was funded under Program Elements 0603873C (Family of Systems Engineering and Integration and 0603874C (BMD Technical Operations) Previous project was 3155 Systems Engineering &amp; Integration.</li> </ul> <p>Total                    0</p> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 27792 <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• 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.</li> <li>• Develop Block 2004 implementation plan addressing deployment of Interface Control Documents and IERs across BMDS Elements.</li> <li>• 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.</li> <li>• Explore with Defense Information Systems Agency best approach for BMDS C2 Global Command and Control System (GCCS) Integration.</li> <li>• 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.</li> <li>• 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.</li> <li>• Establish and maintain a BM/C2/Comm Integrated Management Plan (IMP).</li> <li>• Establish and maintain BM/C2/Comm level Integrated Master Schedule (IMS) that implements the IMP in a block-build structure.</li> <li>• 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.</li> <li>• Initiate Block 2006 Engineering Capabilities Baseline Study.</li> <li>• Transition existing BM/C2/Comm-SE&amp;I contractor and tasks to new MDNTB.</li> </ul> </li> </ul>		
Project 1010	Page 5 of 48 Pages	Exhibit R-2A (PE 0603880C)

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	
3000	<ul style="list-style-type: none"><li>• 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.</li><li>• Develop Block 2004 BM/C2 test requirements.</li><li>• 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.</li><li>• 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.</li><li>• 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.</li></ul>	
Total	30792	

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1010</b>

**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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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1010</b>
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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>B. <u>Other Program Funding Summary</u></b>	<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 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 Project 1010

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1010</b>
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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.

<b>D. Schedule Profile</b>	<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>FY 2008</u>
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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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1010</b>
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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



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**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**  
**1010**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. 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	<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. 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	<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. 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	<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.										
b.										
Subtotal Management Services:										

Remark:

Project Total Cost:				30792		112816			143608	
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Remark:

Project 1010

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1020</b>
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COST ( <i>In Thousands</i> )	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.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		<b>DATE</b> February 2002
<b>BUDGET ACTIVITY</b> 4 - Program Definition and Risk Reduction	<b>PE NUMBER AND TITLE</b> 0603880C BMD System	<b>PROJECT</b> 1020
<b>FY 2001 Accomplishments:</b>		
<ul style="list-style-type: none"> <li>Project was funded under Program Elements 0603873C (Family of Systems Engineering and Integration) and 0603874C (BMD Technical Operations) Previous project was 3155 Systems Engineering &amp; Integration.</li> </ul>		
Total	0	
<b>FY 2002 Planned Program:</b>		
<ul style="list-style-type: none"> <li>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.               <ul style="list-style-type: none"> <li>Develop Block 2004 Implementation Plan.</li> <li>Allocate system and test requirements generated by the System Engineer to the appropriate components (i.e., transmission, entry points, switches, relays).</li> <li>Develop the detailed specifications for these Communication components.</li> <li>Analyze requirements for communication interfaces to other BMD segments, and to external systems including TAMD and allies/coalition.</li> <li>Establish a Communication risk management process that will define the risk mitigation program to be employed.</li> <li>Refine the Joint Range Extension Application Protocol (JREAP) by designing a layered approach to accommodate global communications.</li> <li>Continue the development of Link-16 and Global Command and Control System (GCCS) interoperability enhancements.</li> <li>Prepare the Incremental Development of Communications.</li> <li>Develop and maintain a Configuration Management process and a process for documentation control.</li> <li>Develop an acquisition plan to ensure that the right resources will be used for BMDS communications.</li> <li>Continue software development for the JRE prototype. (Spiral 3&amp;4).</li> <li>Initiate support planning for required logistic support for Communication. Assess survivability requirements for Communications.</li> </ul> </li> <li>1100 • Participate in Commander and Chief (CINC)/Service experiments, tests, and demos using the Joint Range Extension prototype at Reception, Staging, Operation &amp; Force Integration (RSOI) 02 and System Integration Test Phase 2 (SIT II).               <ul style="list-style-type: none"> <li>Perform Test and Evaluation of proposed Block 2004 communications architecture at JNIC.</li> </ul> </li> </ul>		
Total	9845	
Project 1020	<i>Page 13 of 48 Pages</i>	Exhibit R-2A (PE 0603880C)

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1020</b>

**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>B. Other Program Funding Summary</b>	<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 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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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1020</b>
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**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.

<b>D. Schedule Profile</b>	<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>FY 2008</u>
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

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1020</b>
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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. 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	
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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1030</b>
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COST ( <i>In Thousands</i> )	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.

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE <b>February 2002</b>		
BUDGET ACTIVITY	PE NUMBER AND TITLE					PROJECT			
<b>4 - Program Definition and Risk Reduction</b>	<b>0603880C BMD System</b>					<b>1030</b>			
<ul style="list-style-type: none"> <li>• 11023 <u>Target Inventory</u>: 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.</li> <li>• 7500 <u>Advanced Target Development</u>: Continue support for advanced target development relating to the support of booster / target systems for BMD targets.</li> <li>• 11942 <u>Program Support</u>: Provides for government personnel, project costs, and targets program management support.</li> </ul>	Total 95055								
<b>FY 2003 Planned Program:</b>									
<ul style="list-style-type: none"> <li>• 4475 <u>Target Logistics / Range Coordination</u>: Continue target and target-related engineering and technical assistance, and MDTJPO core and mission support to the BMD programs.</li> <li>• 1600 <u>Target Integration and Launch Services</u>: Provides for storage, surveillance, and launch services of FMA assets.</li> <li>• 43832 <u>Targets Booster Development/Logistics</u>: 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.</li> <li>• 7165 <u>Target Payloads</u>: 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.</li> <li>• 24518 <u>Target Countermeasures</u>: 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.</li> <li>• 22072 <u>Target Inventory</u>: 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.</li> <li>• 10000 <u>Advanced Target Development</u>: Continues an early concept development and prototyping of advanced systems or subsystems for BMD targets, including boosters, payloads, instrumentation, or re-entry vehicles.</li> <li>• 14518 <u>Program Support</u>: Provides for government personnel, project costs, and targets program management support.</li> </ul>	Total 128180								
<b>B. <u>Other Program Funding Summary</u></b>									
	<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 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.
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1030</b>
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 develop 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.

<b>D. Schedule Profile</b>	<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>
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				

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1030</b>
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<b>I. Product Development</b>	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. 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:

<b>II. Support Costs</b>	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. 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	

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**MDA RDT&E COST ANALYSIS (R-3)**

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**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603880C BMD System**

**PROJECT**  
**1030**

<b>III. Test and Evaluation</b>	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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 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:

<b>IV. Management Services</b>	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. 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	
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1050</b>
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COST <i>(In Thousands)</i>	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.

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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603880C BMD System	PROJECT 1050
<p>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.</p> <p>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 &amp; 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.</p> <p>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.</p> <p>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.</p> <p>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.</p>		
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1050</b>
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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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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1050</b>
<p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 54451 <b>SE&amp;A/TSE</b> - The MDNTS will:             <ul style="list-style-type: none"> <li>• Establish overall BMDS capabilities and allocate capability specifications to the individual elements and components.</li> <li>• Define and develop the BMDS Block Plans.</li> <li>• Develop the BMDS TOG and SCS Version 1.0 and place it under configuration control.</li> <li>• Fully support the implementation of the BMDS Configuration Control Board.</li> <li>• Develop new/alternative concepts and conducts trade studies to support System evolution and risk mitigation.</li> <li>• Develop standards and orchestrate activities across all BMDS elements to ensure System integration.</li> <li>• 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.</li> <li>• Continue risk mitigation activities.</li> <li>• Continue to execute the Corporate Lethality to support effective intercepts and establish collateral effects.</li> <li>• Conduct force-on-force level and detailed element level analyses to assess System effectiveness, ensure robust performance, and establish expected capabilities.</li> <li>• Support analysis of System alternatives involving potential coalition partners that explore interoperability concepts, BM/C2 alternatives, and associated engineering requirements.</li> <li>• Establish requirements for and provide engineering support to System and verification and testing.</li> <li>• 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.</li> <li>• Conduct the Corporate Countermeasures/Counter-Counter measures (i.e. Red-White-Blue) program.</li> <li>• Establish an Adversary Capability Document definition necessary to support BMD design, development, and testing.</li> <li>• Develop a number of reference scenarios illustrative of the threat space, for use in assessment of BMDS capabilities.</li> <li>• Perform threat modeling and simulation to characterize the threat, providing digital data to support BMDS analyses.</li> <li>• Update modeling and simulation capability and provide threat media to support analyses.</li> <li>• Produce quick reaction assessments for the Director of potential impacts to BMDS capabilities.</li> <li>• Support focused BMD efforts such as Project Hercules and Targets and Countermeasures.</li> </ul> </li> <li>• 55506 <b>Advanced Concepts</b> – 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.</li> </ul>		
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<b>BUDGET ACTIVITY</b>	<b>PE NUMBER AND TITLE</b>	<b>PROJECT</b>
<b>4 - Program Definition and Risk Reduction</b>	<b>0603880C BMD System</b>	<b>1050</b>
<ul style="list-style-type: none"> <li>• 10372 <b>Intelligence Systems Threat</b> – 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.</li> <li>• 17520 <b>Joint Warfighter Support</b> – 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.</li> <li>• 45272 <b>Joint National Integration Center</b> – 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.</li> <li>• 985 <b>Cooperative Program and Allied Support</b> - 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.</li> <li>• 17811 <b>Information Management System</b> - 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.</li> </ul>		
Total	201917	



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1050</b>
<p><b>FY 2003 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 192307 <b>SE&amp;A/TSE</b> - The MDNTS will: <ul style="list-style-type: none"> <li>• Update the BMDS TOG and SCS.</li> <li>• Continue to define and develop the BMDS Block Plans.</li> <li>• Continue to develop new/alternative concepts and conduct trade studies to support system evolution and risk mitigation.</li> <li>• Update standards and orchestrate activities across all BMDS elements to ensure System integration.</li> <li>• 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.</li> <li>• Maintain risk mitigation activities.</li> <li>• Continue to execute the Corporate Lethality to support effective intercepts and establish collateral effects.</li> <li>• Conduct force-on-force level and detailed element level analyses to assess System effectiveness, ensure robust performance, and establish expected capabilities.</li> <li>• Support analysis of System alternatives involving potential coalition partners that explore interoperability concepts, BM/C2 alternatives, and associated engineering requirements.</li> <li>• Continue to establish requirements for and provide engineering support to System and verification and testing.</li> <li>• 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.</li> <li>• Conduct the Corporate Countermeasures/Counter-Counter measures (i.e. Red-White-Blue) program.</li> <li>• Maintain an Adversary Capability Document definition necessary to support BMD design, development, and testing.</li> <li>• Maintain a number of reference scenarios illustrative of the threat space, for use in assessment of BMDS capabilities.</li> <li>• Perform threat modeling and simulation to characterize the threat, providing digital data to support BMDS analyses.</li> <li>• Update modeling and simulation capability and provide threat media to support analyses.</li> <li>• Produce quick reaction assessments for the Director of potential impacts to BMDS capabilities.</li> <li>• Support focused BMD efforts such as Project Hercules and Targets and Countermeasures.</li> </ul> </li> <li>• 79501 <b>Advanced Concept</b> - 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.</li> <li>• 12615 <b>Intelligence Systems Threat</b> - 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</li> </ul>		
Project 1050	Page 27 of 48 Pages	Exhibit R-2A (PE 0603880C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1050</b>
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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>B. Other Program Funding Summary</b>	<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 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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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1050</b>
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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.

<b>D. <u>Schedule Profile</u></b>	<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>
<b>System Engineering and Architecture</b>							
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
<b>Advanced Concept</b>							
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
<b>Intelligence System Threat</b>							
BMD Threat Assessment		3Q	3Q	3Q	3Q	3Q	3Q
<b>Joint Warfighter</b>							
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

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1050</b>
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<b>JNIC</b>							
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					
<b>Cooperative Programs &amp; Allied Support</b>							
Quarterly Program Reviews		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Establish New Program Exchanges		As Rqd					
<b>Information Management System</b>							
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			

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1050</b>
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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
<b>a. Advanced Concept Dev</b>	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
<b>a. SE &amp; A</b>										
b. MDNTS	Various	Various	N/A	7846	2Q	123624	2Q	Cont.	131470	
<b>c. Advanced Concept Dev</b>	Various	Various	N/A	20000	2Q	25000	2Q	Cont.	45000	
<b>d. Intelligence</b>										
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	
<b>k. Joint Warfighter</b>										
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	
<b>n. Information Management System - BMD Information Management System</b>	Various	Various	N/A	16518	2Q	19213	2Q	Cont.	35731	
Subtotal Support Costs				56801		181443			238244	

Remark:  
Project 1050

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**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**  
**1050**

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. <b>Joint Warfighter</b> - Commanders in Chief Experiments	Sub-allocation	Theater Commanders in Chiefs	N/A	14075	1Q	14270	2Q	Cont.	28345	
c. <b>Joint National Integration Center</b>										
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. <b>SE &amp; A</b>										
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. <b>Advanced Concept</b>	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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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1050</b>
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q.	JNIC	MIPR	FFRDC	N/A	2080	2Q	2366	2Q	Cont.	4446	
r.	<b>Joint Warfighter Support Contracts</b>	MIPR	CSC, Vanguard, & SPARTA, VA	N/A	2115	1Q	2137	2Q	Cont.	4252	
s.	<b>CF SETA Support</b>	CPFF/GSA	SPARTA, CA	N/A	250	2Q	444	2Q	Cont.	694	
t.	<b>Information Management System - BMD IM/IT Plans, Policies &amp; Analyses</b>	Various	Various	N/A	1293	2Q	1734	2Q	Cont.	3027	
	Subtotal Management Services:				65897		89072			154969	

Remark:

Project Total Cost:					201917		371149			573066	
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Remark:

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1060</b>
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COST ( <i>In Thousands</i> )	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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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>		February 2002
PE NUMBER AND TITLE <b>0603880C BMD System</b>		PROJECT <b>1060</b>
<b>FY 2002 Planned Program:</b>		
•	92683 <b>Modeling &amp; Simulation</b> – 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 <b>System-Wide Test &amp; Evaluation</b> - 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 <b>Test Resources</b> - 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 <b>Facilities, Siting &amp; Environmental (FS&amp;E)</b> - 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	
<b>FY 2003 Planned Program:</b>		
•	102497 <b>Modeling &amp; Simulation</b> – 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 <b>System-Wide Test &amp; Evaluation</b> - 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 <b>Test Resources</b> - 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 <b>Facilities, Siting &amp; Environmental (FS&amp;E)</b> - 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	
Project 1060		

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1060</b>
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<b>B. <u>Other Program Funding Summary</u></b>	<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 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.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1060</b>
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<b>D. Schedule Profile</b>	<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>
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					

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MDA RDT&E COST ANALYSIS (R-3)										DATE
BUDGET ACTIVITY										PROJECT
4 - Program Definition and Risk Reduction										1060
PE NUMBER AND TITLE										
0603880C BMD System										
DATE										February 2002
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. <b>Modeling and Simulation</b>										
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		
<b>h. System-Wide Test and Evaluation</b>							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	

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1060</b>
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q. Advanced Concepts Support	Allot	Various	N/A	28541	1Q	30000		TBD	58541	
r. BMD System 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	
<b>w. Test Resources</b>										
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	
<b>ee. Facilities Siting &amp; Environment</b>										
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. <b>Modeling and Simulation:</b> Gov Project Per & Supt	Allot	USASMDC Huntsville, AL	N/A	1555	1Q	1546	1Q	TBD	3101	
b. <b>Modeling and Simulation</b> Support Contracts	Various Contract Types	MDA, Multiple	N/A	4728	1Q	4583	1Q	TBD	9311	

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603880C BMD System</b>	<b>PROJECT</b> <b>1060</b>
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c. <b>System-wide T&amp;E:</b> Gov't Project Per & Supt	Allot	USASMDC Huntsville, AL	N/A	2627	1Q	2554	1Q	TBD	5181	
d. <b>System-wide T&amp;E</b> Support Contracts	Various Contract Types	MDA, Multiple	N/A	7289	1Q-2Q	7508	1Q	TBD	14797	
e. <b>Test Resources:</b> Support Contracts	Various Contract Types	MDA, Multiple	N/A	6141	1Q-2Q	6126	1Q	TBD	12267	
f. <b>Test Resources:</b> Gov't Project Per & Supt	Allot	USASMDC Huntsville, AL	N/A	2019	1Q	544	1Q	TBD	2563	
g. <b>Facilities Siting and Environment</b> Support Contracts	Various Contract Types	MDA, Multiple	N/A	3295	1Q	2611	1Q	TBD	5906	
h. <b>T &amp; E Travel</b>	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	
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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
<p><b>A. <u>Mission Description and Budget Item Justification</u></b>            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.</p> <p>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.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Total 0</li> </ul> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 12550 <b>Technology Insertion</b> - 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.</li> <li>• 2150 <b>Manufacturing Technology/Title III</b> – 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.</li> <li>• 2032 <b>Management Services</b> – 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.</li> </ul> <p>Total 16732 Project 1070</p>												

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

**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>B. <u>Other Program Funding Summary</u></b>	<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 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.



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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>							February 2002
PE NUMBER AND TITLE <b>0603880C BMD System</b>							PROJECT <b>1070</b>
<b>D. Schedule Profile</b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
<b>Technology Insertion</b>							
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			
<b>Manufacturing Technology/Title III</b>							
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				

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1070</b>
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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.										
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:

<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY  
**4 - Program Definition and Risk Reduction**

PE NUMBER AND TITLE  
**0603880C BMD System**

Project Total Cost:				16732	21916		38648	
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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
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project covers personnel and related facility support costs, statutory and fiscal requirements, and support service contracts.</p> <p>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 &amp; 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.</p> <p>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.</p> <p>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.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>Project was funded under Program Elements: 0603873C (Family of Systems Engineering and Integration) and 0603874C (BMD Technical Operations). Previous projects included: 4000</li> </ul> <p>Total            0</p> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>29944 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents &amp; utilities, and supplies.</li> </ul> <p>Total            29944</p> <p>Project 1090</p>									

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603880C BMD System</b>	PROJECT <b>1090</b>
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**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>B. <u>Other Program Funding Summary</u></b>	<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>
N/A									

**C. Acquisition Strategy:**  
N/A

<b>D. <u>Schedule Profile</u></b>	<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>
N/A							

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603881C Terminal Defense Segment</b>
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COST <i>(In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	0	200119	169974	200171	234318	228443	367744	Continuing	Continuing
2015 Medium Extended Air Defense System (MEADS)	0	70507	0	0	0	0	0	Continuing	Continuing
2016 Israeli Arrow Program	0	129612	65749	66000	66000	66000	66000	Continuing	Continuing
2022 Sea-Based Terminal	0	0	90000	120000	154000	148000	284000	Continuing	Continuing
2090 Program Operations	0	0	14225	14171	14318	14443	17744	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The Terminal Defense Segment (TDS) program element combined with the THAAD System program element (PE 0604861C) and the PAC-3 program elements (PE 0604865C/PE 0208865C) constitutes the operational Terminal Defense Segment of the Ballistic Missile Defense System (BMDS). This restructure is in direct compliance with Congressional direction.

The primary projects under this Program Element (PE) are the Medium Extended Air Defense System (MEADS) Project and the Israeli Arrow Deployability Program (ADP), and Sea-Based Terminal. Related activities include the Israeli Test Bed (ITB), Arrow System Improvement Program (ASIP), and studies via the Israeli Systems Architecture and Integration (ISA&I) effort that assess the Arrow performance relative to both existing and emerging threats. The MDA Director approves of the TDS capability-based development and selective upgrades of defensive capabilities that engage and negate ballistic missiles in the terminal phase of their trajectory. The flow down of Ballistic Missile Defense System (BMDS) capability specifications resulting from Missile Defense National Team Efforts in Battle Management/Command and Control (BM/C<sup>2</sup>) and Systems Engineering and Integration will guide the integration of the Terminal Defense Segment into the BMD System, the BMDS BM/C<sup>2</sup> architecture, and the BMDS Test Bed.

The Medium Extended Air Defense System (MEADS) is an objective force system. It is an international cooperative program essential to fulfill the requirements of the U.S. Army and the U.S. Marine Corps for a low-medium air defense system in the 21st century. MEADS will offer a significant improvement in tactical mobility and strategic deployability over comparable missile systems. It will defend the maneuver force and other critical forward-deployed assets against short and medium range Theater Ballistic Missiles (TBMs), cruise missiles and other air-breathing threats throughout all phases of tactical operations. MEADS will operate both in an enclave with upper-tier systems in areas of debarkation and assembly and provide continuous coverage alone or with Short-Range Air Defense Systems (SHORAD) in the division area of the battlefield during movement to contact and decisive operations. MEADS will be interoperable with other airborne and ground-based sensors and utilize a netted and distributed architecture and modularly-configurable battle elements to provide a robust, 360-degree defense against short and medium range TBMs, cruise missiles, unmanned-aerial-vehicles, tactical air to surface missiles, rotary-wing and fixed-wing threats.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603881C Terminal Defense Segment</b>
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The Arrow system (developed jointly by the U.S. and Israel) provides Israel an indigenous capability to defend against short and medium range ballistic missiles and helps ensure U.S. freedom of action in future contingencies. Arrow also provides protection against ballistic missile attacks to U.S. forces deployed to the region. The Arrow Deployability Program (ADP) supports Israel's acquisition of a third Arrow battery, development of Arrow co-manufacturing capability, and Arrow's interoperability with U.S theater missile defense systems (TMD) via a Joint Tactical Information Data System (JTIDS)/Link-16 common communication architecture. The Arrow System Improvement Program (ASIP) will develop upgrades to the existing Arrow Weapon System to allow Arrow to address more stressing ballistic missile threats. Related activities include the Israeli Test Bed (ITB), and studies via the Israeli Systems Architecture and Integration (ISA&I) effort that assess the Arrow performance relative to both existing and emerging threats. Technologies cooperatively developed under the Arrow programs are transitioned to U.S. TMD developmental programs for their use or to provide risk reduction and lessons learned.

As part of the integrated Ballistic Missile Defense System designed to provide layered defense against ballistic missiles of all ranges, Missile Defense Agency (MDA) has been directed to address the need for a timely development and deployment of sea-based terminal defenses. The mission of the terminal defense layer is to protect the U.S., U.S. forces, U.S. Allies, friends and facilities of vital interest from ballistic missile attack by intercepting ballistic missiles in the final stage of flight. The objective of the Sea Based Terminal defense project is to perform research, development and test and perform experimentation to identify options and alternative approaches to developing a sea based terminal capability as part of the Ballistic Missile Defense System (BMDS).

Program operations funding includes the required personnel and management support. This infrastructure includes items such as: travel; personnel and related facility support costs; statutory and fiscal requirements, and support service contracts.

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002</u> PB)		988180	
Appropriated Value			
Adjustments to Appropriated Value		63913	
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 2002</u> PB		-851974	169974
Fiscal Year (FY) 2003 Budget Estimates		200119	169974

Change Summary Explanation: In FY 2002, THAAD and Program Operations projects moved to Program Element 0604861C, and MEADS added to Terminal Defense Segment Program Element. FY 2003 Funding was not included during FY 2002 Amended President's Budget Submission.



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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002					
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603881C Terminal Defense Segment				PROJECT 2015				
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
2015 Medium Extended Air Defense System (MEADS)				0	70507	0	0	0	0	0	Continuing	Continuing
<p>Medium Extended Air Defense System (MEADS), to include programmatic and funding, is being transferred to the Army beginning in FY 2003.</p> <p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>The Medium Extended Air Defense System (MEADS) is an objective force system. It is an international cooperative program essential to fulfill the requirements of the U.S. Army and the U.S. Marine Corps for a low-medium air defense system in the 21st century. MEADS will offer a significant improvement in tactical mobility and strategic deployability over comparable missile systems. It will defend the maneuver force and other critical forward-deployed assets against short and medium range Theater Ballistic Missiles (TBMs), cruise missiles and other air-breathing threats throughout all phases of tactical operations. MEADS will operate both in an enclave with upper-tier systems in areas of debarkation and assembly and provide continuous coverage alone or with Short-Range Air Defense Systems (SHORAD) systems in the division area of the battlefield during movement to contact and decisive operations. MEADS will be interoperable with other airborne and ground-based sensors and utilize a netted and distributed architecture and modularly-configurable battle elements to provide a robust, 360-degree defense against short and medium range TBMs, cruise missiles, unmanned-aerial-vehicles, tactical air to surface missiles, rotary-wing and fixed-wing threats.</p> <p>The MEADS program has been restructured to leverage the interceptor from the PATRIOT Advanced Capability-3 (PAC-3) program with a three-year Risk Reduction Effort (RRE) that focuses on developing the critical technologies required for maneuver force protection and overall risk reduction. A U.S. funded bridging effort commenced on 14 August 2000 to begin work on the highest risk and long-lead items in the RRE Scope of Work. The International Memorandum of Understanding (MOU) was signed 27 June 2001, and the RRE contract was awarded 10 July 2001.</p> <p>There remains a critical void in maneuver force defense against short and medium range TBMs, cruise missiles, and low-to-medium altitude advanced air-breathing threats. This program will meet this challenge by integrating the PAC-3 missile and developing the critical technologies required for maneuver force protection, including development of a prototype lightweight launcher, 360-degree radar and tactical operation center. The PAC-3 missile is the baseline interceptor for MEADS. Sensor and battle management software technology from both U.S. and international programs will be examined to enhance and augment organic-equipment functions, reducing development cost and risk. Improvements will be balanced against costs and the projected threat to develop a U.S. and allied capability to counter the maneuver force threat. The approach emphasizes prototyping of system-specific and surrogate hardware in key areas of Battle Management/Command, Control, Communications, Computers, and Intelligence (BM/C4I), fire control radar, and light weight launcher to satisfy mobility, strategic deployability and interoperability requirements. The Army requirement for MEADS supports the objective transition path of the Army Transformation Campaign Plan.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 0 Funding for MEADS exists and is provided under Project 1262, Program Element 0603869C.</li> </ul> <p>Total 0</p> <p><b>FY 2002 Planned Program:</b></p>												
Project 2015				Page 3 of 18 Pages				Exhibit R-2A (PE 0603881C)				

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603881C Terminal Defense Segment</b>	<b>PROJECT</b> <b>2015</b>
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- 39320 Continue U.S. contribution to the NATO Medium Extended Air Defense System Management Agency (NAMEADSMA) international Program Office operational and administrative budgets for the MEADS RRE contract and continued development of digital-end-to-end simulation, continue development of prototype launcher, fire control radar and BMC4I hardware/ software and test planning.
  - 17517 Conduct program integration efforts that will examine DOD Joint Vision and Army transformation objective force mix and integration issues; support MEADS in the test and evaluation of Air and Missile Defense (AMD) task force interoperability and Army family-of-system requirements; support development and maintenance of Joint Data Network interface requirements and planning and appropriate planning of MEADS manpower, training, human factors and safety issues, modeling and simulation support.
  - 7310 Continue funding for government agencies and support contracts to provide technical analysis and tools in specialty areas of lethality, BMC4I and system simulations, as well as support of conducting independent evaluations of contractor trades and analysis.
  - 6360 Continue MEADS program management, support and salaries for both the national and international program offices. Includes U.S. efforts tied to national support of executing the replanned program and preparing for the Milestone B review.
- Total 70507

**FY 2003 Planned Program:**

- 0 Funding for this project transfers to the Army beginning FY 2003.
- Total 0

<b><u>B. Other Program Funding Summary</u></b>	<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 0603869C MEADS	49700								
PE 0604861C THAAD	530432	866530	934681	714679	830204	920988	1131109	Cont	Cont
PE 0604865C PAC-3	81892	128199							
PE 0603875C Int'l Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603882C Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1398817	1399902	1591160	2274654	Cont	Cont
PE 0603884C Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C BMD Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
PE 0603869A MEADS (Army)			117745	280580	272070	277115	281890	Cont	Cont

**C. Acquisition Strategy:** The MEADS acquisition strategy included competition between two transatlantic industrial teams in the Program Definition/Validation (PD-V) phase. These two international entities prepared and competed for the PD/V phases. As the Department of Defense and partner nations restructured the program, the PD/V phase was extended with the selection of a single contractor team to conduct a three-year RRE. In August 2000, the Defense Acquisition Executive (DAE) approved entry in

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603881C Terminal Defense Segment</b>	PROJECT <b>2015</b>
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the RRE. In this phase, technology from Germany, Italy and the United States, including the PAC-3 missile, will be leveraged to define the most cost-effective solution to meet the MEADS operational requirements. The MEADS Product Office is also pursuing integration of MEADS BMC4I with the Project Manager, Air & Missile Defense Command and Control Systems (AMDCCS), to take advantage of other Army developments that can be incorporated into the MEADS program. Per the 2 January 2002 SECDEF missile defense direction memo, the U.S. national unique requirements of the MEADS program will be developed in consultation with the MDA. The international requirements of the MEADS program will be directed per the International Memorandum of Understanding (MOU) and as modified in the future for international participation in the BMDS. MEADS 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.

<b>D. Schedule Profile</b>	<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>
Component Demonstration Completed		3Q					
Program Review		1-4Q					

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
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**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603881C Terminal Defense Segment**

**PROJECT**  
**2015**

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. Risk Reduction	FFP	NAMEADSMA, AL		37930	2Q			Cont	37930	
b. Multiband Spectra Radar Frequency Data Link	CPFF	LMMS, TX		6200	1Q			Cont	6200	
Subtotal Product Development:				44130				Cont	44130	

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. Int'l Program Office	MIPR	NAMEADSMA, AL		1390	2Q			Cont	1390	
b. Program Integration	MIPR	PEO AMD/ARMY, AL		5617	2Q			Cont	5617	
c. U.S. Contracts	MIPR	MEADS Prod Ofc, AL		2250	2Q			Cont	2250	
d. U.S. OGAs	MIPR	MEADS Prod Ofc, AL		5060	2Q			Cont	5060	
e. Modeling & Simulation	MIPR	MRDEC, AL		5700	2Q			Cont	5700	
Subtotal Support Costs:				20017				Cont	20017	

Remark:

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603881C Terminal Defense Segment</b>	<b>PROJECT</b> <b>2015</b>
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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. N/A										
Subtotal Test and Evaluation:										

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. Internal Operating	In-House	MEADS Prod Ofc / NAMEEADSMA, AL		6360	2Q			Cont	6360	
Subtotal Management Services:				6360				Cont	6360	

Remark:

Project Total Cost:				70507					70507	
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603881C Terminal Defense Segment</b>	<b>PROJECT</b> <b>2016</b>
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COST ( <i>In Thousands</i> )	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
2016 Israeli Arrow Program	0	129612	65749	66000	66000	66000	66000	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project provides funding for the Arrow Deployability Program (ADP) to include the third Arrow battery and development activities to produce Arrow components in the United States, Arrow interoperability with U.S. missile defense systems, the Arrow System Improvement Program (ASIP), Israeli Test Bed (ITB), and the Israeli System Architecture and Integration (ISA&I). The United States derives considerable benefits from its participation in these projects. The presence of a ballistic missile defense system in Israel developed under this project helps ensure U.S. freedom of action in future contingencies and provides protection against ballistic missile attacks to U.S. forces deployed to the region. The cooperative effort also provides risk reduction and alternative technologies for U.S. ballistic missile defense programs as well as phenomenology and kill assessment data. The Arrow Deployability Program (ADP) integrates and tests the cooperatively developed Arrow II missile with the Israeli developed ground components. The ADP effort also provides for deployment of a contingency capable User Operational Evaluation System (UOES) and development of Arrow manufacturing capability. The Arrow is interoperable with U.S. missile defense systems through the Link 16 system. The International Agreement (IA) between the U.S. and Israel for the ADP will be amended to provide a final installment of \$34 million in FY 2002 to complete U.S. funding of an Arrow third battery. The ASIP effort will evolve the Arrow Weapon System (AWS) to defeat longer range and more robust threats expected to be deployed in the Middle East in the near future. An annex for phase II of ASIP will also be concluded to allow work on ASIP to continue. The Israeli Test Bed and ISA&I efforts will continue to support AWS development as well as develop future missile defense architectures.

