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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>								DATE <b>February 1999</b>		
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>				<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>						
<i>COST (In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	684181	200133	195722	218608	215329	216049	182536	186580	TBD	TBD
1155 Discrimination	31579	0	0	0	0	0	0	0	TBD	TBD
1170 TMD Risk Reduction	30955	14637	17251	19330	19195	19130	16359	16623	Continuing	Continuing
2160 TMD Existing System Mods	10275	2447	0	0	0	0	0	0	TBD	TBD
2259 Israeli Cooperative Project	94878	0	0	0	0	0	0	0	TBD	TBD
3153 Systems Architecture and Engineering	14143	0	0	0	0	0	0	0	TBD	TBD
3157 Environmental, Siting and Facilities	3350	0	0	0	0	0	0	0	TBD	TBD
3251 Systems Engineering and Technical Support	47599	19987	22398	18774	20384	21666	15656	15986	Continuing	Continuing
3261 TMD MB/C3I (BM/C3I Concepts)	68958	0	0	0	0	0	0	0	TBD	TBD
3265 User Interface	14484	17229	9871	11264	11103	11074	9654	9982	Continuing	Continuing
3270 Threat and Countermeasures Program	22911	0	0	0	0	0	0	0	TBD	TBD
3352 Modeling and Simulations	62965	17148	11268	11592	11497	11465	9796	9955	Continuing	Continuing
3353 JNTF - TF	38956	0	0	0	0	0	0	0	TBD	TBD
3354 Targets Support	69453	17866	41966	40133	40135	40028	34224	34778	Continuing	Continuing
3359 System Test and Evaluation	38676	4786	11734	24662	24639	24614	21918	21934	Continuing	Continuing
3360 Test Resources	61557	46179	13515	14227	13661	13593	11600	11773	Continuing	Continuing
4000 Operational Support	73442	59854	67719	78626	74715	74479	63329	65549	Continuing	Continuing

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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>The Theater Missile Defense (TMD) program's goal is to develop, maintain and deploy a cost-effective, Anti-Ballistic Missile (ABM) Treaty compliant system designed to protect the United States and its Allies 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, and Navy Area Theater Ballistic Missile Defense (TBMD) formerly (Lower Tier) and Navy Theater-Wide TBMD formerly(Upper Tier).</p> <p>Theater Missile Defense programs, projects, and activities in Advanced Development that have as a primary objective the development of technologies capable of supporting systems, components, and architectures that could produce highly effective defenses against theater missile threats. Includes manpower authorizations and the associated costs specifically identified and measured to the performance of these programs.</p> <p>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.</p>		
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<b>B. Program Change Summary</b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	582000	176846	219480	217220
Congressional Adjustments		31000		
Appropriated Value		207846		
Adjustments to Appropriated Value				
a. Congressional Reductions (FFRDC, Inflation, etc)		-7606		
b. OSD Reductions		-107		
c. Emergency Supplemental				
Adjustments to Budget Years Since FY 1999 PB				
Current Budget Submit (FY 2000 / 2001 PB)	684181	200133	195722	218608

Change Summary Explanation: FY 1998 Change due to Congressional Emergency Supplemental Appropriation for Iranian Missile Protection Act (IMPACT 98) of +\$102M; Congressional Reprogramming of +\$4.852M from Navy to BMDO for PMRF; -\$30.916M for Defense Wide Reductions; and Below Threshold Reprogramming of +\$3.898M to meet program requirements. FY99 changes due to Defense Wide Reductions and internal reprogramming for higher priority effort. FY 2000 and FY2001 funding was decreased \$23758 and \$18612 respectively, and reallocated to the Navy Theater Wide program to enable an earlier FUE of 2007, as well as to meet additional test and evaluation requirements for threat representative testing. FY2001 funding was increased +\$20M to meet requirements for additional Lethality analysis.

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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>				<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>				<b>PROJECT</b> <b>1155</b>		
<i>COST (In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
1155 Discrimination	31579	0	0	0	0	0	0	0	TBD	TBD

All funding in Project 1155 has been transferred to PE 0603874C starting in FY 1999.

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

This project provides the U.S. with the data and predictive tools to generate high confidence target signatures for ballistic missile defenses (BMD). This is a critical adjunct to the evaluation of BMD system performance across the full spectrum of threats and engagement scenarios. This program provides data collection sensors and instruments for use on live-fire missions and analysis of the resulting test data. This program provides predictive models of target signatures in both Radar and Infrared spectrums. This program evaluates and develops algorithms for the critical functions of discrimination, target handover, and aimpoint selection. This program provides for data storage and retrieval of all Ballistic Missile Defense Office (BMDO) sponsored tests per statutory requirements.

Data Centers and Management. Storage, archival, and retrieval of signature related data is provided by the BMDO-funded Missile Defense Data Center (MDDC) and Advanced Missile Signature Center (AMSC). Both MDDC and AMSC meet the statutory requirements for program data archiving. Starting in FY 98, Data Centers and Management are transferred to Project 3352.

Data Collection Platforms. This project provides core operating costs for Airborne Surveillance Testbed (AST) target signature collection sensor and platform. Mission costs for AST are provided by user acquisition programs. This project provided FY 96 termination costs for the COBRA EYE sensor. This project monitors other BMDO signature data collection programs to ensure complete coverage and avoid duplication.

Algorithms and Analysis. This project performs analysis of radar and optical data on ballistic missile threat signatures and intercept events for the Theater High Altitude Area Defense (THAAD), Navy Theater Wide (NTW), and Navy Area Defense System (NADS) programs. This project develops and evaluates discrimination and kill assessment algorithms for the THAAD, NTW, and NADS programs. In analysis, this project provides accurate, objective, and timely flight data analysis in support of target signature phenomenology characterization and sensor algorithm development and evaluation. This includes TMD optical sensor data from the TMD targets program, project 1170, project 3270, and others. This project provides post-flight characterizations of expected and unexpected target features. Under the guidance of the Target Signatures Working Group (TSWG) develop target models and provide high fidelity signature sets of TMD targets. Evaluate TMD software aimpoint selection, discrimination, and handover algorithms against Dem/Val targets and UOES threats. Provide analysis and recommendations for TMD aimpoint selection, discrimination, and sensor handover. In algorithms, this project develops and analyzes algorithms that have the highest payoff potential for the critical functions of detection, tracking, bulk classification, typing, discrimination, target object map generation, aimpoint selection, and kill assessment. Maintenance and upgrades to the simulation facilities required to develop and evaluate these algorithms against real and simulated data is provided for. The Lexington Discrimination System (LDS) is used to merge radar and optical data analysis on a real-time basis for algorithm development and assessment. Specific tasks include: (1) Use LDS to support

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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>1155</b>
<p>development and evaluation of objective system algorithms to be installed on the THAAD and NTW programs; (2) Use signature data to identify robust discriminants using field measurements; (3) Develop and deliver individual radar discrimination algorithms based on identified discriminants; (4) Develop, deliver, and exercise on the LDS, algorithms which utilize radar and optical data to facilitate seeker Target Object Map and aim-point selection for TMD systems; and (5) Complete the LDS real-time multiple-sensor, multiple-target handling capability and test TMD algorithms/architectures using this capability.</p> <p>Modeling. This project provides high confidence, target and background scene predictions for sensors and BMD systems. These generated scenes are the foundation for high confidence simulations of engagements that cannot or will not be flight tested. The high-fidelity, physics-based models, predicted composite scenes, and associated analytic output developed in this task are evaluated against measured data to ensure confidence in simulation results and provide a reliable route to systems verification and validation. To facilitate this objective, this task also provides crucial data-driven software tools for exploiting measured data and integrating measurements with simulations in support of technology development, test and evaluation, and acquisition efforts.</p> <p>This project also provides for participation in international technical exchange programs in the areas of optical and radar discrimination, reentry, and background and plume phenomenology include: U.S./U.K. Scientific Cooperation Research Exchange (SCORE); use of the UK Multifunctional Electronically Scanned Adaptive Radar (MESAR); NATO Extended Air Defense (EAD)/TMD Ad Hoc Working Group - Plume Phenomenology Expert Group (U.S., U.K., France, Canada); U.S./French Bilateral Group - Plumes, Backgrounds, and Reentry Signatures; U.S./Israeli TBM Signature and Phenomenology Research; and the U.S./German Phenomenology Research committee.</p> <p><b>FY 1998 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 13016 Data Collection Platform: Provide AST core operating costs to collect optical data of TMD target development flights and intercepts.</li> <li>• 13307 Algorithms and Analysis: Continue data analysis support for TMD systems in Dem/Val and EMD. Provide support for TMD radar/optical discrimination algorithms and architectures for advanced TMD threats and pen aids. Develop real-time algorithms for battlefield learning using neural networks, field data, and simulations on LDS. Develop algorithms for real-time sensor resource allocation to support threat-adaptive algorithm architectures.</li> <li>• 5256 Models: Deliver validated signature models for high priority engagement scenarios. Continue participation in international technical exchange programs in the areas of optical and radar discrimination, reentry, and signature phenomenology.</li> </ul> <p>Total 31579</p> <p><b>FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• See PE 0603874C</li> </ul> <p>Total 0</p> <p><b>FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• See PE 0603874C</li> </ul> <p>Total 0</p>		
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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>					<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>					<b>PROJECT</b> <b>1155</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:												
Remark:												

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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>1170</b>
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COST ( <i>In Thousands</i> )	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
1170 TMD Risk Reduction	30955	14637	17251	19330	19195	19130	16359	16623	Continuing	Continuing

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

This project is the primary Theater Missile Defense (TMD) Family of Systems (FoS) Battle Management, Command, Control, Communications, Computers and Intelligence (BMC4I) risk mitigation program for assessing target/threat signature (and the signature-to-system interfaces) issues for all FoS elements beginning early in system development. This project, once encompassing six elements, is now comprised solely of the TMD Critical Measurements Program (TCMP) which builds, flies, observes, and analyzes ballistic missile targets similar to foreign threats.

The purpose of TCMP is to provide the FoS elements with signature and related data collected on tactical ballistic missile targets to mitigate the significant risks associated with TMD weapon system development. The data provided by this project supports the FoS elements throughout their life cycle, from their initial design and testing, to their subsequent product improvement activities. The list of critical data needs is compiled for the principal BMC4I functions of target acquisition, bulk filtering and track, discrimination, threat handover, aimpoint selection, interceptor guidance and control, and finally kill assessment.

Program requirements for this multi-flight test program are derived from the FoS elements through the TCMP User Requirements process. The flight tests are developed to be conducted at the Kwajalein Missile Range using the KREMS radars and other key ancillary sensors to provide radar and optical "truth" data in the following areas of need: resolved infrared (IR) data of an intact missile, exo to low endoatmospheric booster fragmentation, target object maps of closely spaced objects, intact missile intercept debris, tumbling intact missile/warhead, fuel debris, simple decoys, inadvertent and crude maneuvering reentry vehicle, and intact missile breakup. Radar and infrared signature measurements may be performed on both the TCMP flight test articles and foreign threat theater ballistic missiles to ensure the TCMP targets exhibit their intended characteristics and mitigate the risk of test failure. The FoS elements participate in the missile campaign to exercise and assess their sensor and BMC4I capabilities.

**FY 1998 Accomplishments:**

- 27566 Purchased boosters and remaining payload hardware for TCMP 3 flights, focused on countermeasures and mid range threats. Continued payload fabrication, hardware integration, and sensor planning.
- 1250 Continued to collect data and to develop the primary kill assessment algorithms for Engineering Manufacturing and Development (EMD) in support of the THAAD Radar system and Navy Theater Wide program. Completed development of three kill assessment algorithms (blast wave speed, piece size, and RCS polarization).