**FY 2001 Accomplishments:**

- 0 Funding for this project exists and is provided under Project 2259, Program Element 0603875C.
- Total 0

**FY 2002 Planned Program:**

- 47000 Arrow System Improvement Program. Initiate ASIP Phase II to develop and test technologies to improve the Arrow Weapon System performance to defeat emerging threats. Acquire targets for U.S. flight testing of Arrow. Continue development of Israeli interoperability capability to include providing Joint Interoperability Test Command assessment of AWS interoperability with U.S. Theater Missile Defense (TMD) systems.
- 77612 Arrow Deployability Program. Develop Arrow Block 3 capability to provide more robust defense against existing Middle East missile threats. Develop capability to produce Arrow missile components in the U.S. Funding includes final U.S. installment of \$34 million for Israel's third Arrow battery. The United States will again adjust its ADP cost share to allow Israel to reduce its ADP funding by an equal amount so that it may provide final funding of third battery components.

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603881C Terminal Defense Segment</b>	<b>PROJECT</b> <b>2016</b>
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- 2500 ITB. Conduct ITB experiments to evaluate Arrow System Improvement Program performance specifications against future threats and assess Arrow interoperability between improved Arrow and U.S. TMD systems. Support United States European Command/Israeli Air Force (USEUCOM/IAF) involvement at the ITB to incorporate experiment results in subsequent revisions to the combined Operations Plan (OPLAN) and Combined Standard Operating Procedures (CSOP).
  - 1500 ISA&I. Assess potential contributions by deployed U.S. Theater Missile Defense (TMD) assets to Israel's missile defense. Determine ITB experiment objectives and analyze experiment results. Assess improved Arrow performance against emerging regional threats and identify growth path refinements necessary for the AWS to remain an effective ballistic missile defense for the State of Israel.
  - 1000 Program Support. Document foreground and background data rights for ASIP, ITB, ADP, and legacy programs. Develop and maintain security plans and classification guides. Develop test tools for interoperability.
- Total 129612

**FY 2003 Planned Program:**

- 50000 Arrow System Improvement Program. Continue ASIP Phase II to develop and test technologies to improve the Arrow Weapon System performance to defeat emerging threats. Continue Arrow interoperability validation to include assessing combined engagement coordination and providing Joint Interoperability Test Command assessment of AWS interoperability with U.S. TMD systems. Prepare for Arrow testing in U.S.
  - 9749 Arrow Deployability Program. Continue development of U.S. production capability for Arrow missile components. Continue development of Arrow interoperability capability to include combined engagement coordination. Complete development of Arrow Block 3 capability to provide more robust defense against existing Middle East missile threats.
  - 3000 ITB. Conduct ITB experiments to evaluate Arrow System Improvement Program performance specifications against future threats and assess Arrow interoperability between improved Arrow and U.S. TMD systems. Support USEUCOM/IAF involvement at the ITB to incorporate experiment results in subsequent revisions to the combined OPLAN and CSOP.
  - 2000 ISA&I. Initiate assessment and prioritization of options for 2015 Israeli Missile Defense architecture. Determine ITB experiment objectives and analyze experiment results. Define Arrow performance against emerging regional threats and identify growth path refinements necessary for the AWS to remain an effective ballistic missile defense for the State of Israel.
  - 1000 Program Support. Continue documentation of foreground and background data rights for ASIP, ITB, and ADP. Develop and maintain security plans and classification guides. Develop test tools for interoperability.
- Total 65749

<b>B. Other Program Funding Summary</b>	<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 0604861C THAAD	530432	866530	934681	714679	830204	920988	1131109		
PE 0603875C Int'l Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603882C Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	Cont	Cont

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BUDGET ACTIVITY

PE NUMBER AND TITLE

**4 - Program Definition and Risk Reduction**

**0603881C Terminal Defense Segment**

PE 0603883C Boost Defense Segment		599835	796927	1398817	1399902	1591160	2274654	Cont	Cont
PE 0603884C Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C BMD Technology		139340	121751	155056	130299	142785	147457	Cont	Cont

**C. Acquisition Strategy:**

<b>D. Schedule Profile</b>	<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>
ADP Flight Test	4Q						
ADP final Third Battery Cost Share Adjustment		2Q					
Initiate Co-Manufacturing Development		2Q					
Complete ADP			4Q				
Initiate Co-Manufacturing of Arrow missiles				3Q			
Complete ASIP Feasibility Study		1Q					
Initiate ASIP Phase II		2Q					
Conduct ASIP Flight Tests		4Q	1Q&3Q		1Q&3Q	1Q&3Q	1Q&3Q
Complete ASIP Development						3Q	
U.S. Flight Tests of Arrow				1Q&2Q			
Interoperability Tests w/ U.S. TMDSE		1Q&4Q	1Q&4Q	1Q	3Q	1Q	3Q
Interoperability Field Tests			2Q		2Q		2Q
Interoperability Tests w/ U.S. TMDSE		4Q	3Q	1Q	3Q	1Q	3Q
ITB Experiments		2Q&4Q	2Q&4Q	2Q&4Q	2Q&4Q	2Q&4Q	2Q&4Q
Missile Defense Architecture Assessment		2Q		2Q			
2015 Missile Defense Architecture						2Q	



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**MDA RDT&E COST ANALYSIS (R-3)**

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**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603881C Terminal Defense Segment**

**PROJECT**  
**2016**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. ADP (Development, Co-Manufacturing, Third Arrow Battery)	International Agreement with Israel	Israel Ministry of Defense, Israel		77612	2Q	9749	1Q	Cont	87361	
b. ISA&I	FFP with Cost Share	Wales, Ltd., Israel		1500	1Q	2000	1Q	Cont	3500	
c. ITB	FFB	USA/SMDC Huntsville, AL		2500	1Q	3000	1Q	Cont	5500	
d. ASIP Development (Israel)	International Agreement with Israel	Israel Ministry of Defense, Israel		21000	2Q	18000	1Q	Cont	39000	
e. ASIP Development (U.S.)	CPAF/FF	MDA Huntsville, AL		6500	1Q	7000	1Q	Cont	13500	
Subtotal Product Development:				109112		39749		Cont	148861	

Remark: Prior Year Funding provided under Project 2259, Program Element 0603875C

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Program Support ADP/ASIP	aLLOT	MDA Huntsville, AL		1000	1Q	1000	1Q	Cont	2000	
Subtotal Support Costs:				1000		1000		Cont	2000	

Remark:

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603881C Terminal Defense Segment</b>	PROJECT <b>2016</b>
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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. Targets and Ranges	MIPR	MDA Huntsville, AL		16500	2Q	6000	1Q	Cont	22500	
b. Test Support	International Agreement with Israel	Israel Ministry of Defense, Israel		3000	2Q	19000	1Q	Cont	22000	
Subtotal Test and Evaluation:				19500		25000		Cont	44500	

Remark: Prior Year Funding provided under Project 2259, Program Element 0603875C

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. N/A										
b.										
Subtotal Management Services:										

Remark:

Project Total Cost:				129612		65749			195361	
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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603881C Terminal Defense Segment				PROJECT 2022		
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
2022	Sea-Based Terminal	0	0	90000	120000	154000	148000	284000	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

As part of the integrated Ballistic Missile Defense System (BMDS) designed to provide layered defense against ballistic missiles of all ranges, Missile Defense Agency (MDA) has been directed to address the need for a timely development and deployment of sea-based terminal defenses. Sea-Based Terminal 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 mission of the terminal defense layer is to protect the U.S., U.S. forces, U.S. Allies, friends, and facilities of vital interest from ballistic missile attack by intercepting ballistic missiles in the final stage of flight. The objective of the Sea Based Terminal defense project is to perform research, development and test and perform experimentation to identify options and alternative approaches to developing a sea based terminal capability as part of the Ballistic Missile Defense System (BMDS).

Risk Reduction  
Decisions on pursuit of a sea based terminal defense as an incremental block upgrade to the BMDS Test Bed will be supported by focused risk reduction activities. These include hardware in the loop testing of any modified legacy hardware, system integration testing, and a functional analysis to facilitate performance assessments, design, engineering trade-space evaluation, and integration and risk analysis.

Experimentation.  
As part of the risk reduction effort, various tests and experiments will be conducted to gather empirical data, identify integration and software issues, and assess project progress. An initial critical experiment and flight test could be conducted to address priority high-risk items and, given success, delivery to the BMDS Test Bed. This project may leverage prior investments across the BMDS program.

**FY 2001 Accomplishments:**

- 0

Total 0

**FY 2002 Planned Program:**

- 0

Total 0

**FY 2003 Planned Program:**

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603881C Terminal Defense Segment</b>	PROJECT <b>2022</b>
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- 5000 Define and evaluate alternative sea based terminal defense concepts.
  - 55000 Initiate risk reduction activities/ test planning and identify areas for leverage from the investments legacy equipment.
  - 5000 Conduct ground and flight test planning.
  - 20000 Conduct critical experiment in FY 2003.
  - 5000 Management Support.
- Total 90000

<b>B. Other Program Funding Summary</b>	<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		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603882C Midcourse Defense Segment		3762250	3192594	3071581	3016343	2969142	2595708	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1398817	1399902	1591160	2274654	Cont	Cont
PE 0603884C Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C BMD Technology		139340	121751	155056	130299	142785	147457	Cont	Cont

**C. Acquisition Strategy:** The Sea-Based Terminal project 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 project will pursue risk reduction and concept development activity in several key areas to include ship integration and technology development for seekers, kill vehicles, and BMC2I. MDA will pursue multiple risk reduction efforts in these areas to support an early decision on Sea-Based Terminal.

<b>D. Schedule Profile</b>	<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>FY 2008</u>
Courses of Action of OUSD AT&L		3Q						
Critical Experiment			1Q					

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603881C Terminal Defense Segment**

**PROJECT**  
**2022**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Risk Reduction Activities	Various	Various				55000	TBD	Cont	55000	
b. Concept Definition	Various	Various				5000	TBD	Cont	5000	
Subtotal Product Development:						60000			60000	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. N/A										
Subtotal Support Costs:										

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Critical Experiment	Various	Various				20000	TBD	Cont	20000	
b. Flight Test	Various	Various				5000	TBD	Cont	5000	
Subtotal Test and Evaluation:						25000		Cont	25000	

Remark:

<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603881C Terminal Defense Segment</b>
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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. Analysis /Assessment and Mgmt Support	Various	Various				5000	TBD	Cont	5000	
Subtotal Management Services:						5000		Cont	5000	

Remark:

Project Total Cost:						90000			90000	
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Remark:

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603881C Terminal Defense Segment				PROJECT 2090		
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	
2090 Program Operations	0	0	14225	14171	14318	14443	17744	Continuing	Continuing	
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project covers personnel and related facility support costs, statutory and fiscal requirements, and support service contracts.</p> <p>Personnel covers government civilians performing program-wide oversight functions such as financial management, contracting, security, information systems support, and legal services at Missile Defense Agency's (MDA's) Executing Agents within the US Army Space &amp; Missile Defense Command, US Army 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, Automated Data Processing (ADP) equipment, and all the associated operation and maintenance activities.</p> <p>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.</p> <p>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.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 0 Funding for this project existed and is provided under Family of Systems project, Program Element 0603873C.</li> </ul> <p>Total 0</p> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>•</li> </ul> <p>Total 0 Fiscal Year 2002 funding is provided under project 2011 in Theater High Altitude Area Defense, Program Element 0604861C.</p>										
Project 2090	Page 17 of 18 Pages					Exhibit R-2A (PE 0603881C)				

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603881C Terminal Defense Segment</b>	PROJECT <b>2090</b>
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**FY 2003 Planned Program:**

- 14225 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities, and supplies.

Total 14225

<b>B. <u>Other Program Funding Summary</u></b>	<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
N/A									

**C. Acquisition Strategy:**  
N/A

<b>D. <u>Schedule Profile</u></b>	<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>
N/A							



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603882C Midcourse Defense Segment</b>
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COST <i>(In Thousands)</i>	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	3762250	3192594	3071581	3016343	2969142	2595708	Continuing	Continuing
3011 Block 2004 Test Bed	0	786485	533947	554098	348000	0	0	Continuing	Continuing
3012 Ground-Based Midcourse Defense (GMD) Development and Test Bed Upgrades	0	2393736	2072516	1837908	1668617	1758102	1638155	Continuing	Continuing
3020 Sea-Based Midcourse Defense (SMD)	0	468220	426601	456100	742800	824000	791500	Continuing	Continuing
3050 Segment Common Systems Engineering and Integration	0	44000	95000	150000	192000	322000	100000	Continuing	Continuing
3090 Program Operations	0	69809	64530	73475	64926	65040	66053	Continuing	Continuing

**NOTE: This Program Element (PE) R-2 does not match the earlier R-1 submission for FY 2003. There was a net zero sum transfer of funds between Ground Based Midcourse, PE 0603882C, Project 3012, (-\$2510K), and THAAD, PE 0604861C, Project 2011, (+\$2510K), which is correctly reflected in this R-2 but not in the R-1.**

**A. Mission Description and Budget Item Justification**

The Midcourse Defense Segment (MDS) provides a “hit-to-kill” capability to counter ballistic missiles in the midcourse stage of flight. In this capacity, the MDS provides the midcourse defense layer of the overall Ballistic Missile Defense System (BMDS) (via a ground-based system element (referred to as Ground-based Midcourse Defense (GMD)) and a sea-based system element (referred to as Sea-based Midcourse Defense (SMD))). Additionally, the MDS provides for the initial development and construction of a multi-part Ballistic Missile Defense System (BMDS) Test Bed, each part having independent utility, to demonstrate midcourse capabilities. The test bed could also be used to test the capabilities of other defense layers (i.e., boost and terminal phases) as they develop and the integration of those layers in the BMDS. The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C2 and Systems Engineering & Integration will guide the integration of MDS into the BMD System, the BMDS BMC/C2 architecture, and the BMDS Test Bed.

The MDS develops and demonstrates increasingly robust technologies and capabilities in order to enable incremental improvements and block upgrades to the BMDS over time, and incorporates: 1) countermeasures mitigation; 2) use of a Combined Test Force; 3) expanded engagement conditions; 4) additional target and interceptor test launch sites; 5) multiple engagement scenarios; 6) expanded test range/engagement areas; and 7) improved test infrastructure. Implementation of these improvements will enhance realism in test scenarios, improve test communications/data handling and enable multiple engagement test flight scenarios, intercept possibilities over a larger area, and higher speed Exoatmospheric Kill Vehicle (EKV) engagements.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603882C Midcourse Defense Segment</b>	
<p>The MDS Program Element contains the following projects: 1) 3011 – Block 2004 Test Bed (the GMD parts of the BMDS); 2) 3012 – GMD Development; 3) 3020 – SMD Development; 4) 3050 – Systems Engineering and Integration; and 5) 3090 – Program Operations. Projects 3011 and 3012 are successors to the National Missile Defense (NMD) program (previously captured under PE 0603871C), and Project 3020 is the successor to the Navy Theater Wide (NTW) Program (previously captured under PE 0603868C). Projects 3050 and 3090 provide technical support to both the GMD Projects (3011 and 3012) and the SMD Project (3020).</p> <p>Under the GMD Projects, the focus of MDS in the near term is to enhance testing via the development and construction of the, GMD parts of the BMDS Test Bed by 2004 (see detailed discussion under Project 3011, Block 2004). Although initial development of the test bed occurs within GMD, this test bed will have the flexibility to provide a future test infrastructure for other BMDS elements (i.e., boost and terminal phase) to use. It provides a near-operational environment for verifying component hardware and software integration under varying and stressing conditions; allows evaluation in a geographically dispersed environment; and permits testing of multiple simultaneous engagements. The BMDS Test Bed will provide unprecedented near term capabilities to 1) demonstrate BMDS improvements and the feasibility of a layered missile defense, and 2) provide a contingency capability (if and when directed).</p> <p>The Block 2004 Test Bed will also verify construction, transportation and certification procedures and validate logistics support concepts and system data. This includes maintenance procedures; loading and unloading operations; supply activities and databases; technical manuals; and reliability, availability, and maintainability data.</p> <p>Both the GMD Development project (3012) and the SMD project (3020), include development of technical improvements to system components; development of replacement components resembling more operationally realistic units (e.g., radars), enhanced and more robust command, control, and communications elements; and advanced interceptors. These more operationally realistic improvements will also be used to upgrade the missile defense test bed over time.</p> <p>Under Project 3012, key technologies will be matured in logical stages to allow for the initial test bed by 2004 and a more robust test bed over time using more operationally realistic hardware and software in block upgrades. The GMD will develop and demonstrate a wide range of technologies supporting a ground-based “hit-to-kill” capability through the use of advanced kill vehicles, improved launch vehicles, a robust launch and command, control and communications (C3) infrastructure, and advanced sensors. The complementary development program will support a robust ground and flight test program capable of validating the technologies and components being developed.</p> <p>The Sea-based Midcourse Defense (SMD) element of the Ballistic Missile Defense System (BMDS) will provide the capability for U.S. Navy Surface Combatants to intercept and destroy Medium Range to Inter-Continental Ballistic Missiles (ICBM) in the midcourse ascent phase of the exoatmospheric battlespace while forward deployed or on Fleet Missile Defense Patrol in defense of the nation, deployed U.S. forces, friends, and allies. The SMD element builds upon the existing Aegis Weapons System (AWS) and the Standard Missile (SM) infrastructure. The SMD element objectives include: 1) continue testing and complete the Navy Aegis Light-weight ExoAtmospheric Projectile (LEAP) Intercept (ALI) Flight Demonstration Project (FDP) to demonstrate that LEAP technologies can be successfully integrated with the Navy’s Standard Missile and the AWS; 2) design and develop a Block 2004 ship-based component to be integrated with BMDS test bed; and, 3) initiate, in FY 2002, a Block 2006, 2008, 2010 sea-based midcourse capability against Intermediate Range Ballistic Missiles (IRBMs) and ICBMs in concert with the Missile Defense National Team efforts as defined by the concept definition.</p>		
<i>Page 2 of 37 Pages</i>		Exhibit R-2 (PE 0603882C)

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

DATE

February 2002

BUDGET ACTIVITY

**4 - Program Definition and Risk Reduction**

PE NUMBER AND TITLE

**0603882C Midcourse Defense Segment**

Japan / U. S. Cooperative BMD Research Project. The Department of Defense signed a Memorandum of Agreement with the Japan Defense Agency in 1999 to conduct cooperative research to enhance the capabilities of the STANDARD Missile-3. The focus of research is on four components: sensor, advanced kinetic warhead, second stage propulsion, and lightweight nosecone. The project plans to flight test a jointly-developed component (lightweight nosecone) on a STANDARD Missile-3 in FY 2005.

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002</u> PB)	0	3940534	
Appropriated Value	0		
Adjustments to Appropriated Value			
a. Congressional General Reductions		178284	
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since <u>FY 2002</u> PB		178284	
Current Budget Submit ( <u>FY 2003</u> Budget Estimates)	0	3762250	3192594

**Change Summary Explanation:**

This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)

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

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002					
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>				PROJECT <b>3011</b>				
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
3011 Block 2004 Test Bed				0	786485	533947	554098	348000	0	0	Continuing	Continuing
<b>A. <u>Mission Description and Budget Item Justification</u></b>												
<p>The Ground-based Midcourse Defense (GMD) System Element of the Midcourse Defense Segment (MDS) consists of two (2) major efforts: 1) early development and construction of the initial GMD parts of the BMDS Test Bed (covered under Project 3011), and 2) development of capabilities to detect, track, intercept, and defeat ballistic missile threats to the U.S. during the midcourse phase of flight as well as GMD improvements to the BMDS Test Bed (covered under Project 3012). This exhibit addresses efforts under Project 3011, Block 2004 Test Bed.</p> <p>Project 3011 provides an early BMDS test bed capability to add realism to test and evaluation efforts and improve demonstration capabilities. This multi-part test bed will use initial developmental hardware and software assets to provide two different types of testing functions. Portions of the test bed are intended to validate the GMD operational concept. Other components of the test bed will provide increased realism for GMD interception testing with various locations for flight testing. Together, the initial GMD parts of the BMDS Test Bed will provide:</p> <ol style="list-style-type: none"> <li>1) More realistic test and evaluation through geographically dispersed assets and an operationally representative environment to check out component hardware and software integration,</li> <li>2) Distributed, integrated ground testing,</li> <li>3) Accelerates initial GMD Battle Management Command, Control and Communications (GBMC3) to support the Test Bed.</li> <li>4) Sensor assets including the upgraded COBRA DANE radar in Shemya and initial development of a Test X-Band Radar (XBR),</li> <li>5) Proof of construction, transportation, site activation, and validated logistics,</li> <li>6) Leverages ongoing basic development program activities in Project 3012 such as currently planned upgrades to the Beale EWR and continuation of development for other Test Bed components (GBMC3 and GBI),</li> <li>7) Incorporate Aegis Weapon System (AWS) sensors to support GMD Integrated Flight Test Program as soon as practicable,</li> <li>8) Full spectrum of testing to demonstrate system performance including multiple simultaneous engagements (MSEs),</li> <li>9) Common test infrastructure (for ground- and sea-based elements) that is expandable to boost and terminal segments, and</li> <li>10) Adds launch capabilities including Kodiak Island, Alaska.</li> </ol> <p>Project 3012 will provide for the development, test conduct, and improve upon and expand these early BMDS test bed capabilities.</p> <p>If necessary, this test bed will also be capable of providing a contingency capability, if directed, that offers rudimentary protection of the United States.</p>												
Project 3011				Page 4 of 37 Pages				Exhibit R-2A (PE 0603882C)				

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>		February 2002
PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>		PROJECT <b>3011</b>
<p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 0 This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)</li> </ul> <p>Total 0</p> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• <b>481964 Block 2004 Test Bed Development</b> Initiate efforts for the Block 2004 Test Bed with five Ground-Based Interceptors (GBI), “common” silos with sparing, Command Launch Equipment (CLE). Accelerate In-Flight Inceptor Communication System (IFICS) and GBMC3 software development. Enhance ground test capability by accelerating a long haul communications fiber network to provide data assurance and speed up the data collection and reduction effort. Initiate COBRA DANE radar hardware and software upgrades. Initiate upgrade of range assets to the Ronald Reagan Test Site (RTS) and other locations to enhance launch capabilities and range safety. This will add intercept areas, reduce artificiality in testing, and add realism to test scenarios. Upgrades will allow for flight test scenarios featuring multiple engagements. Begin integration effort to provide for AWS sensors to participate in GMD flight test program.</li> <li>• <b>21700 Kodiak Test Site</b> Initiate efforts for the Kodiak Test Site in support of the increased realism of GMD interception testing function of the Block 2004 Test Bed. The attached DD Form 1391 identifies \$2.8M of this amount for construction at the Kodiak Test Site and is included in the construction section of the MDA FY 2002 budget submission. The remainder is for equipment installation, design and environmental documentation.</li> <li>• <b>273121 RDT&amp;E Test Bed Facility Construction</b> Provides funding for design and construction efforts in support of the validation of the operational concept function of the Block 2004 Test Bed. The DD Form 1391, which details these efforts, is included in the construction section of the MDA FY 2002 budget submission.</li> <li>• <b>9700 Block 2004 Community Impacts</b> Provides funding for mitigating community impacts. These efforts include an additional fire station, off post landfill, school assistance, and a communications/TV tower.</li> </ul> <p><b>Total 786485 Block 2004 Test Bed</b></p> <p><b>FY 2003 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• <b>368947 Block 2004 Test Bed</b></li> </ul>		
Project 3011	Page 5 of 37 Pages	Exhibit R-2A (PE 0603882C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3011</b>
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Continue efforts for Block 2004 Test Bed with five Ground-Based Interceptors (GBI), "common" silos with sparing, and CLE. Continue to accelerate IFICS and GBMC3. Continue COBRA DANE radar hardware, software and power plant upgrades. Continue to enhance ground test capability by adding the long haul communications fiber network to provide data assurance and speed up the data collection and reduction effort. Continue AWS integration effort. Initiate the Test XBR development effort. Continue with upgrades of range assets to the RTS and other locations to enhance launch capabilities and range safety. This will add intercept areas, reduce artificiality in testing and add realism to test scenarios. Upgrades will allow for flight test scenarios featuring multiple engagements.

- **121800 RDT&E Test Bed Facility Construction**  
Provides funding for design and construction efforts in support of the validation of the operational concept function of the Block 2004 Test Bed. The DD Form 1391, which details these efforts, is included in the construction section of the MDA FY 2003 budget submission.
  - **8600 Block 2004 Community Impacts**  
Provides funding to mitigate community impacts. FY 2003 efforts include continued school assistance, an additional fire truck and ambulance, plus upgrades to recreation center, library, and city hall. FY 2003 funding will also provide for social service grants, business grants and loans, and education programs.
  - **34600 Kodiak Test Site**  
Continue efforts for the Kodiak Test Site in support of the increased realism of GMD interception testing function of the Block 2004 Test Bed. The attached DD Form 1391 identifies \$13.9M of this amount for construction at the Kodiak Test Site and is included in the construction section of the MDA FY 2003 budget submission. The remaining \$20.7M is for test equipment.
- Total 533947 Block 2004 Test Bed**

<b>B. Other Program Funding Summary</b>	<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 0603871C, NMD-PDRR	1819688								
PE 0208865C, PAC-3 Proc	440930	731455							
PE 0603868C, NTW-PDRR	456372								
PE 0604861C THAAD – EMD	530432	866530	934681	714679	830204	920988	1131109	Cont	Cont
PE 0603875C International Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
PE 0603884C Sensors		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
PE 0604865C PAC-3 RDT&E		128199							
PE 0604867C Navy Area (Termination)	267453	99302							

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3011</b>
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**C. Acquisition Strategy:** GMD 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 Department has restructured the missile defense acquisition strategy into a multi-path approach to assure that the most effective missile defense is available at the earliest possible time. The GMD project has adopted an acquisition approach that supports evolutionary projects development under the overall technical management of Boeing as the Prime Contractor. The strategy is to build the initial GMD parts of the BMDS Test Bed NLT 4th Quarter FY 2004 as an early BMDS Test Bed and deliver capability block upgrades as early as practical, adopting a spiral development methodology in recognition of the rapidly changing technology environment and the need to satisfy requirements that are defined in general terms within an evolving technology base. This process will (1) allow early implementation of a capability while supporting an evolving requirement/threat definition process, (2) minimize the risks of obsolescence posed by the rapid pace of technology development, (3) provide opportunities to update the project to a changing set of standards, and (4) allow informed trades between cost, schedule, and performance while exploring operational possibilities. The development approach has been enhanced to include (1) initiating a countermeasures mitigation program and developing capabilities to resolve issues with likely countermeasures, (2) adding test infrastructure and improving test management to allow more operationally challenging representative flight tests and providing for increased testing against more challenging targets, and (3) increasing the fidelity of the project simulations.

<b>D. Schedule Profile</b>	<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>
Drill 5 silo holes with sparing - Greely		4Q					
Deliver 5 EKV's				1Q			
Deliver 5 Boosters				2Q			
5 Interceptors installed – Greely				4Q			
5 Silos with sparing I&CO				4Q			
Extended test range Environmental Impact Statement (EIS) Record of Decision (ROD)			2Q				
Initiate Test XBR Planning			2Q				
Drill 2 silo holes – Kodiak			3Q				
2 silos I&CO – Kodiak				4Q			
Aegis Interface			3Q				
COBRA DANE Upgrades				2Q			
IFICS – Greely			4Q	1Q/3Q			
IFICS – Kodiak Support				4Q			
IFICS – Shemya				1Q			
GCN – Alaska Ring				2Q			
GBMC2 Nodes - Greely				2Q			
GBMC2 Nodes – JNIC/CMOC				2Q			
Initiate Test Bed Testing					1Q		
Test Bed Block Upgrade Decision Points (see Project 3012)				3Q		3Q	

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>							DATE <b>February 2002</b>
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>			PROJECT <b>3011</b>

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
<b>PRIME CONTRACTOR</b>										
Block 2004 Test Bed:	CPAF	Boeing/Various						CONT		CONT
SE&I	CPAF	Boeing/Various		18195	2Q	42338	2Q		60533	
GBI	CPAF	Boeing/Various		237733	2Q	49193	2Q		286926	
UEWR	CPAF	Boeing/Various		34490	2Q	29032	2Q		63522	
GBMC3	CPAF	Boeing/Various		114468	2Q	86390	2Q		200858	
T&E	CPAF	Boeing/Various		17295	2Q	36290	2Q		53585	
D&S	CPAF	Boeing/Various		52985	2Q	88003	2Q		140988	
TTEC	CPAF	Boeing/Various		6798	2Q	13004	2Q		19802	
XBR	CPAF	Boeing/Various				24697	2Q		24697	
Kodiak Test Site	TBD	TBD/Various		21700	2Q	34600	2Q	CONT	56300	CONT
Subtotal Product Development:				503664		403547			907211	

Remark:  
 The funding specific breakouts within the Prime Contractor/Boeing section of the R-3 are an estimate. At the time of the FY03 Budget Estimate Submission, the contract was not definitized for the restructured Ground-based Midcourse Defense capability-based acquisition strategy. In addition, even when definitized, the Prime Contractor has the responsibility to balance resources across the GMD program and allocate component funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the components' estimates, provided in this R-3 document.