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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>1170</b>
<ul style="list-style-type: none"> <li>• 600 Used Seeker Experimental System to provide technology assessment for MWIR SM BK IVA focal plane array performance, NTW LWIR focal plane array performance, and THAAD non-uniformity correction techniques. Discrimination performance measurements were performed for THAAD (booster segmentation issue), Navy Area (complex targets), and NTW (baseline 2 color LWIR).</li> <li>• 350 Observed the HERA Blk 2B flight test with the HALO/IRIS optical auxiliary sensor data collection asset. Conducted static RCS tests on TMD targets. Analyzed the FMA item static RCS data. Conducted radar cross section variability analysis on TMD threat missile systems.</li> <li>• 1189 Completed Jet interaction program planning, wind tunnel test model development, analysis of transient JI data to understand response times, and computational analysis.</li> </ul>		
Total      30955		
<b>FY 1999 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• 6097 Complete TCMP-3A launch vehicle and payload fabrication. Conduct pathfinder testing on 3A. Complete 3B booster procurement.</li> <li>• 693 Finalize documentation, and provide technical support and on-site support of flight 3A.</li> <li>• 2828 Conduct TCMP-3A flight test.</li> <li>• 3611 Deploy sensors and analyze data in support of flight 3A.</li> <li>• 490 Continue to plan and execute collection of intercept data. Assess NTW Blk II sensor alternatives for kill assessment.</li> <li>• 918 Government Project Personnel and Support</li> </ul>		
Total      14637		
<b>FY 2000 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• 4164 Complete TCMP payload build-up, integration and testing for TCMP-3B.</li> <li>• 2500 Complete launch vehicle build-up, integration and testing for flight 3B. Conduct TCMP-3B flight test.</li> <li>• 5690 Finalize documentation, and provide technical support and on-site support of flight 3B. Perform flight operations.</li> <li>• 3910 Deploy sensors and analyze data in support of flight 3B.</li> <li>• 987 Government Project Personnel and Support</li> </ul>		
Total      17251		
<b>FY 2001 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• 1940 Conduct mission planning for TCMP-4.</li> <li>• 7653 Design and purchase payload hardware for TCMP-4 flight tests.</li> <li>• 7543 Design and initiate purchase of launch vehicle hardware for TCMP-4 flight tests.</li> <li>• 1060 Initiate sensor planning for TCMP-4. Complete data analysis for TCMP-3 flight tests.</li> <li>• 1134 Government Project Personnel and Support</li> </ul>		
Total      19330		
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<b>B. <u>Other Program Funding Summary</u></b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>

**C. Acquisition Strategy:**

<b>D. <u>Schedule Profile</u></b>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
ALI Kill Assessment Data Collection Plan				4Q						
Block II Sensor Assessment				4Q						
TCMP User Meetings			2Q	1Q	2Q	2Q	2Q	2Q	2Q	2Q
TCMP Launches				4Q	4Q			1Q (2 flights)		2Q (2 flights)
TCMP Data Workshops					1Q	1Q		4Q		4Q

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

DATE **February 1999**

**BUDGET ACTIVITY**  
**4 - Demonstration and Validation**

**PE NUMBER AND TITLE**  
**0603872C Joint TMD - DEM/VAL**

**PROJECT**  
**1170**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. TCMP Payload		MIT/LL, Lexington, Mass.		1000		5017		8786			14803	
b. TCMP Launch Vehicle		OSC, Chandler, AZ		5600		2500		7543			15643	
c. TCMP Booster Mods		Aerojet, CA		1300		1200		1770			4270	
Subtotal Product Development:				7900		8717		18099			34716	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. TCMP Technical Support/Data		TBE, Huntsville, AL		275		400		275			950	
b. TCMP Data Analysis		PRA, Huntsville, AL		280		280		280			840	
c. TCMP Technical Support		NRC, Huntsville, AL		275		275		275			825	
d. TCMP Flight Analysis		AF-TRW		397		600		400			1397	
Subtotal Support Costs:				1227		1555		1230			4012	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. TMD Kill Assessment		USN		490	1 Oct 98	0	0	0	0	490	980	490
b. TCMP Range/Flight Ops		KMR/Raytheon		1602		4292					5894	
c. TCMP Range/Flight Ops		CDC, Wake Island		1000		200					1200	
d. Sensor Deployment		Various		1500		1500					3000	
Subtotal Test and Evaluation:				4592		5992				490	11074	

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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Govt Prog Pers		USASMDC		918	1 Oct 98	987	1 Oct 99	1,134	1 Oct 00		1906	
Subtotal Management Services:				918		987		1			1906	

Remark:

Project Total Cost:				14637		17251		19330		490	51708	
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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>2160</b>
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COST ( <i>In Thousands</i> )	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2160 TMD Existing System Mods	10275	2447	0	0	0	0	0	0	TBD	TBD

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

CUEING AND NETTING. The overarching objective of the cueing and netting task was to enable the US Marine Corps AN/TPS-59 long-range surveillance radar to accept external cues from, and pass cues to, different theater sensors in order to facilitate theater ballistic missile (TBM) identification, location, and tracking. The effort consisted of the development, testing, and operational demonstration of hardware and software improvements to the radar and other supporting systems which were completed in FY98.

SHIELD (Formerly Talon Shield). The SHIELD program is developing a system that receives and fuses Defense Support Program (DSP) assets, other national intelligence data and SIGINT data on theater ballistic missile (TBM) events to provide more timely warning of worldwide TBM launch point, time, azimuth and impact point prediction to tactical units. As processing improvements and additional sources are integrated and fused, these upgraded capabilities are passed to the Air Force Attack and Launch Early Reporting to Theater (ALERT) and the Army Joint Tactical Ground Station (JTAGS) programs for incorporation in the operational systems. The SHIELD system is co-located at the Joint National Test Facility, Falcon Air Force Base, CO with ALERT.

EXTENDED AIRBORNE GLOBAL LAUNCH EVALUATOR (EAGLE). EAGLE was a complementary effort to SHIELD that would have developed a prototype TBM detection, tracking, and cueing system for demonstration and evaluation aboard Air Force AWACS TS-3 test aircraft. It consisted of a passive infrared search and track sensor and an eye-safe laser radar (Ladar). EAGLE was planned to provide precise cues to deployed GBR and SPY-1 fire control radars as well as improved estimates of TBM launch and impact points. The EAGLE program was canceled as a result of the Theater Airborne Surveillance Study (TASS) recommendation to transfer the EAGLE technology to the Airborne Laser's sensor suite.

AIRBORNE SENSOR FOR BALLISTIC MISSILE TRACKING FY97 Congressional Language mandated funding be moved from "TMD Existing Systems - EAGLE" to "Airborne Sensor for Ballistic Missile Tracking". The language also directed the Under Secretary of Defense for Acquisition and Technology {USD (A&T)} to conduct a study (TASS) and provide a plan to congressional defense committees for developing an airborne sensor capability for ballistic missile tracking. The plan suggested the Airborne Laser sensor be evaluated and modified to conduct a post-boost missile tracking adjunct mission and invested in several airborne sensor system programs designed to increase overall TBM Defense performance. The remaining FY97 funds were allocated to developing an Airborne Laser post-boost adjunct mission capability, TBM Data Fusion Improvements with the SHIELD program (see Task 2), and for a classified TBM Adjunct Mission Study. In FY98, the Airborne Sensor for Ballistic Missile Tracking effort continued the SHIELD TMD Data Fusion Improvements, development for the TBM Adjunct Mission, and airborne sensor work associated with the Low Cost Autonomous Attack System and the Airborne Laser program.

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>								DATE <b>February 1999</b>			
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>				<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>				<b>PROJECT</b> <b>2160</b>			
<b>FY 1998 Accomplishments:</b>											
•	313	CUEING AND NETTING. Conduct an operational demonstration of the TPS-59 capability to accept and pass an external cue. Conduct an operational demonstration of fusing infrared and radar data to improve impact point predictions and reduce impact ellipse size.									
•	2815	SHIELD. Continue SHIELD development, test and evaluation activities; continue to incrementally develop test and demonstrate improved processing capabilities and fusion of other intelligence and sensor data sources with DSP. SHIELD and ALERT processors will be able to accept multiple data inputs from DSP, and additional infrared and radar sensors.									
•	1147	AIRBORNE SENSORS for BALLISTIC MISSILE TRACKING. Continue development of sensor improvement efforts and mission studies for Joint STARS, Ladar/IRST sensor development, and data fusion development and test.									
•	6000	IMPACT 98 initiative for Early Warning Enhancements									
Total	10275										
<b>FY 1999 Planned Program:</b>											
•	2447	SHIELD: Continue SHIELD development, test and evaluation activities; continue to incrementally develop test and demonstrate improved processing capabilities and fusion of other intelligence and sensor data sources with DSP. Infrared and data fusion efforts will culminate with operational code for ALERT and Space Based Infrared System Increment 1 capabilities.									
Total	2447										
<b>FY 2000 Planned Program:</b>											
•											
Total	0										
<b>FY 2001 Planned Program:</b>											
•											
Total	0										
<b>B. Other Program Funding Summary</b>		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To Compl	Total Cost
<b>C. Acquisition Strategy:</b>											
<b>D. Schedule Profile</b>		<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Project 2160		Page 14 of 68 Pages					Exhibit R-2A (PE 0603872C)				

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>											DATE <b>February 1999</b>	
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>						PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>					PROJECT <b>2160</b>	
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	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 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. AF Cueing Support		Air Force		2447							2447	
Subtotal Support Costs:				2447							2447	
Remark:												
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	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 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:				2447							2447	
Remark:												

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>								DATE <b>February 1999</b>		
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>				<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>				<b>PROJECT</b> <b>2259</b>		
<i>COST (In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2259 Israeli Cooperative Project	94878	0	0	0	0	0	0	0	TBD	TBD
<p>All funding in Project 2259 has been transferred to PE 0603875C starting in FY 1999.</p> <p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project includes the Arrow Deployability Project (ADP), the Israeli Test Bed (ITB), Israeli Cooperative Research &amp; Development (R&amp;D), and the Israeli System Architecture and Integration (ISA&amp;I) Project. The U.S. derives considerable benefits from its participation in these projects. The primary benefits are in U.S. gains in technology and technical information that will reduce risks in U.S. TMD development programs. The U.S. also benefits from the eventual presence of an anti-ballistic missile defense system in Israel, which provides deterrence of future tactical ballistic missile (TBM) conflicts in that region. This defensive system also contributes to a more robust defensive response should deterrence fail.</p> <p>The Israeli / Arrow program consists of efforts to develop a ballistic missile defense system for Israel. It includes the U.S.-Government of Israel (GOI) initiative to assist the GOI development of an anti-tactical ballistic missile (ATBM) interceptor and launcher. The program also includes an Israeli developed fire control radar (Green Pine), fire control center (Citron tree) and launch control center (Hazelnut Tree). Comprised of three phases, this initiative began with the Arrow Experiments project (Phase I) that developed the preprototype Arrow I interceptor. Followed by the ACES project (Phase II) which is a continuation of Phase I, and consists of critical lethality tests using the upgraded Arrow II interceptor. Arrow provides the basis for an informed GOI engineering and manufacturing decision for an ATBM defense capability. If successful, the Arrow II will satisfy the Israeli requirement for an interceptor for defense of military assets and population centers and will support U.S. technology base requirements for new advanced anti-tactical ballistic missile technologies that could be incorporated into the U.S. theater missile defense (TMD) systems.</p> <p>The third phase is the ADP, which began in Fiscal Year 1996. This phase of the project will pursue the research and development of technologies associated with the deployment of the Arrow Weapon System (AWS) and will permit the GOI to make a decision regarding deployment (without financial participation by the U.S. beyond the R&amp;D stage). This effort will include system-level flight tests of the total Arrow Weapon System. An interface will be developed for AWS interoperability with U.S. TMD systems. Lethality, kill assessment and producibility will continue to be assessed. Subsequent U.S.-Israeli cooperative R&amp;D on other ballistic missile defense concepts may occur in the future.</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 trains 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 both mature and contingency Middle East theater operations. This funding also provides for a portion of the operation and maintenance of the ITB and for planned enhancements. Completed experiments identified additional enhancements needed to improve the ITB as an analysis tool. The enhancements incorporated in the ITB to date include</p>										
Project 2259			Page 16 of 68 Pages				Exhibit R-2A (PE 0603872C)			

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 1999</b>
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>2259</b>
<p>radar and weapons models, and a Boost Phase Intercept (BPI) simulation capability. The BPI enhancement benefited the Israeli BPI study completed in January 1996. The Adaptive Battle Management Center (ABMC) enhancement benefits the U.S. by enabling the ITB to simulate a wide variety of command and control and interoperability issues. The planned inclusion of the Distributed Interactive Simulation (DIS) will enable joint exercise experiments to be conducted both in Israel and across the water between US TMD and IS TMD systems.</p> <p>The Israeli Cooperative R&amp;D program supports the advancement of emerging TMD technologies. This support will advance the technology demonstration phase which will provide for the defense of the State of Israel. It further supports the U.S. technology base needs for these technologies, and furthers the pursuit of interoperability with U.S. TBMD systems. This task supports efforts in developing an interface to allow for interoperability between Israeli TMD systems and U.S. TBMD systems and the implementation of such a system.</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. Evolutionary growth paths to enhance the IRMA robustness against future threats will be identified. Critical TMD system architecture issues and technologies will be analyzed, and the conformance to established requirements of various Israeli anti-tactical ballistic missile (ATBM) programs, including the Arrow missile development activity, the ADP, and the ITB will be conducted. Finally, previously developed simulations and models will be used selectively to address significant TMD issues. Collectively, the tasks conducted under this cooperatively sponsored ISA&amp;I project will 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>Since 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 International Agreement was signed in March 1996 and Presidential certification was completed in May 1996.</p> <p>The ITB became operational in the second quarter of FY 1992. The ITB experiments validated the performance of the prospective near-term Israel Theater Missile Defense System. It provided valuable insight into the potential role of Human-In-The-Loop (HIL) for a TMD system. The ITB is being utilized to determine Combined Standard Operating Procedures (CSOP) between the US and Israel for TMD.</p> <p>The ISA&amp;I Project activities demonstrated that defense of the State of Israel from tactical ballistic missile (TBM) attacks is feasible and cost-effective. The ISA&amp;I effort analyzed and addressed numerous TMD system issues including HIL, resource allocation, and threat analysis. The U.S. 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.</p>		
Project 2259	Page 17 of 68 Pages	Exhibit R-2A (PE 0603872C)

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>2259</b>
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**FY 1998 Accomplishments:**

- 46519 Arrow Deployability Project and Support. Continue AWS integrated flight tests. Evaluate U.S. and Arrow components for electro-magnetic interference. Transfer the results of the AWS tests to U.S. TMD interceptor developers. Continue interoperability, lethality, kill assessment and producibility studies. Develop an US/Israeli Interoperability Capability.
- 1877 Continue ITB experiments on near-term improvements to the TMD system and on deployability. Provide improved threat model and Arrow II update enhancements. Continue supporting CSOP requirements.
- 1482 ISA&I. Analyze results of ITB Interoperability experiments. Continue evaluations of the performance of the near-term TMD system based on ADP system flight tests. Continue analysis of TMD refinements for future threats.
- 45000 IMPACT 98 Initiative for Arrow Third Battery

Total 94878

**FY 1999 Planned Program:**

- See PE 0603875C

Total 0

**FY 2000 Planned Program:**

- See PE 0603875C

Total 0

**FY 2001 Planned Program:**

- See PE 0603875C

Total 0

<b>B. <u>Other Program Funding Summary</u></b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>

**C. Acquisition Strategy:** This is a cooperative U.S./GOI development program. By completing the Arrow Deployability Project, U.S. TMD programs will be afforded state-of-the-art technical data for program risk reduction and the GOI will have developed information to make a sound Arrow Weapon System deployment decision. The planned ISA&I and ITB efforts will continue to refine the operational tactics and techniques of the fielded near-term TMD system. The U.S. and the GOI, 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. Each contract associated with the individual projects is a firm-fixed price (FFP) contract.

<b>D. <u>Schedule Profile</u></b>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>					PROJECT <b>2259</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:												
Remark:												

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>3153</b>
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COST ( <i>In Thousands</i> )	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3153 Systems Architecture and Engineering	14143	0	0	0	0	0	0	0	TBD	TBD

All funding in Project 3153 has been transferred to PE 0603874C starting in FY 1999

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

In January 1997, the BMDO Director established the Office of the Chief Architect/Engineer. This reorganized project ensures that appropriate issues relating to Joint Systems Architecture and Engineering (JSAE) are addressed in a coordinated and synergistic manner across all National Missile Defense (NMD) and Theater Air and Missile Defense (TAMD) efforts. The office reports directly and independently to the BMDO Director to provide the necessary mission-area oversight of critical BMDO technical issues.

Within this project, the BMDO critical JSAE tasks are divided into the areas of Joint Systems Analysis; Baseline and Risk Management; Interfaces and Interoperability (Battle Management/Command, Control, and Communications (BM/C3)); Modeling and Simulation (M&S) Requirements and Standards; Developmental Planning; and Test and Evaluation (T&E). The project provides BMDO with a technical assessment of the expected effectiveness of major programs under development and requirements for supporting technology. Through FY98, the work is funded through two program elements, one for TAMD and the other for NMD.

This program element focuses on TAMD systems and technology. The primary thrust of the work is to show analytically the need for and expected performance of different defense systems under development to handle current and projected threats. The systems-level architecture/engineering analysis supports efforts to determine the expected operational performance and effectiveness of missile defense systems under development. Models and simulations are used to investigate architecture and system level capability and to resolve critical technical issues related to the development of specific elements of the architecture. Tradeoffs in alternative elements, specific designs, inventory and integration of systems are conducted to determine the most cost effective approach for a particular missile defense mission. Analysis is performed on a continuing basis in order to determine the impact of changing threats, mission requirements, and technological advances. The remaining core JSAE efforts focus on integrating ongoing efforts across the TAMD and NMD mission areas and developing and implementing policies designed to enhance system and cost performance. These efforts help to reduce system and architectural risks, improve system interoperability, focus technology planning and prioritization, and integrate T&E and M&S efforts.

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3153</b>
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**FY 1998 Accomplishments:**

- 9579 Architecture/Engineering Analysis: Develop an overall analysis plan for the BMDO and oversee the analysis process. Participate in engineering trade studies with the TAMD systems engineer. Perform commonality studies on the Upper Tier TMD systems. Continue systems analysis of architecture/system performance and related technical issues as directed by Congress, the Department of Defense, the BMDO Director, and the Chief Architect/Engineer. Direct the Joint Systems Engineering Team (JSET). Manage the systems technology implementation process and develop pre-planned program improvement requirements.
- 4564 Architecture/Engineering Core: Lead BMDO JSAE efforts to develop strategies, policies, and processes. Provide BMDO system-level capability to address emerging system requirements and concerns in a synergistic manner across all NMD and TAMD development efforts and facilitate the translation of operational requirements to joint and combined interoperable systems. Lead BMDO participation in the development and implementation of various BMDO, DoD, Allied, and other Government and commercial initiatives relating to BMDO NMD/TMD BM/C3 development. Participate in the development of JTA version 2.0; conduct JTA compliance engineering; hold TESG and BOTEC meetings; oversee HLA compliance and migration; and produce the BMDO Open Systems Assessment and the TEAS.

Total 14143

**FY 1999 Planned Program:**

See PE 0603874C.

Total 0

**FY 2000 Planned Program:**

- See PE 0603874C

Total 0

**FY 2001 Planned Program:**

- See PE 0603874C

Total 0

<b>B. Other Program Funding Summary</b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
0603871C – National Missile Defense	3690	0	0	0	0	0	0	0		
0603874C – BMD Technical Operations	0	17899	17201	15730	15872	15873	15135	15505		

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3153</b>
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**C. Acquisition Strategy:** Systems analysis work in this project is contracted. In November 1995, a two year competitive contract for this work (with two, one year extension options) was awarded to a ten-member corporate team. For other JSAE efforts, expertise of Government, Federally Funded Research & Development Center (FFRDC), System Engineering and Integration Contractor (SEIC), and Scientific, Engineering and Technical Assistance (SETA) personnel are leveraged in the execution of project activities, using existing contracts to the maximum extent possible. Specifically, U.S. Army Space and Missile Defense Command (USASMDC) and USAF/Electronic Systems Center (ESC) Government and contractor personnel lead Information Architecture and development efforts; SETA and SEIC contracts provide the core of technical expertise for a variety of JSAE activities; and FFRDC contract vehicles provide state-of-the-art technical expertise in Software Engineering and related technical areas. Additional contractor services will be procured if needed to meet emerging program requirements.

<b>D. Schedule Profile</b>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>					PROJECT <b>3153</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:												
Remark:												

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL				PROJECT 3157		
COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3157 Environmental, Siting and Facilities	3350	0	0	0	0	0	0	0	TBD	TBD
<p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>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) system. Plans, programs, budgets, and oversees facility acquisition through the Military Construction (MILCON) and RDT&amp;E construction programs. Provides guidance and supports BMDO TMD Environmental Safety and occupational Health Program which includes the Environmental Assessment and Environmental Impact Statement process, environmental compliance, pollution prevention, and other environmental efforts for TMD activities. Develops guidance for Executing Agents on facilities, siting, acquisition, and environmental matters.</p> <p><b>FY 1998 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 1608 Supported TMD programs with siting analyses, environmental analyses and documentation, environmental compliance and pollution prevention programs, and test range studies. Continued environmental analyses on conducting TMD testing at Eglin Gulf Test Range, Pacific Missile Range Facility, and air dropped target missiles from aircraft. Worked on the System Integrated Tests requirements development and continued on the Navy Area, THAAD and PAC-3 systems. The program managed activities associated with maturing acquisition programs, fielding of systems, integrated system tests, and test and evaluation programs.</li> <li>• 67 Completed facility planning for TMD facility requirements. Began planning and development of unique range test facilities for both Atlantic and Pacific requirements. Initiated planning for the FY00 and FY01 System Integration Tests.</li> <li>• 1675 Provided funds to execute overall FY98-00 MILCON, Minor MILCON, and RDT&amp;E facility design, construction projects and related activities. Facility projects include: Multi-purpose Missile Test Facility, Launch Complex Infrastructure Modernization, and Fire Protection System Modernization at USAKA; Hazardous Material Storage Facility at Wake Island, and the THAAD Missile Storage Facility at Anniston Army Depot, AL. Continual improvements to TMD's test and evaluation facilities are required to support the ever increasing complexity of test scenarios.</li> </ul> <p>Total 3350</p> <p><b>FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• Funding has been transferred to Project 3360, PE 0603872C</li> </ul> <p>Total 0</p> <p><b>FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• Funding has been transferred to Project 3360, PE 0603874C</li> </ul> <p>Total 0</p>										
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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>								DATE <b>February 1999</b>		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>			PROJECT <b>3157</b>		
<b>FY 2001 Planned Program:</b> <ul style="list-style-type: none"> <li>• Funding has been transferred to Project 3360, PE 0603874C</li> </ul> Total                    0										
<b>B. Other Program Funding Summary</b>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To Compl	Total Cost
3157 Minor MILCON & Design, Joint TMD Dem/Val, PE 0603872C	1965									
2408 MILCON Design, NMD PE0603871	540									
2408 Environmental Assessment, NMD PEO603871	282									
<b>C. Acquisition Strategy:</b> BMDO is assisted by executing agents in the Army, Navy, Air Force and contractor support. They provide technical assistance of facilities, siting, and environmental activities. The U.S. Army Space and Strategic Defense Command, U.S. Army Corps of Engineers, the U.S. Army Program Executive Office-Missile Defense and Navy PEO Theater Air Defense provide specific additional technical assistance in delivering the Facilities, Siting, and Environmental documentation products needed for program execution. BMDO tasks the Services through Program Management Agreements to perform the required tasks in support of the TMD program. BMDO performs quarterly on-site reviews to verify and validate completed tasks										
<b>D. Schedule Profile</b>										
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Environmental Analysis for Eglin Gulf Test Range			1-4Q							
Environmental Analysis for Pacific Missile Range Facility			1-4Q							
Environmental Analysis for Target Missile Air Drop			1-4Q							
Environmental Analysis for Long Range Air Launch			3-4Q							
Environmental Analysis for Advanced Interceptor Technology			*							
THAAD 1 <sup>ST</sup> Objective Battalion, Ft Bliss			1-4Q							
PAC-3 Missile Assembly Bldg, White Sands			1-4Q							
Launch Facilities Infrastructure Modernization, USAKA			1-4Q							
Fire Protection System Modernization, USAKA			1-4Q							
Hazardous Material Storage Building, Wake Island			3-4Q							
Project 3157 <span style="float: right;">Page 25 of 68 Pages</span> <span style="float: right;">Exhibit R-2A (PE 0603872C)</span>										

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>					<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>					<b>PROJECT</b> <b>3157</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:												
Remark:												

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3251</b>
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COST ( <i>In Thousands</i> )	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3251 Systems Engineering and Technical Support	47599	19987	22398	18774	20384	21666	15656	15986	Continuing	Continuing

Some funding has been transferred to PE 0603873C, Projects 3251 and 3261, starting in FY99

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

This project provides system engineering and technical support for the integration of Service-supplied weapon systems to facilitate the identification and resolution of inter-Service integration and interoperability issues; technical and engineering assessments and trade-off studies of Theater Missile Defense (TMD) system architectures and concepts; support for UK developed sensor data fusion methodology; Ballistic Missile Defense (BMD) system survivability oversight and assessment; risk reduction and acquisition streamlining support; modeling, simulation, experiment, and flight test support; development and maintenance of technical and programmatic databases; and preparation of technical reports, briefings, and programmatic documentation associated with TMD studies and critical issues.

**FY 1998 Accomplishments:**

- 918 Continued UK sensor data fusion efforts including Target Oriented Tracking System (TOTS) integration testing and development and testing of TOTS applications. Began use of TOTS in test analysis at various BMD test ranges.
- 9721 Provided scientific, engineering, and technical support for the acquisition, integration, and fielding of TMD systems including: review of products in comparison to standards, specifications, and requirements; modeling and simulation support of architecture analyses and trade-off studies; risk reduction and acquisition streamlining support; engineering and technical support for international programs and BM/C3 efforts; conducted EADTB distributed analyses and operations; development and maintenance of technical and programmatic databases; and preparation of technical reports, briefings, and programmatic documentation.
- 1460 Provided support for the TAMD ACQ Study and for a classified project.
- 9787 Using FFRDC resources, performed independent technical and engineering assessments of TMD system architectures including: system concept development and assessment; critical element technical and programmatic assessments including trade-off analyses; reviews of mandated documents, international cooperative programs, and treaty implications; multi-Service and allied BM/C3 integration; modeling, simulation, experiment and flight test support; integration of fielded components into operational units; and specific studies and analyses of critical issues.
- 11450 Increased system engineering and integration support at the TMD system level. Continued to identify inter-Service integration interfaces; prepared engineering documents to identify changes required in theater air defense C3I systems to support TBMD; updated TMD Integrated Test Plan; updated system description documents; and planned, coordinated, and analyzed C2 wargames for CINC CONOPS development.