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
Block 2004 Test Bed Facility Construction	TBD	TBD/Various		273121	3Q	121800	3Q	CONT	394921	CONT
Block 2004 Test Bed Community Impacts	TBD	TBD/Various		9700	2Q-4Q	8600	2Q-4Q	CONT	18300	CONT
Subtotal Support Costs:				282821		130400			413221	

Remark:



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3011</b>
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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
N/A										
Subtotal Test and Evaluation:										

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. N/A										
Subtotal Management Services:										

Remark:

Project Total Cost:				786485		533947			1320432	
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Remark:

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603882C Midcourse Defense Segment				PROJECT 3012		
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
3012	Ground-Based Midcourse Defense (GMD) Development and Test Bed Upgrades	0	2393736	2072516	1837908	1668617	1758102	1638155	Continuing	Continuing
<p><b>See R-2 Note.</b></p> <p><b>A. Mission Description and Budget Item Justification</b></p> <p>The Ground-based Midcourse Defense (GMD) System Element of the Midcourse Defense Segment (MDS) consists of two (2) major efforts: 1) early development and construction of the initial GMD parts of the BMDS Test Bed (covered under Project 3011), and 2) development of capabilities to detect, track, intercept, and defeat ballistic missile threats to the U.S. during the midcourse phase of flight as well as GMD improvements to the BMDS Test Bed (covered under Project 3012, GMD Development and Test Bed Upgrades). This exhibit addresses efforts under Project 3012, GMD Development and Test Bed Upgrades.</p> <p>The GMD Development and Test Bed Upgrades project provides hardware, planning, mission support and execution of the GMD test program. It also provides a broad range of development activities and technologies and components for the ground-based element of BMDS. This development effort will mature key technologies in logical stages to allow for an initial capability, an enhanced and more robust BMDS Test Bed (using operationally representative hardware and software vice developmental hardware and software), and a continuing program to develop and demonstrate a wide range of technologies supporting a ground-based "Hit-to-Kill" capability. This project requires infrastructure support for the GMD program at Redstone Arsenal, Alabama.</p> <p>The GMD Development program provides a robust development and test program of more capable interceptors (both launch and kill vehicles), targets, sensors, and C3 systems and infrastructure.</p> <ul style="list-style-type: none"> <li>The Objective Boost Vehicle (OBV) will be the primary delivery system for the Exoatmospheric Kill Vehicle (EKV). The OBV is still in development with flight tests planned in FY 2002 and 2003. Until the OBV has completed testing and is certified for use in the MDS flight test program, the Payload Launch Vehicle (PLV) will be used.</li> <li>The EKV is a "Hit-to-Kill" payload designed to acquire, discriminate, track, and intercept targets in the midcourse phase of flight. The key components and technologies of the EKV include the acquisition and tracking sensors, the on-board maneuvering system, and the on-board vehicle C3 systems. Component development is on-going and is demonstrated as part of the block improvement process in the Integrated Flight Test program.</li> <li>The sensor development program is a mix of enhancements to existing radar assets and development of new radar capabilities. The program will continue the upgrades to the Early Warning Radar system at Beale to support the Test Bed. It also continues planning for upgrades to other EWR sites. The key elements of the upgrades are the software builds to improve the effectiveness of the radars. A broad range of X-Band Radar (XBR) technologies will continue in development. The Ground-Based Radar Prototype (GBR-P) is a X-Band prototype located at the Ronald Reagan Test Site (RTS) at Kwajalein and is being used as part of the Integrated Flight Test program. The GBR-P will serve as a demonstration platform for these evolving technologies.</li> <li>The Ground-Based Battle Management Command, Control, and Communications (GBMC3) component is an integrated network of nodes supporting the full spectrum of GMD C3 requirements. This includes a) various communications links (e.g., CONUS and Alaska rings and Satellite Communications (SATCOM) to</li> </ul>										
Project 3012		Page 10 of 37 Pages				Exhibit R-2A (PE 0603882C)				

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603882C Midcourse Defense Segment</b>	
<p>Shemya, Ft Greely, and In-Flight Interceptor Communication System (IFICS) Data Terminals (IDTs); b) GBMC2 (command and control) Nodes (Ft Greely and Joint National Integration Center (JNIC) at Cheyenne Mountain Operations Center (CMOC); and c) IDTs at various locations. Block development initiatives continue on these technologies and components meeting future block capability requirements. This effort will be developed to be consistent with the BMDS BMC/C2 architecture.</p> <ul style="list-style-type: none"> <li>• The GMD Development program supports the full test article requirements of the Integrated Flight Test program. The typical yearly profile includes four (4) flight tests. This profile includes multiple launches against multiple threat targets as the Block capability matures. This support includes targets, launch vehicles, EKV's, launch infrastructure, test range assets, and other mission support. Additionally, incorporate Aegis Weapon System (AWS) sensors to support GMD integrated flight test program as soon as practicable.</li> <li>• Pre-deployment planning continues in order to provide a capability to respond to a future deployment order in the shortest time possible. This includes site surveys and activation planning, silo design and planning, facility planning, environmental impact studies and assessments, logistics planning, and operational procedures.</li> <li>• In FY 2003, SE&amp;I activities will initiate the planning for future capability improvement efforts.</li> </ul> <p>These initiatives will support a robust ground and flight test program capable of validating the technologies and components being developed.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 0 This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)</li> </ul> <p>Total 0</p>		
<i>Page 11 of 37 Pages</i>		Exhibit R-2A (PE 0603882C)

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>		February 2002
PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>		PROJECT <b>3012</b>
<p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li> <p><b>• 2393736 Ground-Based Midcourse Development</b>            Support continued evolution of the BMDS Test Bed as well as support continued upgrade of deployment capability. Initiate Design Review process Block 2004 Test Bed. Evaluate production alternatives. Continue booster development and investigate booster alternatives as part of risk mitigation. Conduct Booster Verification (BV) tests. Design common silo. Continue EKV development, including algorithm upgrades. Develop GBI support projects, including CLE. Support T&amp;E engineering, simulations, ground tests and conduct IFTs-7 through 9. Begin the increasing prototype manufacturing rate capability to support increased flight test frequency and required test bed assets. Deliver basic XBR software. Develop and release BMC2 software increment BI-2. Initiate Northern tier SATCOM and fiber optic communications links to provide reliable communications to BMC2 nodes. Continue development of high fidelity simulations. Begin planning for simultaneous engagements to assess project operational performance. Complete UEWR software builds 3 and 4. Conduct software / algorithm Verification and Validation (V&amp;V), logistics / configuration support, and installation planning. Continue development of project deployment and sustainment strategy planning to include maintenance and supply support. Continue development and testing of incremental XBR and UEWR software. Continue program management, technical and testing oversight of the GBI, XBR, UEWR and GBMC3 projects. Support IFTs-7 through 10. Provide targets and conduct target launches. Conduct post test data reduction activities. Continue requirements refinement for System Capabilities Document (SCD). Support major program milestones, project requirements and design reviews, internal and external interface development/implementation cost assessment, elevation of deployment readiness, and project deployment. Conduct C2Sim exercise and tabletops. Continue integration with the Space Based InfraRed System (SBIRS) Program Office to ensure the satisfaction of project requirements. Perform nuclear environment calculations/requirements verification. Conduct data fusion/project discrimination development. Coordinate project Verification, Validation and Accreditation (VV&amp;A) and maintain Independent Verification and Validation (IV&amp;V) capability to perform project VV&amp;A. Support Common System Engineering with Sea-based Midcourse Defense (SMD) element. Continue development of project sustainment program planning. Conduct facilities design. Continue project RAM and supportability/testability data and issue analysis reports. Develop plan for employing the Test, Training and Exercise Capability (TTEC). Review Manpower, Personnel and Training (MPT) issues and ensure MPT is on track to provide trained personnel for Block capabilities. Develop and issue project Producibility and Manufacturing (P&amp;M) plans. Continue Environmental, Safety, and Health (ESH) documentation, including associated siting and National Environmental Policy Act (NEPA) analysis and ESH compliance documentation required for continued project development and deployment. Continue Programmatic Environmental Safety and Health Evaluation (PESHE).</p> </li> </ul> <p><b>Total 2393736 Ground-Based Midcourse Development</b></p>		
Project 3012	Page 12 of 37 Pages	Exhibit R-2A (PE 0603882C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3012</b>
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**FY 2003 Planned Program:**

- 2072516 Ground-Based Midcourse Development**  
 Support continued evolution of the BMDS Test Bed as well as support continued upgrade of deployment capability. Continue Design Review process for Block 2004 Test Bed. Continue evaluating production alternatives. Support T&E engineering, simulations, ground tests and conduct IFTs-10 through 13. Conduct BV tests. Continue development of selected Alternate Booster and common silo. Continue development of GBI support projects, including CLE. Continue development and testing of XBR and UEWR software. Complete UEWR software builds 5 and 6. Continue increasing prototype manufacturing rate capability to support increased flight test frequency and required test bed assets. Continue EKV development, including algorithm upgrades. Continue communications network in Northern tier SATCOM links. Lay fiber to provide reliable communications to BMC2 nodes. Continue development of high fidelity simulations. Continue planning for simultaneous engagements to assess the project operational performance. Conduct software / algorithm V&V, logistics / configuration support, and installation planning. Continue development of project deployment and sustainment strategy planning to include maintenance and supply support. Continue program management, technical and testing oversight of the GBI, XBR, UEWR and GBMC3 projects. Provide targets and conduct target launches. Conduct post test data reduction activities. Continue to support major program milestones, project requirements and design reviews, internal and external interface development/implementation cost assessment, elevation of deployment readiness, and project deployment. Continue to conduct C2Sim exercise and tabletops. Continue integration with the SBIRS Program Office to ensure the satisfaction of project requirements. Continue to perform nuclear environment calculations / requirements verification. Continue to conduct data fusion/project discrimination development. Continue to coordinate project VV&A. Maintain IV&V capability to perform project VV&A. Continue development of project sustainment program planning. Continue to conduct facilities design. Continue project RAM and development of supportability / testability data and issue analysis reports. Develop plan for employing the TTEC. Continue to review MPT issues and ensure MPT is on track to provide trained personnel for Block capabilities. Continue to develop and issue project P&M plans. Continue ESH documentation, including associated siting and NEPA analysis and ESH compliance documentation required for continued project development and deployment. Continue PESHE

**Total 2072516 Ground-Based Midcourse Development**

<b>B. Other Program Funding Summary</b>	<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 0603871C, NMD-PDRR	1819688								
PE 0208865C, PAC-3 Proc	440930	731455							
PE 0603868C, NTW-PDRR	456372								
PE 0604861C THAAD – EMD	530432	866530	934681	714679	830204	920988	1131109	Cont	Cont
PE 0603875C International Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603882C Midcourse Defense Segment</b>	<b>PROJECT</b> <b>3012</b>
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PE 0603884C Sensors		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
PE 0604865C PAC-3 RDT&E		128199							
PE 0604867C Navy Area (Termination)	267453	99302							

**C. Acquisition Strategy:** GMD 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 Department has restructured the missile defense acquisition strategy into a multi-path approach to assure that the most effective missile defense is available at the earliest possible time. The GMD project has adopted an acquisition approach that supports evolutionary projects development under the overall technical management of Boeing as the Prime Contractor. The strategy is to build the initial GMD parts of the BMDS Test Bed NLT 4th Quarter FY 2004 and deliver capability block upgrades as early as practical, adopting a spiral development methodology in recognition of the rapidly changing technology environment and the need to satisfy requirements that are defined in general terms within an evolving technology base. This process will (1) allow early implementation of a capability while supporting an evolving requirement/threat definition process, (2) minimize the risks of obsolescence posed by the rapid pace of technology development, (3) provide opportunities to update the project to a changing set of standards, and (4) allow informed trades between cost, schedule, and performance while exploring operational possibilities. The development approach has been enhanced to include (1) initiating a countermeasures mitigation program and developing capabilities to resolve issues with likely countermeasures, (2) adding test infrastructure and improving test management to allow more operationally challenging representative flight tests and providing for increased testing against more challenging targets, and (3) increasing the fidelity of the project simulations.

<b>D. Schedule Profile</b>	<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>
<b>Production Decision Points (NET)</b>		3Q	3Q	3Q	3Q	3Q	3Q
<b>Test Bed Block Upgrade Decision Points</b>				3Q		3Q	
<b>Integrated Flight Tests (IFT)</b>							
IFT - 7		1Q					
IFT - 8		2Q					
IFT - 9		4Q					
IFT - 10			1Q				
IFT - 11			2Q				
IFT - 12			3Q				
IFT - 13			4Q				
IFT - 14				1Q			
IFT - 15				2Q			
IFT - 16				3Q			
IFT - 17				4Q			

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)						DATE February 2002	
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>		PROJECT <b>3012</b>	
IFT - 18					1Q		
IFT - 19					2Q(MSE)		
IFT - 20					2Q(MSE)		
IFT - 21					3Q		
IFT - 22					4Q		
IFT - 23						1Q(MSE)	
IFT - 24						1Q(MSE)	
IFT - 25						2Q	
IFT - 26						3Q	
IFT - 27							1Q
IFT - 28							2Q
IFT - 29							3Q
IFT - 30							4Q
<b>Other Tests</b>							
IGT - 7			1Q				
IGT - 8				1Q			
IGT - 9				2Q			
IMT - 1			3Q				
IMT - 2				2Q			
IMT - 3					2Q		
IMT - 4						1Q	
IMT - 5							1Q
IST - 1				3Q			
IST - 2					1Q		
IST - 3						1Q	
IST - 4						4Q	
IST - 5							4Q
IST - 6							4Q
<b>Ground-Based Interceptor (GBI)</b>							
Boost Vehicle - 3			1Q				
OBV Test Flights			4Q	2/3Q			
OBV PDR			3Q				
OBV CDR			4Q				
GBI Delta CDR				1Q			

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)						DATE
BUDGET ACTIVITY						February 2002
<b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE		PROJECT
				<b>0603882C Midcourse Defense Segment</b>		<b>3012</b>
EKV Processor Upgrades				4Q		
<b>Early Warning Radars (EWR)</b>						
EWR Hardware Upgrades CDR		1Q				
Complete Hardware Upgrades – Beale				3Q		
Software Upgrades – Build 3		1Q				
Software Upgrades – Build 4		2Q				
Software Upgrades – Build 5			1Q			
Software Upgrades – Build 6			3Q			
Software Upgrades – Functional Qual. Test			4Q			
Software Upgrades – Build 7					4Q	
<b>XBR</b>						
XBR CRD		3Q				
XBR Delta CDR			1Q			
GBR – P Upgrade CDR		2Q				
GBR – P Complete Array Refurbishment				3Q		
GBP – P Complete						4Q
XBR Software – Build 2		2Q				
XBR Software – Build 3			2Q			
XBR Software – Build 4				2Q		
XBR Software – Build 5					2Q	
<b>GBMC3</b>						
GCN CDR		2Q				
GCN – SATCOM				2Q		
GCN – CONUS				2Q		
IFICS – CDR		1Q				
IFICS - FQT		3Q				
IFICS – I&CO Complete						4Q
Software – DI-A			3Q			
Software – DI-B				3Q		
Software – DI-C						1Q
GBMC3 FQT			4Q			



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## MDA RDT&amp;E COST ANALYSIS (R-3)

DATE

February 2002

BUDGET ACTIVITY

4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE

0603882C Midcourse Defense Segment

PROJECT

3012

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
<b>PRIME CONTRACTOR</b>										
SE&I	CPAF	Boeing/Various		131111	2Q	111044	2Q	CONT	242155	CONT
GBI	CPAF	Boeing/Various		851817	2Q	840503	2Q	CONT	1692320	CONT
UEWR	CPAF	Boeing/Various		128812	2Q	118359	2Q	CONT	247171	CONT
GBMC3	CPAF	Boeing/Various		252569	2Q	141263	2Q	CONT	393832	CONT
T&E	CPAF	Boeing/Various		112381	2Q	94735	2Q	CONT	207116	CONT
D&S	CPAF	Boeing/Various		19305	2Q	14990	2Q	CONT	34295	CONT
TTEC	CPAF	Boeing/Various		42861	2Q	30579	2Q	CONT	73440	CONT
XBR	CPAF	Boeing/Various		120309	2Q	97973	2Q	CONT	218282	CONT
Program Management	CPAF			102958	2Q	96893	2Q		199851	CONT
<b>GBI</b>	TM	CSC/Various		7500	2/3Q	7725	2/3Q	CONT	15225	CONT
	CPFF	Sparta/Various		1720	2/3Q	1772	2/3Q	CONT	3492	CONT
	TM	Mevatec /Various		7612	2/3Q	7840	2/3Q	CONT	15452	CONT
	TM	TSI/Various		6028	2/3Q	6209	2/3Q	CONT	12237	CONT
	CPFF	Stone Engineer/Various		1751	2/3Q	1803	2/3Q	CONT	3554	CONT
	CPFF	Colsa/Various		6	2/3Q	5	2/3Q	CONT	11	CONT
	MITRE	Eng/Tech Spt/Various		263	2/3Q	271	2/3Q	CONT	534	CONT
	MIPR	OGAs/Various		8514	2/3Q	5255	2/3Q	CONT	13769	CONT
	N/A	Misc Contracts/Various		740	2/3Q	762	2/3Q	CONT	1502	CONT
<b>GBMC3</b>	N/A	NWSC/Various		2200	2/3Q	2059	2/3Q	CONT	4259	CONT
	CPAF	TRW/Various		3800	2/3Q	3700	2/3Q	CONT	7500	CONT
	FFRDC	MITRE Corp. /Various		1353	2/3Q	1200	2/3Q	CONT	2553	CONT
	CPFF	Sparta/Various		4500	2/3Q	4250	2/3Q	CONT	8750	CONT
	CPFF	CST/Various		109	2/3Q	100	2/3Q	CONT	209	CONT
	MIPR	QRI/Various		1750	2/3Q	1500	2/3Q	CONT	3250	CONT
	CPAF	CSC/Various		3600	2/3Q	3300	2/3Q	CONT	6900	CONT
	MIPR	AMCOM/Various		159	2/3Q	150	2/3Q	CONT	309	CONT
	CPAF	Vanguard Research		200	2/3Q	180	2/3Q	CONT	380	CONT
	BPA (ITSP)	TECOLOTE/Various		582	2/3Q	550	2/3Q	CONT	1132	CONT
	MIPR	USAF ESC/Various		67	2/3Q	60	2/3Q	CONT	127	CONT
	N/A	Misc Contracts/Various		45	2/3Q	0	2/3Q	CONT	45	CONT
	MIPR	ARL/Various		350	2/3Q	300	2/3Q	CONT	650	CONT

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**BMDO RDT&E COST ANALYSIS (R-3)**

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BUDGET ACTIVITY

PE NUMBER AND TITLE

**4 - Program Definition and Risk Reduction**

**0603882C Midcourse Defense Segment**

<b>XBR</b>	CPAF	TBE/Various		3550	2/3Q	3000	2/3Q	CONT	6550	CONT
	CPAF	CSC/Various		1200	2/3Q	1100	2/3Q	CONT	2300	CONT
	MIPR	MIT (Lincoln Labs)		1800	2/3Q	1700	2/3Q	CONT	3500	CONT
	CPAF	Ga Tech/Georgia		1550	2/3Q	1400	2/3Q	CONT	2950	CONT
	TM	Mevatec/Various		5503	2/3Q	5297	2/3Q	CONT	10800	CONT
	N/A	OGA Other Spt/Various		2449	2/3Q	2383	2/3Q	CONT	4832	CONT
<b>UEWR</b>	MIPR	MITRE/Massachusetts		4873	2/3Q	5244	2/3Q	CONT	10117	CONT
	BPA (ITSP)	SENCOM/ Massachusetts		2952	2/3Q	2702	2/3Q	CONT	5654	CONT
	MIPR	MIT Lincoln Lab/Massachusetts		100	2/3Q	0	2/3Q	CONT	100	CONT
	CPAF	TRW @ JNIC/Massachusetts		600	2/3Q	255	2/3Q	CONT	855	CONT
	GSA	AFRL/Massachusetts		175	2/3Q	0	2/3Q	CONT	175	CONT
	BPA (ITSP)	Tecolote/Massachusetts		264	2/3Q	277	2/3Q	CONT	541	CONT
	GSA	Xontech/Massachusetts		569	2/3Q	0	2/3Q	CONT	569	CONT
	N/A	Misc Contracts/Massachusetts		167	2/3Q	514	2/3Q	CONT	681	CONT
<b>TTEC</b>	CPFF	SY Technology/Various		4116	2/3Q	3815	2/3Q	CONT	7931	CONT
	CPFF	CST/Various		195	2/3Q	181	2/3Q	CONT	376	CONT
	CPFF	Mevatec/Various		190	2/3Q	176	2/3Q	CONT	366	CONT
	CPFF	Jaycor/Various		455	2/3Q	422	2/3Q	CONT	877	CONT
	GSA	Aegis/Various		500	2/3Q	463	2/3Q	CONT	963	CONT
	GSA	Tec-Masters/Various		151	2/3Q	140	2/3Q	CONT	291	CONT
	MIPR	SED/Various		1000	2/3Q	927	2/3Q	CONT	1927	CONT
	CPFF	Sparta/Various		500	2/3Q	463	2/3Q	CONT	963	CONT
	MIPR	STRICOM/Various		728	2/3Q	675	2/3Q	CONT	1403	CONT
	MIPR	MRDEC/Various		106	2/3Q	98	2/3Q	CONT	204	CONT
	MIPR	MITRE/Various		240	2/3Q	222	2/3Q	CONT	462	CONT
	MIPR	User Lab/Various		500	2/3Q	465	2/3Q	CONT	965	CONT
Subtotal Product Development:				1849405		1627249			3476654	

Remark:

The funding specific breakouts within the Prime Contractor/Boeing section of the R-3 are an estimate. At the time of the FY03 Budget Estimate Submission, the contract was not definitized for the restructured Ground-based Midcourse Defense capability-based acquisition strategy. In addition, even when definitized, the Prime Contractor has the responsibility to balance resources across the GMD program and allocate component funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the components' estimates, provided in this R-3 document.

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**MDA RDT&E COST ANALYSIS (R-3)**

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603882C Midcourse Defense Segment</b>	<b>PROJECT</b> <b>3012</b>
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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
<b>SYSTEM ENGINEERING</b>	CPFF	BMD/CSC/Various		17400	2/3Q	18868	2/3Q	CONT	36268	CONT
	MIPR	JNIC/Various		6580	2/3Q	4850	2/3Q	CONT	11430	CONT
	MIPR	DTRA/Various		1810	2/3Q	1810	2/3Q	CONT	3620	CONT
	MIPR	USAF/SMC/SBIRS/Various		2900	2/3Q	2900	2/3Q	CONT	5800	CONT
	MIPR	NSWC/Various		5170	2/3Q	5600	2/3Q	CONT	10770	CONT
	MIPR	MIT/Lincoln Lab		4943	2/3Q	3380	2/3Q	CONT	8323	CONT
	MIPR	Misc/POET/Various		3457	2/3Q	1621	2/3Q	CONT	5078	CONT
	MIPR	Threat & CM/Various		2000	2/3Q	2000	2/3Q	CONT	4000	
	TBD	MDA/SE/Comm/Various		64000	2/3Q	0	2/3Q	CONT	64000	CONT
<b>PRODUCTION &amp; QUALITY; LOGISTICS; SITE ACTIVATION COMMAND; PROGRAM PROTECTIONS</b>	CPFF	CSC		14930	2/3Q	14183	2/3Q	CONT	29113	CONT
	CPFF	Nichols/Various		5185	2/3Q	5019	2/3Q	CONT	10204	CONT
	CPFF	Colsa/Various		721	2/3Q	620	2/3Q	CONT	1341	CONT
	CPFF	Mevatec/Various		420	2/3Q	1332	2/3Q	CONT	1752	CONT
	CPFF	Tybrin/Various		50	2/3Q	50	2/3Q	CONT	100	CONT
	CPFF	Boeing Support/Various		800	2/3Q	750	2/3Q	CONT	1550	CONT
	MIPR	SMDC/Various		2453	2/3Q	2375	2/3Q	CONT	4828	CONT
	MIPR	AMCOM/Various		4657	2/3Q	4508	2/3Q	CONT	9165	CONT
	MIPR	USACE/Various		10143	2/3Q	9819	2/3Q	CONT	19962	CONT
	MIPR	USA War College		1454	2/3Q	1408	2/3Q	CONT	2862	CONT
	MIPR	Schreiver AFB		525	2/3Q	508	2/3Q	CONT	1033	CONT
	MIPR	HQ AFCEE		1065	2/3Q	1079	2/3Q	CONT	2144	CONT
	MIPR	OGAs/Various		3200	2/3Q	3000	2/3Q	CONT	6200	CONT
	MIPR	Site Activation Cmd		16175	2/3Q	14995	2/3Q	CONT	31170	CONT
	MIPR	611 <sup>th</sup> ASG/FMA		4726	2/3Q	4500	2/3Q	CONT	9226	CONT
	MIPR	System GFX		59621	2/3Q	52772	2/3Q	CONT	112393	CONT
<b>MANAGEMENT AND OPERATIONAL SUPPORT</b>	CPAF/CPFF	CSC/Various		67456	2/4Q	62532	2/4Q	CONT	129988	CONT
	N/A	GOVT PERS (DC)		22619	2/4Q	20968	2/4Q	CONT	43587	CONT
	N/A	TSM (SMDC)		20000	2/4Q	18540	2/4Q	CONT	38540	CONT
	N/A	GOVT PER (HSV)		37506	2/4Q	34768	2/4Q	CONT	72274	CONT

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3012</b>
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Subtotal Support Costs:			381966	294755	676721
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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
<b>SUPPORT FOR GND/FLT TESTS</b>	CPFF	Colsa/Various		7871	2/3Q	7296	2/3Q	CONT	15167	CONT
	CPFF	Boeing/Various		1437	2/3Q	1332	2/3Q	CONT	2769	CONT
	CPAF	Nichols/Various		2465	2/3Q	2285	2/3Q	CONT	4750	CONT
	MIPR	USAKA		22872	2/3Q	21202	2/3Q	CONT	44074	CONT
	FFRDC/MIPR	Sandia		353	2/3Q	327	2/3Q	CONT	680	CONT
	OGA/MIPR	USASMDC		1078	2/3Q	999	2/3Q	CONT	2077	CONT
	OGA/MIPR	JNIC		341	2/3Q	316	2/3Q	CONT	657	CONT
	MIPR	VAFB		1006	2/3Q	932	2/3Q	CONT	1938	CONT
	TM	Mevatec/Various		5408	2/3Q	5013	2/3Q	CONT	10421	CONT
	CPFF	CAS/Various		1335	2/3Q	1238	2/3Q	CONT	2573	CONT
	CPFF	SY TECH/Various		18	2/3Q	17	2/3Q	CONT	35	CONT
	OGA/MIPR	SBIRS SPO		259	2/3Q	240	2/3Q	CONT	499	CONT
	MIPR	USARSPACE		539	2/3Q	499	2/3Q	CONT	1038	CONT
	MIPR	Eglin AFB		3130	2/3Q	2901	2/3Q	CONT	6031	CONT
	N/A	SATCOM/Various		180	2/3Q	166	2/3Q	CONT	346	CONT
	OGA/MIPR	OGAs/Various		734	2/3Q	680	2/3Q	CONT	1414	CONT
	N/A	RTTC		521	2/3Q	483	2/3Q	CONT	1004	CONT
<b>OPERATIONAL TEST AGENCIES</b>	N/A	DYNETC/Various		742	2/3Q	688	2/3Q	CONT	1430	CONT
	N/A	VRC/Various		3367	2/3Q	3121	2/3Q	CONT	6488	CONT
	N/A	SLAD/Various		200	2/3Q	185	2/3Q	CONT	385	CONT
	N/A	CEI/Various		738	2/3Q	684	2/3Q	CONT	1422	CONT
	CPFF	Colsa/Various		479	2/3Q	444	2/3Q	CONT	923	CONT
	CPFF	TRW/Various		2660	2/3Q	2466	2/3Q	CONT	5126	CONT

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE **February 2002**

<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603882C Midcourse Defense Segment</b>	<b>PROJECT</b> <b>3012</b>
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	N/A	Various OGAs/Various		1688	2/3Q	1564	2/3Q	CONT	3252	CONT
	CPFF	SAIC/Various		1078	2/3Q	999	2/3Q	CONT	2077	CONT
<b>LETHALITY</b>	MIPR	MIT		2921	2/3Q	2708	2/3Q	CONT	5629	CONT
	CPFF	ITT/Various		1142	2/3Q	1059	2/3Q	CONT	2201	CONT
	OGA/MIPR	AEDC		312	2/3Q	290	2/3Q	CONT	602	CONT
	N/A	Sandia		3577	2/3Q	3316	2/3Q	CONT	6893	CONT
	N/A	Mevatec/Various		90	2/3Q	83	2/3Q	CONT	173	CONT
	N/A	TBE/Various		1216	2/3Q	1130	2/3Q	CONT	2346	CONT
	N/A	SMDC		87	2/3Q	81	2/3Q	CONT	168	CONT
	N/A	SMDC		2640	2/3Q	2447	2/3Q	CONT	5087	CONT
<b>TARGETS</b>	FFRDC/MIPR	Sandia		44534	2/3Q	41283	2/3Q	CONT	85817	CONT
	OGA/MIPR	SMDC		13463	2/3Q	12481	2/3Q	CONT	25944	CONT
	MIPR	SMDC		27045	2/3Q	25071	2/3Q	CONT	52116	CONT
	MIPR	LLNL		1556	2/3Q	1443	2/3Q	CONT	2999	CONT
	CPFF	SY TECH/Various		3283	2/3Q	3043	2/3Q	CONT	6326	CONT
Subtotal Test and Evaluation:				162365		150512			312877	

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
N/A										
Subtotal Management Services:										

Remark:

Project Total Cost:				2393736		2072516			4466252	
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Remark:

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603882C Midcourse Defense Segment				PROJECT 3020		
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
3020	Sea-Based Midcourse Defense (SMD)	0	468220	426601	456100	742800	824000	791500	Continuing	Continuing
<p><b>A. Mission Description and Budget Item Justification</b></p> <p>The Sea-based Midcourse Defense (SMD) element of the Ballistic Missile Defense System (BMDS) will provide the capability for U.S. Navy Surface Combatants to intercept and destroy Medium Range to Inter-Continental Ballistic Missiles (ICBM) in the midcourse ascent phase of the exoatmospheric battlespace while forward deployed or on Fleet Missile Defense Patrol in defense of the nation, deployed U.S. forces, friends, and allies. The SMD element builds upon the existing Aegis Weapons System (AWS) and the Standard Missile (SM) infrastructure. The SMD element objectives include: 1) continue testing and complete the Navy Aegis Light-weight ExoAtmospheric Projectile (LEAP) Intercept (ALI) Flight Demonstration Project (FDP) to demonstrate that LEAP technologies can be successfully integrated with the Navy's Standard Missile and the AWS; 2) design and develop a Block 2004 ship-based component to be integrated with BMDS Test Bed; and, 3) initiate, in FY 2002, a Block 2006, 2008, 2010 sea-based midcourse capability against Intermediate Range Ballistic Missiles (IRBMs) and ICBMs in concert with the Missile Defense National Team efforts as defined by the concept definition work.</p> <p>System development and testing will be integrated with the BMDS Test bed and BMDS architecture and fully support the Missile Defense Agency's (MDA) capability based acquisition approach for BMD. Each technological advance in SMD will be evaluated for upgrades to the BMDS testbed/architecture in accordance with annual MDA decision reviews. The overall program execution strategy will be to rely on the government and industry team while concurrently selecting combat system engineering agents for the Block 2004 and Block 2008-2010 SMD capabilities.</p> <p><u>ALI Block 2004 Test bed</u> – The ALI FDP currently consists of a series of near-term flight tests with the primary objective of demonstrating that LEAP technologies can be integrated with a modified Standard Missile and the AWS to successfully intercept a ballistic missile in the exoatmosphere. ALI successfully executed Flight Test Round (FTR) -1A in Jan 2001, and Flight Mission (FM) -2, A Kinectic Warhead (KW) characterization flight, in Jan 2002. Although not one of the test objectives, FM-2 resulted in an intercept of a ballistic missile in the exoatmosphere. Two additional flight missions, FM-3-4, are scheduled for completion in FY 2002. The primary objective of these flight missions is to demonstrate exoatmosphere intercept repeatability. FM-5-7 are scheduled to be completed in FY 2003 and will provide for opportunities to: 1) flight test SDACS improvements, 2) conduct intercept engagements in varying portions of the ballistic missile trajectory, or 3) transition to more stressing targets/target scenarios based upon technological advances in associated risk reduction areas.</p> <p><u>Block 2006, 2008, 2010</u> – This effort provides for development of the Sea-based Midcourse Defense Block 2006-2010 midcourse ascent phase intercept capability. In FY 2002, the Capability Definition phase will confirm technical objectives and goals and the program will conduct concept definition work encouraging the best use of known, deployed technologies, and technologies expected to be available in the 2006, 2008, 2010 timeframe. In FY 2002 and FY 2003, risk reduction activities will be conducted to increase the readiness levels of key technologies. The Department of Defense signed a Memorandum of Agreement with the Japan Defense Agency in 1999 to conduct cooperative research to enhance the capabilities of the Standard Missile-3. The focus of research is on four components: sensor, advanced kinetic warhead, second stage propulsion, and lightweight nosecone. The Japan Cooperative project plans to flight test a jointly-developed component (lightweight nosecone) on a Standard Missile-3 in</p>										
Project 3020		Page 22 of 37 Pages				Exhibit R-2A (PE 0603882C)				

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2002
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>4 - Program Definition and Risk Reduction</b>	<b>0603882C Midcourse Defense Segment</b>	<b>3020</b>
<p>FY 2005 (Joint Control Test Vehicle (JCTV)-1 and Joint Flight Mission (JFM)-1). To assure midcourse segment BMDS meet the capability specifications across the full range of midcourse engagements, the program will conduct a structured concept definition effort leading to re-allocation of system capabilities among ground-based and sea-based products to achieve the best integrated segment performance at the lowest overall cost.</p>		
<p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)</li> </ul> <p><b>Total</b>            0</p>		
<p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li><b>200000 ALI Block 2004 Test Bed</b> Continue planning and execution of the ALI FDP, FM-2, FM-3, and FM-4 test events. Perform data reduction, analysis and modifications as necessary to support each follow-on test. Develop and manage the SDACS replan consisting of three parallel Solid Divert Attitude Control System (SDACS) developments ensuring each development is fully ground and flight-tested. Complete the developmental changes necessary to incorporate the new SDACS into the Standard Missile and the Aegis Weapon System. Begin the system engineering and development of the Block 2004 Sea-based Midcourse Defense parts of the BMDS expanded test infrastructure. Initiate procurement of test rounds and targets for threat representative testing.</li> <li><b>233792 Block 2006, 2008, 2010</b> Initiate the concept definition work for the Block 2006, 2008, 2010 Sea-based Midcourse Defense capabilities. Award, monitor and support contractor studies and the Missile Defense National Team with SMD engineering team. Support Common System Engineering with GMD element. Continue to perform key technology risk reduction activities in the areas of ship and weapon system integration, ship equipment integrations, weapons control, radar development, and radar system integration, missile / launcher improvements and Battle Management Command and Control upgrades.</li> <li><b>34428 Japan Cooperative Research</b> Continue the management of the Japan Cooperative Research project to enhance the capabilities of the Standard Missile through research in sensor, advanced kinetic warhead, second stage propulsion, and lightweight nosecone.</li> </ul> <p><b>Total</b>    <b>468220</b>    <b>Sea-based Midcourse</b></p>		
Project 3020	Page 23 of 37 Pages	Exhibit R-2A (PE 0603882C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3020</b>

**FY 2003 Planned Program:**

- **200000 ALI Block 2004 Test Bed**  
Continue planning and execution of the ALI FDP, FM-5, FM-6, and FM-7 test events. Perform data reduction, analysis and modifications as necessary to support each follow-on test. Continue the development and testing of the parallel SDACS efforts. Continue engineering to support missile and Aegis Weapon System changes required by different SDACS. Continue the system engineering and development of the Block 2004 Sea-based Midcourse Defense parts of the BMDS expanded test bed. Continue procurement of test rounds and targets for threat representative testing.
  
- **147901 Block 2006, 2008, 2010**  
Complete the concept definition work for the Block 2006, 2008, 2010 Sea-based Midcourse Defense capabilities. Select SMD concepts for Block 2006, 2008, 2010 in concert with the Missile Defense National Team. Development and award competitive contracts for the development of SMD test beds in support of the capability Blocks. Focus key ongoing risk reduction activities, including radar development work, to support Block 2006, 2008, 2010 Sea-based Midcourse Defense capability test beds selected for development. Incorporate Common System Engineering activities (SMD/GMD) into the concepts selected for development and test.
  
- **78700 Japan Cooperative Research**  
Continue development and system engineering support for the four U.S. / Japan cooperative research components. Begin procuring test articles and ship modifications for JCTV-1 and JFM-1.

**Total 426601 Sea-based Midcourse**

<b>B. Other Program Funding Summary</b>	<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 0603871C, NMD-PDRR	1819688								
PE 0208865C, PAC-3 Proc	440930	731455							
PE 0603868C, NTW-PDRR	456372								
PE 0604861C THAAD – EMD	530432	866530	934681	714679	830204	920988	1131109	Cont	Cont
PE 0603875C International Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
PE 0603884C Sensors		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C Technology		139340	121751	155056	130299	142785	147457	Cont	Cont



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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603882C Midcourse Defense Segment</b>	<b>PROJECT</b> <b>3020</b>
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PE 0604865C PAC-3 RDT&E		128199						
PE 0604867C Navy Area (Termination)	267453	99302						

C. Acquisition Strategy: Sea-based Midcourse Defense will follow the Missile Defense Agency's (MDA) capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. This multi-path approach provides assurance that the most effective missile defense is available at the earliest possible time. The best approach (competitive or selected source) will be determined after considering all the technical and management aspects of the program. Current development activities supporting the ALI could be used to provide a limited capability to protect deployed U.S. and allied forces.

<b>D. Schedule Profile</b>	<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>
<b>ALI Block 2004 Test Bed</b>							
Flight Mission 2		2Q					
Flight Mission 3		3Q					
Flight Mission 4		4Q					
Flight Mission 5			1Q				
Flight Mission 6			2Q				
Flight Mission 7			3Q				
<b>ALI Flight Test Program</b>							
PDR			1Q				
CDR			3Q				
Flight Mission 8				1Q			
Flight Mission 9				2Q			
Flight Mission 10				3Q			
Flight Mission 11					1Q		
Flight Mission 12					2Q		
Flight Mission 13					3Q		
Flight Mission 14					4Q		
Flight Mission 15						1Q	
Flight Mission 16						2Q	
Flight Mission 17						3Q	
Flight Mission 18						4Q	

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3020</b>
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<b>Japan Cooperative Research</b>							
JCTV-1					2Q		
JFM-1					4Q		
<b>Block 2006</b>							
Decision Point			1Q				
PDR			4Q				
CDR				4Q			
System Level Ground-based Test						3Q	
At-sea Test							4Q
<b>Block 2008, 2010</b>							
Decision Point				1Q			
PDR					4Q		
CDR						4Q	

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**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603882C Midcourse Defense Segment**

**PROJECT**  
**3020**

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
<b>ALI Block 2004 Test Bed</b>										
	CPAF	Lockheed Martin/NJ		17263	3Q	17500	2Q	CONT	34763	CONT
	CPIF/AF	Raytheon/AZ		99350	2Q	100200	1Q	CONT	199550	CONT
	CPAF	United Defense/MN		350	3Q	400	2Q	CONT	750	CONT
	CPFF	JHU/APL/MD		5551	3Q	5600	2Q	CONT	11151	CONT
	WR	NSWC/DD/VA		3141	2Q	3200	3Q	CONT	6341	CONT
	WR	NSWC/PHD/CA		2634	2Q	2650	2Q	CONT	5284	CONT
	MIPR	MIT/LL/MA		1000	3Q	1000	3Q	CONT	2000	CONT
	WR	WSMR/NM		553	3Q	600	2Q	CONT	1153	CONT
	WR	NWAS/CA		320	2Q	350	2Q	CONT	670	CONT
	Various	Various		488	2Q	500	2Q	CONT	988	CONT
<b>Block 2006, 2008, 2010</b>										
Concept Definition Work	TBD	MDA/SE/Comm/Various		10000	3Q	9000	3Q	CONT	19000	CONT
Risk Reduction Activity	CPAF	Lockheed Martin/NJ & MD		93134	3Q	61120	2Q	CONT	154254	CONT
Risk Reduction Activity	CPAF	Raytheon/AZ & MA		70515	2Q	44680	2Q	CONT	115195	CONT
Risk Reduction Activity	CPAF	United Defense/MN		900	3Q	500	2Q	CONT	1400	CONT
Risk Reduction Activity	CPFF	JHU/APL/MD		7120	3Q	5000	2Q	CONT	12120	CONT
Risk Reduction Activity	WR	NSWC/DD/VA		4756	2Q	2500	1Q	CONT	7256	CONT
Risk Reduction Activity	WR	NAWC/CL/CA		1495	2Q	1000	1Q	CONT	2495	CONT
Risk Reduction Activity	WR	NSWC/PHD/CA		624	2Q	500	1Q	CONT	1124	CONT
Risk Reduction Activity	MIPR	MIT/LL/MA		5175	3Q	1000	3Q	CONT	6175	CONT
Risk Reduction Activity	WR	NSWC/IH/MD		331	2Q	300	2Q	CONT	631	CONT
Risk Reduction Activity	WR	NRL/DC		470	2Q	400	2Q	CONT	870	CONT
Risk Reduction Activity	CPAF	TSC/Various		850	3Q	700	3Q	CONT	1550	CONT
Risk Reduction Activity	CPAF	Aerojet/CA		450	3Q	400	3Q	CONT	850	CONT
Risk Reduction Activity	CPAF	Northrop Grumman/Various		400	3Q	350	3Q	CONT	750	CONT
Risk Reduction Activity	Various	Various		2598	2Q	670	2Q	CONT	3268	CONT

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

BUDGET ACTIVITY  
**4 - Program Definition and Risk Reduction**

PE NUMBER AND TITLE  
**0603882C Midcourse Defense Segment**

PROJECT  
**3020**

<b>Japan Cooperative Research</b>										
	CPAF	Lockheed Martin/NJ & MD		4000	3Q	11000	2Q	CONT	15000	CONT
	CPAF	Raytheon/AZ & MA		20000	2Q	46000	2Q	CONT	66000	CONT
	CPFF	JHU/APL/MD		900	3Q	2000	2Q	CONT	2900	CONT
	WR	NSWC/DD/VA		1100	2Q	2500	1Q	CONT	3600	CONT
	MIPR	MIT/LL/MA		2200	3Q	5000	3Q	CONT	7200	CONT
	Various	Various		1000	2Q	700	2Q	CONT	1700	CONT
<b>Subtotal Product Development:</b>				<b>358668</b>		<b>327320</b>			<b>685988</b>	

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
<b>ALI Block 2004 Test Bed</b>										
	CPFF	JHU/APL/MD		2124	3Q	2200	2Q	CONT	4324	CONT
	CPAF	TSC/Various		400	3Q	400	3Q	CONT	800	
	MIPR	MIT/LL/MA		1500	3Q	1500	3Q	CONT	3000	CONT
	WR	NSWC/DD/VA		5415	2Q	5500	1Q	CONT	10915	CONT
	WR	NSWC/CD/MD		2000	2Q	2000	1Q	CONT	4000	CONT
	WR	NSWC/IH/MD		359	2Q	350	1Q	CONT	709	CONT
	WR	NSWC/PHD/CA		1467	2Q	1500	1Q	CONT	2967	CONT
	Various	PEO TSC/Various		2700	3Q	1885	2Q	CONT	4585	CONT
	Various	Various		1505	2Q	900	2Q	CONT	2405	CONT
	MIPR	BMPCOE/NJ		1000	3Q	1000	2Q	CONT	2000	CONT
	TBD	MDA/Various		5594	3Q	5000	3Q	CONT	10594	CONT
<b>Block 2006, 2008, 2010</b>										
	CPFF	JHU/APL/MD		6110	3Q	2400	2Q	CONT	8510	CONT
	MIPR	MIT/LL/MA		1950	3Q	500	3Q	CONT	2450	CONT
	WR	NSWC/DD/VA		4737	2Q	3000	1Q	CONT	7737	CONT
	CPFF	SEG/CA		2280	3Q	2000	2Q	CONT	4280	CONT
	WR	NSWC/PHD/CA		1246	2Q	1000	1Q	CONT	2246	CONT

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3020</b>
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	CPAF	TSC/Various		850	3Q	800	3Q	CONT	1650	CONT
	Various	PEO TSC/Various		5490	3Q	0		CONT	5490	CONT
	Various	Various		1972	2Q	1000	2Q	CONT	2972	CONT
<b>Japan Cooperative Research</b>										
	CPFF	JHU/APL/MD		2700	3Q	6000	2Q	CONT	8700	CONT
	WR	NSWC/DD/VA		1100	2Q	2500	1Q	CONT	3600	CONT
	MIPR	MIT/LL/MA		1000	3Q	2000	3Q	CONT	3000	CONT
	Various	Various		428	2Q	1000	2Q	CONT	1428	CONT
Subtotal Support Costs:				53927		44435			98362	

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
<b>ALI Block 2004 Test Bed</b>										
DT&E	WR	PMRF/HI		3927	2Q	4000	1Q	CONT	7927	CONT
DT&E	CPFF	Integrts/CA		481	2Q	500	2Q	CONT	981	
DT&E	WR	NAWC/PM/CA		1867	2Q	1900	1Q	CONT	3767	CONT
DT&E	WR	NSWC/DD/VA		2325	2Q	2400	1Q	CONT	4725	CONT
DT&E	WR	NSWC/PHD/CA		3414	2Q	3500	1Q	CONT	6914	CONT
DT&E	WR	NWAS/CA		460	2Q	460	1Q	CONT	920	CONT
DT&E	MIPR	NAIC/OH		538	3Q	550	2Q	CONT	1088	CONT
DT&E	MIPR	HTS/CA		1160	3Q	1200	2Q	CONT	2360	CONT
DT&E	CPFF	JHU/APL/MD		2500	3Q	2500	2Q	CONT	5000	CONT
DT&E	MIPR	SMDC/AL		11095	3Q	11100	3Q	CONT	22195	CONT
DT&E	WR	CINPACFLT/HI		700	2Q	700	1Q	CONT	1400	CONT
DT&E	WR	AIRPAC/CA		360	3Q	360	2Q	CONT	720	CONT
DT&E	WR	COMOPTEVFOR/VA		250	2Q	250	2Q	CONT	500	CONT
DT&E	Various	Various		544	2Q	580	2Q	CONT	1124	CONT
<b>Block 2006, 2008, 2010</b>										
Lethality	WR	NSWC/DD/VA		700	1Q	0		CONT	700	CONT
Subtotal Test and Evaluation:				30321		30000			60321	

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

BUDGET ACTIVITY  
**4 - Program Definition and Risk Reduction**

PE NUMBER AND TITLE  
**0603882C Midcourse Defense Segment**

PROJECT  
**3020**

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
<b>ALI Block 2004 Test Bed</b>										
Program Management	CPFF	Anteon		6680	2Q	6680	1Q	CONT	13360	CONT
Program Management	CPFF	Paradigm		2025	2Q	2025	1Q	CONT	4050	CONT
Program Management	CPAF	Logicon		710	2Q	710	1Q	CONT	1420	CONT
Program Management	CPFF	JHU/APL		1000	3Q	1000	2Q	CONT	2000	CONT
Program Management	WR	NSWC/DD		750	2Q	750	2Q	CONT	1500	CONT
Internal Operating		Govt Salary		4000	2Q	4100	1Q	CONT	8100	CONT
Internal Operating		Operating Funds		500	2Q	500	2Q	CONT	1000	CONT
<b>Block 2006, 2008, 2010</b>										
Program Management	CPFF	Anteon		4670	2Q	4500	1Q	CONT	9170	CONT
Program Management	CPAF	Logicon		1200	3Q	1000	1Q	CONT	2200	CONT
Program Management	CPAF	PCI		1625	3Q	1500	1Q	CONT	3125	CONT
Program Management	CPAF	BAE		2144	3Q	2081	1Q	CONT	4225	CONT
Subtotal Management Services:				25304		24846			50150	

Remark:

Project Total Cost:				468220		426601			894821	
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3050</b>
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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
3050 Segment Common Systems Engineering and Integration	0	44000	95000	150000	192000	322000	100000	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project provides for engineering risk management for the ground and sea based elements. Initially the focus will be on the ground-based segment. The primary activity is the countermeasures mitigation activity addressing a few reentry vehicles with simple countermeasure capabilities and expanding to complex countermeasures mitigation with several reentry vehicles. In addition, engineering management activities for risk reduction are provided in this project.

Counter/Countermeasures – The counter/countermeasures effort identifies, develops, and demonstrates solutions to improve the performance of missile defense projects against countermeasure suites. This requires a process to identify and prioritize solutions to credible countermeasures for integration into the program, and requires increased robustness in the test program to incorporate testing against a broader range of credible threats. Results of the testing program will result in the development of additional algorithms to mitigate credible threats. To minimize the programmatic impacts resulting from intelligence estimates, the program is transitioning from threat point-designs to a capability-based approach. Solutions with potential to improve the capabilities against countermeasures will be incorporated through Block upgrades into the Midcourse segment (both ground and sea) and will be provided to the overall BMDS through the MDA Red-White-Blue team process.

Risk Reduction – The complementary EKV program started in FY 2002 will continue in FY 2003. The complementary EKV is an effort to develop a kill vehicle utilizing latest technology to provide risk mitigation. This will allow for a potential common EKV for Ground and Sea-based Midcourse Defense. Development will be based on insertion of new technology and lessons learned from existing EKV development. The program is planned to include design, testing and project insertion, where appropriate, into the block development approach. Additional risk reduction and integration activities will be performed as necessary.

**FY 2001 Accomplishments:**

- This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)

**Total**                    0

**FY 2002 Planned Program:**

- **30000 Risk Reduction**  
Initiate complementary EKV effort to reduce susceptibility to countermeasures and protect the program from potential threat technological advances.  
Perform risk reduction and integration activities as necessary

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3050</b>
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- **14000 Counter/Countermeasures**  
Initiate counter/countermeasures effort. The program is responsible for determining the capability of the baseline projects against credible countermeasure suites; identifying candidate solutions to address performance shortfalls; conducting ground tests against digital models of countermeasure suites; planning the integration of successful improvements into program block upgrades; and identifying candidate ground and sea-based midcourse solutions to credible countermeasures.
  - Total 44000 Systems Engineering & Integration**
- FY 2003 Planned Program:**
- **65000 Risk Reduction**  
Continue complementary EKV effort. Perform risk reduction and integration activities as necessary.
  - **30000 Counter/Countermeasures**  
Continue counter/countermeasures effort.
  - Total 95000 Systems Engineering & Integration**

<b>B. Other Program Funding Summary</b>	<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 0603871C, NMD-PDRR	1819688								
PE 0208865C, PAC-3 Proc	440930	731455							
PE 0603868C, NTW-PDRR	456372								
PE 0604861C THAAD – EMD	530432	866530	934681	714679	830204	920988	1131109	Cont	Cont
PE 0603875C International Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
PE 0603884C Sensors		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
PE 0604865C PAC-3 RDT&E		128199							
PE 0604867C Navy Area (Termination)	267453	99302							

**Acquisition Strategy:** GMD 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 SE&I project will include risk reduction activities for Ground- and Sea-based Midcourse Defense projects and counter/countermeasures that are capability rather than threat based. Midcourse Defense Segment will participate in a MDA countermeasures program that will focus on identifying threat countermeasures that may not yet be evident, but are physically plausible and technically feasible. The program will then identify and develop solutions to



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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603882C Midcourse Defense Segment</b>	<b>PROJECT</b> <b>3050</b>
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improve the capability of ballistic missile defense projects to defeat those countermeasures. Solutions that successfully demonstrate an improvement in MDS project performance will be integrated into the block development program. For the complementary EKV, multiple EKV design efforts will be initially funded with down select to the most promising design. A complementary EKV will allow the program to take advantage of the performance capability strengths of the multiple EKVs, and structure follow-on acquisition of EKVs to give the GMD project the most effective missile defense capability.

<b>D. Schedule Profile</b>	<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>
Complementary EKV (CEKV):							
System Requirements Review (SRR)		4Q					
Concept Development Start (No Earlier Than (NET))		4Q					
Concept Development Completion (NET)			4Q				
Follow-on Contract Award (NET)				1Q			

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3050</b>
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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
b. N/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
<b>SYSTEM ENGINEERING</b>										
Risk Reduction	TBD	TBD		30000	2/3Q	65000	2/3Q	CONT	CONT	CONT
Counter/Countermeasures	TBD	TBD		14000	2/3Q	30000	2/3Q	CONT	CONT	CONT
Subtotal Support Costs:				44000		95000				

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
c. N/A										
Subtotal Test and Evaluation:										

Remark:

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3050</b>
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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.	N/A									
Subtotal Management Services:										

Remark:

Project Total Cost:				44000		95000				
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Remark:

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603882C Midcourse Defense Segment				PROJECT 3090		
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	
3090 Program Operations	0	69809	64530	73475	64926	65040	66053	Continuing	Continuing	
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project covers personnel and related facility support costs, statutory and fiscal requirements, support service contracts and the MDA Data Centers Programs.</p> <p>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 (MDA) located in Washington D.C., as well as MDA's Executing Agents within the US Army Space &amp; Missile Defense Command (USASMDC), US Army Program Executive Officer (PEO) Air and Missile Defense, US Navy PEO for Theater Surface Combatants (TSC), US Air Force and the Joint National Integration Center (JNIC), formerly known as Joint National Test Facility (JNTF). Related facility costs include rents, utilities, supplies, automated data processing equipment, and all the associated operation and maintenance activities.</p> <p>Fiscal Requirements include reimbursable services acquired through the Defense Working Capital Fund 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. The Ballistic Missile Defense Organization 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.</p> <p>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 automated data processing 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.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>0 This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Program Element 0603871C (for ground-based), and Program Element 0603868C (for sea-based.)</li> </ul> <p>Total 0</p> <p><b>FY 2002 Planned Program:</b></p>										
Project 3090			Page 36 of 37 Pages				Exhibit R-2A (PE 0603882C)			

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603882C Midcourse Defense Segment</b>	PROJECT <b>3090</b>
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- **69809 Program Operations**  
Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities, supplies and the data centers programs.
- Total      69809    Program Operations

**FY 2003 Planned Program:**

- **64530 Program Operations**  
Continue providing management and support for overhead / indirect fixed costs.
- Total      64530    Program Operations

<b>B. <u>Other Program Funding Summary</u></b>	<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</u>	<u>Total</u>
								<u>Compl</u>	<u>Cost</u>

**C. Acquisition Strategy:**

<b>D. <u>Schedule Profile</u></b>	<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>
N/A							

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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603883C Boost Defense Segment</b>
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COST <i>(In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	0	599835	796927	1389817	1399902	1591160	2274654	Continuing	Continuing
4020 Sea-Based Boost	0	30601	89639	258000	545000	747000	1246000	Continuing	Continuing
4030 Air-Based Boost	0	475818	597969	830350	489120	357020	455670	Continuing	Continuing
4040 Space-Based Boost	0	23842	54393	177000	230000	365000	501000	Continuing	Continuing
4043 Space-Based Laser	0	49211	34810	50000	50000	50000	50000	Continuing	Continuing
4060 Test and Evaluation	0	0	0	55000	65000	50000	0	Continuing	Continuing
4090 Program Operations	0	20363	20116	19467	20782	22140	21984	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

**BOOST DEFENSE SEGMENT**

The mission of the Boost Defense Segment (BDS) is to protect US Forces, US Allies, friends and areas of vital interest from ballistic missile attack by providing the Ballistic Missile Defense System (BMDS) the capability to negate the effectiveness of ballistic missiles early in their trajectory while in powered flight. The objective of the BDS is to develop and demonstrate directed energy (DE) and kinetic energy (KE) capabilities to perform this mission, creating a boost phase early defense layer. Early proof of principle activities include a lethality demonstration (missile shootdown) using an Airborne Laser (ABL), KE risk reduction and flight test experiments, and risk reduction for a future Space Based Laser. These activities will show the feasibility of engaging a ballistic missile during the boost phase in a representative environment.

The boost phase of the ballistic missile trajectory is the flight segment from post launch through propellant burnout when the missile enters the midcourse phase of ballistic flight. The boost phase typically includes the first 60-300 seconds of flight and concludes at altitudes between 20-450 kilometers. This short duration and low altitude combined with an accelerating target pose technical challenges for boost phase intercepts. Engaging ballistic missiles in the boost phase is important to Ballistic Missile Defense (BMD) as threats can be negated long before they have an opportunity to deploy reentry vehicles, submunitions, or countermeasures. Some of the critical technical challenges to be addressed in the BDS effort include: off-board and on-board sensors; battle management, command, control and intelligence (BM/C2I) development; and the development of operations concepts sufficient to support the quick reaction launch of KE missiles or firing of DE weapons. The flow-down of

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**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603883C Boost Defense Segment**

BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C2 and Systems Engineering & Integration will guide the integration of the Boost Defense Elements into the BMD System, the BMDS BM/C2 architecture, and the BMD testbed.

The BDS consists of Sea-Based Boost, Air-Based Boost, Space-Based Boost, and Space-Based Laser projects, as well as associated Test and Evaluation (T&E) and supporting Program Operations. These efforts are defined in further detail below.

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002</u> PB)	0	685363	
Appropriated Value			
Adjustments to Appropriated Value			
a. Congressional General Reductions		-85582	
b. SBIR / STTR			
c. LEG/Tier 1			
d. FFRDC			
e. Mgmt. Efficiency			
Adjustments to Budget Years Since <u>FY 2002</u> PB			796927
Current Budget Submit (FY 2003 Budget Estimates)		599835	796927

**Change Summary Explanation:**

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

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4020</b>
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COST ( <i>In Thousands</i> )	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
4020 Sea-Based Boost	0	30601	89639	258000	545000	747000	1246000	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

SEA-BASED BOOST

The purpose of this project is to reduce the technical and programmatic risks of fielding a boost phase intercept (BPI) capability using a sea-based platform. The sea-based boost project will be supported by modeling and simulation validated by rigorous experimentation and phenomenology data collection. The sea-based BPI capabilities will be balanced with the other Boost Defense Segment (BDS) elements to achieve a robust boost defense capability, and will be delivered as part of the overall Ballistic Missile Defense (BMD) System Block capability increments.

Risk Reduction

Decisions on pursuit of a sea-based Kinetic Energy (KE) BPI concept will be supported by focused risk reduction initiatives. A functional analysis will assess risk in the kill chain and develop an investment strategy for critical KE Boost element component candidates, including KVs, boosters, sensors, battle management command and control, and platform integration. These investments will mitigate element risk through design, fabrication, and testing of element component candidates. These investments may include development and captive carry testing of high dynamic range Kill Vehicle (KV) seekers, hot fire tests of fast boosters, and investigations of alternative sea launch platforms that can accept improved interceptors. Sensor and BM/C2 assessment will be supported in this activity through integrated testing of platform, KV, booster, and sensor.

Critical Experiments

As part of the risk reduction effort, various tests and experiments will be conducted to gather empirical data, identify integration issues, and assess project progress. Targets of Opportunity will be exploited, including tracking three Titan II launches in FY 2002 and FY 2003. These tracking experiments will test ground-, sea-, and air-based sensors and systems to address critical boost phase kill chain issues, from early launch detection to missile intercept. Test planning, target acquisition, shipboard computer program development and testing, and missile acquisition will occur in FY 2003. KE boost sea-based critical experiments and flight tests will begin in FY 2004. Advanced planning for an FY 2005 focused demonstration is ongoing.

Concept Definition and Assessment

The purpose of this project is to develop feasible system and element concepts to accomplish the Boost segment mission. This effort will be accomplished with the Missile Defense National Team effort.



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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603883C Boost Defense Segment</b>	<b>PROJECT</b> <b>4020</b>
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**FY 2001 Accomplishments:**

- 0 No Activity in FY 2001. FY 2002 new Program Element.
- Total 0

**FY 2002 Planned Program:**

- 9963 Initiate Sea-Based KE BPI risk reduction activities.
  - 14838 Initiate Sea-Based KE experiment design, hardware and software requirement definition and development.
  - 5800 KE Boost Concept Definition, concept assessment. Includes funding for the Missile Defense National Team Systems Engineering and Integration effort.
- Total 30601

**FY 2003 Planned Program:**

- 35000 Expand risk reduction efforts to include fabrication and design validation testing of various KE Boost element components.
  - 54639 Initiate component fabrication and increased test activities in preparation for sea-based KE BPI critical experiments.
- Total 89639

<b>B. <u>Other Program Funding Summary</u></b>	<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		807993	1065982	1208546	1157025	1139885	1176979	Cont.	Cont.
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 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0604861C, THAAD		866530	934681	714679	830204	920988	1131109	Cont.	Cont.

**C. Acquisition Strategy:**

The Sea-Based Boost risk reduction efforts will reduce the risks in several key areas to include technology development for boosters, kill vehicles, BM/C2, platform integration, and external sensors. The Missile Defense Agency will pursue multiple risk reduction efforts in these areas to support a focused demonstration decision point not earlier than FY 2005. The Sea-Based Boost project 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.

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4020</b>
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<b>D. Schedule Profile</b>	<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>
Initiate Broad Agency Announcements (BAA)		2Q					
Concept Assessment Complete		4Q					
KV Hover Test			2Q	4Q			
Critical Experiments				4Q	1Q		
KE Boost Focused Demonstration					4Q*		
Sea Boost Transition							4Q*

\*Not earlier than

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603883C Boost Defense Segment</b>	<b>PROJECT</b> <b>4020</b>
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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. Experiment Component Development	CPAF	Lockheed Martin. Moorestown, NJ and Navy Executing Agent		6100	2Q			Cont.	Cont.	
b. Experiment Component Development	CPAF	Raytheon, Tucson AZ and Navy Executing Agent		11058	2Q			Cont.	Cont.	
c. Component Risk Reduction	Various	Various		1900	2Q-3Q			Cont.	Cont.	
d. Concept Development Support	Various	Various		5800	2Q-3Q			Cont.	Cont.	
e. Sea-Based Risk Reduction Activities	Various	Various				35000	1Q-2Q	Cont.	Cont.	
Subtotal Product Development:				24858		35000		Cont.	Cont.	