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BUDGET ACTIVITY		PE NUMBER AND TITLE	PROJECT
<b>4 - Demonstration and Validation</b>		<b>0603872C Joint TMD - DEM/VAL</b>	<b>3251</b>
•	6707	Provided support to Service integration, interoperability, and resolution of interface issues; determined adequacy of threshold/objective hardness specifications for C4I support equipment; identified SEOs for C4I/support equipment to meet/exceed identified exposure levels to ensure critical operational effectiveness; continued environmental modeling and simulation tool improvements; assisted in coordinating technology infusion to support pre-planned product improvements; continued support to TMD program offices in refining software development practices and mitigating technical, cost, and schedule risks across BMD/TMD software development, integration, testing, and maintenance efforts.	
•	1499	Supported BMDO services (e.g., security, contracting, supplies).	
•	2007	Provided technical support to Combat Developments Directorate-Ft Bliss, TX.	
•	4050	Provide funding for government personnel and project management	
Total	47599		
<b>FY 1999 Planned Program:</b>			
•	994	Continue UK sensor data fusion efforts including Target Oriented Tracking System (TOTS) integration testing and development and testing of TOTS applications.	
•	5929	Provide scientific, engineering, and technical support for the acquisition, integration, and fielding of TMD systems including: review of products in comparison to standards, specifications, and requirements; modeling and simulation support of architecture analyses and trade-off studies; risk reduction and acquisition streamlining support; engineering and technical support for international programs and BM/C3 efforts; conducted EADTB distributed analyses and operations; development and maintenance of technical and programmatic databases; and preparation of technical reports, briefings, and programmatic documentation.	
•	7070	Using FFRDC resources, perform independent technical and engineering assessments of TMD system architectures including: system concept development and assessment; critical element technical and programmatic assessments including trade-off analyses; reviews of mandated documents, international cooperative programs, and treaty implications; multi-Service and allied BM/C3 integration; modeling, simulation, experiment and flight test support; integration of fielded components into operational units; and specific studies and analyses of critical issues.	
•	1823	Support BMDO services (e.g., security, contracting, supplies).	
•	4171	Provide funding for government personnel and project management	
Total	19987		
<b>FY 2000 Planned Program:</b>			
•	999	Continue UK sensor data fusion efforts including Target Oriented Tracking System (TOTS) integration testing and development and testing of TOTS applications.	
•	6400	Provide scientific, engineering, and technical support for the acquisition, integration, and fielding of TMD systems including: review of products in comparison to standards, specifications, and requirements; modeling and simulation support of architecture analyses and trade-off studies; risk reduction and acquisition streamlining support; engineering and technical support for international programs and BM/C3 efforts; conducted EADTB distributed analyses and operations; development and maintenance of technical and programmatic databases; and preparation of technical reports, briefings, and programmatic documentation.	
Project 3251		Page 28 of 68 Pages	Exhibit R-2A (PE 0603872C)

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>								DATE <b>February 1999</b>				
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>				<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>				<b>PROJECT</b> <b>3251</b>				
<ul style="list-style-type: none"> <li>• 8326 Using FFRDC resources, perform independent technical and engineering assessments of TMD system architectures including: system concept development and assessment; critical element technical and programmatic assessments including trade-off analyses; reviews of mandated documents, international cooperative programs, and treaty implications; multi-Service and allied BM/C3 integration; modeling, simulation, experiment and flight test support; integration of fielded components into operational units; and specific studies and analyses of critical issues.</li> <li>• 2663 Support BMDO services (e.g., security, contracting, supplies).</li> <li>• 4010 Provide funding for government personnel and project management</li> </ul> <p>Total 22398</p>	<p><b>FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 1075 Continue UK sensor data fusion efforts including Target Oriented Tracking System (TOTS) integration testing and development and testing of TOTS applications.</li> <li>• 5289 Provide scientific, engineering, and technical support for the acquisition, integration, and fielding of TMD systems including: review of products in comparison to standards, specifications, and requirements; modeling and simulation support of architecture analyses and trade-off studies; risk reduction and acquisition streamlining support; engineering and technical support for international programs and BM/C3 efforts; conducted EADTB distributed analyses and operations; development and maintenance of technical and programmatic databases; and preparation of technical reports, briefings, and programmatic documentation.</li> <li>• 6243 Using FFRDC resources, perform independent technical and engineering assessments of TMD system architectures including: system concept development and assessment; critical element technical and programmatic assessments including trade-off analyses; reviews of mandated documents, international cooperative programs, and treaty implications; multi-Service and allied BM/C3 integration; modeling, simulation, experiment and flight test support; integration of fielded components into operational units; and specific studies and analyses of critical issues.</li> <li>• 2142 Support BMDO services (e.g., security, contracting, supplies).</li> <li>• 4025 Provide funding for government personnel and project management</li> </ul> <p>Total 18774</p>											
<b>B. <u>Other Program Funding Summary</u></b>			<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
<p><b>C. <u>Acquisition Strategy:</u></b> This project uses a combination of FFRDC, competitively awarded SETA contracts, and a Memorandum of Understanding (MOU) with the United Kingdom Ministry of Defense.</p>												
<b>D. <u>Schedule Profile</u></b>			<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Project 3251			Page 29 of 68 Pages					Exhibit R-2A (PE 0603872C)				

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>					PROJECT <b>3251</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. SETA Supt	CPAF	SPARTA-Va		5929		6400		5289			17618	
Subtotal Support Costs:				5929		6400		5289			17618	
Remark:												
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. FFRDCs/POET	MIPRs	Multiple		7070		8326		6243			21639	
b. BMDO Ops/Personnel		BMDO		5994		6673		6167			18834	
c. International Program	MIPR	UK Ministry of Def.		994		999		1075			3068	
Subtotal Management Services:				14058		15998		13485			43541	
Remark:												
Project Total Cost:				19987		22398		18774			61159	
Remark:												

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>3261</b>
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COST <i>(In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3261 TMD MB/C3I (BM/C3I Concepts)	68958	0	0	0	0	0	0	0	TBD	TBD

All funding in Project 3261 has been transferred to PE 0603873C, starting in FY 1999.

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

The objective of this project is to provide the warfighter with Theater Air and Missile Defense (TAMD) Battle Management/Command, Control, Computers and Intelligence (BM/C4I) that is flexible, responsive, and interoperable. TAMD is based on a Family-of-Systems (FoS) concept where the Services' air and ballistic missile defense and command and control (C2) systems are integrated together using various existing and developing communications capabilities and systems. The resulting FoS provides the CINC with a TAMD systems 'plug and fight' capability to address a wide variety of air and missile threats that can be tailored for his theater of operations.

To achieve this objective of providing the warfighter with flexible, responsive, and interoperable BM/C4I for TAMD, the Ballistic Missile Defense Organization (BMDO) uses this project to provide oversight, leadership, guidance, and support to the Services' TAMD BM/C4I programs. The focus is on Joint approaches to integrate and synergize the Services' programs.

In recent years, this project has been focused on three thrusts: (1) early warning and dissemination of theater ballistic missile launch information, (2) communication interoperability, and (3) command and control upgrades. In concert with this successful approach, BMDO has developed a TAMD BM/C4I Architecture to enable further improvements in TAMD performance. By focusing project efforts on this architecture, the integration of individual activities will be enhanced while continuing to support earlier objectives.

This TAMD BM/C4I Architecture can be viewed as a set of FoS connectivities and common mission functions integrated via three networks. The first network to be implemented is the Joint Data Network (JDN): a near-real-time network based primarily on the Tactical Digital Information Link [TADIL-J / LINK-16] datalink to provide overall FoS situational awareness, command and control, and weapon coordination. The second network to be implemented is the Joint Planning Network (JPN): a non-real-time/near-real-time network building upon the Global Command and Control System (GCCS) to support centralized planning and guidance. The JPN will complement the JDN by enabling consistent TAMD plan development and dissemination across command levels, Services, and CINCs. The third and final network to be implemented is the Joint Composite Tracking Network (JCTN): a real-time network based on the Navy's Cooperative Engagement Capability (CEC) to directly link sensors and shooters within a theater to provide fire quality information to maximize the synergy of multiple systems.

To achieve the TAMD BM/C4I Architecture, project efforts will address the following key areas: the development of external cueing for FoS sensors; the implementation of JDN [TADIL-J / LINK-16] TMD messages in FoS C2 nodes; and the development and integration of GCCS TMD applications. The overall objective of this project is to ensure the integration of Service systems so that they will be both affordable and interoperable.

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

DATE **February 1999**

BUDGET ACTIVITY  
**4 - Demonstration and Validation**

PE NUMBER AND TITLE  
**0603872C Joint TMD - DEM/VAL**

PROJECT  
**3261**

**FY 1998 Accomplishments:**

- 7121 BM/C3I Integration- Army: Field two Tactical Operations Centers (TOC) to active Army brigades; support JTIDS range Extension (JRE)efforts; participated in JTIDS network management activities; initiate Joint Defensive Planner (JDP) integration into Army host platforms.
- 12294 BM/C3I Integration- Air Force: Continue TADIL-J TAMD message set integration, complete AOC and ABCCC, initiate remaining JSTARS upgrade for TAMD; Continue to support JRE IPT process and joint protocol standardization; complete JDP 1.0 and TCTA software integration in TBMCS V1.0; Complete development of functional and software architecture for Automated Application of Intelligence Preparation of the Battlespace (A2IPB) and start A2IPB prototype development; begin integrated surveillance system (ISS) architecture development and analysis of situational awareness correlation/fusion techniques; implement R2 correlation algorithm for live exercise testing; develop communication planning module(CPM) prototyping and demonstration plan.
- 8769 BM/C3I Integration- Navy & USMC: Continue support of Joint development of JRE and integrate JDP into JMCIS for initial assessment/evaluation. Complete testing of AN/TPS-59 cue capability; and continue TAOM BMC3I software development.
- 3164 BM/C3I Integration- Joint/Combined: Update TADIL-J message set approval, support JRE development and NATO TAMD BMC3 analyses, and initiate definition and development of joint composite tracking network (JCTN).
- 2610 BM/C3I Integration-JNTF: Continue BM/C3I work shops; support JDP requirements update based on initial test/demo results; and provide Global Command and Control System (GCCS) capability for TAMD application evaluation.
- 35000 BM/C3I Integration- Joint/Combined Impact 98 PAC3/CEC Interface Design Document (IDD) for the real time data exchange; Real Time Data Exchange (RTDE) between PAC3 and AEGIS using CEC at ASCIET 99; RTDE data analysis report; PAC3/CEC IDD for Engage on Remote (EOR) live fire activity; draft THAAD/CEC concept of operations; THAAD/CEC simulation demonstration.

Total 68958

**FY 1999 Planned Program:**

- See PE 0603873C
- Total 0

**FY 2000 Planned Program:**

- See PE 0603873C
- Total 0

**FY 2001 Planned Program:**

- See PE 0603873C
- Total 0

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3261</b>
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<b>B. Other Program Funding Summary</b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
3261 TAMD BM/C3I PE 0603872C	68958									68958
3261 TAMD BM/C3I PE 0603873C		36427	42556	45768	44434	44352	43442	44397		301376

**C. Acquisition Strategy:** The 3261 Project acquisition strategy leverages existing system acquisition programs (which are subject to milestone decisions and testing) and accomplishes supporting tasks to satisfy BM/C3I performance requirements. A significant 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 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Data Link handbook published	*									
TAMD software library & re-use data	*									
Two CIC/SAAWF prototype	*									
AWACS software implemented		*								
Complete testing of AN/TPS-59			X							
Field two TOCs to active Army brigades			X							
Update TADIL-J message set approval			X							

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 1999</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>3261</b>
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 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 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 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 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 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 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												

Remark:

Project Total Cost:												
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Remark:

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>3265</b>
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COST ( <i>In Thousands</i> )	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3265 User Interface	14484	17229	9871	11264	11103	11074	9654	9982	Continuing	Continuing

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

This project focuses on supporting: (1) the warfighters Joint Theater Air and Missile Defense (JTAMD) requirements; (2) TMD and TAMD Master Plan demonstration projects/events and; (3) Interoperability Program Plan (IPP) Capability Increments (CIs). Warfighter support is achieved by enabling JTAMD deployment and providing the Joint Staff and the warfighting CINC's with the means to: ensure TAMD development adequately reflects evolving military needs; collect and analyze performance data on the TAMD Family of Systems (FoS), and conduct realistic meaningful JTAMD exercises involving all facets of the FoS. JTAMD demonstration projects and events are supported by providing the JTAMD exercise framework wherein the projects, events, and demonstrations objectives are tested/evaluated and wherein increments are validated. Support of the IPP is achieved by collecting data from exercises to verify the status of FoS interoperability in each theater. The long-term objective is to ensure successful transition of interoperable JTAMD FoS capabilities to the warfighters.

Task 1 supports the warfighting CINC's preparation for future JTAMD operations, demonstration projects, events, and IPP CIs by enabling the conduct of CINC TAMD exercises. Objectives include providing TAMD overlays, simulation tools, connectivity support, hardware/software, and technical expertise to optimize the CINC's preparations for future JTAMD operations. This task also investigates the Joint Information Control Officer and Single Integrated Air Picture within an exercise framework. Further, it serves to verify IPP CIs and collects data on TAMD objectives to identify problems and take corrective action.