Remarks:

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. Sea-Based Experiments	Various	Various				54639	1Q-2Q	Cont.	Cont.	
b. Sea-Based Test and Evaluation	Allot	SMDC, Huntsville, AL		1500	2Q			Cont.	Cont.	
Subtotal Test and Evaluation:				1500		54639		Cont.	Cont.	

Remarks:

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. SETA/FFRDC	Various	Various		4243	2Q			Cont.	Cont.	
Subtotal Management Services:				4243				Cont.	Cont.	

Remarks:

Project Total Cost:				30601		89639		Cont	Cont	
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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4030</b>
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COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
4030 Air-Based Boost	0	475818	597969	830350	489120	357020	455670	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

AIR-BASED BOOST

The Airborne Laser (ABL) is an element of the Ballistic Missile Defense System (BMDS). ABL Block 2004 and ABL Block 2008 designate capability levels. This nomenclature reflects the block designations of the BMDS. ABL is an existing product line that will design, build and test an air-based laser system to acquire, track, and kill ballistic missiles in their boost phase. The ABL system integrates three major subsystems (Laser, Beam Control, and Battle Management, Command, Control, Communications, Computers and Intelligence (BMC4I)) into a modified commercial Boeing 747-400F aircraft. The ABL system also includes ABL-specific ground support equipment.

The ABL system development 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.

ABL Block 2004 – An ABL program definition and risk reduction contract was awarded to the Boeing/TRW/Lockheed-Martin team in November 1996, to design, fabricate, integrate, and test an ABL aircraft with a laser device. The Block 2004 phase culminates in a lethality demonstration (missile shootdown) against boosting ballistic missile threat-representative targets and delivers one aircraft for integration and testing in the BMDS testbed. This aircraft will be capable of providing contingency capability, if directed, that offers rudimentary protection of the United States.

ABL Block 2008, 2010, 2012 – This effort provides for development of the Air-Based Boost Defense capability consistent with BMDS needs. It will include maturation to a second ABL aircraft, ABL Block 2008 that includes new technologies, with enhanced lethality, and additional operational suitability.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		<b>DATE</b> February 2002
<b>BUDGET ACTIVITY</b>	<b>PE NUMBER AND TITLE</b>	<b>PROJECT</b>
<b>4 - Program Definition and Risk Reduction</b>	<b>0603883C Boost Defense Segment</b>	<b>4030</b>
<b>FY 2001 Accomplishments:</b>		
•	0 The Boost Defense Segment is a new program element (PE –0603883C) that includes programmatic and funding transferred from PE 0603319F – Airborne Laser Technology (AF). For completeness, the program plans/accomplishments of this PE are included here.	
•	0 Airborne Laser (0603319F): Continued Boeing/TRW/Lockheed-Martin program definition and risk reduction contract effort for design, fabrication, integration, and testing the ABL system, including design and development of the System Integration Laboratory (SIL) at the Birk Test Facility at Edwards AFB, CA. Continued procurement of targets, conducted test activities at Edwards AFB, lethality assessments on ABL target sets, modeling and simulation activities, and performed advisory and assistance services. Continued government operations and support for labor, training, and Integrated Product Team (IPT) participation.	
Total	0	
<b>FY 2002 Planned Program:</b>		
•	10000 Initiate buy of long-lead optics for Block 2008.	
•	400000 Continue Boeing/TRW/Lockheed-Martin Block 2004 program definition and risk reduction contract effort for design, fabrication, integration, and testing the ABL system, including design and development of the SIL at the Birk Test Facility at Edwards AFB, CA. - Complete Laser Module 1 Testing - Deliver beacon and target illuminator lasers - Deliver and mount laser turret and roll shell - Coat primary mirror	
•	65818 Continue buy of targets, conduct test activities at Edwards AFB, lethality assessments on ABL target sets, modeling and simulation activities, and perform advisory and assistance services. Continue government operations and support for labor, training, and IPT participation.	
Total	475818	
<b>FY 2003 Planned Program:</b>		
•	85000 ABL Block 2008: Initiate payments for commercial “green” 747-400 aircraft and continue acquisition of long-lead optics.	
•	435250 Continue Block 2004 contract effort for development, integration, and test activities leading to integration of ABL Block 2004 in the BMDS testbed. Complete BMC4I segment testing, laser integration, and continue ground testing. Begin Block 2008 engineering design.	
•	77719 Continue acquisition of targets, conduct test activities at Edwards AFB, lethality assessments on ABL target sets, modeling and simulation activities, and perform advisory and assistance services. Continue government operations and support for labor, training, and IPT participation.	
Total	597969	
Project 4030	Page 8 of 22 Pages	Exhibit R-2A (PE 0603883C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4030</b>
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<b>B. Other Program Funding Summary</b>	<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		807993	1065982	1208546	1157025	1139885	1176979	Cont.	Cont.
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 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0603173C, Supp and Follow-on Tech/Advanced Tech Development	130716								
PE 0603319F, Airborne Laser Technology	385876								
PE 0604861C THAAD		866530	934681	714679	830204	920988	1131109	Cont.	Cont.

**C. Acquisition Strategy:**

The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C2 and Systems Engineering & Integration will guide the integration of the ABL system into the BMD System, the BMDS BM/C2 architecture, and the BMDS testbed. The ABL system entered into a program definition and risk reduction contract in November 1996. Major subsystem development, integration, and testing is projected to commence in FY 2003. The program plan is structured to demonstrate technical achievements throughout the preliminary design and risk reduction phase, culminating in a lethality demonstration. This capability-based program takes a spiral development approach towards fielding an ABL system. The approach takes advantage of producing a line of ABL systems that systematically and incrementally adds more capability as the technology matures. This strategy produces Block 2004 and Block 2008 ABL capabilities during the development phase. The Block 2004 ABL system will integrate and test key technologies, allowing improved capabilities and integration of maturing technologies in the Block 2008 ABL system.

<b>D. Schedule Profile</b>	<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>
ABL: Start long lead items for Block 2008		2Q					
ABL: Start Block 2008 Green Aircraft payments			1Q				
ABL: Block 2004 Lethality Demonstration					1Q		
ABL: Integrate Block 2004 into BMDS Testbed					3Q		
ABL: Begin Block 2008 Aircraft Modifications					1Q		
ABL: Production Decision Points (NET)			3Q	3Q	3Q	3Q	3Q
ABL: Testbed Block Upgrade Decision Points				3Q		3Q	

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**MDA RDT&E COST ANALYSIS (R-3)**

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**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603883C Boost Defense Segment**

**PROJECT**  
**4030**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. ABL PDRR Contract and Concept Design	CPAF	Boeing Defense & Space Group Seattle, WA								
-Aircraft				40000	1Q-4Q			Cont.	40000	
-Laser				115000	1Q-4Q	75000	1Q-4Q	Cont.	190000	
-Beam Control/Fire Control				130000	1Q-4Q	60000	1Q-4Q	Cont.	190000	
Battle Manangement/C4I				20000	1Q-4Q	20000	1Q-4Q	Cont.	40000	
-Integration and Test				95000	1Q-4Q	125000	1Q-4Q	Cont.	220000	
-Long Lead				10000	1Q-4Q			Cont.	10000	
-Block 2008										
-IronBird/SIL						50000	1Q-4Q	Cont.	50000	
-Design (SRR, PDR, CDR)						105000	1Q-4Q	Cont.	105000	
-Long Lead						85000	1Q-4Q	Cont.	85000	
Subtotal Product Development:				410000		520000			930000	

Remark:  
ABL – The Air Force awarded an ABL program definition and risk reduction contract on 12 Nov 1996 to a team composed of Boeing, TRW, and Lockheed Martin.

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. ABL Technical Support Contracts	Various	Various		6000	1Q-4Q	6000	1Q-4Q	Cont.	12000	
b. Targets	Various	Various		15000	1Q-4Q	8000	1Q-4Q		23000	
c. ABL Government In – House and Other External Support	Various	Various		44818	1Q-4Q	63719	1Q-4Q	Cont.	108537	
Subtotal Support Costs:				65818		77719			143537	

Remark:

<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY  
**4 - Program Definition and Risk Reduction**

PE NUMBER AND TITLE  
**0603883C Boost Defense Segment**

Project Total Cost:				475818		597969			
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Remark:



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603883C Boost Defense Segment</b>	<b>PROJECT</b> <b>4040</b>
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<i>COST (In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
4040 Space-Based Boost	0	23842	54393	177000	230000	365000	501000	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

**SPACE-BASED BOOST**

This effort is focused on development of space-based kinetic energy (KE) applications for intercepting targets in the boost phase. Appropriate experimentation and test & evaluation activities will be conducted to support informed assessment and decision-making regarding candidate space based boost kinetic energy intercept capabilities. These candidate capabilities will be supported by risk reduction activities, advanced sensor data integration and fusion, BM/C2, and advanced Kill Vehicle (KV) components and integration. In parallel, this project will be supported by modeling and simulation validated by experimentation and phenomenology data collection. The completion of concept assessment in early FY 2003 will facilitate the rapid initiation of component development and fabrication for risk reduction and critical experiments.

**Risk Reduction**

Decisions on pursuit of a space-based KE BPI concept will be supported by focused risk reduction initiatives. A functional analysis will assess risk in the kill chain and develop an investment strategy for critical KE Boost element components, including Kill Vehicles (KV), boosters, sensors, battle management command and control, and platform integration. These investments will mitigate element risk through design, fabrication, and test of element component candidates. Investments will include development and captive carry testing of high dynamic range KV seekers, advanced lightweight KVs, and space launch platforms. Sensor and BM/C2I assessment will be supported in this activity through integrated testing of platform, KV, booster, and sensor.

**Critical Experiments**

Critical risks to space-based boost phase intercepts are well defined. A spectrum of experiments is planned to demonstrate risk reduction progress and to provide empirical data to enable decisions on the acquisition of space-based KE Boost capabilities.

**Concept Definition and Assessment**

The purpose of this project is to develop feasible system and element concepts to accomplish the Boost segment mission. This effort will be accomplished with the Missile Defense National Team effort.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4040</b>

**FY 2001 Accomplishments:** New start: Not funded prior to FY 2002

**FY 2002 Planned Program:**

- 4642 Space-Based KE BPI risk reduction activities.
  - 5200 Initiate KE experiment design and hardware and software requirement definition and design.
  - 14000 KE Boost Concept Definition, concept assessment. Includes funding for the Missile Defense National Team Systems Engineering and Integration effort.
- Total 23842

**FY 2003 Planned Program:**

- 4393 Continued component risk reduction activity for Space Based KE Boost.
  - 50000 Continued KE experiment design and develop and fabricate components for experiments.
- Total 54393

<b>B. <u>Other Program Funding Summary</u></b>	<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		807993	1065982	1208546	1157025	1139885	1176979	Cont.	Cont.
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 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0604861C THAAD		866530	934681	714679	830204	920988	1131109	Cont.	Cont.

**C. Acquisition Strategy:**

The Space-Based Boost risk reduction efforts will reduce the risks in several key areas to include technology development for boosters, kill vehicles, BM/C2, platform integration, and external sensors. The Missile Defense Agency will pursue multiple risk reduction efforts in these areas to support a product line decision not earlier than FY 2006. The Space-Based Boost project 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  
**0603883C Boost Defense Segment**

PROJECT  
**4040**

<b>D. Schedule Profile</b>	<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>
Concept Assessment Complete		4Q					
Decision Point For Accelerated Early Focused Critical Experiment			1Q				
Initiate Experiment Component Development			2Q	2Q			
KE Critical Experiment					4Q		
Focused Demonstration						2Q	

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**MDA RDT&E COST ANALYSIS (R-3)**

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**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603883C Boost Defense Segment**

**PROJECT**  
**4040**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. KE Component Risk-Reduction	Various	Multiple				4393	1Q-2Q	Cont.	Cont.	
b. KE Experiment Design	Various	Multiple				50000	1Q-2Q	Cont.	Cont.	
c. Experiment Component Development	CPFF	Boeing, Canoga Park, CA, and Air Force Executing Agent		5500	2Q			Cont.	Cont.	
d. Experiment Component Design	CPAF	Raytheon, Tucson, AZ.		842	2Q			Cont.	Cont.	
e. Component Risk Reduction	Various	Multiple		500	2Q-3Q			Cont.	Cont.	
f. Concept Development Support	Various	Multiple		14000	2Q-3Q			Cont.	Cont.	
Subtotal Product Development:				20842		54393		Cont.	Cont.	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. SETA/FFRDC	Various	Multiple		3000	2Q			Cont.	Cont.	
Subtotal Management Services:				3000				Cont.	Cont.	

Remark:

Project Total Cost:				23842		54393		Cont.	Cont.	
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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4043</b>
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COST ( <i>In Thousands</i> )	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
4043 Space-Based Laser	0	49211	34810	50000	50000	50000	50000	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Based on the FY 2002 funding reduction, the MDA will be reevaluating the Space Based Laser (SBL) program. Activities involving the Integrated Flight Experiment concept will be brought to a halt in an orderly manner, preserving long term value for a future program.

The SBL project will continue to fund technology development and risk reduction contributing to operational SBL system concepts. An Affordable Concept Study will be conducted to investigate SBL contributions to the BMDS with a major milestone decision on the future program in late FY 2003. Technology risk reduction may be pursued in the key areas of lasers, beam control, and beam director. These efforts leverage work started under previous SBL-funded technology development programs.

The project is part of the department's long-term strategy to enable the future development of an affordable, responsive SBL operational system. An operational SBL system may ultimately provide a highly effective defense against ballistic missile attack through continuous, global availability and the ability to perform early, boost phase missile destruction prior to reentry vehicle and countermeasure deployment. Nearer term contributions to the BMDS may include discrimination, Reentry Vehicle (RV) identification and other non-lethal missions.

**FY 2001 Accomplishments:** Project was funded under Program Element 0603174C (Support and Follow on Technologies – Space Based Laser) and Air Force Program Element 0603876F (SBL).

- 0 For FY 2001 accomplishments for this project refer to BMDO Program Element 0603174C (Support and Follow on Technologies – Space Based Laser) and Air Force Program Element 0603876F (SBL) in FY 2001.
- Total 0

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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4043</b>
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**FY 2002 Planned Program:**

- 49211 - Accomplish System Definition Review (SDR) for the SBL Integrated Flight Experiment (**completed**).
- Accomplish Critical Design Review of the IFX laser “short stack” (**completed**).
- Complete documentation of IFX work accomplished through CY 2001.
- Conduct experiments and risk reduction activities that may include the following:
  - - High energy laser experiments and advanced laser technology activities for application to operational system.
  - - Advanced beam control experiments.
  - - Large Light-weight Optics Technology development.
- Conduct Affordable Concept Study to define operational concept and early BMDS contributions.

Total 49211

**FY 2003 Planned Program:**

- 34810 - Continue FY 2002 technology experiments and risk reduction activities that may include the following:
  - - High energy laser experiments and advanced laser technologies activities for application to operational system.
  - - Advanced beam control experiments.
  - - Large Light-weight Optics Technology development.
- Conclude Affordable Concept Study.
- Begin to Implement Affordable Concept Study results.

Total 34810

<b>B. Other Program Funding Summary</b>	<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		807993	1065982	1208546	1157025	1139885	1176979	Cont.	Cont.
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 0603884C, Sensors Segment		335338	373447	489181	1145680	899806	1007660	Cont.	Cont.
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont.	Cont.
PE 0603174C, BMDO SBL	69595							Compl	Compl
PE 0603876F, Air Force Space-Based Laser	67414								
PE 0604861C THAAD		866530	934681	714679	830204	920988	1131109	Cont.	Cont.

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4043</b>
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**C. Acquisition Strategy:**

The SBL acquisition strategy to date has been to employ a Joint Venture consisting of Boeing, Lockheed Martin, and TRW to pursue the Integrated Flight Experiment. Budget reductions have led to a need to reevaluate the SBL program. Near term focus has changed to conducting key technology risk reduction activities. The Joint Venture contract will be definitized to accomplish this activity in FY 2002, and possibly into FY 2003, then closed out. New contract vehicles will be pursued to address the needs of follow-on activities.

In FY 2002 an Affordable Concept Study will be conducted to determine the best path to achieving an affordable operational SBL system that contributes to the BMDS at the earliest possible time. Future acquisition strategy will be guided by the results of this study.

SBL 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.

<b>D. <u>Schedule Profile</u></b>	<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>
IFX System Requirements Review	2Q						
IFX System Definition Review		1Q					
Conduct APEX Beam Control Experiment		2Q					
Conduct High Energy Laser Test		3Q					
Program Restructure Decision			3Q*				
Conduct Closed-Loop Beam Control Experiment			4Q				
Conduct Disturbance Mitigation and Pointing System Experiment			4Q				

\*The Department will decide in 3Q FY 2003 on the future SBL program structure. Funding in the out-years addresses technology base activities.

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4043</b>
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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. SBL IFX Joint Venture team	CPAF	Boeing, Lockheed, TRW El Segundo, CA		30000	1 Nov 01 (Inc. 3)			Cont.	30000	
b. Other	Various	Various		15767	3Q-4Q	31557	2Q-3Q	Cont.	47324	
Subtotal Product Development:				45767		31557			77324	

Remark: SBL IFX Joint Venture team contract will be phased ou in FY 2002.

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. SBL IFX Technical Support Contracts	Various	Various		3444	1Q	3363	2Q-3Q	Cont.	Cont.	
Subtotal Support Costs:				3444		3363		Cont.	Cont.	

Remark:

Project Total Cost:				49211		34810		Cont.	Cont.	
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Remark:



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4060</b>
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COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
4060 Test and Evaluation	0	0	0	55000	65000	50000	0	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project is responsible for procurement of targets and countermeasures developed for boost experiments and demonstrations. Funding for this project begins in FY 2004 to support sea- and space-based Kinetic Energy (KE) Critical Experiments in FY 2004 – FY 2005 and Focused Demonstrations in FY 2005 – FY 2006. Further project detail will be provided in the FY 2004 Budget Estimates.

**FY 2001 Accomplishments:**

- 0 No Activity in FY 2001.
- Total 0

**FY 2002 Planned Program:**

- 0 No Activity in FY 2002.
- Total 0

**FY 2003 Planned Program:**

- 0 No Activity in FY 2003.
- Total 0

<b>B. <u>Other Program Funding Summary</u></b>	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

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

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603883C Boost Defense Segment				PROJECT 4090		
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost	
4090 Program Operations	0	20363	20116	19467	20782	22140	21984	Continuing	Continuing	
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project covers personnel and related facility support costs, statutory and fiscal requirements, support service contracts and the Missile Defense Agency (MDA) Data Centers Programs.</p> <p>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 located within the Washington D.C. area, as well as The MDA's Executing Agents within the US Army Space &amp; 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.</p> <p>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. The MDA 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.</p> <p>Assistance required to support Ballistic Missile Defense 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, and 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.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 0 No Activity in FY2001.</li> </ul> <p>Total 0</p> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 20363 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents &amp; utilities, supplies and the data centers programs.</li> </ul> <p>Total 20363</p>										
Project 4090			Page 21 of 22 Pages				Exhibit R-2A (PE 0603883C)			

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603883C Boost Defense Segment</b>	PROJECT <b>4090</b>
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**FY 2003 Planned Program:**

- 20116 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities, supplies and the data centers programs.

Total 20116

<b>B. <u>Other Program Funding Summary</u></b>	<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>
N/A									

**C. Acquisition Strategy:**  
N/A

<b>D. <u>Schedule Profile</u></b>	<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>
N/A							

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 2002	
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603884C Sensors					
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	335338	373447	489181	1145680	899806	1007660	Continuing	Continuing
5041 Space-based Infrared System (SBIRS) Low	0	245656	293878	394999	1080000	875999	985699	Continuing	Continuing
5049 Russian-American Observation Satellite Program	0	54461	69130	83423	54512	11493	11494	Continuing	Continuing
5050 System Engineering and Integration	0	10000	0	0	0	0	0	Continuing	Continuing
5060 Test and Evaluation	0	14762	0	0	0	0	0	Continuing	Continuing
5090 Program Operations	0	10459	10439	10759	11168	12314	10467	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The Sensors Program Element is responsible for the research and development of technologies and capabilities that enhance ballistic missile detection, midcourse tracking and discrimination. This Program Element includes five projects: Space-Based Infrared System (SBIRS) Low, Russian-American Observation Satellite (RAMOS) Program, System Engineering and Integration, Test and Evaluation, and Program Operations.

FY 2002 funding was appropriated in a Satellite Sensor Technology line for use in technology efforts including Space-Based Infrared System (SBIRS) Low. Although this budget provides funding to develop a constellation of SBIRS-Low satellites with anticipated first launch in 2008, the Department is reviewing the program and conducting trades between technology development and SBIRS-Low acquisition. Per the Congressional direction, by May 15, 2002, the Department will provide a plan for developing space-based sensors to best support the BMD system. The SBIRS Low project supports the Program Definition phase of SBIRS Low. SBIRS Low will provide an initial test capability, which will grow with proven advancements in technology.

The RAMOS Program project engages U.S. and Russian developers in early warning satellite technology, providing a forum for information exchange through the joint definition and execution of space experiments.

The sensors System Engineering & Integration project supports the Space-Based Infrared System Low/Ballistic Missile Defense Project integration. Activities include concept definition, risk reduction, data collection and phenomenology and experiments

The Test and Evaluation project includes developing an advanced radar technology testbed and prove out leap-ahead technologies.

The Program Operations project supports the management of the Sensors Segment.

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

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BUDGET ACTIVITY

4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE

0603884C Sensors

The Flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C<sup>2</sup> and Systems Engineering & Integration will guide the integration of SBIRS Low into the BMD System, the BMDS BM/C<sup>2</sup> architecture, and the BMD testbed.

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002</u> PB)		495600	
Appropriated Value			
Adjustments to Appropriated Value			
a. Congressional General Reductions		-160262	
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since <u>FY 2002</u> PB		-160262	373447
Current Budget Submit ( <u>FY 2003</u> Budget Estimates)		335338	373447

Change Summary Explanation:

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

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>								DATE <b>February 2002</b>				
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE <b>0603884C Sensors</b>				PROJECT <b>5041</b>				
COST ( <i>In Thousands</i> )				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
5041 Space-based Infrared System (SBIRS) Low				0	245656	293878	394999	1080000	875999	985699	Continuing	Continuing
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>FY 2002 funding was appropriated in a Satellite Sensor Technology line for use in technology efforts including Space-Based Infrared System (SBIRS) Low. Although this budget provides funding to develop a constellation of SBIRS-Low satellites with anticipated first launch in 2008, the Department is reviewing the program and conducting trades between technology development and SBIRS-Low acquisition. Per the Congressional direction, by May 15, 2002, the Department will provide a plan for developing space-based sensors to best support the BMD system.</p> <p>SBIRS Low is an element of the Ballistic Missile Defense (BMD) System and will provide a space based infrared capability to acquire, track and discriminate ballistic missiles. SBIRS Low will follow a capability based acquisition strategy to first develop an adjunct to the BMD System testbed. Following spiral development, the capability of SBIRS Low will evolve and be integrated into the Ballistic Missile Defense System two year Blocks. SBIRS Low will incorporate new technologies to enhance detection; improve reporting of Intercontinental Ballistic Missile, Submarine Launch Ballistic Missile and tactical ballistic missiles; and provide critical mid-course tracking, discrimination and hit assessment data for the BMD System.</p> <p>SBIRS Low's primary mission is missile defense. It provides initial warning of a ballistic missile attack on the US, its deployed forces or its allies. SBIRS Low satellites provide continuous tracking from launch to intercept or reentry. Functions include booster detection, post boost vehicle tracking, midcourse object tracking, resolved object discrimination and intercept hit assessment. This system will pass data to boost, midcourse and terminal defense systems. The data will be used to cue radars over-the-horizon and provide interceptor handovers. The design and development of the first satellites and accompanying ground system is planned for the later FYDP years, which includes significant hardware purchases.</p> <p>The Flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C<sup>2</sup> and Systems Engineering &amp; Integration will guide the integration of SBIRS Low into the BMD System, the BMDS BM/C<sup>2</sup> architecture, and the BMD testbed.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 0 Project was funded under Program Element 0604442F (Space-Based Infrared System Low).</li> </ul> <p>Total                    0</p> <p><b>FY 2002 Planned Program:</b></p>												
Project 5041				Page 3 of 21 Pages				Exhibit R-2 (PE 0603884C)				

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603884C Sensors</b>	PROJECT <b>5041</b>
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- 195656 **Space-Based Infrared System Low Program** Definition contract will include efforts to restructure the SBIRS Low program, to include design risk reduction activities and software development. FY 2002 actions will mitigate risk through ground simulations and hardware-in-the-loop demonstrations and, pending a decision on the acquisition strategy, would also include holding the Preliminary Design Review (PDR).
  - 15779 Provide **Program Definition Support** (Includes studies, interface definition, and modeling and simulation)
  - 11183 Accomplish other **risk reduction** activities (Includes cryocoolers, batteries, algorithms, radiation hardened parts, phenomenology, optical filters, Midcourse Space Experiment data reduction, contamination control, focal plane arrays (visible and long-wave), and survivability)
  - 23038 Support **Program Office** activities
- Total 245656

**FY 2003 Planned Program:**

- 226162 **Space-Based Infrared System Low Program** Definition contract will continue efforts to mature the SBIRS Low design and to enhance risk reduction and software development. FY 2003 actions will also include mitigating risk through ground simulations, hardware-in-the-loop demonstrations and preparing for Critical Design Review (CDR).
  - 38145 Providing **Program Definition Support** (Includes studies, integration into the BMD System, and modeling and simulation)
  - 7383 Accomplishing other **risk reduction** activities (Includes cryocoolers, batteries, algorithms, radiation hardened parts, phenomenology, optical filters, Midcourse Space Experiment data reduction, contamination control, focal plane arrays (visible and long-wave), and survivability)
  - 22188 Supporting **Program Office** activities
- Total 293878

<b>B. Other Program Funding Summary</b>	<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		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C, Terminal Defense System		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603882C, Midcourse Defense System		3762250	3192594	3071581	3016343	2969142	2595708	Cont	Cont
PE 0603883C, Boost Defense System		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
PE 0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
PE 0603875C, International Cooperative Program	125805								

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603884C Sensors</b>	PROJECT <b>5041</b>
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**C. Acquisition Strategy:**

SBIRS Low began Program Definition activities in August 1999 with the award of two firm fixed price contracts. During its first year, the program refined the requirements culminating in the August 2000 System Requirements Review (SRR). A successful SRR defined the driving design requirements and allowed the SBIRS Low contractors to complete an initial design, which was validated at the System Design Review in April 2001. The program matured the design and mitigated risk as it prepared for the Preliminary Design Review scheduled for 3/4Q FY 2002. Program Definition may continue past CDR to support the evolutionary development of the SBIRS Low system to support the BMD System. Program Definition is expected to be followed by a competitive Engineering Development contract, scheduled for award in the fourth quarter of FY 2005, leading toward a first launch in 4Q FY 2008.

SBIRS Low is an integral part of the BMD System. The SBIRS Low restructure will develop a capabilities based acquisition program that emphasizes the Missile Defense Agency's evolutionary acquisition, spiral development and testing strategy through the use of two-year capability blocks. SBIRS Low will initially focus on providing an adjunct to the BMD testbed and continue to develop enhanced capabilities to support the BMD block structure and integration.

As directed by the FY 2002 National Defense Appropriations Conference Report, the Department will develop specific program plans for delivery to the Congressional defense committees by 15 May 02.

<b>D. <u>Schedule Profile*</u></b>	<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>
Deliver Program Plan to Congressional defense committees.		3Q					
Preliminary Design Review		3Q-4Q					
Critical Design Review					3Q		
Engineering Development Contract Award					4Q		

\*Remainder of schedule subject to the Congressionally directed restructure due to the Congressional defense committees by 15 May 2002.



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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603884C Sensors</b>	PROJECT <b>5041</b>
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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
<b>a. Space Based Infrared System Low</b>										
b. Program Definition	FFP	TRW, CA		97828	2Q				Cont	
c. Program Definition	FFP	Spectrum Astro, AZ		97828	2Q				Cont	
d. Program Definition Extension	TBD	TRW, CA				113081	1Q	Cont	Cont	
e. Program Definition Extension	TBD	Spectrum Astro, AZ				113081	1Q	Cont	Cont	
<b>f. Program Definition Support</b>	Various	Various		15779	2Q	38145	2Q	Cont	Cont	
<b>g. Other Risk Reduction</b>	Various	Various		11183	2Q	7383	2Q	Cont	Cont	
h.										
Subtotal Product Development:				222618		271690			Cont	

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
<b>i. Program Office Support (OGC)</b>	Various	Various		23038	2Q	22188	2Q	Cont.	Cont	
j.										
Subtotal Support Costs:				23038		22188			Cont	

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. N/A										
Subtotal Test and Evaluation:										

<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603884C Sensors</b>	PROJECT <b>5041</b>
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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. N/A										
Subtotal Management Services:										

Remark:

Project Total Cost:				245656		293878			Cont	
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Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2002
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BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603884C Sensors	PROJECT 5049
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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
5049 Russian-American Observation Satellite Program	0	54461	69130	83423	54512	11493	11494	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The Russian-American Observation Satellites (RAMOS) project is an innovative U.S. – Russian space-based remote sensor research and development program addressing ballistic missile defense and national security. This program engages Russian developers of early warning satellite in the joint definition and execution of aircraft and space experiments. The RAMOS program will design, build, launch, and operate two satellites that will provide stereoscopic observations of the earth’s atmosphere and ballistic missile launches in the short wavelength and mid-to-long wavelength infrared bands. Preliminary experiments designed to support program definition occurred between 1995 and 1999 using existing U.S. and Russian space and aircraft platforms to collect imagery. The U.S. Midcourse Space Experiment and the Miniature Sensor Technology Integration satellites were used to collect nearly simultaneous stereo imagery with the Russian RESURS 01 satellite. Joint experiments using U.S. and Russian prototype sensors were flown aboard the U.S. Flying Infrared Signatures Technology Aircraft, demonstrating our ability to jointly plan, execute, and analyze RAMOS type experiments. Note that RAMOS is not an operational element of the overall Ballistic Missile Defense System. It is a cooperative program with the Russian Federation on mutually beneficial research that is missile defense related and provides a foundation for future cooperative efforts.

The RAMOS team began Program Design in the fall of 2000. The RAMOS project consists of two co-orbital satellites each with a sensor suite consisting of an infrared imaging radiometer, a visible wide-angle photometer, and a visible camera. Additionally one satellite will carry a short waveband infrared polarimeter and the other an ultraviolet photometer. Current plans call for Russia to provide the launch capability, satellite platforms, and the ground processing and control equipment while the U.S. will provide the infrared sensors. The satellites are scheduled for launch in FY2006 with a nominal two-year on-orbit life expectancy.

**FY 2001 Accomplishments:**

- Project was funded under Program Element 0603875C (International Cooperative Programs). Previous projects included: 1161 Advanced Sensor Technology and 4000 Operational Support.
- Total                    0

**FY 2002 Planned Program:**

- 22000 **RF Hardware Development** - Continue detailed designs of the satellite platforms, ground project, launch vehicle, and all associated projects and instruments to accomplish the space experiment, including build-to-specification, detailed drawings and updated risk mitigation plans. Develop test plans for system and component testing and perform quality assurance activities during fabrication of the projects. Finalize concept of operations and continue experiments planning.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603884C Sensors</b>	PROJECT <b>5049</b>
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- 23770 **US Hardware Development & Program Management Support** -Begin detailed designs of the satellite primary sensors and all associated projects and instruments to accomplish the space experiments. Finalize test plans for testing and continue to perform quality assurance activities during fabrication of the sensor project. Design and fabricate sensor prototypes to be used during interface and project tests. Continue concept of operations and experiments planning. Begin fabrication of long lead items. Begin writing software for sensor. Begin development of models and simulations to test the design and concepts to include computer mass and mathematical models, orbit models of experiment simulations, and simulations to validate hardware and design trades. Prepare concept for management, processing, storage, and analysis of experiment data.
  - 8691 **Engineering & Integration Support, Security Monitoring Support, and Development Support** - Perform system engineering and configuration control processes for the RAMOS project. Monitor and facilitate progress of critical design. Monitor and evaluate subproject and component testing. Provide technical review of exported data. Provided in country administrative, security, and technical support of the RAMOS program office.
- Total 54461

**FY 2003 Planned Program:**

- 32000 **RF Hardware development** - Complete detailed designs of the satellite platforms, launch vehicle, and all associated projects and instruments to accomplish the space experiment, including build-to-specification, detailed drawings and updated risk mitigation plans. Complete assembly, integration & test of 1st Technological Model and begin assembly of Universal Space Platform Engineering Model #2. Complete definition of ground facility, mission operations design and operations concept. Finalize test plans for system and component testing and perform quality assurance activities during fabrication of the projects. Continue science experiments planning. Initiate procurement of mission operations software and hardware.
  - 27330 **U.S. Hardware Development & Program Management Support** - Complete detailed designs of the satellite primary sensors and all associated projects and instruments to accomplish the space experiments. Begin fabrication & assembly of US sensors, payload support electronics, and ground support equipment and continue quality assurance activities during sensor fabrication. Complete fabrication, assembly, and test of payload calibration system. Complete integration and test of engineering model #1 and continue development of engineering model #2. Finalize concept of operations and experiments planning. Continue sensor software development. Continue development of models and simulations.
  - 9800 **Engineering & Integration Support, Security Monitoring Support, and Development Support** - Perform system engineering and configuration control processes for the RAMOS project. Update and control program documentation, and support Critical Design Review and transition to Fabrication and Assembly phase of program. Monitor and evaluate subproject and component testing. Provide technical review of exported data. Provided in country administrative, security, and technical support of the RAMOS program office.
- Total 69130

<b>B. Other Program Funding Summary</b>	<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
0603880C, BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
0603881C, Terminal Defense System		200119	169974	200171	234318	228443	367744	Cont	Cont
0603882C, Midcourse Defense System		3762250	3192594	3071581	3016343	2969142	2595708	Cont	Cont

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>								DATE <b>February 2002</b>	
<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>				<b>PE NUMBER AND TITLE</b> <b>0603884C Sensors</b>				<b>PROJECT</b> <b>5049</b>	
0603883C, Boost Defense System		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
0603875C, International Cooperative Program	125805								

**C. Acquisition Strategy:**

Russian-American Observation Satellite is a cooperative experiment program designed to engage the Russians in early warning and theater missile defense related technologies. The tasks to complete the design, fabrication, launch, and operations of the two-satellite constellation will be completed under three major contracts.

The first contract is with Utah State University/Space Dynamics Laboratory (USU/SDL), a designated University Affiliated Research Center for space sensors. Space Dynamics Lab is the current U.S. prime contractor for RAMOS and has a prime/subcontractor relationship with the Russian State Company, Rosvoorouzhenie (now Rosoboronexport), for Russian tasks. This contractual approach will be used for design and development of the RAMOS project through the Preliminary Design Review scheduled for 2Q FY02. After Preliminary Design Review, Utah State University will remain as the prime U.S. contractor for the sensor development and fabrication as well as mission planning and data reduction.

The second contract will be a direct contract with the Russian State Company, Rosoboronexport (formerly Rosvoorouzhenie). During FY2001-FY2002, Missile Defense Agency (MDA) plans to negotiate a government-to-government agreement with the Russian Federation to govern the RAMOS program. Once this agreement is concluded, MDA will contract directly with Rosoboronexport for the Russian efforts. Under this contract, Rosoboronexport, through Russian subcontractors, will be responsible for the development and fabrication of the satellite platforms, development and operation of the ground project, and launch services for the two RAMOS satellites.

The third contract is with Ball Aerospace and Technologies Corporation (BATC) of Boulder, CO. As the Systems Engineering and Integration contractor for Missile Defense Agency, BATC will be primarily responsible for monitoring the Russian effort and facilitating the integration of U.S. and Russian components. BATC will also support preparation of program documentation for technology protection and security and provide in country administrative, security and technical support of RAMOS Program Office.

RAMOS 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.

<b>D. <u>Schedule Profile</u></b>	<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>
Preliminary Design Review for U.S. Sensors		3Q					
RAMOS Project Preliminary Design Review		4Q					
Earliest Opportunity to Authorize Detailed Design		4Q					

Project 5049 Page 10 of 21 Pages Exhibit R-2A (PE 0603884C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603884C Sensors</b>	<b>PROJECT</b> <b>5049</b>
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MDA-USU/SDL Contract Award		4Q					
MDA/Russian Contract Signed		4Q					
Complete Critical Design for U.S. Sensors			2Q				
RAMOS Project Critical Design Review			3Q				
Earliest Opportunity to Authorize Hardware Fabrication			3Q				
Begin Payload Test and Calibration Activities				1Q			
Earliest Opportunity to Authorize Shipment of Payload					2Q		
Ship US Payload #1					2Q		
Ship US Payload #2					4Q		
Launch Satellite #1						4Q	
Launch Satellite #2						4Q	
Earliest Opportunity to Declare Satellites Operational							1Q

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603884C Sensors</b>	<b>PROJECT</b> <b>5049</b>
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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. US Hardware Development	CPAF	Utah State University/Space Dynamics Lab, Logan, UT		23603	1Q	27030	1Q		50633	
b. RF Hardware Development	OTAF	Rosoboronexport, RF		22000	2Q	32000	2Q		54000	
c. Engineering & Integration Support	CPAF	Ball Aerospace and Technologies Corporation, Boulder, CO		8000	1Q	9000	1Q		17000	
d.										
<b>Subtotal Product Development:</b>				53603		68030			121633	

Remark: Prior to FY99, the Russian-American Observation Satellite program was in BA3 – Advanced Technology Development, PE 0603173C, Support Technologies – ATD

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. Development Support	Allot	AFRL, Hanscom AFB		591	1Q	600	1Q	Continuing	1191	
b.										
<b>Subtotal Support Costs:</b>				591		600			1191	

Remark: Prior to FY99, the Russian-American Observation Satellite program was in BA3 – Advanced Technology Development, PE 0603173C, Support Technologies – ATD

Air Force Research Laboratory technical support will be required in program development, experiment planning and data analysis, with emphasis on earth backgrounds, data certification technology transfer and surveillance.

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603884C Sensors</b>	PROJECT <b>5049</b>
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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. N/A										
<b>Subtotal Test and Evaluation:</b>										

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. Security Monitoring Spt	Allot	DTRA		100	2Q	200	2Q		300	
b. Program Mgt Spt	CPFF	CSC/NRC, Arlington, VA and Aerospace, El Segundao, CA		167	2Q	300	2Q		467	
c.										
<b>Subtotal Management Services:</b>				267		500			767	

Remark: Prior to FY99, the Russian-American Observation Satellite program was in BA3 – Advanced Technology Development, PE 0603173C, Support Technologies – ATD

Project Total Cost:				54461		69130			123591	
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Remark:



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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603884C Sensors				PROJECT 5050		
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	
5050 System Engineering and Integration	0	10000	0	0	0	0	0	Continuing	Continuing	

**A. Mission Description and Budget Item Justification**

System Engineering and Integration will support the integration of SBIRS Increment 3 into the BMD System. This effort includes the definition and risk reduction of Space-Based Infrared System Increment 3/BMD System interfaces. This activity is incorporated into 5041 Space-Based Infrared System Low in FY 2003 and beyond.

**Concept Definition**  
This project performs the necessary engineering, trade studies, and system requirements definition for the sensor project of the BMD system.

**Risk Reduction**  
Provide Simulation and Hardware in the loop demonstrations of Space-Based Infrared System Low and BMD functionality. Provide exercise support to elicit operator-in-the loop feedback.

**Data Collection and Phenomenology**  
Analyze past Infrared and Visible Sensor Data collections from previous experiments and test to support algorithm development.

**Experiments**  
Plan and develop pre-on-orbit tests (Integrated Flight Tests, Critical Measurement Program Flights, Red Crow Experiments, etc...) that provide data for Space-Based Infrared System Low Risk Reduction Effort.

**Space-Based Infrared System Integration**  
Integrate Space-Based Infrared System into BMD Blocks.

The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C2 and Systems Engineering & Integration will guide the integration of SE&I into the BMD System, the BMDS BM/C2 architecture, and the BMD testbed.

**FY 2001 Accomplishments:**

- Total

Project 5050 Page 14 of 21 Pages Exhibit R-2A (PE 0603884C)

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603884C Sensors</b>	PROJECT <b>5050</b>
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**FY 2002 Planned Program:**

- 10000 Perform systems engineering for SBIRS integration into the Ballistic Missile Defense Architecture. Address interoperability issues and interface features (data flow rate, volume, format, and data content), data fusion/sensor synergy and architecture analysis).
- Total 10000

**FY 2003 Planned Program:**

- 
- Total

<b>B. Other Program Funding Summary</b>	<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>
0603880C, BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
0603881C, Terminal Defense System		200119	169974	200171	234318	228443	367744	Cont	Cont
0603882C, Midcourse Defense System		3762250	3192594	3071581	3016343	2969142	2595708	Cont	Cont
0603883C, Boost Defense System		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
0603875C, International Cooperative Program	125805								

**C. Acquisition Strategy:**

The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C2 and Systems Engineering & Integration will guide the integration of SE&I into the BMD System, the BMDS BM/C2 architecture, and the BMD testbed.

<b>D. Schedule Profile</b>	<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>
Concept Study Evaluations & Recommendations		1Q-4Q					
Decision Architecture Reviews		1Q-4Q					
AC Program Review		4Q					

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603884C Sensors**

**PROJECT**  
**5050**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. N/A										
Subtotal Product Development:										

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. Systems Engineering & Integration	Various	Various		10000	1/2Q			Cont	Cont	
b.										
Subtotal Support Costs:				10000				Cont	Cont	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. N/A										
Subtotal Test and Evaluation:										

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. N/A										
Subtotal Management Services:										

Remark:

Project Total Cost:				10000				Cont	Cont	
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Remark:

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>								DATE <b>February 2002</b>	
BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>				PE NUMBER AND TITLE <b>0603884C Sensors</b>				PROJECT <b>5060</b>	
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
5060 Test and Evaluation	0	14762	0	0	0	0	0	Continuing	Continuing
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>The Advanced Radar technology test bed will capitalize on recent advances in radar and computational technologies to enable leap-ahead advances in radar capabilities. These capabilities are required to make projects more affordable while providing capabilities against counter-measures and advanced threats. This project will employ an open system architecture to permit infusion of new components from throughout the radar technology community.</p> <p>The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C2 and Systems Engineering &amp; Integration will guide the integration of T&amp;E into the BMD System, the BMDS BM/C2 architecture, and the BMD testbed.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>Total 0</li> </ul> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>4762 Concept evaluation.</li> <li>5000 Concept studies.</li> <li>2000 RF/IR countermeasure mitigation.</li> <li>3000 Decision Architecture prototype development and integration.</li> </ul> <p>Total 14762</p> <p><b>FY 2003 Planned Program:</b></p> <ul style="list-style-type: none"> <li>Total</li> </ul>									
<b>B. <u>Other Program Funding Summary</u></b>	<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
Project 5060									

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0603884C Sensors</b>	<b>PROJECT</b> <b>5060</b>
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0603880C, BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
0603881C, Terminal Defense System		200119	169974	200171	234318	228443	367744	Cont	Cont
0603882C, Midcourse Defense System		3762250	3192594	3071581	3016343	2969142	2595708	Cont	Cont
0603883C, Boost Defense System		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
0603175C, Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
0603875C, International Cooperative Program	125805								

**C. Acquisition Strategy:**

The program will be managed by Missile Defense Agency with support from the U.S. Army Space and Missile Defense Command and the Navy PEO for Theater, Air and Missile Defense. Test and Evaluation 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.

<b>D. <u>Schedule Profile</u></b>	<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>
Concept study evaluations & recommendations		1Q-4Q					
Decision Architecture reviews		1Q-4Q					
AC Program Review		4Q					

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**4 - Program Definition and Risk Reduction**

**PE NUMBER AND TITLE**  
**0603884C Sensors**

**PROJECT**  
**5060**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2002 Cost</u>	<u>FY 2002 Award Date</u>	<u>FY 2003 Cost</u>	<u>FY 2003 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Decision Architecture	Various	SPARTA/SMDC		3000	2Q			Cont.	3000	
b. Concept Studies	Various	Various		5000	2Q			Cont.	5000	
c. CM Mitigation	Various	LockMart/SMDC		2000	2Q			Cont.	2000	
Subtotal Product Development:				10000					10000	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2002 Cost</u>	<u>FY 2002 Award Date</u>	<u>FY 2003 Cost</u>	<u>FY 2003 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Concept Evaluation	Various	Various		4762	2Q			Cont.	4762	
Subtotal Support Costs:				4762					4762	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2002 Cost</u>	<u>FY 2002 Award Date</u>	<u>FY 2003 Cost</u>	<u>FY 2003 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. N/A										
Subtotal Test and Evaluation:										

Remark:

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

Remark:

Project Total Cost:				14762					14762	
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Remark:

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2002		
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction				PE NUMBER AND TITLE 0603884C Sensors				PROJECT 5090	
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
5090 Program Operations	0	10459	10439	10759	11168	12314	10467	Continuing	Continuing
<b>A. <u>Mission Description and Budget Item Justification</u></b>									
<p>This project covers personnel and related facility support costs, statutory and fiscal requirements, and support service contracts.</p> <p>Personnel covers government civilians performing program-wide oversight functions such as financial management, contracting, security, information systems support, and legal services at Missile Defense Agency's Executing Agents within the US Army Space &amp; Missile Defense Command, US Army 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.</p> <p>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. Missile Defense Agency 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.</p> <p>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 Missile Defense Agency and Executing Agent government personnel. Typical efforts include cost estimating; security management; information management; technology integration across Missile Defense Agency 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.</p>									
<b>FY 2001 Accomplishments:</b>									
	<ul style="list-style-type: none"> <li>Project was funded under Program Elements: 0604442F (SPACE BASED INFRARED SYSTEM) and 0603875C (International Cooperative Programs).</li> </ul>								
Total	0								
<b>FY 2002 Planned Program:</b>									
	10459	Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities, and supplies.							
Total	10459								
Project 5090									
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Exhibit R-2 (PE 0603884C)									

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>4 - Program Definition and Risk Reduction</b>	PE NUMBER AND TITLE <b>0603884C Sensors</b>	PROJECT <b>5090</b>
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**FY 2003 Planned Program:**

- 10439 Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities, and supplies.

Total 10439

<b>B. <u>Other Program Funding Summary</u></b>	<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>
N/A									

**C. Acquisition Strategy:**  
N/A

<b>D. <u>Schedule Profile</u></b>	<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>
N/A							



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Program Definition and Risk Reduction</b>	<b>PE NUMBER AND TITLE</b> <b>0901585C PENTAGON RESERV MAINT RESERVE FUND</b>	<b>PROJECT</b> <b>4151</b>
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COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
4151 PENTAGON RESERV MAINT RESERVE FUND	6129								

**A. Mission Description and Budget Item Justification**

This DoD-directed Program Element started in FY 2001 to separately identify costs for the Pentagon Reservation Maintenance Reserve Fund (PRMRF). The PRMRF finances the following: real property operation and maintenance costs of the Pentagon and Federal Office Building 2, the renovation of the Pentagon, the Remote Delivery Facility, and the Metro Entrance Facility Projects.

**FY 2001 Planned Program:**

- 6129 Continue program as described in Block A.
- Total 6129

<b>B. <u>Program Change Summary</u></b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget (FY 2002 PB)	4772		
Appropriated Value			
Adjustments to Appropriated Value			
a. Congressional General Reductions	-43		
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since FY 2002 PB	1400		
Current Budget Submit (FY 2003 Budget Estimates)	6129		

Change Summary Explanation:

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>5 - Engineering and Manufacturing Development</b>	<b>PE NUMBER AND TITLE</b> <b>0604861C THAAD System</b>
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COST <i>(In Thousands)</i>	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	530432	866530	934681	714679	830204	920988	1131109	Continuing	Continuing
2011 Theater High Altitude Area Defense (THAAD)	0	852592	934681	714679	830204	920988	1131109	Continuing	Continuing
2260 Theater High Altitude Area Defense (THAAD)	530432	0	0	0	0	0	0	0	0
2090 Program Operations	0	13938	0	0	0	0	0	Continuing	Continuing

**NOTE: This Program Element (PE) does not match the earlier R-1 submission. There was a net zero sum transfer of funds between Ground Base Misdcourse, PE 0603882C, Project 3012, -\$2.510K and THAAD, PE 0604861C, Project 2011, +\$2.510K.**

**A. Mission Description and Budget Item Justification**

The THAAD program was restructured from project 2260 in FY 2001 to project 2011 in FY 2002 – FY 2007.

The mission of the Theater High Altitude Area Defense (THAAD) system is to defend against short and medium range Ballistic Missiles (BMs) and other near-term threats from long range and endo- and exo-atmospheric altitudes. THAAD is an element of the Terminal Defense System (TDS). The MDA Director approves the TDS capability-based development and selective upgrades of defensive capabilities that engage and negate ballistic missiles in the terminal phase of their trajectory. THAAD's long-range capability will protect U. S. and allied armed forces, broadly dispersed assets and population centers against BM attacks. THAAD's capability to intercept at endo- and exo-atmospheric altitudes makes effective countermeasures to THAAD difficult, allows multiple intercept opportunities, and will significantly mitigate the effects of weapons of mass destruction. The THAAD element development phase will refine and mature the system design to ensure component and system performance, producibility, and supportability. The THAAD program is employing a low-risk spiral development approach. Five major components (missiles, launchers, radar(s), Battle Management/Command and Control (BM/C<sup>2</sup>), and THAAD-specific support equipment) will be integrated into the THAAD element and BMDS. The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C<sup>2</sup> and Systems Engineering & Integration will guide the integration of THAAD into the BMD System, the BMDS BM/C<sup>2</sup> architecture, and the Ballistic Missile Defense (BMD) Test Bed.

Program operations funding includes the required personnel and management support. This infrastructure includes items such as: travel; personnel and related facility support costs; statutory and fiscal requirements, and support service contracts.

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

DATE

February 2002

BUDGET ACTIVITY

**5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE

**0604861C THAAD System**

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget (FY 2002 APB)	549945		762191*
Appropriated Value		872481	
BMDO Adjustments	-5025		
Adjustments to Appropriated Value	-14488		
a. Congressional General Reductions		-5951	
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since FY 2002 APB	-19513		172490**
Fiscal Year (FY) 2003 Budget Estimate	530432	866530	934681

## Change Summary Explanation:

FY2001 (-7447): Congressional general reductions.  
 (-1500): SIAP Reprogramming.

FY 2002 Congressional reductions of -5951.

\* FY 2003 Previous Administration's President's Budget.

\*\*This program was restructured starting in FY 2002.

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604861C THAAD System</b>	PROJECT <b>2011</b>
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COST ( <i>In Thousands</i> )	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
2011 Theater High Altitude Area Defense (THAAD)	0	852592	934681	714679	830204	920988	1131109	Continuing	Continuing

**See R-2 Note**

**A. Mission Description and Budget Item Justification**

The Theater High Altitude Area Defense (THAAD) is an element of the Terminal Defense Segment (TDS) of the Ballistic Missile Defense System (BMDS). TDS allocates resources to support development and selective upgrades of defensive capabilities that engage and negate ballistic missiles in the terminal phase of their trajectory. The mission of the THAAD system is to defend against short and medium range Ballistic Missiles (BMs) and other near-term threats from long range and endo- and exo-atmospheric altitudes. THAAD's long-range capability will protect U. S. and allied armed forces, broadly dispersed assets and population centers against BM attacks. THAAD's capability to intercept at endo- and exo-atmospheric altitudes makes effective countermeasures to THAAD difficult, allows multiple intercept opportunities, and will significantly mitigate the effects of weapons of mass destruction. The THAAD element development phase will refine and mature the system design to ensure component and system performance, producibility, and supportability. The THAAD program is employing a low-risk spiral development approach. Five major components (missiles, launchers, radar(s), Battle Management/Command and Control (BM/C<sup>2</sup>), and THAAD-specific support equipment) will be integrated into the THAAD element and BMDS. Additionally, the program will investigate the integration of THAAD into the BMDS, BMDS Command and Control Elements, and the BMD Test Bed (BTB). THAAD 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.

Block 2004 THAAD Technical and schedule risk reduction through early component deliveries, system integration and verification in Hardware-In-The-Loop testing and additional flight testing. Early component deliveries include BM/C<sup>2</sup> and radar software development, first and second radars, missile sub-assembly development, integration and testing. Block 2004 provides the opportunity to decide whether to continue acquisition of test assets that could be available for a limited contingency capability.

Block 2006 THAAD Block 2006 represents the earliest opportunity for THAAD to transition to initial production. A single firing unit (one radar, BM/C<sup>2</sup>, launcher and missiles) will be available that will have the capability to defeat short and medium range ballistic missiles and other near-term threats. Flight testing, production qualification and initial operational testing of all THAAD system components will be successfully completed and all production facilities capabilities will be verified.

Block 2008, 2010, and 2012 THAAD Represents the incremental capability delivered as part of THAAD's evolutionary acquisition/development strategy. These blocks build on the core, near-term missile defense capability provided by THAAD Block 2006. These blocks expand the capabilities of the THAAD system to address longer range and more advanced threats. These blocks will implement multiple battery and highly integrated BMDS engagement operations; additionally, upgraded missile and radar software will specifically enhance the system's performance in the presence of sophisticated countermeasures.

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY		February 2002
<b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE	PROJECT
	<b>0604861C THAAD System</b>	<b>2011</b>
<p><b>FY 2001 Accomplishments:</b> Funding for this project exists and is in Project 2260, Program Element 0604861C</p>		
<p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• <b>Ground Based Projects Block 2004 THAAD</b></li> <li>• 160000 Initiate technical and schedule risk reduction efforts to establish early Hardware-In-The-Loop facilities, initiate early component deliveries and prepare for additional flight testing. Early component fabrication, including initiating earlier BM/C<sup>2</sup> and radar software development, first and second radars hardware fabrication, and missile sub-assembly development, integration, and testing.</li> <li>• <b>Ground Based Projects Block 2006 THAAD</b></li> <li>• 617309 Continue missile, radar, BM/C<sup>2</sup>, and launcher hardware and software development. Conduct missile, launcher, and system Preliminary Design Reviews (PDRs). Conduct BM/C<sup>2</sup> and launcher Critical Design Reviews (CDRs). Begin first developmental radar and battle manager fabrication. Initiate prototype and brassboard missile component testing. Continue missile risk reduction testing.</li> <li>• 36520 Support Contracts: Continue software independent verification and validation. Continue development of Simulation-Over-Live-Driver (SOLD). Perform technical analysis support.</li> <li>• 14540 Other Government Agencies (OGAs), Government Furnished Equipment (GFE)/other: Continue system Hardware-In-The-Loop development efforts. Continue BM/C<sup>2</sup> interoperability and simulation efforts. Continue threat vulnerability assessment. Maintain integrated logistics and product assurance efforts. Perform quality and manufacturing technology tasks. Continue MIT/LL efforts.</li> <li>• 20028 In-house support: Fund government salaries, benefits, travel, and training (includes MITRE).</li> <li>• 1064 Test Planning: Initiate integration into White Sands Missile Range (WSMR) and the BMD Test Bed.</li> <li>• 3131 Lethality: Conduct lethality planning and model design.</li> </ul> <p>Total 852592</p>		
<p><b>FY 2003 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• <b>Ground Based Projects Block 2004 THAAD</b></li> <li>• 175000 Continue early establishment of system Hardware-In-The-Loop capability and missile, radar, launcher and BM/C<sup>2</sup> component hardware and software development for early verification of system integration. Continue earlier fabrication of radars #1 and #2 to support additional ground and flight testing in FY 2005 and FY 2006.</li> <li>• <b>Ground Based Projects Block 2006 THAAD</b></li> </ul>		
Project 2011	Page 4 of 15 Pages	Exhibit R-2A (PE 0604861C)

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604861C THAAD System</b>	PROJECT <b>2011</b>
• 662329	Continue missile, radar, BM/C <sup>2</sup> , and launcher hardware and software development. Conduct missile and launcher CDRs and initiate fabrication of launcher and missile ground test units. Support range activation and operation activities at WSMR and the BMD Test Bed (BTB) at the Pacific Missile Range Facility (PMRF). Continue system integration into BTB. Continue fabrication of EMD Radar #2. Continue launcher and battle manager test beds. Complete assembly of radar antenna #1 and begin calibration and testing.	
• 47000	Support Contracts: Continue software independent verification and validation. Continue development of simulation-over-live-driver. Perform technical analysis support.	
• 19132	Other Government Agencies (OGAs), Government Furnished Equipment (GFE)/other: Initiate THAAD range operations at WSMR and BTB at PMRF and continue system Hardware-In-The-Loop development efforts. Continue BM/C <sup>2</sup> interoperability and simulation efforts. Continue threat vulnerability assessment. Maintain integrated logistics and product assurance efforts. Perform quality and manufacturing technology tasks. Prepare for soldier participation in early flight testing.	
• 20000	In-house support: Fund government salaries, benefits, travel, and training (includes MITRE).	
• 6620	Test Planning: Continue test planning for WSMR and BTB.	
• 4600	Lethality: Conduct lethality simulation code validation and planning. Initiate lethality test article development.	
•		
Total	934681	

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604861C THAAD System</b>	PROJECT <b>2011</b>
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<b>B. <u>Other Program Funding Summary</u></b>	<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 0604861C	530432								
PE 0603875C	125805								
PE 0603880C		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603882C		3762250	3192594	3071581	3016343	2969142	2595708	Cont	Cont
PE 0603883C		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
PE 0603884C		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C		139340	121751	155056	130299	142785	147457	Cont	Cont
PE 0604861C*		750	23400	12255	13390			Cont	Cont

\*DD Form 1391s have been prepared for the THAAD associated BMDS Test Bed at PMRF and other THAAD MILCON budget items. These dollars are part of the overall THAAD budget and should be **added** to the dollars on page 1 to provide total budget required.

**C. Acquisition Strategy:** THAAD 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.

<b>D. <u>Schedule Profile</u></b>	<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>
Launcher PDR		3Q					
Missile PDR		3Q					
BM/C <sup>3</sup> I CDR		3Q					
System PDR		4Q					
Launcher CDR			2Q				
Missile CDR			3Q				
System CDR				1Q			
Block 2004 Flight Tests Begin				4Q			
Earliest decision to initiate Block 2008					1Q		
Radar 1 Integration & Test Complete					2Q		
Radar 2 Integration & Test Complete					3Q		
Award 14 Missile Option for Block 2006 for IOTE					3Q		
Block 2006 Production Qualification Test Ready					3Q		

**BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)** DATE **February 2002**

BUDGET ACTIVITY **5 - Engineering and Manufacturing Development** PE NUMBER AND TITLE **0604861C THAAD System** PROJECT **2011**

Block 2006 Production Readiness Review Assessment						3Q		
Block 2006 Flight Tests Begin						4Q		
Earliest opportunity for transition to Block 2006 production							1Q	



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**BMDO RDT&E COST ANALYSIS (R-3)**

DATE **February 2002**

BUDGET ACTIVITY  
**5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE  
**0604861C THAAD System**

PROJECT  
**2011**

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
<b>Block 2004/2006</b>										
a. System Design	CPAF/FF	LMSSC, CA/AL		316000	1Q	215000	1Q	Cont	531000	
b. Fabrication of missile components	CPAF/FF	LMSSC, CA		141000	1Q	200000	1Q	Cont	341000	
c. Fabrication of radars	CPAF/FF	LM/Raytheon, MA		242000	1Q	270000	1Q	Cont	512000	
d. Activation of ranges	CPAF/FF	LMSSC, CA/AL		16309	1Q	21329	1Q	Cont	37638	
e. System integration/HWIL	CPAF/FF	LMSSC, CA/AL		27000	1Q	40000	1Q	Cont	67000	
f. Fabricate ground assemblies/product lines	CPAF/FF	LMSSC, CA		35000	1Q	51000	1Q	Cont	86000	
g. 10 add'l test bed missiles						40000	1Q	Cont	40000	
Subtotal Product Development:				777309		837329			1614638	

Remark: All of the effort above is part of the THAAD EMD contract with Lockheed Martin and their major subcontractor Raytheon. Line a: Completion of system design and component/sub-assembly testing (missile, launcher, radar, BMC2); Line b: Fabrication of missile sub-assemblies and test facilities to conduct intensive ground testing in FY04-FY05; Line c: Completion of Radar #1 in FY03 and continued radar #2 fabrication; Line d: Activation of two ranges for flight testing in FY04 and FY05 (Pacific Missile Range Facility and White Sands Missile Range); Line e: Complete system integration and analysis in Hardware-in-the-Loop; Line f: Fabrication of ground component hardware and establishment/verification of production lines to produce production representative hardware for ground and flight testing in FY04/05; Line g: 10 additional test bed missiles.