Task 3 supports FoS interoperability by assisting CINC's' efforts to develop JTAMD doctrine, Concepts of Operations (CONOPS) and Tactics, Techniques, and Procedures (TTPs). This task is linked to Task 1 in that it uses the TAMD exercise framework and support to foster document development. The objective is to provide the environment and support necessary to develop, test, and refine these documents as TAMD FoS interoperability evolves.

Task 5 promotes development of allied involvement in TAMD doctrine, CONOPS, TTPs, and exercises. The objective is to assist our allies in developing interoperable TAMD capabilities which will augment US capabilities. Beginning in FY00 these funds and objectives are integrated into Task 1.

Task 6 supports the conduct of TAMD and FoS simulations, seminars, and desktop/interactive and planning exercises. The objectives are to use simulations/scenarios/evaluations/demonstrations to orient/indoctrinate the warfighter community to the challenges involved in carrying out effective JTAMD operations and in achieving FoS interoperability. Through planning activities this task also provides a forum for discussing specific aspects of the threat, weapons systems requirements, changes to CONOPS and TTPs, and addresses strategies for acquiring TAMD systems.

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY		February 1999
<b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE	PROJECT
	<b>0603872C Joint TMD - DEM/VAL</b>	<b>3265</b>
<b>FY 1998 Accomplishments:</b>		
•	2800 Support USEUCOM Joint Project Optic Needle and TMD exercise Central Enterprise.	
•	2800 Support USCENTCOM Joint Project Optic Cobra.	
•	2800 Support USFK Joint Project Ornate Impact and TMD exercise Foal Eagle.	
•	2600 Support USACOM Joint Project Optic Windmill and other TMD exercises.	
•	2300 Support USPACOM TMD exercises.	
•	400 Integrate capability to display simulated TBMs on developing operator radar scopes supporting Field Training Exercises.	
•	100 Review Operational TMD Requirements Documents (ORDs)/Capstone Requirements Documents (CRDs).	
•	172 Conduct theater and strategic wargaming, including GLOBAL 98.	
•	439 Conduct mission analysis for TMD (including allies/friends).	
•	073 Conduct Warfare Analysis Laboratory Exercises.	
Total	14484	
<b>FY 1999 Planned Program:</b>		
•	3338 Support CINC USEUCOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	3338 Support CINC USCENTCOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	3138 Support CINC USACOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	3112 Support USFK by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	3006 Support CINC USPACOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	169 Support development of JTAMD doctrine, CONOPS, and TTPs needed for FoS Interoperability.	
•	423 Promote development of allied involvement in TAMD doctrine, CONOPS, TTPs, and exercises.	
•	705 Support conduct of JTAMD FoS simulations, seminars and desktop/interactive and planning activities.	
Total	17229	
<b>FY 2000 Planned Program:</b>		
•	1693 Support CINC USEUCOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	1693 Support CINC USCENTCOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	1693 Support CINC USACOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	1493 Support USFK by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	1278 Support CINC USPACOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.	
•	1256 Support development of JTAMD doctrine, CONOPS, and TTPs needed for FoS Interoperability.	
•	765 Support conduct of JTAMD FoS simulations, seminars and desktop/interactive and planning activities.	
Total	9871	
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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>								DATE <b>February 1999</b>				
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>				PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>				PROJECT <b>3265</b>				
<b>FY 2001 Planned Program:</b>												
<ul style="list-style-type: none"> <li>• 1899 Support CINC USEUCOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.</li> <li>• 1899 Support CINC USCENTCOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.</li> <li>• 1899 Support CINC USACOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.</li> <li>• 1749 Support USFK by adding TAMD overlays to selected exercises, collecting data, and analyzing results.</li> <li>• 1597 Support CINC USPACOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results.</li> <li>• 1353 Support development of JTAMD doctrine, CONOPS, and TTPs needed for FoS Interoperability.</li> <li>• 868 Support conduct of JTAMD FoS simulations, seminars and desktop/interactive and planning activities.</li> </ul>												
Total 11264												
<b>B. Other Program Funding Summary</b>			<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
<p><b>C. Acquisition Strategy:</b> Management is 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.</p>												
<b>D. Schedule Profile</b>			<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
CINC TAMD Exercises			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
FoS Interoperability Procedures			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Allied Involvement in TAMD			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
TAMD FoS Preparation Events			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Project 3265			Page 37 of 68 Pages					Exhibit R-2A (PE 0603872C)				

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>											DATE <b>February 1999</b>	
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>				PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>						PROJECT <b>3265</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 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 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 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 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. CINC TMD Assessment Program	Cost Plus Award Fee	SRS Technologies	13974	4620	Continued	4652	Continued	4702	Continued	16287	44235	23317
b. EUCOM Program	MIPRS	Theater	5469	2679	NA	1167	NA	1403	NA	NA	10718	NA
c. CENTCOM Program	"	"	5469	2679	"	1167	"	1403	"	"	10718	"
d. USFK Program	"	"	5469	2479	"	1167	"	1403	"	"	10518	"
e. ACOM Program	"	"	4919	2479	"	967	"	1253	"	"	9618	"
f. PACOM Program	"	"	4421	2293	"	751	"	1100	"	"	8565	"
Subtotal Test and Evaluation:			NA	NA	NA	9871	NA	11264	NA	16287	94372	23,317
Remark:												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:				39721	17229		9871		11264		16287	94372
Remark:												

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>								DATE <b>February 1999</b>		
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>				<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>				<b>PROJECT</b> <b>3270</b>		
<i>COST (In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3270 Threat and Countermeasures Program	22911	0	0	0	0	0	0	0	TBD	TBD
All funding for Project 3270 has been transferred to PE 0603876C starting in FY 1999										
<b>A. <u>Mission Description and Budget Item Justification</u></b>										
<p>Threat and Countermeasures Program. The BMDO Threat Program defines potential adversary military forces missile threats. To accomplish this mission, BMDO has a threat development 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 three component tasks: Intelligence Threat, Threat Systems Engineering, and Threat Applications.</p> <p>Intelligence Threat Task. The purpose of this task is to provide an Intelligence Community-Validated TMD and 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 the TMD and NMD "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>Threat 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 BMDO cost and operational effectiveness analyses (COEA). 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 System Threat Scenario Descriptions.</li> </ul>										
Project 3270			<i>Page 39 of 68 Pages</i>				Exhibit R-2A (PE 0603872C)			

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 1999</b>
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>3270</b>
<p>Produces threat computer digital media and supporting documentation for use by the development and acquisition communities.</p> <p>Threat Systems Engineering Task. The BMDO Threat Systems Engineering Program assists TMD and 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 to the system designers early 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.</p> <p><b>FY 1998 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 6433 Intelligence Threat Task: Provide Capstone STAR, speciality threats, targets analysis, operational threat environment intelligence assessments, management, and planning support</li> <li>• 4611 Threat Applications Task: Continue development of threat system characterizations and scenario descriptions in response to the analysis needs of the system/element developers. Upgrade the threat modeling capability and produce digital media and supporting documentation through the JNTF. Develop scenarios depicting threat systems employed in theater environments.</li> <li>• 11867 Threat Systems Engineering Task: Perform TMD CM Red/Blue activities and counter-countermeasure parametric studies and TMD CM technical experiments and evaluations. Support Countermeasures Hands-On Program (CHOP) "Skunkworks" teams in conducting CM concept, design, fabrication, tests. Conduct non-technical analysis, oversight, and database management.</li> </ul> <p>Total            22911</p> <p><b>FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• See PE 0603876C</li> </ul> <p>Total            0</p> <p><b>FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• See PE 0603876C</li> </ul> <p>Total            0</p> <p><b>FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• See PE 0603876C</li> </ul> <p>Total            0</p>		
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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3270</b>
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<b>B. <u>Other Program Funding Summary</u></b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>

**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.

<b>D. <u>Schedule Profile</u></b>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>					<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>					<b>PROJECT</b> <b>3270</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:												
Remark:												

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL					PROJECT 3352	
COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3352 Modeling and Simulations	62965	17148	11268	11592	11497	11465	9796	9955	Continuing	Continuing
<p>All tasks and associated funding in Project 3352, with the exception of the Extended Air Defense Test Bed and Extended Air Defense Simulation (TMD unique projects), have been transferred to PE 0603874C starting in FY 1999.</p> <p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project ensures timely availability of reliable, cooperative, and cost-effective BMDO and Service-provided Modeling, Simulation, &amp; Networks (MS&amp;N) tools and capabilities responsive to BMDO requirements. This project provides for the planning, coordination, program management, and technical oversight of system level MS &amp;N for the Theater Air Missile Defense (TAMD) and the National Missile Defense (NMD) Deployment Readiness Programs. This cost effective approach reduces the high cost of missile test programs and generates the information needed to make timely and informed operational, requirements, performance, design/cost/risk tradeoffs, mitigation and resource allocation decisions.</p> <p>This project funds the development, operation, and Verification, Validation and Accreditation (VV&amp;A) of the Extended Air Defense Bed (EADTB) and the Extended Air Defense Simulation (EADSIM) simulations, which support the analysis required for TAMD program acquisition and integration. The EADTB is a flexible distributed simulation tool that can determine the performance of existing and conceptual extended air and missile defense systems with the added complexity of theater missile defense threats. This is a multi-site test bed that is comprised of high and medium fidelity models of sensors, environments, weapon systems, threats, and Battle Management Command, Control and Communication (BM/C3) systems. The capabilities of the EADTB are being incrementally developed and accredited with the Services. EADSIM is a low to medium detail simulation system that operates on a stand-alone workstation. This simulation is used for architectural analysis of EAD systems and provides user interface for scenario preparation and model description.</p>										
Project 3352			Page 43 of 68 Pages				Exhibit R-2A (PE 0603872C)			

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 1999</b>
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>3352</b>
<p><b>FY 1998 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 17076 Defined, developed, tested, integrated, and delivered EADTB Capability 4.3. Began integration of runtime infrastructure to support High Level Architecture (HLA) compliance/HLS study. Compiled V&amp;V documentation to support user accreditation decisions. Provided selective co-funding of EADTB application. Obtained EADTB study documentation. Defined, directed and integrated Phase II of the SSR Certification Program. Participated in TAMD Joint Engagement Operations Study. This figure also included Government project personnel and support.</li> <li>• 16644 Provided super-computing resources at the ARC/SC to operate a multiple experiment test bed environment for conducting research and development activities for the Army's Ground Based Elements including the EADTB, EADSIM, the THAAD Test Bed, TISES, and TMDSE. Major areas of support included maintenance, modification, and enhancements of/to: CFD analysis; COEA of TMD systems; technical base analysis; concept studies; and alternative trade-off analysis. This figure also included Government project personnel and support.</li> <li>• 10733 Provided BMDO MS&amp;N support in four primary areas: assessments, development/modification, computer architecture/networks, and program management for BMDO and Service M&amp;S programs. Provided continued support to continue development and refinement of the M&amp;S Roadmap. This area also included funding for Service M&amp;S activities. Top priorities included continued development of the EADTB SSRs. Specific Service SSR support included continued/completed development of: Army - PAC 2/3, THAAD, MEADS, JTAGS, ADTOC; Air Force - AWACS, Generic Fighter, CEC; and Navy - TBMD Aegis, JNTF - ALERT, SBIRS and JDN Interoperability.</li> <li>• 1382 Continued to fund modernization and upgrades of Mission Oriented ITR in BMDO and BMDO-funded missile defense development programs in order to satisfy validated requirements of the ITR user community.</li> <li>• 11872 Provided JNTF Project funding to support continued development of Wargame 2000 and BMD SSC. The Wargame 2000 program continued to design and develop a "world-class" simulation tool for use in support of CINC wargames and exercises testing operational concepts involving Theater Air and Missile Defense. Major emphasis was given to VV&amp;A of Wargame 2000 software and simulation operations. The BMD SSC continued to support TMD and NMD in the following areas: assisted in software development process improvement for M&amp;S, developed processes for testing and improving models and algorithms, incorporated new WEB technologies into the BMD SSC, and updated the TMD, NMD and Building Block M&amp;S catalogs/repositories.</li> <li>• 5258 Provided the BMDO Data Centers Program with funding to archive, manage, develop data products, distributed and provided remote access to all relevant BMD test, experiment, M&amp;S, and wargame data. Specific priorities include: AMSC - provide TAMD FoS, NTW and Navy Area TBMD and other TMD program data management support; BCoE - provided Navy Theater Wide (NTW) and Navy Area TAMD programs data management support; MDDC - provided TAMD FoS, THAAD, PAC-3/PATRIOT, MEADS, ARROW, and other TMD programs data management support; BMD SSC - provided Optic Cobra, TMDSE, SIT-98 and SIT-99, Wargame 2000, and EADTB data management support.</li> </ul> <p>Total            62965</p>		
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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>3352</b>
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- FY 1999 Planned Program:**
- 17148 Deliver EADTB development and enhancements. Perform EADTB Final Formal Qualification Testing and deliver EADTB Version 4.4R at the end of 1st quarter. Provide limited on-site support to a select group of EADTB sites. Continue limited EADTB VV&A activities. Closeout and transition to new prime contract. Provide EADSIM baseline maintenance.
- Total 17148
- FY 2000 Planned Program:**
- 11268 Deliver EADTB enhancements to meet formal BMDO approved study/test requirements. Perform EADTB Final Formal Qualification Testing and as required, commence development of EADTB Version 5.0. Provide limited on-site support to a select group of EADTB sites. Continue limited EADTB VV&A activities. Provide EADSIM baseline maintenance.
- Total 11268
- FY 2001 Planned Program:**
- 11592 Deliver EADTB enhancements to support formal BMDO approved study/test requirements. Begin design and development of follow-on releases. Continue VV&A efforts. Provide EADSIM baseline maintenance.
- Total 11592

<b>B. Other Program Funding Summary</b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
2400 NMD Program, PE 0603171C	8099	700	0	0	0	0	0	0
3352 Support Technologies - ATD, PE 0603173C	5015	0	0	0	0	0	0	0
3352 BMD Technical Operations, PE 0603874C	0	50079	29350	29306	30791	27651	27983	28315

**C. Acquisition Strategy:** The tasks in this project are met through full and open competition. The prime contractor for development and operation of the EADTB is Raytheon Systems Company (previously called Hughes Aircraft Company), which was awarded a Cost Plus Award Fee (CPAF) contract in September 1989. The follow-on contract will also be awarded through full and open competition.