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. Support Contractor	Various	Various		35920	1Q/2Q	47000	1Q/2Q	Cont	82920	
b. OGAs	MIPR	Various		14540	1Q/2Q	19132	1Q/2Q	Cont	33672	
c. In-house Support	Various	Various		17028	1Q/2Q	17000	1Q/2Q	Cont	34028	
Subtotal Support Costs:				67488		83132		Cont	150620	

Remark:

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604861C THAAD System</b>	PROJECT <b>2011</b>
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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. Test Planning	MIPR	Various		1064	2Q	6620	2Q	Cont	7684	
b. Lethality/LFT&E	Various	Various		3131	2Q	4600	2Q	Cont	7731	
Subtotal Test and Evaluation:				4195		11220			15415	

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. Support Contractor	MIPR/FFRDC	MIT/LL, Lexington, MA		600	2Q		2Q	Cont	600	
b. In-house Support	MIPR/FFRDC	Mitre, Ft. Monmouth, NJ		3000	2Q	3000	2Q	Cont	6000	
Subtotal Management Services:				3600		3000			6600	

Remark:

Project Total Cost:				852592		934681			1787273	
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Remark:

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2002			
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604861C THAAD System				PROJECT 2260		
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
2260	Theater High Altitude Area Defense (THAAD)	530432	0	0	0	0	0	0	0	0
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>The THAAD System Engineering and Manufacturing Development (EMD) phase will refine and mature the Program Definition and Risk Reduction (PDRR) system design to ensure component and system performance, producibility, and supportability. The mission of the THAAD System is to defend against short and medium range Theater Ballistic Missiles (TBMs) from long range and high altitudes. THAAD's long range capability will protect U. S. and allied Armed Forces, broadly dispersed assets and population centers against TBM attacks. THAAD's capability to intercept at high altitudes allows multiple intercept opportunities and will significantly mitigate the effects of weapons of mass destruction. The THAAD System consists of missiles, launchers, and radar(s), Battle Management/Command, Control, Communications, and Intelligence (BM/C<sup>3</sup>I) units, and support equipment. THAAD 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.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 434736 Funded EMD contract with Lockheed. Continued hardware and software development for the missile, radar, launcher, and BM/C<sup>2</sup>. Conducted BM/C<sup>2</sup> Preliminary Design Review. Conducted radar Critical Design Review.</li> <li>• 59299 Support contracts and Other Government Agencies: continued support to include software independent verification and validation; technical analysis and evaluation; hardware-in-the-loop efforts; vulnerability assessment; logistics, product assurance, test, and manufacturing efforts; Government Furnished Equipment; Simulation-Over-Live-Driver (SOLD); and PEO support.</li> <li>• 18582 In-house support to include government salaries and benefits, travel, training, equipment, and Automated Data Processing (ADP).</li> <li>• 17815 BMDO support, Operational Test and Evaluation (OT&amp;E) work.</li> </ul> <p>Total 530432</p> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• The THAAD program is under project 2011 beginning in FY 2002.</li> </ul> <p>Total 0</p> <p><b>FY 2003 Planned Program:</b></p> <ul style="list-style-type: none"> <li>•</li> </ul> <p>Total 0</p>										
Project 2260			Page 10 of 15 Pages				Exhibit R-2A (PE 0604861C)			

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>5 - Engineering and Manufacturing Development</b>	<b>PE NUMBER AND TITLE</b> <b>0604861C THAAD System</b>
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<b>B. <u>Other Program Funding Summary</u></b>	<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 0604865C	81892								
PE 0604867C	267453								

**D. C. Acquisition Strategy:** The EMD contract was a sole source award to the Dem/Val contractor team (as approved September 15, 1995 by Under Secretary of Defense for Acquisition, Technology, and Logistics utilizing the DoD Acquisition Streamlining approach) with Lockheed Martin Space Systems Company being the prime and Raytheon Company being the major subcontractor. The EMD contractor team will become the contractor team for the Low Rate Initial Production (LRIP) and Full Rate Production (FRP) phases. This single prime contractor will have total system performance responsibility for the EMD, LRIP, and FRP phases.

<b>D. <u>Schedule Profile</u></b>	<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>FY 2008</u>

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604861C THAAD System</b>	PROJECT <b>2260</b>
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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. THAAD Project	CPAF/FF	LMSSC, Sunnyvale, CA & Huntsville, AL	512263						512263	
Subtotal Product Development:			512263						512263	

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	Various	Huntsville, AL	39814						39814	
b. OGAs	MIPR	Various	16330						16330	
c. Program Mgmt	Various	Huntsville, AL	17470						17470	
d. BMDO-Hercules	Various	Various	9000						9000	
Subtotal Support Costs:			82614						82614	

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. Test Planning	MPIR/Various	Various	2560						2560	
b. OT&E	Various	Various	1244						1244	
Subtotal Test and Evaluation:			3804						3804	

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. MIT/LL	MIPR/FFRDC	Lexington, MA	1200						1200	
b. Mitre	MIPR/FFRDE	Ft. Monmouth, NJ	3067						3067	
c. BMDO-Test Support	Various	Various	3750						3750	

<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604861C THAAD System</b>	PROJECT <b>2260</b>
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c. BMDO-Test Support Radar	Various	Various	3750							3750
Subtotal Management Services:			8017							8017

Remark:

Project Total Cost:			606698							606698
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Remark:

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE <b>February 2002</b>			
BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>				PE NUMBER AND TITLE <b>0604861C THAAD System</b>			PROJECT <b>2090</b>			
COST (In Thousands)	FY2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost	
2090 Program Operations	0	13938	0	0	0	0	0	Continuing	Continuing	
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project covers personnel and related facility support costs, statutory and fiscal requirements, and support service contracts.</p> <p>Personnel covers government civilians performing program-wide oversight functions such as financial management, contracting, security, information systems support, and legal services at Missile Defense Agency's (MDA's) Executing Agents within the US Army Space &amp; Missile Defense Command, US Army 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.</p> <p>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. BMDO 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.</p> <p>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 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.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Total            0    Funding for this project exists and is provided under the Family of Systems project, Program Element 0603873C.</li> </ul> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>•            13938    Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents &amp; utilities, and supplies.</li> </ul> <p>Total            13938</p>										
Project 2090	<i>Page 14 of 15 Pages</i>					Exhibit R-2 (PE 0604861C)				

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604861C THAAD System</b>	PROJECT <b>2090</b>
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**FY 2003 Planned Program:**

- 0 Fiscal Year 2003 through 2007 funding is provided under project 2090 in the Terminal Defense Segment, Program Element 0603881C.

Total 0

<b>B. <u>Other Program Funding Summary</u></b>	<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>
N/A									

**C. Acquisition Strategy:**  
N/A

<b>D. <u>Schedule Profile</u></b>	<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>
N/A							



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>5 - Engineering and Manufacturing Development</b>	<b>PE NUMBER AND TITLE</b> <b>0604865C PAC3 - EMD</b>
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COST <i>(In Thousands)</i>	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	81892	128199	0	0	0	0	0	0	210091
2014 Patriot	0	128199	0	0	0	0	0	0	210091
2257 Patriot	81892	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

The PATRIOT Advanced Capability-3 (PAC-3) program was restructured from project 2257 in FY 2001 to project 2014 in FY 2002-2007.

PATRIOT is a mobile, field Army and Corps air defense system, using guided missiles to simultaneously engage and destroy multiple target types at varying ranges. The PAC-3 Upgrade Program is the latest evolution of the phased materiel change improvement program to PATRIOT. The materiel changes will provide improved performance across the spectrum for system and threat intercept performance. In addition to modernization of the ground support equipment, funding resources a new missile design providing a high velocity, hit to kill, surface to air missile with the range, accuracy, and lethality necessary to effectively intercept and destroy tactical missiles with Nuclear Biological Chemical/High Explosive (NBC/HE) warheads and air breathing threats. The full capability will provide defense against short to medium range theater ballistic missiles (TBMs), cruise missiles (CMs), unmanned aerial vehicles (UAVs) and other air breathing threats as part of the Ballistic Missile Defense System (BMDS). The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C<sup>2</sup> and Systems Engineering & Integration will guide the integration of PAC-3 into the BMD System, the BMDS BM/C<sup>2</sup> architecture, and the BMD testbed. PATRIOT is pursuing integration of PATRIOT Battle Management Command, Control, Communications and Intelligence (BMC3I) with the Project Manager, Air Defense Command and Control Systems to take advantage of previous U.S. Army developments that can be incorporated into the PATRIOT program. The Army requirement for PAC-3 supports the Legacy to Objective transition path of the Transformation Campaign Plan.

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**February 2002**

BUDGET ACTIVITY  
**5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE  
**0604865C PAC3 - EMD**

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002</u> PB)	81016	0	77200*
Appropriated Value	81016	129100	
a. Congressional General Reductions	-1165		
b. SBIR / STTR	-1759		
c. OSD Reductions		-901	
d. Below Threshold Reprogramming	3800		
e. Rescissions			
Adjustments to Budget Years Since <u>FY 2002</u> PB			-77200**
Current Budget Submit ( <u>FY 2003</u> Budget Estimates)	81892	128191	0

Change Summary Explanation:

Funding: FY 2001 (-2924) Congressional general reductions  
 FY 2001 (+3800) Internal realignment

Funding:

\* FY 2003: Previous Administration's President's Budget.

\*\* This Program is transferring to the service.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>5 - Engineering and Manufacturing Development</b>	<b>PE NUMBER AND TITLE</b> <b>0604865C PAC3 - EMD</b>	<b>PROJECT</b> <b>2014</b>
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COST <i>(In Thousands)</i>	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
2014 Patriot	0	128199	0	0	0	0	0	0	210091

**A. Mission Description and Budget Item Justification**

PATRIOT is a mobile, field Army and Corps air defense system, using guided missiles to simultaneously engage and destroy multiple target types at varying ranges. The PATRIOT Advanced Capability 3 (PAC-3) Upgrade Program is the latest evolution of the phased materiel change improvement program to PATRIOT. The materiel changes will provide improved performance across the spectrum for system and threat intercept performance. In addition to modernization of the ground support equipment, funding resources a new missile design providing a high velocity, hit to kill, surface to air missile with the range, accuracy, and lethality necessary to effectively intercept and destroy tactical missiles with Nuclear Biological Chemical/High Explosive (NBC/HE) warheads and air breathing threats. The full capability will provide defense against short to medium range theater ballistic missiles (TBMs), cruise missiles (CMs), unmanned aerial vehicles (UAVs) and other air breathing threats as part of the Ballistic Missile Defense System (BMDS). The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C<sup>2</sup> and Systems Engineering & Integration will guide the integration of PAC-3 into the BMD System, the BMDS BM/C<sup>2</sup> architecture, and the BMD testbed. PATRIOT is pursuing integration of PATRIOT Battle Management Command, Control, Communications and Intelligence (BMC3I) with the Project Manager, Air Defense Command and Control Systems to take advantage of previous U.S. Army developments that can be incorporated into the PATRIOT program. The Army requirement for PAC-3 supports the Legacy to Objective transition path of the Transformation Campaign Plan.

**FY 2001 Accomplishments:**

- 0 This project was reports in Project 2257, Program Element 0604865C in FY01.
- Total 0

**FY 2002 Planned Program:**

- 42787 Complete PAC-3 missile Engineering and Manufacturing Development (EMD) program.
  - 11000 Initiate follow-on Block test program with Lockheed Martin Missiles and Fire Control (LMMFC)-Dallas and Raytheon.
  - 31923 Continue Operation Test & Evaluation.
  - 6390 Continue PAC-3 Target and Test Support.
  - 36099 Evolutionary Development.
- Total 128199

**FY 2003 Planned Program:**

- 0 This project will transfer to the Service (U.S. Army).
- Total 0

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>		PE NUMBER AND TITLE <b>0604865C PAC3 - EMD</b>
		PROJECT <b>2014</b>

<b>B. Other Program Funding Summary</b>	<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 0604865A Patriot PAC-3			150819	177404	79774	22045	16295		446337
PE 0604865C PAC-3 EMD	81892								
PE 0208865C PAC-3 Procurement	357692								
PE 0208865C PAC3 Procurement		731455							1094266
C49200, PATRIOT PAC-3 Procurement			471670	450514	501107	502977	501977	1545301	3973546
C50700, PATRIOT Mods	22718	24942	151307	234600	90918	79431	81634	521362	684830
CA0267, Initial Spares	2625	726	40655	32692	15206	15622	9811	32337	117337

**C. Acquisition Strategy:** The design objective of the PATRIOT system is to provide an element of an integrated Ballistic Missile Defense system capable of being modified to cope with the evolving threat. This strategy minimizes technological risks and provides a means of enhancing system capability through planned Block upgrades of deployed systems. The PATRIOT program consists of two interrelated acquisition programs - the PATRIOT PAC-3 Growth Program and the PAC-3 Missile Program. Growth Program modifications are grouped into configurations which are scheduled to be fielded in the same time frame. The PAC-3 Missile Program focuses on developing, fabricating and testing the high velocity, hit to kill, surface to air missile and associated ground support equipment to provide essential increases in battle space, accuracy, lethality and firepower to counter and destroy evolving air defense threats. PAC-3 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 missile performance is demonstrated through a series of flight tests and modeling and simulation activities. PAC-3 Block Evolutionary development efforts will further improve system interoperability, commonality, and capabilities against emerging and reactive threats.

<b>D. Schedule Profile</b>	<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>FY 2008</u>
Configuration 3 Initial Operational Test & Evaluation (IOT&E)		1-4Q						
PAC-3 FUE	4Q							
Milestone III		4Q						
PAC-3 Missile FRP			1Q					
PAC-3 Missile FOT			4Q					
PAC-3 Missile IOC					4Q			
Initiate PAC-3 Evolutionary Block Upgrades		1Q						
Evolutionary Block Upgrades earliest Transition to Production					2Q			

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**5 - Engineering and Manufacturing Development**

**PE NUMBER AND TITLE**  
**0604865C PAC3 - EMD**

**PROJECT**  
**2014**

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. PAC-3 Missile EMD	SS-CPIF	LMMFC/TX	959518	12000	1Q				971518	
b. PAC-3 Missile Integration	SS-CPIF	Raytheon/MA	174933	6000	1Q				180933	
c. RDEC	MIPR	MRDEC/AL	68999	1490	1Q				70489	
d. PAC-3 Missile FOT	SS-CPIF	LMMFC/TX		6000	2Q				6000	
e. RSC Integration	SS-CPIF	Raytheon/MA		5000	2Q				5000	
f. PAC-3 Evolutionary Development			9500	36099	2Q				45599	
Subtotal Product Development:			1212950	66589					1279539	

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	C-CPAF	CAS/AL	48683	4690	1Q				53373	
b. OGA/In-House	PO	Various	81086	10407	1Q				91493	
c. Engineering Support	SS-CPIF	Raytheon/MA	81575	2300	2Q				83875	
Subtotal Support Costs:			211344	17397					228741	

Remark:

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**5 - Engineering and Manufacturing Development**

**PE NUMBER AND TITLE**  
**0604865C PAC3 - EMD**

**PROJECT**  
**2014**

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. White Sands Missile Range	MIPR	WSMR/NM	100461	5900	1Q				106361	
b. ADSAM			4668						4668	
c. Impact			3467						3467	
d. Operational Test Support	MIPR		35279	31923	1Q				67202	
e. Targets	MIPR	SMDC/AL	101981	6390	1Q				108371	
f. Lethality	MIPR	SMDC/AL	37628						37628	
Subtotal Test and Evaluation:			283484	44213					327697	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. N/A										
Subtotal Management Services:										

Remark:

Project Total Cost:			1707778	128199					1835977	
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Remark:

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>5 - Engineering and Manufacturing Development</b>	<b>PE NUMBER AND TITLE</b> <b>0604865C PAC3 - EMD</b>	<b>PROJECT</b> <b>2257</b>
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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
2257 Patriot	81892	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

PATRIOT is a long range, mobile, field Army and Corps air defense system, using guided missiles to simultaneously engage and destroy multiple targets types at varying ranges. The PATRIOT Advanced Capability 3 (PAC-3) Upgrade Program is the latest evolution of the phased materiel change improvement program to PATRIOT. The materiel changes will provide improved performance across the spectrum for system and threat intercept performance. In addition to modernization of the ground support equipment, funding provides for a new missile design that provides a high velocity, hit to kill, surface to air missile with the range, accuracy, and lethality necessary to effectively intercept and destroy tactical missiles with Nuclear Biological Chemical/High Explosive (NBC/HE) warheads and air breathing threats. The full capability will provide defense against short to medium range theater ballistic missiles (TBM's), cruise missiles (CM's), unmanned aerial vehicles (UAVs) and other air breathing threats as part of the Theater Missile Defense (TMD) family of systems, a multilayered Theater Air and Missile Defense Architecture. PATRIOT is pursuing integration of PATRIOT Battle Management Command, Control, Communications and Intelligence (BMC3I) with the Project Manager, Air Defense Command and Control Systems to take advantage of previous U.S. Army developments that can be incorporated into the PATRIOT program.

**FY 2001 Accomplishments:**

- 67289 Continue PAC-3 missile Engineering and Manufacturing Development (EMD) program.
  - 9313 Continue PAC-3 Target and Test Support.
  - 5290 Continue Operational Test Support.
- Total 81892

**FY 2002 Planned Program:**

- 0 This project was reports in Project 2014, Program Element 0604865C in FY02.
- Total 0

**FY 2003 Planned Program:**

- 0 This project will transfer to the Service (U.S. Army).
- Total 0

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604865C PAC3 - EMD</b>
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<b>B. <u>Other Program Funding Summary</u></b>	<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 0208865C PAC-3 Procurement	357692								

**C. Acquisition Strategy:** The design objective of the PATRIOT system is to provide a system capable of being modified to cope with the evolving threat. This strategy minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. The PATRIOT program consists of two interrelated acquisition programs – the PATRIOT PAC-3 Growth Program and the PAC-3 Missile Program. Growth Program modifications are grouped into configurations which are scheduled to be fielded in the same time frame. Configuration groupings are a convenience for managing block changes and are not a performance related grouping. However, incremental increases in performance are determined for each configuration in order to provide benchmarks for configuration testing and for the development of user doctrine and tactics. The PAC-3 Missile Program focuses on developing, fabricating and testing the high velocity, hit to kill, surface to air missile and associated ground support equipment to provide essential increases in battle space, accuracy, lethality and firepower to counter and destroy evolving air defense threats. The missile performance is demonstrated through a series of flight tests and modeling and simulation activities. A PAC-3 Follow-on Test Program will supplement EMD by demonstrating system and missile improvements and capabilities not verified during EMD flight tests. Evolutionary development efforts will further improve system capabilities against emerging and reactive threats.

<b>D. <u>Schedule Profile</u></b>	<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>FY 2008</u>
PAC-3 FUE	4Q							



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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
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**BUDGET ACTIVITY**  
**5 - Engineering and Manufacturing Development**

**PE NUMBER AND TITLE**  
**0604865C PAC3 - EMD**

**PROJECT**  
**2257**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. PAC-3 Missile EMD	SS-CPIF	LMMFC/TX	959518						959518	
b. PAC-3 Missile Integration	SS-CPIF	Raytheon/MA	174933						174933	
c. RDEC	MIPR	MRDEC/AL	68999						68999	
d. PAC-3 Missile FOT	SS-CPIF	LMMFC/TX								
e. RSC Integration	SS-CPIF	Raytheon/MA								
f. PAC-3 Evolutionary Development			9500						9500	
Subtotal Product Development:			1212950						1212950	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. SETA	C-CPAF	CAS/AL	48683						48683	
b. OGA/In-House	PO		81086						81086	
c. Engineering Support	SS-CPIF	Raytheon/MA	81575						81575	
Subtotal Support Costs:			211344						211344	

Remark:

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**5 - Engineering and Manufacturing Development**

**PE NUMBER AND TITLE**  
**0604865C PAC3 - EMD**

**PROJECT**  
**2257**

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. White Sands Missile Range	MIPR	WSMR/NM	100461						100461	
b. ADSAM			4668						4668	
c. Impact			3467						3467	
d. Operational Test Support	MIPR		35279						35279	
e. Targets	MIPR	SMDC/AL	101981						101981	
f. Lethality	MIPR	SMDC/AL	37628						37628	
Subtotal Test and Evaluation:			283484						283484	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. N/A										
Subtotal Management Services:										

Remark:

Project Total Cost:			1707778						1707778	
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Remark:

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604867C Navy Area - EMD</b>
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COST <i>(In Thousands)</i>	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	267453	99302	0	0	0	0	0	0	0
2021 Navy Area	0	99302	0	0	0	0	0	0	0
2263 Navy Area	267453	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

The Navy AREA Theater Ballistic Missile Defense (TBMD) program was planned to provide ballistic missile defense against short to medium range threat missiles. However, on 14 December 2001, OUSD (AT&L) elected to cancel in lieu of certifying the program in accordance with Nunn-McCurdy provision under USC Title 10. Navy AREA TBMD was being built on the national investment in AEGIS ships, AEGIS Weapon Systems (AWS), and Navy Standard Missile II (SM-2) Block IV missiles while retaining the Anti-Air Warfare (AAW) capability. Two classes of ships are deployed with the AEGIS combat system: the CG-47 TICONDEROGA-class cruisers and the DDG-51 ARLEIGH BURKE-class destroyers. Navy AREA TBMD took advantage of the attributes of naval forces including overseas presence, mobility, flexibility, and sustainability in order to provide lower tier protection to debarkation ports, coastal airfields, amphibious objective areas, Allied forces ashore, and other high value sites. Navy assets provided an option for initial TBMD allowing the insertion of additional land-based TBMD assets and other expeditionary forces in an anti access or area denial environment. Navy AREA TBMD was designed to be fully interoperable within the Ballistic Missile Defense System (BMDS).

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>5 - Engineering and Manufacturing Development</b>	<b>PE NUMBER AND TITLE</b> <b>0604867C Navy Area - EMD</b>
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<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget (FY 2002 PB)	271648	388496	145066*
Congressional Adjustments		-288496	
Appropriated Value	274234	100000	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-3182	-698	
b. SBIR / STTR	-5973		
c. SIAP Reprogramming	-1500		
d. Below Threshold Reprogramming			
e. Internal Realignment	3874		
f. Rescissions			
Adjustments to Budget Years Since FY 2002 PB	-4195		-145066**
Current Budget Submit (FY 2003 Budget Estimates)	267453	99302	0

Change Summary Explanation:  
 Funding: The FY 2001 decreases of \$3182K represent this program's portion of the Congressional reductions and the \$5973K was for SBIR. The \$1500K was reprogrammed for SIAP.

Funding: FY 2002: We operated under Continuing Resolution Authority (CRA) funding (\$64M), through the 1st quarter FY02 for program of record efforts. The OUSD (AT&L) decision to cancel the program on 14 December 2001, coupled with executing the Program of Record under the CRA will leave an appropriation balance of \$36M to fund termination liabilities of the program.

Funding: FY 2003: \* From Previous Administration President's Budget.  
 \*\* Program terminated in FY 2002.

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>5 - Engineering and Manufacturing Development</b>	<b>PE NUMBER AND TITLE</b> <b>0604867C Navy Area - EMD</b>	<b>PROJECT</b> <b>2021</b>
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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
2021 Navy Area	0	99302	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

The Navy AREA Theater Ballistic Missile Defense (TBMD) program was planned to provide ballistic missile defense against short to medium range threat missiles. However, on 14 December 2001, OUSD (AT&L) elected to cancel in lieu of certifying the program in accordance with Nunn-McCurdy provision under USC Title 10. Navy AREA TBMD was being built on the national investment in AEGIS ships, AEGIS Weapon Systems (AWS), and Navy Standard Missile II (SM-2) Block IV missiles while retaining the Anti-Air Warfare (AAW) capability. Two classes of ships are deployed with the AEGIS combat system: the CG-47 TICONDEROGA-class cruisers and the DDG-51 ARLEIGH BURKE-class destroyers. Navy AREA TBMD took advantage of the attributes of naval forces including overseas presence, mobility, flexibility, and sustainability in order to provide lower tier protection to debarkation ports, coastal airfields, amphibious objective areas, Allied forces ashore, and other high value sites. Navy assets provided an option for initial TBMD allowing the insertion of additional land-based TBMD assets and other expeditionary forces in an anti access or area denial environment. Navy AREA TBMD was designed to be fully interoperable within the Ballistic Missile Defense System (BMDS).

**FY 2001 Accomplishments:**

- 0 This project was reported in project 2263, Program Element 0604867C.
- Total 0

**FY 2002 Planned Program:**

- 99302 Program Termination Liability. Conduct orderly termination of the program based on the termination implementation plan approved by the Department.
- Total 99302

**FY 2003 Planned Program:**

- 0 Program Terminated.
- Total 0

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604867C Navy Area - EMD</b>
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<b>B. <u>Other Program Funding Summary</u></b>	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

<b>D. <u>Schedule Profile</u></b>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Termination Effort		4Q						

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**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**5 - Engineering and Manufacturing Development**

**PE NUMBER AND TITLE**  
**0604867C Navy Area - EMD**

**PROJECT**  
**2021**

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. SM-2 Blk IVA Missile	CPAF	RAYTHEON, AZ	572267						572267	
b. SM-2 Blk IVA Missile	WR	CHINA LAKE, CA	7600						7600	
c. AWS/BMC41/T&E	CPAF	LOCKHEED MARTIN, MA	244484						244484	
d. AWS/BMC41/SM-2	WR	NSWC/DD, VA	36022						36022	
e. AWS/BMC41/SM-2	CPFF	JHU/APL, MD	48350						48350	
f. AWS/SM-2	MIPR	MIT/LL, MA	3790						3790	
g. AWS/BMC41	CPFF	TSC, VA	1600						1600	
h. AWS/SM-2/BMC41	WR	NWAS, CA	3854						3854	
i. VLS/SM-2	CPAF	UNITED DEFENSE, VA	7722						7722	
j. BMC41	RCP	SPAWAR, CA	18944						18944	
k. BMC41	CPFF	ANTEON, VA	7495						7495	
l. SM-2/AWS/VLC/BMC41	VARIOUS	VARIOUS	44144						44144	
Subtotal Product Development:			996272						996272	

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. Sys Architecture/AWS	CPFF	JHU/APL, MD	4997						4997	
b. SM2/AWS/SysArch/VLS	WR	NSWC/DD, VA	19850						19850	
c. VLS/Sys Arch/BMC41	VARIOUS	VARIOUS	17345						17345	
d. AWSI	CPFF	TSC, VA	5272						5272	
e. AWS	WR	NWAS, CA	3880						3880	
f. AWS	MIPR	MIT/LL, MA	5200						5200	
Subtotal Support Costs:			56544						56544	

Remark:

**UNCLASSIFIED**

**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**5 - Engineering and Manufacturing Development**

**PE NUMBER AND TITLE**  
**0604867C Navy Area - EMD**

**PROJECT**  
**2021**

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. T&E/Lethality	CPFF	JHU/APL, MD	7348						7348	
b. Test & Evaluation	CPAF	RAYTHEON, AZ	968						968	
c. VLS	CPAF	LOCKHEED MARTIN, NJ	141						141	
d. Test & Evaluation	WR	WSMR, NM	8847						8847	
e. Test & Evaluation	WR	PMRF, HI	2261						2261	
f. T&E/IMPACT/Lethality	WR	NSWC/DD, VA	32666						32666	
g. VLS/T&E	WR	NSWC/PHD, CA	7396						7396	
h. T&E/Lethality	MIPR	MIT/LL, MA	788						788	
i. T&E	WR	COTF, VA	1375						1375	
j. Targets	N/A	SMDC Army, AL	94384						94384	
k. T&E/VLS/BMC4I	VARIOUS	VARIOUS	7074						7074	
Subtotal Test and Evaluation:			163248						163248	

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. SM-2 Blk IVA Missile/AWS	CPAF	BAE SYSTEMS, VA	9879						9879	
b. AEGIS Weapon System	CPFF	PCI, VA	1450						1450	
c. System Architecture	PD	NAVSEA, VA	11000						11000	
d. T&E/ Sys Architecture/AWS	CPFFf	ANTEON, VA	4221						4221	
e. SM/BMC4I/SysArc/VLS	VARIOUS	VARIOUS	10506						10506	
Subtotal Management Services:			37056						37056	

Remark:



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MDA RDT&E COST ANALYSIS (R-3)										DATE
BUDGET ACTIVITY										February 2002
<b>5 - Engineering and Manufacturing Development</b>					PE NUMBER AND TITLE					PROJECT
					<b>0604867C Navy Area - EMD</b>					<b>2021</b>
V. CRA for Program of Record/Termination Liability	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. SM-2 Blk IVA Missile	CPAF	RAYTHEON, AZ		33258	1/2Q				33258	
b. SM-2 Blk IVA Missile	WR	CHINA LAKE, CA		327	1/2Q				327	
c. AWS/BMC41	CPAF	LOCKHEED MARTIN, NJ		2600	1/2Q				2600	
d. AWS/BMC4I/SM-2	WR	NSWC/DD, VA		4431	1/2Q				4431	
e. AWS/BMC4I/SM-2	CPFF	JHU/APL, MD		5053	1/2Q				5053	
f. AEGIS Weapon System	MIPR	MIT/LL, MA		550	1/2Q				550	
g. AWS/BMC41	CPFF	TSC, VA		200	1/2Q				200	
h. AWS/SM-2	WR	NWAS/Corona, CA		750	1/2Q				750	
i. BMC41	CPFF	ANTEON, VA		1765	1/2Q				1765	
j. SM-2/AWS	CPAF	LOGICON, VA		471	1/2Q				471	
k. SM-2	IPR	DTI, VA		79	1/2Q				79	
l. SM-2/VLS/T&E	WR	NSWC/PHD, CA		3535	1/2Q				3535	
m. SM-2/VLS	WR	NSWC/IH, MD		552	1/2Q				552	
n. AWS/T&E	IPR	BAE Systems, VA		950	1/2Q				950	
o. AWS	WR	NAWC/AD, MD		75	1/2Q				75	
p. AWS/T&E	WR	NRL, DC		240	1/2Q				240	
q. AWS	CPFF	PCI, VA		597	1/2Q				597	
r. T&E	WR	NAWC/PM, CA		325	1/2Q				325	
s. T&E	MIPR	MITRE, NJ		330	1/2Q				330	
t. T&E	WR	PMRF, HI		120	1/2Q				120	
u. BMC4I	IPR	JAYCOR, VA		10	1/2Q				10	
v. BMC4I	IPR	SPA, VA		345	1/2Q				345	
w. SYS ARCHITECTURE	CPFF	PARADIGM, VA		900	1/2Q				900	
x. SYS ARCHITECTURE	MIPR	ADI, VA		150	1/2Q				150	
y. SYS ARCHITECTURE	N/A	NAVSEA, VA		1075	1/2Q				1075	
z. Targets	N/A	SMDC Army, AL		345	1/2Q				345	
aa.SM-2/AWS/VLS	VARIOUS	VARIOUS		40269	1/2Q				40269	
Subtotal				99302					99302	
Termination Costs:										

<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604867C Navy Area - EMD</b>	PROJECT <b>2021</b>
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Project Total Cost:			1253120	99302				1352422	
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Remark:

**UNCLASSIFIED**

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604867C Navy Area - EMD</b>	PROJECT <b>2263</b>
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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
2263 Navy Area	267453	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

The Navy Area Theater Ballistic Missile Defense (TBMD) program builds on the national investment in AEGIS ships, AEGIS Weapon Systems (AWS), and Navy Standard Missile II (SM-2) Block IV missiles. Two classes of ships continue to be deployed with the AEGIS combat system: the CG-47 TICONDEROGA-class cruisers and the DDG-51 ARLEIGH BURKE-class destroyers. Navy Area TBMD will take advantage of the attributes of naval forces including overseas presence, mobility, flexibility, and sustainability in order to provide lower tier protection to debarkation ports, coastal airfields, amphibious objective areas, Allied forces ashore, and other high value sites. Navy assets will provide an option for initial TBMD allowing the insertion of additional land-based TBMD assets and other expeditionary forces in an opposed environment. Navy Area TBMD is designed to be fully interoperable within the Theater Missile Defense (TMD) Family of Systems (FoS) architecture, will complement the land-based PAC-3 system, the Navy Theater Wide (NTW) and Theater High Altitude Area Defense (THAAD) upper tier TBMD systems.