<b>D. Schedule Profile</b>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Deliever EADTB Capability 4.4R				1Q						
EADTB Final Formal Qualification				2Q						
Deliever EADTB Capability 5.0					1Q					

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>					<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>					<b>PROJECT</b> <b>3352</b>		
<b>I. Product Development</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total PYs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>FY 2001 Cost</b>	<b>FY 2001 Award Date</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
a. EADTB Development	CPAF	Raytheon Systems Corporation (HSV)	15829	17148	9/89					TBD	32977	
b. EADTB Development	CPAF	TBD - (HSV)				11268	9/99	11592	TBD	TBD	22860	
Subtotal Product Development:			15829	17148		11268		11592			55837	
Remark: The follow-on contractor for the EADTB Development has not been determined at this time. The contract will be awarded through full and open competition.												
<b>II. Support Costs</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total PYs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>FY 2001 Cost</b>	<b>FY 2001 Award Date</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
a.												
Subtotal Support Costs:												
Remark:												
<b>III. Test and Evaluation</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total PYs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>FY 2001 Cost</b>	<b>FY 2001 Award Date</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
a.												
Subtotal Test and Evaluation:												
Remark:												
<b>IV. Management Services</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total PYs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>FY 2001 Cost</b>	<b>FY 2001 Award Date</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
a.												
Subtotal Management Services:												
Remark: * As stated in the CPS.												
Project Total Cost:			15829	17148		11268		11592			55837	
Remark:												
Project 3352 <span style="float: right;">Page 46 of 68 Pages</span> <span style="float: right;">Exhibit R-3 (PE 0603872C)</span>												

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL					PROJECT 3353		
COST (In Thousands)		FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3353	JNTF - TF	38956	0	0	0	0	0	0	0	TBD	TBD
<p>All of the funding in Project 3353 has been transferred to PE 0603874C starting in FY 1999.</p> <p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>This project provides core funding for the Joint National Test Facility (JNTF) for the Ballistic Missile Defense Organization's (BMDO) joint missile defense modeling, simulation, and test center of excellence whose focus is the joint inter-service, interoperability, and integration aspects of missile defense system acquisition. It is staffed by all of the Services. The JNTF is the BMDO's level playing field for the resolution of missile defense issues which cut across Service interfaces. The JNTF conducts human-in-the-loop missile defense wargaming for concept of operations (CONOPS) exploration and development. The JNTF also provides simulation, communication connectivity and other JNTF assets in support of BMDO- and CINC-sponsored theater missile defense exercises. Test planning and analysis for Theater Missile Defense (TMD) is conducted at the JNTF. Ballistic Missile Defense (BMD) system-level analysis of missile defense issues is conducted here. The JNTF also performs studies and analysis in support of joint missile defense and provides inter-service computational capabilities and wide area network communication networks with Service facilities.</p> <p><b>FY 1998 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 21595 Continue JNTF Recurring Operations &amp; Maintenance (O&amp;M) support for services (such as facility, security, supplies, data management, property management, configuration management, media services, logistics engineering, and quality assurance), computer O&amp;M, communications O&amp;M, program management, software engineering, systems engineering, utilities, and government project personnel and personnel support.</li> <li>• 9529 Continue JNTF Nonrecurring Operations &amp; Maintenance support for facility modernization, contract recompetition, physical security upgrades, and information technology improvements and modernization.</li> <li>• 7832 Continue JNTF Core Capability support of small, core cadre of experienced personnel to maintain technical expertise for current and expected JNTF responsibilities (such as information systems security engineering, wargaming, command and control simulations, studies and analysis, and research &amp; development management support.</li> </ul> <p>Total 38956</p> <p><b>FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• See PE 0603874C</li> </ul> <p>Total 0</p>											
Project 3353			Page 47 of 68 Pages					Exhibit R-2A (PE 0603872C)			

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3353</b>
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**FY 2000 Planned Program:**

- See PE 0603874C

Total            0

**FY 2001 Planned Program:**

- See PE 0603874C

Total            0

<b>B. <u>Other Program Funding Summary</u></b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
3353 Joint National Test Facility, PE 0603871C	8584	0	0	0	0	0	0	0		
3353 Joint National Test Facility, PE 0603874C		52847	57889	56498	61718	60166	60990	62514		
3352 Modeling & Simulation, PE 0603871C	2849	0	0	0	0	0	0	0		
3352 Modeling & Simulation, PE 0603872C	13054	0	0	0	0	0	0	0		

**C. Acquisition Strategy:** The tasks in this project are met through full and open competition. The JNTF support contracts were awarded to Lockheed Martin, (Operations & Maintenance) and TRW (Research & Development), both contracts are Cost Plus Award Fee. Contract Advisory & Assistance Services are provided by Vanguard Research as Cost Plus Award Fee. In February 1999, the OMC and RDC will be combined and referred to as the CRDC (Combined Research & Development Contract) with TRW being the prime contract and Lockheed-Martin a Sub-contract to TRW.

<b>D. <u>Schedule Profile</u></b>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
TMD Wargame			2 Q							
TMD Tabletop			4 Q							
CINC Exercise Support			1-4 Q							
TMD System Exerciser Test Support			1-4 Q							
Joint TMD Planner Support			1-4 Q							
TMD BM/C4I Modeling			1-4 Q							

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>							DATE <b>February 1999</b>			
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>				PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>				PROJECT <b>3353</b>		
Wargame 2000 Host Support			1-4 Q							
EADTB Studies Support			1-4 Q							
BMD Simulation Support Center			1-4 Q							
Special Program Center Threat Support			1-4 Q							
Joint Technical Architecture Support			1-4 Q							
Information Technology Improvement & Modernization			1-4 Q							
Project 3353			Page 49 of 68 Pages				Exhibit R-2A (PE 0603872C)			

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>					PROJECT <b>3353</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</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 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:												
Remark:												

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3354</b>
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COST ( <i>In Thousands</i> )	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3354 Targets Support	69453	17866	41966	40133	40135	40028	34224	34778	Continuing	Continuing

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

This project provides core funding for targets and target related services needed to support the testing and evaluation of all Theater Missile Defense (TMD) programs, in particular:

- Theater High-Altitude Area Defense (THAAD) system
- PATRIOT Advanced Capability - 3 (PAC-3) system
- Navy Area Defense (NAD) system
- Navy Theater Wide (NTW) system
- and the US Air Force Airborne Laser (ABL).

This project is a segment of the BMDO Consolidated Targets Program (CTP). The CTP mission is to provide threat representative ballistic missile target system support to interceptor and sensor development and acquisition programs. Each target system is tailored and configured to meet unique mission requirements for each test. This project funds the development and demonstration of U.S. built target systems and Foreign Military Acquisition (FMA) targets to support TMD test and evaluation. The TMD programs provide funds to purchase the targets they actually use in their individual tests.

The THAAD program intends to use the Hera target system with planned launches at White Sands Missile Range (WSMR) including FT. Wingate Launch complex in New Mexico and from Wake Island into the Kwajalein Missile Range (KMR) impact area. The PAC-3 program will use Storm and Hera targets launched from WSMR and Wake Island. The Navy Area and Theater Defense programs will use Hera and other ground targets at WSMR and the Pacific Missile Range Facility (PMRF) (Barking Sands, Kauai, HI). This project is developing a short range (200-600 Km) air launch ballistic target and a long range (600-3000 Km) air-launch target to satisfy the collective target requirements of PAC-3, THAAD, both Navy programs, and TMD Family of Systems (FoS) tests for multiple simultaneous engagements, multi-axis scenarios, and short range and long-range threat target presentations. THAAD and PAC-3 will use air-launched targets at KMR and the Navy will use air-launched targets at PMRF. The project is also developing threat representative reentry vehicles to simulate a set of baseline threats.

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY		February 1999
<b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE	PROJECT
	<b>0603872C Joint TMD - DEM/VAL</b>	<b>3354</b>
<b>FY 1998 Accomplishments:</b>		
•	27975	Initiated Dem/Val of Short and Long Range Air Launch Target (LRALT) development.
•	28900	Continued development and sensor characterization of advanced target payloads.
•	5559	Provided funding for demonstration of Hera from Wake Island to Kwajalein.
•	7019	Provided technical support for targets program operations, including initial definition of ABL target requirements.
Total	69453	
<b>FY 1999 Planned Program:</b>		
•	8135	Provide for validation of TMD targets; which includes support for program management, maintenance & refurbishment, and research & development.
•	96	Continue development and sensor characterization of FMAs.
•	2447	Provide for government project personnel and support.
•	7188	Provide for development of a MBRV.
Total	17866	
<b>FY 2000 Planned Program:</b>		
•	9768	Provide technical support and booster hardware for target program operation.
•	21928	Continue development of LRALT, and initiate development of a Low Fidelity Test Target, and full trajectory threat emulating target capabilities.
•	10270	Continue development and sensor characterization of FMAs and advanced target payloads.
Total	41966	
<b>FY 2001 Planned Program:</b>		
•	10028	Provide technical support and booster hardware for target program operation.
•	19635	Continue development of LRALT, a Low Fidelity Test Target, and full trajectory threat emulating target capabilities.
•	10470	Continue development and sensor characterization of FMAs and advanced target payloads.
Total	40133	
Project 3354	Page 52 of 68 Pages	Exhibit R-2A (PE 0603872C)

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3354</b>
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<b>B. Other Program Funding Summary</b>	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
2257 PATRIOT, PE 0604865C	242690	320342	29141	39119	0	0	0	0	TBD	TBD
2257 PATRIOT, PE 0208865C	316789	245494	300898	367762	400205	379220	366228	266880	TBD	TBD
2260 THAAD, PE 0602218C	0	0	0	0	162136	191272	208120	246902	TBD	TBD
2260 THAAD, PE 0604861C	0	0	577493	556178	417530	293886	205852	0	TBD	TBD
2260 THAAD, PE 0603861C	387260	433172	34133	3519	0	0	0	0	TBD	TBD
2260 THAAD, PE 0208861C	0	0	0	0	0	91729	182628	603924	TBD	TBD
1266 NAVY THEATER WIDE, PE 0603868C	437896	344284	329768	369049	0	0	0	0	TBD	TBD
1266 NAVY THEATER WIDE, PE 0604868C	0	0	0	0	0	92000	323000	406000	TBD	TBD
1266 NAVY THEATER WIDE, PE 0602218C	0	0	0	0	352182	280580	309782	387648	TBD	TBD
2263 NAVY AREA, 0604867C	292063	242347	268389	226772	64208	51548	33596	26665	TBD	TBD
2263 NAVY AREA, PE 0208867C	14859	43189	55002	61066	121035	134379	152319	181381	TBD	TBD
3354 TARGETS, PE 0603874C	0	1962	2320	0	0	0	0	0	CONT	CONT
3360 TEST RESOURCES, PE 0603874C	0	41428	51909	23759	25003	24150	24267	24756	CONT	CONT
3360 TEST RESOURCES, PE 0603872C	61557	46179	13515	14227	13661	13593	11600	11773	CONT	CONT

**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 Products Office (SMDC-TJ-TT) in Huntsville, AL. The Hera target system, developed by Coleman Aerospace Corporation (CAC) (Orlando, FL) is being procured with a contract for a quantity of 25 targets. Orbital Sciences Corporation (OSC) has delivered four Storm Maneuvering Tactical Target Vehicles (MTTV). Additional targets include the Lance target system and Foreign Material Acquisition. The development and demonstration of the air launch ballistic target system is being managed by USASMDC/TT&E office with the Air Force Space and Missile Command as the contracting agency. The Consolidated Theater Target Systems (CTTS) contract was awarded 27 February 1998 to CAC, OSC and Lockheed Martin Missile Systems (LMMS) to produce future theater targets. This contract provides increased flexibility to meet MDAP schedules and requirements.