**FY 2001 Accomplishments:**

- 234421 Continued Engineering/Manufacturing Development (EMD) of the SM-2 Block IVA missile. Continued White Sands Missile Range (WSMR) missile flight testing. Continued fabrication and delivery of EMD test rounds. Continued AWS Baseline 6 Phase III full capability (tactical) computer program coding and computer program testing at Combat Systems Engineering Development Site (CSEDS). Began preparations for delivery of AWS tactical computer program to Developmental Testing/Operational Testing (DT/OT) test ship. Continued follow-on AWS Baseline 7 Phase I computer program development. Continued implementation of modifications to Navy Command and Controls systems. Gained Low Rate Initial Production Long Lead Material (LRIP LLM) decision and awarded LRIP LLM contract December 00.
  - 1634 Completed Live Fire Test & Evaluation (LFT&E) ground test program activities. Continued required lethality analyses and lethality model refinements.
  - 31398 Continued building targets to support Navy TBMD flight tests and maintained infrastructure to support TMD targets.
- Total 267453

**FY 2002 Planned Program:**

- 0 This project was moved to project 2021, Program Element 0604867C.
- Total 0

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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>	PE NUMBER AND TITLE <b>0604867C Navy Area - EMD</b>	PROJECT <b>2263</b>
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**FY 2003 Planned Program:**

- 0 Program Terminated.
- Total 0

<b>B. Other Program Funding Summary</b>	<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>
WPN BLI: 223400 -SM-2 BLK IVA	68141	0	0	0	0	0	0	0	TBD
WPN 229000er Missile Support Mk 21 Mod 1 VLS Canisters for SM-2 BLK IVA	2342	0	0	0	0	0	0	0	TBD

**C. Acquisition Strategy:**

Navy Area Defense. The Navy Area program builds on the existing Aegis air defense system to achieve a sea-based lower-tier BMD capability. The program includes a phased development with early demonstration of AEGIS Theater Ballistic Missile detection capability. This strategy consists of a Navy Area TBMD Program evolving to a Theater-Wide Defense TBMD program. The Navy Area Program strategy will build on existing force structure by modifying the SM-2 Block IV missile and AEGIS Combat System to achieve TBMD capability.

<b>D. Schedule Profile</b>	<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>FY 2008</u>
Long Lead Material for Low Rate Initial Production Decision	1Q							
AWS Baseline 6 Phase 3 Demonstration (CSEDS)	4Q							

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<b>MDA RDT&amp;E COST ANALYSIS (R-3)</b>		DATE <b>February 2002</b>
BUDGET ACTIVITY <b>5 - Engineering and Manufacturing Development</b>		PE NUMBER AND TITLE <b>0604867C Navy Area - EMD</b>
		PROJECT <b>2263</b>

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. SM-2 Blk IVA Missile	CPAF	RAYTHEON, AZ	572267						572267	
b. SM-2 Blk IVA Missile	WR	CHINA LAKE, CA	7600						7600	
c. AWS/BMC41/T&E	CPAF	LOCKHEED MARTIN, NJ	244484						244484	
d. AWS/BMC41/SM-2	WR	NSWC/DD, VA	36022						36022	
e. AWS/BMC41/SM-2	CPFF	JHU/APL, MD	48350						48350	
f. AEGIS Weapon System	MIPR	MIT/LL, MA	3790						3790	
g. AWS/BMC41	CPFF	TSC, VA	1600						1600	
h. AWS/SM-2	WR	NWAS/Corona, CA	3854						3854	
i. Vertical Launch System	CPAF	UNITED DEFENSE, MN	7722						7722	
j. BMC4I	RCP	SPAWAR, CA	18944						18944	
k. BMC4I	CPFF	ANTEON, CA	7495						7495	
l. SM-2/AWS/VLS	VARIOUS	VARIOUS	44144						44144	
Subtotal Product Development:			996272						996272	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<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. System Architecture	CPFF	JHU/APL, MD	4997						4997	
b. SM-2/AWS/Sys Arch	WR	NSWC/DD, VA	19850						19850	
c. VLS/Sys Arch/BMC4I	VARIOUS	VARIOUS	17345						17345	
d. AWS	CPFF	TSC, VA	5272						5272	
e. AWS	WR	NWAS/Corona, CA	3880						3880	
f. AWS	MIPR	MIT/LL, MA	5200						5200	
Subtotal Support Costs:			56544						56544	

Remark:

UNCLASSIFIED

**MDA RDT&E COST ANALYSIS (R-3)**

DATE  
**February 2002**

**BUDGET ACTIVITY**  
**5 - Engineering and Manufacturing Development**

**PE NUMBER AND TITLE**  
**0604867C Navy Area - EMD**

**PROJECT**  
**2263**

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. T&E/Lethality	CPFF	JHU/APL, MD	7348						7348	
b. Test & Evaluation	CPAF	RAYTHEON, AZ	968						968	
c. VLS	CPAF	LOCKHEED MARTIN, NJ	141						141	
d. Test & Evaluation	WR	WSMR, NM	8847						8847	
e. Test & Evaluation	WR	PMRF, HI	2261						2261	
f. T&E/IMPACT/Lethality	WR	NSWC/DD, VA	32666						32666	
g. VLS/T&E	WR	NSWC/PHD, CA	7396						7396	
h. T&E/Lethality	MIPR	MIT/LL, MA	788						788	
i. T&E	WR	COTF, VA	1375						1375	
j. Targets	N/A	SMDC Army, AL	94384						94384	
k. T&E/VLS/BMC4I	VARIOUS	VARIOUS	7074						7074	
Subtotal Test and Evaluation:			163248						163248	

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. Sm-2 Blk IVA Missile	CPAF	BAE SYSTEMS, VA	9879						9879	
b. AEGIS Weapon System	CPFF	PCI, VA	1450						1450	
c. Systems Architecture	PD	NACSEA, VA	11000						11000	
d. T&E/Sys Architecture	CPFF	ANTEON, VA	4221						4221	
e. SM/BMC4I/Sys Arch/VLS	VARIOUS	VARIOUS	10506						10506	
Subtotal Management Services:			37056						37056	

Remark:

Project Total Cost:			1253120						1253120	
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Remark:

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2002		
BUDGET ACTIVITY <b>6 - Management and Support</b>				PE NUMBER AND TITLE <b>0605502C Small Business Innovation Research</b>				PROJECT <b>1660</b>	
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
1660 Statutory and Mandated Programs	89104	0	0	0	0	0	0	TBD	TBD
<p><b>A. Mission Description and Budget Item Justification</b></p> <p>This task explores innovative concepts pursuant to PL102-564 (Small Business Research and Development Enhancement Act of 1992) which mandates a two-phase competition for small businesses with innovative technologies that can also be commercialized. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs will develop a variety of new dual-use technologies for possible future Ballistic Missile Defense Organization (BMDO) needs. Dual-use means that the technologies will also be judged on their potential for future private sector investment both as a vehicle for reducing development time and cost, unit costs of new BMDO technologies, and as a route to national economic growth through new commercial products. BMDO will conduct the competition and the executing agents will award and manage the contracts.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 10859 Phase I SBIR Awards</li> <li>• 65979 Phase II SBIR Awards</li> <li>• 1304 Phase I STTR Awards</li> <li>• 700 Phase II STTR Awards</li> <li>• 10262 Undistributed funds carried forward to FY 2002 for the SBIR/STTR program.</li> </ul> <p>Total 89104</p> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 0* FY 2002 SBIR funding will be at least \$75M in accordance with Conference Report 107-350 to accompany H.R. 3338. These funds will be collected and executed in accordance with the usual annual procedures for administering this program.</li> </ul> <p>Total 0</p> <p><b>FY 2003 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 0 Nothing Planned</li> </ul> <p>Total 0</p>									
Project 1660			Page 1 of 2 Pages			Exhibit R-2 (PE 0605502C)			

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>6 - Management and Support</b>	<b>PE NUMBER AND TITLE</b> <b>0605502C Small Business Innovation Research</b>	<b>PROJECT</b> <b>1660</b>
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<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002</u> PB)	0	0	0
Appropriated Value			
Adjustments to Appropriated Value			
a. Congressional General Reductions			
b. SBIR / STTR	89104		
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since <u>FY 2002</u> PB	89104		
Current Budget Submit ( <u>FY 2003</u> Budget Estimates)	89104	0	0

Change Summary Explanation:

Funding for SBIR at Congressionally mandated level.



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<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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<b>BUDGET ACTIVITY</b> <b>6 - Management and Support</b>	<b>PE NUMBER AND TITLE</b> <b>0901585C Pentagon Reservation Maintenance Reserve Fund</b>	<b>PROJECT</b> <b>1094</b>
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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
1094 PENTAGON RESERVATION MAINT RESERVE FUND	0	6571	7457	7261	7356	7440	7526	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This DoD-directed Program Element started in FY 2001 to separately identify costs for the Pentagon Reservation Maintenance Reserve Fund (PRMRF). The PRMRF finances the following: real property operation and maintenance costs of the Pentagon and Federal Office Building 2, the renovation of the Pentagon, the Remote Delivery Facility, and the Metro Entrance Facility Projects.

**FY 2001 Accomplishments:**

- 0 FY 2001 funding was previously included in this Program Element but under Budget Activity 4
- Total 0

**FY 2002 Planned Program:**

- 6571 Continue program as described in Block A.
- Total 6571

**FY 2003 Planned Program:**

- 7457 Continue program as described in Block A.
- Total 7457

<b><u>B. Program Change Summary</u></b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget (FY 2002 PB)	0	6571	5257*
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			

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**MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)** DATE **February 2002**

<b>BUDGET ACTIVITY</b> <b>6 - Management and Support</b>	<b>PE NUMBER AND TITLE</b> <b>0901585C Pentagon Reservation Maintenance Reserve Fund</b>	<b>PROJECT</b> <b>1094</b>
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Adjustments to Budget Years Since <u>FY 2002</u> PB			+2200**
Current Budget Submit ( <u>FY 2003</u> Budget Estimates)	0	6571	7457

Change Summary Explanation: \*Previous Administration's FY 2002 President's Budget.  
 \*\*FY 2003 Funding: \$5257 was submitted in the Previous Administration President's Budget. Increased funding required for additional square footage for MDA offices in FOB2 (Navy Annex).

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MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2002		
BUDGET ACTIVITY <b>6 - Management and Support</b>				PE NUMBER AND TITLE <b>0901598C Management Headquarters</b>				PROJECT <b>1095</b>	
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
1095 Personnel and Related Costs	0	23943	27909	28705	28948	29080	28664	Continuing	Continuing
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>As directed by the DoD Directive 5100.73, "Major DoD Headquarters Activities", signed by the Deputy Secretary of Defense on 13 May 1999, starting in FY 2002, this new Program Element (PE) is established to separate the Management Headquarters support costs.</p> <p>This project funds the following basic areas: personnel and related costs; and service support contracts.</p> <p>Personnel and related costs covers payroll and benefits of government civilians performing program-wide oversight functions such as financial management, contracting, security, information systems support and legal services at the Missile Defense Agency located within the Washington D.C. area. This project also funds related costs such as civilian benefit, travel, rents &amp; utilities, supplies and equipment and service support contracts for operational and maintenance activities. Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, training, rents and utilities, service contracts and supplies and equipment.</p> <p><b>FY 2001 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 0 This project has no funding in FY 2001 under this Program Element.</li> </ul> <p>Total 0</p> <p><b>FY 2002 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 19202 Civilian Pay &amp; Benefits</li> <li>• 1532 Travel &amp; Transportation</li> <li>• 875 Training</li> <li>• 633 Rents &amp; Utilities</li> <li>• 749 Service Contracts</li> <li>• 952 Supplies &amp; Equipment</li> </ul> <p>Total 23943</p> <p><b>FY 2003 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 19567 Civilian Pay &amp; Benefits</li> <li>• 3986 Travel &amp; Transportation</li> <li>• 872 Training</li> </ul>									
Project 1095			Page 1 of 2 Pages			Exhibit R-2 (PE 0901598C)			

<b>MDA RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2002</b>
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BUDGET ACTIVITY <b>6 - Management and Support</b>	PE NUMBER AND TITLE <b>0901598C Management Headquarters</b>	PROJECT <b>1095</b>
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- 630 Rents & Utilities
  - 949 Service Contracts
  - 1905 Supplies & Equipment
- Total 27909

<b>B. Program Change Summary</b>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Previous President's Budget ( <u>FY 2002</u> PB)	0	0	0
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 2002</u> PB		23943	27909
Current Budget Submit ( <u>FY 2003</u> Budget Estimates)	0	23943	27909

Change Summary Explanation:

1. COMPONENT MDA		FY 2003 RDT&E CONSTRUCTION PROJECT			2. DATE February 2002	
3. INSTALLATION AND LOCATION USA Kodiak Island, Alaska			4. PROJECT TITLE Missile Defense System Test Bed - Kodiak Facilities Ph II			
5. PROGRAM ELEMENT 0603880C 0603882C		6. CATEGORY CODE 312	7. PROJECT NUMBER MDA 505		8. PROJECT COST(\$000) Auth 0 Approp 14,880	
<b>9. COST ESTIMATES</b>						
ITEM			U/M	QUANTITY	UNIT COST	COST (\$000)
<b>PRIMARY FACILITIES</b>						17,250
Test Missile Launch Silos			EA	2	5,330,000	(10,660)
BMC3 IDT Complex for Kodiak Test Site			LS			(1,739)
DSCS Complex at Kodiak Test Site			LS			(869)
Telemetry Facility			LS			(2,485)
Launch Silo Chiller Facilities			EA	2	56,000	(112)
Total from Continuation Page						(1,385)
<b>SUPPORTING FACILITIES</b>						6,023
Electric Service			LS			(1,297)
Water, Sewer, Gas			LS			(669)
Paving, Walks, Curbs and Gutters			LS			(521)
Site Imp (602) /Demo ( )			LS			(602)
Information Systems			LS			(251)
Antiterrorism Force Protection			LS			(1,925)
Other (Mob/Demob)			LS			(758)
<b>ESTIMATED CONTRACT COST</b>						23,273
CONTINGENCY PERCENT (5%)						1,164
SUBTOTAL						24,436
Supervision, Inspection & Overhead (7.5%)						1,833
TOTAL REQUEST						26,269
TOTAL REQUEST (ROUNDED)						26,270
INSTALLED EQPT-OTHER						66,390
APPROPRIATIONS						
<b>10. Description of Proposed Effort:</b> Construct a Ballistic Missile Defense (BMD) System Test Bed Launch Complex at Kodiak, Alaska, for the purpose of BMD System testing, including, initially, Ground-based Midcourse Defense (GMD) Element flight test geometry expansion. GMD will follow Missile Defense Agency (MDA) capability based acquisition strategy that emphasizes testing, spiral development and evolutionary acquisition through the use of 2-year capability blocks. This project was submitted for authorization in FY2002 with multi-year appropriations phased and distributed over more than one fiscal year. In FY2002, \$26.27 million was authorized and \$8.20 appropriated for Phase I, MDA Project Number (PN) 502. This requests is for Phase II; \$14.88 million in FY2003. Additional planned request for Phase III, MDA 506, is \$3.19 million in FY2004. The project provides funding of \$5.40 million in FY2002, \$0.98 million in FY2003, and \$2.71 million in FY2004 under PE No. 0603880C; plus \$2.80 million in FY2002, \$13.90 million in FY2003, and \$0.48 million in FY2004 under PE No. 0603882C. This project upgrades facilities at an existing launch test site, constructs additional test missile launch capabilities and provides for the installation of test Battle Management Command Control and Communications (BMC3) capability with In-Flight Interceptor Communications System Data Terminals (IDT), and Defense Satellite Communication System (DSCS) Test Facilities. This Test Missile Launch site						

1. COMPONENT MDA	FY 2003 RDT&E CONSTRUCTION PROJECT	2. DATE February 2002
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3. INSTALLATION AND LOCATION  
USA KODIAK ISLAND ALASKA

4. PROJECT TITLE Missile Defense System Test Bed - Kodiak Facilities, Ph II	5. PROJECT NUMBER MDA 505
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9. COST ESTIMATES (CONTINUED)				
<u>Item</u>	<u>U.M (M/E)</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Cost (000)</u>
<b>PRIMARY FACILITIES (CONTINUED)</b>				<b>1,385</b>
Add/Alter Launch Control Center	LS			(248)
Add/Alter Missile Assembly Building	LS			(248)
Booster Storage Area	LS			(93)
Fuel Storage Buildings	LS			(93)
Diesel Transfer Point	LS			(93)
Mission Electrical Power Facilities	LS			(609)

**DESCRIPTION OF PROPOSED CONSTRUCTION (CONTINUED):**

Includes alterations to existing launch control facilities and to existing missile assembly building; plus construction of 2 Launch Silos, Telemetry Facility, Launch Silo Chillers Facilities, Booster Storage Area, Fuel and Oxidizer Storage Buildings, Diesel Transfer Point and mission electrical power. Construct BMC3 Test Facilities to house IDT and DSCS satellite communications equipment. Supporting facilities include utilities, pavements, buried power and communication lines, fire detection and suppression systems, security and site infrastructure.

11. REQ: 1 - EA                      ADQT: NONE                      SUBSTD: NONE

**PROJECT**: Construct Launch, Operations and Support Facilities to support the Ballistic Missile Defense System Test Bed. (New Mission)

**REQUIREMENT**: This project is required to provide essential test bed facilities to conduct and support expansion of flight test geometries in an environment that simulates actual operational conditions.

**CURRENT SITUATION**: The Missile Defense Agency (MDA) is developing a missile defense system and planning for a Ballistic Missile Defense System Test Bed to ensure operational equipment and missiles adequately meet technological and threat assessments. One of the major criticisms of the MDA Test Programs has been a lack of operationally realistic testing. An upgrade of the Kodiak Launch Complex is proposed to reduce, or eliminate, this issue. The Missile Defense System Test Bed program can use some existing facilities but will have to construct mission launch facilities and modify some existing facilities to meet all test requirements.

**IMPACT IF NOT PROVIDED**: If this project is not provided, flight testing of the Missile Defense System Test Bed and its components against challenging, realistic targets will be limited, so that some development shortfalls might not be resolved prior to any future fielding. The full potential under current technology to develop, integrate and test a system to protect against a limited attack from a nation of concern may not be achieved.

**ADDITIONAL INFORMATION**: Cost estimates are based on parametric estimates and similar experience gained during construction of test facilities at Kwajalein Missile Range. This project is being coordinated with the appropriate physical security plans, and required physical security and/or combating terrorism (CBT/T) measures are being included. Environmental analysis is being accomplished. Project specific environmental documentation is being prepared as necessary.

1. COMPONENT  MDA	FY 2003 RDT&E CONSTRUCTION PROJECT	2. DATE  February 2002
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3. INSTALLATION AND LOCATION  
USA KODIAK ISLAND ALASKA

4. PROJECT TITLE Missile Defense System Test Bed - Kodiak Facilities, Ph II	5. PROJECT NUMBER MDA 505
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12. SUPPLEMENTAL DATA

A Estimated Design Date

(1) Status

(a) Date Design Started:	Apr 2002
(b) Percent Complete As of January 2002	0%
(c) Date 35% Designed	Jul 2002
(d) Date Design Complete:	Sep 2002
(e) Parametric Cost Estimating Used to Develop Costs	Yes
(f) Type of Design Contract: design-build	

(2) Basis of Design

(a) Standard or Definitive Design	No
(b) Where Design was most recently used:	

(3) Total Cost (000) (c)= (a)+(b) or (d)+(e)

(a) Production of Plans and Specifications:	\$ 1,450
(b) All other Design Costs:	\$ 1,180
(c) Total Design Costs	\$ 2,630
(d) Contract	N/A
(e) In-house	N/A

(4) Construction Contract Award Sep 2002

(5) Construction Start Jan 2003

(6) Construction Complete Oct 2004

B Equipment associated with this project which will be provided from other appropriations:

<u>Equipment Nomenclature</u>	<u>Procuring Appropriation</u>	<u>Fiscal Year Appropriated Or Requested</u>	<u>Cost (\$000)</u>
Test Equipment	RDT&E	2002	22,500
Test Equipment	RDT&E	2003	30,400
Test Equipment	RDT&E	2004	13,490
		TOTAL	66,390

1. COMPONENT MDA	<b>FY 2003 RDT&amp;E CONSTRUCTION PROJECT DATA</b>			2. DATE February 2002
3. INSTALLATION AND LOCATION6 Various Worldwide Locations		4. PROJECT TITLE Missile Defense System Test Bed Facilities, Ph II		
5. PROGRAM ELEMENT 0603882C	6. CATEGORY CODE 312	7. PROJECT NUMBER MDA 503	8. PROJECT COST (\$000) Auth 0 Approp 121,778	
<b>9. COST ESTIMATES</b>				
ITEM	U/M (M/E)	QUANTITY	UNIT COST	COST (\$000)
<b>PRIMARY FACILITIES</b> Upgrade Elec Power Gen Plant LS (200,851) Add/Alt Test Support Facilities LS (26,958) Missile Launch Silos LS (1,072) Mechanical-Electrical Building LS (44,390) Missile Assembly Building LS (2,116) Total from Continuation pages LS (10,442) (115,873)				
<b>SUPPORTING FACILITIES</b> Electric Service LS (127,558) Water, Sewer, Gas LS (18,892) Paving, Walks, Curbs and Gutters LS (45,748) Site Imp (20,591) /Demo ( ) LS (15,586) Information Systems LS (20,591) Antiterrorism Force Protection LS (1,407) Other (Mob/Demob) LS (7,003) (18,331)				
<b>ESTIMATED CONTRACT COST</b> CONTINGENCY PERCENT (5%) 328,409 SUBTOTAL 16,420 SUPERVISION, INSPECT'N & OH (7.5 %) 344,829 TOTAL REQUEST 25,862 370,691  INSTALLED EQPT-OTHER 94,822 APPROPRIATIONS				
<b>10. DESCRIPTION OF PROPOSED CONSTRUCTION:</b> Construct Ballistic Missile Defense (BMD) System Test Bed facilities at various sites for the purpose of BMD System testing, including, initially, Ground-Based Midcourse Defense (GMD) Element operational concept validation. GMD will follow Missile Defense Agency (MDA) capability based acquisition strategy that emphasizes testing, spiral development and evolutionary acquisition through the use of 2-year capability blocks. This project was authorized for construction with multi-year appropriations due to the complex nature and overall cost. In FY2002, \$404.69 million was authorized and \$273.12 million was appropriated (which included \$27.03 million for Planning & Design) for Phase I, MDA Project Number (PN) 501. This request is for Phase II, \$121.80 million in FY2003. Additional planned request for Phase III, MDA PN 504, is \$2.80 million in FY2004. This project continues funding for the initial construction of the test facilities within the Test Bed that will validate the GMD operational concept. This project upgrades facilities at an existing radar site, constructs test missile launch complex and provides for the installation of Battle Management Command, Control and Communication (BMC3) with In-Flight Interceptor Communication System Data Terminals (IDTs), Communications Network (CN), Command and Control Equipment, and Upgrade of Early Warning Radar (EWR). The Radar Site facilities include upgrade to an existing Electrical Power Generation Plant and alterations to existing test support facilities at Eareckson Air Force Station, Shemya, AK. The Test Missile Launch Site facilities include a test Missile Field with Mechanical/Electrical Building, Missile Storage Igloos, a Missile Assembly Building, Exoatmospheric Kill Vehicle (EKV) Assembly Building, EKV Fuel and Oxidizer Storage Buildings, a Readiness/Control/BMC2 Station, a Utility Building, Fuel Unloading and Storage				



<b>1. COMPONENT</b>  MDA	<b>FY 2003 RDT&amp;E CONSTRUCTION PROJECT DATA</b>	<b>2. DATE</b>  February 2002
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**3. INSTALLATION AND LOCATION**  
Various Worldwide Locations

**4. PROJECT TITLE**  
Missile Defense System Test Bed Facilities, Ph II

**5. PROJECT NUMBER**  
MDA  
503

9. COST ESTIMATES (CONTINUED)			Unit	Cost
Item	U/M (M/E)	QUANTITY	COST	(000)
<b>PRIMARY FACILITIES (CONTINUED)</b>				<b>115,873</b>
EKV Assembly Building	LS			(5,987)
EKV Fuel Storage Building	LS			(591)
EKV Oxidizer Storage Buildings	LS			(591)
Readiness/Control/BMC2 Station	m2(SF)	2,178 (23,439)	9,037(839.71)	(19,682)
Utility Building	LS			(7,280)
Fuel Unloading & Storage Facilities	LS			(478)
Electrical Substation	LS			(8,102)
Missile Storage Igloos	EA	3	1,757,667	(5,273)
Add/Alt Test Support Facility	LS			(2,516)
Add/Alt Test Maintenance Building	LS			(2,623)
Entry Control Station	m2(SF)	363 (3,910)	6,708 (622.76)	(2,435)
Water Supply Building	LS			(2,825)
Electronic Security System	LS			(24,000)
Vehicle Cable Tension Test Facility	LS			(550)
Building Information Systems	LS			(1,312)
BMC3 IDT Complex at Radar Site	LS			(7,931)
BMC3 IDT Complex at GBI Site	LS			(7,328)
BMC3 DSCS Complex at Radar Site	LS			(5,353)
BMC3 DSCS Complex at GBI Site	LS			(2,490)
BMC2 Command & Control Node	LS			(1,979)
UEWR Upgrade at Beale AFB	LS			(6,547)

**DESCRIPTION OF PROPOSED CONSTRUCTION (CONTINUED):**

Facilities, an Entry Control Station, an Electrical Substation, a Water Supply Building, alterations to existing test support and maintenance buildings, vehicle cable tension test facility and an Security System at Fort Greely, AK. BMC3 Test Facilities consist of facilities to house the installation of IDTs and Communications Network equipment at Eareckson AFS and Fort Greely, AK. Command and Control Node is planned for Cheyenne Mountain Colorado and there is an upgrade of Early Warning Radar at Beale AFB, CA. Supporting facilities include utilities, pavements, buried power and communications lines, fire detection and suppression systems and site infrastructure.

**11. REQ:** 1 EA ADQT: NONE SUBSTD: NONE

**PROJECT:** Construct Launch, Operations, Maintenance and Support Facilities to support the Ballistic Missile Defense System Test Bed. (New Mission).

**REQUIREMENT:** This project is required to provide essential test bed facilities to conduct and support a robust operational concept validation in an environment that simulates actual operational conditions.

**CURRENT SITUATION:** The Missile Defense Agency (MDA) is developing a Missile Defense System and a Ballistic Missile Defense System Test Bed to ensure operational equipment and missiles adequately meet technological and threat assessments. Currently, no facility capable of supporting realistic testing of system components and elements is available.

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PREVIOUS EDITIONS MAY BE USED INTERNALLY

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1. COMPONENT MDA	<b>FY 2003 RDT&amp;E CONSTRUCTION PROJECT DATA</b>	2. DATE February 2002
3. INSTALLATION AND LOCATION Various Worldwide Locations		
4. PROJECT TITLE Missile Defense System Test Bed Facilities, Ph II		5. PROJECT NUMBER MDA 503

**IMPACT IF NOT PROVIDED:** If this project is not provided, testing of the GMD Element and its components against challenging, realistic environments will be limited, so that some development shortfall might not be resolved. The full potential under current technology to develop, integrate and test a system to protect against a limited attack from a nation of concern may not be achieved.

**ADDITIONAL INFORMATION:** Cost estimates are based upon design and parametric estimates. This project is being coordinated with the installation physical security plan and required physical security and/or combating terrorism (CBT/T) measures are being included. Environmental analysis is being prepared as necessary.

**12. Supplemental Data:**

A Estimated Design Date

- (1) Status
  - (a) Date Design Started: Mar 2000
  - (b) Percent Complete As of January 2001 35%
  - (c) Date 35% Designed Jan 2001
  - (d) Date Design Complete: Jul 2002
  - (e) Parametric Cost Estimating Used to Develop Costs Yes
  - (f) Type of Design Contract: design-bid-build/design-build
- (2) Basis of Design
  - (a) Standard or Definitive Design No
  - (b) Where Design was most recently used:
- (3) Total Cost (000) (c)= (a)+(b) or (d)+(e)
  - (a) Production of Plans and Specifications: \$ 16,593
  - (b) All other Design Costs: \$ 15,317
  - (c) Total Design Costs \$ 31,910
  - (d) Contract \$ 22,018
  - (e) In-house \$ 9,892
- (4) Construction Contract Award Apr 2002
- (5) Construction Start May 2002
- (6) Construction Complete Oct 2004

B. Equipment associated with this project which will be provided from other appropriations:

<u>Equipment Nomenclature</u>	<u>Procuring Appropriation</u>	<u>Fiscal Year Appropriated Or Requested</u>	<u>Cost (\$000)</u>
CN Comm Equipment	RDT&E	2002	9,568
GBI Launch Equipment	RDT&E	2002	68,035
IDT Tracking Equipment	RDT&E	2002	17,219
Furniture	RDT&E	2003	TBD
TOTAL			94,822

<b>1. COMPONENT</b>  MDA	<b>FY 2003 RDT&amp;E CONSTRUCTION PROJECT DATA</b>	<b>2. DATE</b> February 2002
<b>3. INSTALLATION AND LOCATION</b>  Various Worldwide Locations		
<b>4. PROJECT TITLE</b> Missile Defense System Test Bed Facilities, Ph II		<b>5. PROJECT NUMBER</b> MDA 503

12. Supplemental Data: (Continued)

C Other associated costs for this project:

<u>Nomenclature</u>	<u>Appropriation</u>	<u>Fiscal Year Appropriated Or Requested</u>	<u>Cost (\$000)</u>
Planning & Design	RDT&E	2002	27,026
Community Impacts, Ph 1	RDT&E	2002	9,700
Community Impacts, Ph 2	RDT&E	2003	8,620
Community Impacts, Ph 3	RDT&E	2004	6,585
		TOTAL	51,931