<b>D. Schedule Profile</b>	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
SRALT Demo		3Q						
Navy Area		4Q	1 - 4Q's	1 & 2Q's				
Navy Theater Wide		1Q	1 - 4Q's	1 - 4Q's	1 - 4Q's			
PATRIOT			1 - 4Q's	1 & 2Q's				
THAAD			1 - 4Q's	1 - 3Q's			1 - 4Q's	1 - 4Q's
Others (support of Technology Programs)	3Q & 4Q	2 - 4Q's	1 - 4Q's		3Q	3Q & 4Q		

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>					<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>					<b>PROJECT</b> <b>3354</b>		
<b>I. Product Development</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total PYs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>FY 2001 Cost</b>	<b>FY 2001 Award Date</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
a. Target Acquisition	Allot	USASMDC (Huntsville, AL)	N/A	15419	N/A	38946	N/A	37505	N/A	Cont Effort	91870	N/A
Subtotal Product Development:				15419		38946		37505			91870	N/A
Remark:												
<b>II. Support Costs</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total PYs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>FY 2001 Cost</b>	<b>FY 2001 Award Date</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Subtotal Support Costs:												
Remark:												
<b>III. Test and Evaluation</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total PYs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>FY 2001 Cost</b>	<b>FY 2001 Award Date</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Subtotal Test and Evaluation:												
Remark:												
<b>IV. Management Services</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total PYs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>FY 2001 Cost</b>	<b>FY 2001 Award Date</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
a. Gov Project Per & Supt	Allot	USASMDC (Huntsville, AL)	N/A	2447	N/A	3020	N/A	2628	N/A	Cont Effort	8095	N/A
Subtotal Management Services:				2447		3020		2628			8095	N/A
Remark:												
<b>Project Total Cost:</b>				17866		41966		40133				
Remark:												

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL				PROJECT 3359		
COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3359 System Test and Evaluation	38676	4786	11734	24662	24639	24614	21918	21934	Continuing	Continuing
<p>Some of the funding for Project 3359 has been transferred to PE 0603873C starting in FY1999.</p> <p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>Beginning in FY99, within this program element, this project funds only the joint BMD lethality program. This joint lethality program focuses on the capability to confidently predict the effects of intercepting missiles with weapons of mass destruction warheads. This is performed through two core areas: Lethality assessment and analysis, and key laboratory and field experiments. It includes estimates of probability of kill of chemical/biological submunitions, creation of models to determine chemical/biological ground effects, confirmation of damage laws from low mass/high-velocity intercepts, confirmation of damage laws from high velocity rods, development of generic lethality targets. These activities complement the activities performed within the individual system test programs.</p> <p><b>FY 1998 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 25554 Transition TMDSE Build 2 to the Joint National Test Facility. Begin Build 3 development of TMDSE which adds THAAD radar Testbed HWIL, multiple AEGIS ships and Patriot elements, and increased fidelity of BMC<sup>3</sup>. Perform test planning for scheduled SITs. Perform HWIL tests and analysis in conjunction with the schedule. Plan and execute a mini-SIT 98 using PATRIOT's Large Scale Search and Track test and other TMD assets and conduct post SIT analysis. Integration and interoperability testing of the TMD Family of Systems will be performed. Begin acquiring a target for SIT-00.</li> <li>• 7994 Support the standard lethality threat representative targets, performance of the necessary tests and experiments to obtain lethality data. Maintain endgame Parametric Endo-Exo Lethality Simulation (PEELS) and Post Engagement Ground Effects Model (PEGEM) simulations at current state of knowledge of lethality phenomena. Provide realistic model based on test data and analyses for atmospheric transport, diffusion, deposition, and evaporation of Chemical, Biological Weapon (CBW) agents released from ground level to high altitude. Provide plans to examine lethality as a function of mass and velocity, high velocity phenomena, agent response, and ground effects.</li> <li>• 1584 (As a result of the realignment, some of the previously planned evaluation activities are now conducted under projects 3251 and 3153.) Maintain support to execute the Consolidated Evaluation Program and methodology and conduct special studies and technical investigations. Plan FoS test program and draft key program documents, e.g., draft Capstone TEMP and FoS T&amp;E CARD. Participate in THAAD, PAC-3, and NTWDS Test Readiness Reviews. Provide evaluation support to the BMD Acquisition Review Council (BMDARC). Participate in SM-2 Blk IVA Flight Test Readiness Reviews. Provide analyzed test data inputs to support evaluation and analysis for the BMDARC review of PATRIOT for it's DAB and for the Navy Area TBMD UOES. Assess results of HWILT 98 events and TMDSE testing. Support data analysis and review.</li> </ul>										
Project 3359	Page 55 of 68 Pages						Exhibit R-2A (PE 0603872C)			

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BUDGET ACTIVITY		PE NUMBER AND TITLE	PROJECT
<b>4 - Demonstration and Validation</b>		<b>0603872C Joint TMD - DEM/VAL</b>	<b>3359</b>
	3544	Manage operational assessment activities for the TMD FoS. Continue monitoring of THAAD testing. Monitor PAC-3 EMD testing and Navy Area testing. Provide updated inputs to the CER utilizing current test data from MDAPs, SITs, Joint Exercises, and Wargames, as well as analytical techniques to estimate the TMD system maturity.	
Total	38676		
<b>FY 1999 Planned Program:</b>			
	4786	Lethality: Maintain endgame Parametric Endo-Exo Lethality Simulation (PEELS) and postgame (PEGEM) model simulations at current state of knowledge of lethality phenomena. Provide realistic model based on test data and analyses for atmospheric transport, diffusion, deposition, and evaporation of Chemical, Biological Weapon (CBW) agents released from ground level to high altitude. Provide plans to examine lethality as a function of mass and velocity, high velocity phenomena, agent response, and ground effects.	
Total	4786		
<b>FY 2000 Planned Program:</b>			
	5123	Lethality (Modeling): Maintain Parametric Endo-Exo Lethality Simulation (PEELS) and Post Engagement Ground Effects Model (PEGEM) for predicting lethality phenomena. Assess PEELS and PEGEM capability for modeling high velocity and high altitude intercepts. Incorporate PAC-3 scaled intercept and sled test data to calibrate expected ground effects. Incorporate laboratory and field experiment data into model upgrades.	
	6611	Lethality (Assessment and Experiments): Initiate end-to-end assessment of capabilities to confidently predict the effects from intercepts of missile weapons of mass destruction (WMD) warheads. Perform laboratory experiments on warhead materials and CBW agents to increase knowledge base of lethality phenomena and ground effects. Initiate systematic series of field experiments to obtain critical data required to model CBW agent behavior (droplet formation, atmospheric transport, diffusion, deposition, and evaporation). Evaluate existing high velocity equations of state and fracture data and validity of hydrocodes in the high velocity impact regimes. Assess suitability of data collection assets for tracking CBW agent clouds. Assess the benefit of rod lethality enhancers in hit-to-kill intercepts.	
Total	11734		
<b>FY 2001 Planned Program:</b>			
	6000	Lethality (Modeling): Maintain Parametric Endo-Exo Lethality Simulation (PEELS) and Post Engagement Ground Effects Model (PEGEM) for predicting lethality phenomena. Assess PEELS and PEGEM capability for modeling high velocity and high altitude intercepts. Incorporate SM-2 Block IV-A Arena test data to calibrate expected ground effects. Incorporate laboratory and field experiment and MDAP test data into model upgrades.	
	8662	Lethality (Assessment and Laboratory Experiments): Continue end-to-end assessment of capabilities to confidently predict WMD intercept effects. Extend laboratory experiments on warhead materials to expand our knowledge base of lethality phenomena. Continue laboratory experiments to obtain critical data required to model CBW agent behavior (droplet formation, atmospheric transport, diffusion, deposition, and evaporation). Perform laboratory experiments to determine meteorological effects on CBW agents. Evaluate existing high velocity equations of state and fracture data and validity of hydrocodes in the high velocity impact regimes.	
Project 3359			
Page 56 of 68 Pages			
Exhibit R-2A (PE 0603872C)			

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3359</b>
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- 10000 Lethality (Field Experiments): Continue systematic series of field experiments to obtain critical data required to model CBW agent behavior. Track and obtain data on agent cloud transport, diffusion, and ground effects. Evaluate sensor requirements and capabilities to measure hit/kill signatures and identify warhead types. Establish criteria for rapid assessment of target damage. Conduct experiments to determine the benefit of rod lethality enhancers in hit-to-kill intercepts.

Total 24662

<b>B. Other Program Funding Summary</b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>

**C. Acquisition Strategy:** This effort will use existing BMDO and Service executing agents contracts to conduct lethality assessment, modeling, and experimentation. The strategy complements program specific lethality testing, such as sled and light gas gun tests which are funded within the specific missile defense programs. Critical lethality related system characteristics and issues should be identified early in the process and be evaluated to allow for informed decision-making.

<b>D. Schedule Profile</b>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Assess Limitations of WMD Negation Models		3Q		1Q		1Q	4Q
Conduct Systematic End-to-End Lethality Analysis			4Q		2Q, 4Q		4Q
Assess High Velocity Impact Scaling		3Q	4Q	1Q			
Exploratory Lab & Field Experiments			2Q, 4Q	3Q			
Systematic Lab Experiments			4Q		2Q, 4Q		
Critical Anchoring Field Experiments		4Q	2Q, 4Q	3Q	2Q, 4Q	3Q	3Q
Measure Kill Assessment and Warhead Type Signatures				1Q		1Q	

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3359</b>
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 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 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 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 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Lethality Analysis	Multiple	Various		4786		11734		24662			41182	
Subtotal Test and Evaluation:				4786		11734		24662			41182	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												

Remark:

Project Total Cost:				4786		11734		24662			41182	
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Remark:

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>								DATE <b>February 1999</b>		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>				PROJECT <b>3360</b>	
<i>COST (In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3360 Test Resources	61557	46179	13515	14227	13661	13593	11600	11773	Continuing	Continuing
<p>Funding associated with PMA 3157 has been transferred into this project beginning in FY99. Some FY00-05 funding has been transferred to PE 0603874C. The funding that remains in the JTMD PE, 0603872C is for TMD unique Test Resources.</p> <p><b>A. <u>Mission Description and Budget Item Justification</u></b></p> <p>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 ground test facilities, ranges and instrumentation used by JTMD development programs. Project 3360 funds common TMD test resources costs, including BMDO use. Individual programs pay only the direct costs associated with their specific testing efforts.</p> <p>The ground test facilities, which support JTMD, 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 at the Arnold Engineering and Development Center (AEDC) in Tullahoma, TN          7V and 10V Space Chambers at the Arnold Engineering Development Center, Tullahoma, TN          The Center for Research Support (CERES) at the Joint National Facility, Schriver AFB, CO</p> <p>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 central Pacific Ocean          Pacific Missile Range Facility (PMRF) and Kauai Test Facility (KTF) at Kauai, HI          Eglin Gulf Test Range (EGTR) at Fort Walton Beach, FL</p> <p>The range instrumentation special test equipment, data collection assets, and range instrumentation, which support JTMD, include:          High Altitude Observatory (HALO) with the Infrared Imaging System (IRIS) sensor, based at Aeromet, Inc., Tulsa, OK          Miscellaneous improvements to BMDO infrastructures and support systems</p> <p>These ground test facilities, test ranges and instrumentation assets provide valuable risk reduction and test implementation capability in support of the JTMD 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</p>										
Project 3360			<i>Page 59 of 68 Pages</i>				Exhibit R-2A (PE 0603872C)			

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 1999</b>
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3360</b>
<p>common range facilities provide a cost-effective method of flight testing missile and target components applicable to the TMD program and FoS, BMC<sup>o</sup> and interoperability testing. The range instrumentation provides a cost-effective capability to collect target signature characteristics, phenomenology data, and target/interceptor diagnostics on flight tests. These facilities and capabilities support systems design, verification and validation of target realism, and the evaluation of test results.</p> <p>In FY99, this program element and project also 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) system. Plans, programs, budgets, and oversees facility acquisition through the Military Construction (MILCON) and RDT&amp;E construction programs. Provides guidance and supports BMDO TMD Environmental Safety and Health (ESH) Program which includes the Environmental Assessment and Environmental Impact Statement process, environmental compliance, pollution prevention, and other environmental efforts for TMD activities.</p> <p><b>FY 1998 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 11034 Provided ground test facility infrastructure and upgrades for BMDO testing including: end game hardware-in-the-loop testing of integrated IR sensor systems including THAAD and Navy Theater Wide TBMD at KHILS, wind tunnel testing at Tunnel 9 to support AIT, sensor testing at NRaD and AEDC 7V/10V, propellant loading expertise and GBI hover test support from the NHTF, THAAD, PATRIOT and Navy Theater Wide lethality testing at AEDC Range G, IR phenomenology characterization at Tunnel 9 and KHILS, and maintain primary IR standards and black body and optical materials calibrations at the NIST. Supported THAAD objective window testing at Tunnel 9. Provided orbital experiment and satellite operations support at CERES and SBIRS Low Flight Demonstration System Support at CERES.</li> <li>• 8339 Provided planning and test range infrastructure, including caretaker activities at Wake Island, KTF, WSMR and Ft Wingate, and upgrades for BMDO testing including development of TMD launch and range facilities, and associated range instrumentation sites, including a second environmental shelter at Wake Island.</li> <li>• 7159 Provided range instrumentation, upgrades, data collection, and analyses for BMDO testing including data collecting and processing by SLBD, HAOI at WSMR and HALO/IRIS sensor. Supported FOC of upgraded KMRSS to support Multiple Shot Engagements. Achieved IOC of second NP-3 RASA.</li> <li>• 33725 Provide planning, instrumentation upgrades, and facility improvements at PMRF as well as planning and infrastructure support for the KTF in preparation for JTMD related test activities.</li> <li>• 1300 Provide technical support for Resource activities at BMDO</li> </ul> <p>Total 61557</p> <p><b>FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 3278 Provide ground test facility infrastructure and upgrades for BMDO testing at KHILS to support endgame HWIL testing at integrated IR sensors systems including THAAD, AIT, and Navy Theater Wide TBMD.</li> <li>• 5823 Provide planning, test range infrastructure, and caretaker activities at Wake Island in preparation for Family of Systems (FoS) and TMD testing in FY00.</li> </ul>		
Project 3360	Page 60 of 68 Pages	Exhibit R-2A (PE 0603872C)

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>February 1999</b>
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3360</b>
• 5414	Provide range instrumentation, upgrades, data collection, and analyses for BMDO TMD testing including data collecting and processing by HALO/IRIS.	
• 1258	Integrate ESH considerations into BMDO weapon systems acquisition life cycle; to reduce overall risk and costs, while enhancing the human environment and systems' performance. ESH analyses are accomplished in five (5) areas to integrate ESH issues into the systems engineering and other program planning processes. These areas are: 1) the National Environmental Policy Act (NEPA), 2) environmental compliance, 3) safety and occupational health, 4) hazardous materials management, and 5) pollution prevention. Work continues on environmental analyses of TMD testing at Eglin Gulf Test Range, Pacific Missile Range Facility, the Medium Extended Air Defense System (MEADS), and target launch activities at Fort Wingate, USAKA, and Wake Island. Work also continues on the Navy Area, Navy Theater Wide, THAAD and PAC-3 systems.	
• 1115	Ensures the FY99-01 MILCON, Minor MILCON, and RDT&E design and construction activities are executed in time to support BMD programs' facility requirements and ensures compliance with all applicable laws and regulations. The design emphasis will be on initiating design for the National Missile Defense (NMD) facility requirements in preparation for the Deployment Readiness Review and design for THAAD and PAC-3 systems. Provides for TMD and NMD test and evaluation facilities improvements to support increasingly complex test scenarios. The construction emphasis will be on the facilities upgrades at Pacific Missile Range Facility and other ranges where the System Integration Test will occur.	
• 29291	Provide planning, instrumentation upgrades, and facility improvements at PMRF as well as planning and infrastructure support for the KTF in preparation for JTMD related test activities.	
Total	46179	
<b>FY 2000 Planned Program:</b>		
• 2496	Provide ground test facility infrastructure and upgrades for BMDO testing at KHILS to support endgame HWIL testing at integrated IR sensors systems including THAAD, AIT, and Navy Theater Wide TBMD.	
• 6240	Provide planning, test range infrastructure, and caretaker activities at Wake Island in preparation for Family of Systems (FoS) and TMD testing in FY00.	
• 4779	Provide range instrumentation, upgrades, data collection, and analyses for BMDO TMD testing including data collecting and processing by HALO/IRIS.	
Total	13515	
<b>FY 2001 Planned Program:</b>		
• 3222	Provide ground test facility infrastructure and upgrades for BMDO testing at KHILS to support endgame HWIL testing at integrated IR sensors systems including THAAD, AIT, and Navy Theater Wide TBMD.	
• 5711	Provide planning, test range infrastructure, and caretaker activities at Wake Island in preparation for Family of Systems (FoS) and TMD testing in FY00.	
• 5294	Provide range instrumentation, upgrades, data collection, and analyses for BMDO TMD testing including data collecting and processing by HALO/IRIS.	
Total	14227	
Project 3360		

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3360</b>
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<b>B. Other Program Funding Summary</b>	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
2257 PATRIOT, PE 0604865C	242690	320342	29141	39119	0	0	0	0	TBD	TBD
2257 PATRIOT, PE 0208865C	316789	245494	300898	367762	400205	379220	366228	266880	TBD	TBD
2260 THAAD, PE 0602218C	0	0	0	0	162136	191272	208120	246902	TBD	TBD
2260 THAAD, PE 0604861C	0	0	577493	556178	417530	293886	205852	0	TBD	TBD
2260 THAAD, PE 0603861C	387260	433172	34133	3519	0	0	0	0	TBD	TBD
2260 THAAD, PE 0208861C	0	0	0	0	0	91729	182628	603924	TBD	TBD
1266 NAVY THEATER WIDE, PE 0603868C	437896	344284	329768	369049	0	0	0	0	TBD	TBD
1266 NAVY THEATER WIDE, PE 0604868C	0	0	0	0	0	92000	323000	406000	TBD	TBD
1266 NAVY THEATER WIDE, PE 0602218C	0	0	0	0	352182	280580	309782	387648	TBD	TBD
2263 NAVY AREA, 0604867C	292063	242347	268389	226772	64208	51548	33596	26665	TBD	TBD
2263 NAVY AREA, PE 0208867C	14859	43189	55002	61066	121035	134379	152319	181381	TBD	TBD
3354 TARGETS, PE 0603874C	0	1962	2320	0	0	0	0	0	CONT	CONT.
3354 TEST RESOURCES, PE 0603874C	0	41410	51909	23759	25003	24150	24267	24756	CONT	CONT.
3360 TARGETS, PE 0603872C	69453	17866	41966	40133	40135	40028	34224	34778	CONT	CONT.

**C. Acquisition Strategy:** In using ranges and test facilities and providing technical assistance of facilities, siting, and environmental activities, BMDO implements a Reliance process which:

- maintains perspective of national technical test capabilities relative to BMD
- responds to program requirements
- uses existing test resources where possible
- requires coordination prior to development of new resources
- and consolidates management of existing resources where possible and practicable.

This policy results in 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 Command (USASMDC)
- U.S. Navy Office of Naval Research
- Navy Program Office – Theater Air Defense
- U.S. Air Force Research Laboratory
- U.S. Army Corps of Engineers
- and the U.S. Army Program Executive Office-Missile Defense.

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>3360</b>
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The majority of the ground test facilities are government owned and are operated with some degree of contractor support, and support multiple BMDO users. The test ranges are part of the DoD Major Range and Test Facility Base (MRTFB). The HALO/IRIS and AST sensors are operated by competitively awarded contracts.

D. <u>Schedule Profile</u>	FY 1998				FY 1999				FY 2000				FY 2001				FY 2002				FY 2003				FY 2004				FY 2005						
	Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
KHILS – AIT										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
KHILS – DITP (Quantum Well, Integration Tests)					X	X	X	X	X	X	X	X	X	X	X	X	X																		
KHILS – DTRA (Nuclear Requirements)										X	X	X	X	X	X	X	X	X	X	X															
KHILS – THAAD (Seeker Entries, Target Modeling & Algorithm Support)					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X														
KHILS – BPI (System Studies)					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
KHILS – MEADS (HIL Testing)													X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
KHILS – Theater Wide SM 3 (HIL Testing)												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
KHILS – GBI (KV Down Select, Flight Test Support)					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
KHILS – Target VV&A					X	X	X	X	X	X																									
7V/10V – GBI: BNA	X	X	X	X																															
7V/10V – GBI: Raytheon	X	X	X	X																															
Tunnel 9 – THAAD Support	X	X	X	X																															
Tunnel 9 – Arrow Support	X	X	X	X																															
Tunnel 9 – Phenomenology Support	X	X	X	X																															
Tunnel 9 – AIT Support				X	X																														
Tunnel 9 – Navy Lower Tier Support				X																															
NHTF – Hover Ops	X	X	X	X																															
NHTF – Air Force NMD	X	X	X	X																															
NHTF – SM-X				X																															
NHTF – GBI (National)			X																																
NHTF – NTW				X																															
Range G – PAC-3	X	X	X																																
Range G – NMD				X	X																														
Range G – Navy Theater TBMD				X																															
Range G – Phenomenology Impact	X	X																																	
POST – SBIRS Low	X	X	X	X																															
CERES – RCS Programs Support	X	X	X	X																															



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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>	DATE <b>February 1999</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603872C Joint TMD - DEM/VAL</b>	<b>PROJECT</b> <b>3360</b>
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. PMRF Upgrades	Allot	Navy, PMRF		19887	10/01/98						19887	
b. Optical Sensor Upgrade	Allot	Navy, PMRF		4893	10/01/98						4893	
c. Army TMD Facility/ Environmental Programs Development	Allot	Army PEO, Huntsville		490	10/01/99						490	
d. Navy TMD Facility/ Environmental Programs Development	Allot	Navy PEO TAD, Arlington VA		147	10/01/99						147	
e. Air Force TMD Facility/Environmental Programs Development	Allot	AF SMC, Los Angeles CA		10	10/01/99						10	
f. Environmental, Safety & Health Initiatives		TBD		166							232	
Subtotal Product Development:				25659							25659	N/A

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. KTF	Allot	Navy, Kauia Test Facility		4893	10/01/98	0		0			4893	
b. HALO/IRIS Support	Allot	SMDC, Huntsville, AL		5122	10/01/98	4779	10/01/99	5294	10/01/00	TBD	15195	
c. Wake Island Support	Allot	SMDC, Wake Island		5693	10/01/98	6240	10/01/99	5711	10/01/00	Cont	17644	
d. KHLS Support	Allot	Air Force, Florida		3112	10/01/98	2496	10/01/99	3222	10/01/00	Cont	8830	
e. Facility Acquisition Life-Cycle Management		U.S. Army Corps of Engineers, Huntsville AL		100	10/01/99	0	10/01/00	0	10/01/01	Cont	100	
f. System Engineering and Technical Support (BMDO)	CPFF	SciComm, Inc Rosslyn, VA		1600	08/01/99	0	08/01/00	0	8/01/01	Cont	1600	
Subtotal Support Costs:				20520		13515		14227			48262	

Remark:

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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 1999</b>		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>					PROJECT <b>3360</b>		
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal Test and Evaluation:												
Remark:												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal Management Services:												
Remark:												
Project Total Cost:				46179		13515		14227		Continuing Effort	N/A	N/A
Remark:												

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL				PROJECT 4000		
COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4000 Operational Support	73442	59854	67719	78626	74715	74479	63329	65549	Continuing	Continuing

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

This project provides support in three basic areas: personnel and related support costs; funding to meet fluctuation costs and contract terminations; and assistance required to fund support service contracts for the Theater Missile Defense (TMD) program..

Personnel and related support costs common to all TMD projects include support of the Office of the Director, Ballistic Missile Defense Organization and his staff located within the Washington, D.C. area, as well as BMDO's Executing Agents within the US Army Space & Strategic Defense Command, U.S. Army PEO Missile Defense, U.S. Navy PEO for Theater Defense, U.S. Air Force PEO office, and the National Test Facility. This project supports funding for overhead/indirect personnel costs, benefits, and infrastructure costs such as rents, utilities, supplies, etc.

The BMDO prioritizes funding within this project to meet operational, contractual, and statutory fiscal requirements for the TMD program. Operational requirements include reimbursable services acquired through the Defense Business Operating Fund (DBOF), such as accounting services provided by the Defense Finance and Accounting Service (DFAS). Contractual requirements include 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. Finally, statutory requirements include funding for charges to canceled appropriations in accordance with Public Law 101-510.

Assistance required to support BMDO overhead management functions for the TMD program is contained in this project. This assistance ranges from operational contracts to fully support functions such as ADP operations, automated tool, Access control offices, and graphics support, to supportive efforts required, as well as to supplement the BMDO government personnel. Typical efforts include cost estimating, security management, contracts management, strategic relations management and information management. These efforts include assessment of technical project design, development and testing, test planning, assessment of technology maturity and technology integration across BMDO projects; and support of design reviews and technology interface meetings. Program control tasks include assessment of schedule, cost, and performance, with attendant documentation of the many related programmatic issues. The requirement for this area is based on most economical and efficient utilization of contractors versus government personnel.

The Fiscal Year 1996 Defense Authorization Act eliminated the management program element effective with the Fiscal Year 1997 President's Budget submission. This overhead management and indirect program support funding has been realigned in accordance with Public Law 104-106.

**FY 1998 Accomplishments:**

- 73442 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies.

Total 73442

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603872C Joint TMD - DEM/VAL</b>	PROJECT <b>4000</b>
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- FY 1999 Planned Program:**
- 59854 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies.
- Total 59854
- FY 2000 Planned Program:**
- 67719 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies.
- Total 67719
- FY 2001 Planned Program:**
- 78626 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies.
- Total 78626

<b>B. <u>Other Program Funding Summary</u></b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>

**C. Acquisition Strategy:**

<b>D. <u>Schedule Profile</u></b>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>