

UNCLASSIFIED

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL
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COST (In Thousands)	FY 1999 Actual	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	204213	196556	0	0	0	0	0	TBD	TBD
1170 TMD Risk Reduction	25820	0	0	0	0	0	0	TBD	TBD
2160 TMD Existing System Modifications	2447	0	0	0	0	0	0	TBD	TBD
3155 System Engineering & Integration	0	46433	0	0	0	0	0	TBD	TBD
3251 System Engineering & Tech Support	16485	0	0	0	0	0	0	TBD	TBD
3265 User Interface	15266	0	0	0	0	0	0	TBD	TBD
3352 Modeling & Simulation	16539	0	0	0	0	0	0	TBD	TBD
3354 Targets Support	17615	48056	0	0	0	0	0	TBD	TBD
3359 System Test and Evaluation	3966	21363	0	0	0	0	0	TBD	TBD
3360 Test Resources	45846	13734	0	0	0	0	0	TBD	TBD
4000 Operational Support	60229	66970	0	0	0	0	0	TBD	TBD

A. Mission Description and Budget Item Justification

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 deployed forces and areas of operation 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).

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.

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BUDGET ACTIVITY

4 - Demonstration and Validation

PE NUMBER AND TITLE

0603872C Joint TMD - DEM/VAL

Starting in FY 01, all projects in the JTMD program element have been transferred to either the Family of Systems program element (0603873C) or the Technical Operations program element (0603874C). The decision to transfer the funds from the JTMD program element was to ensure and maintain adequate visibility into all Theater Missile Defense efforts.

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

B. Program Change Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 2000 PB)	200464	195722	218608
Congressional Adjustments		+2500	
Appropriated Value		198222	
Adjustments to Appropriated Value			
a. Congressional Reductions (FFRDC, Inflation, etc)		-935	
b. OSD Reductions			
c. Emergency Supplemental			
d. Internal Reprogramming		-721	
Adjustments to Budget Years Since FY 2000 PB	3749		-218608
Current Budget Submit (FY 2001 PB)	204213	196566	0

Change Summary Explanation:

For FY00, a Congressional Plus-Up of \$2.5M was provided for the development of Liquid Fueled Targets (Project 3354).

Starting in FY 01, all JTMD funding will transfer to either the Family of Systems program element (0603873C) or to the Technical Operations program element (0603874C).

C. Acquisition Strategies:

See Individual R2a summaries.

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 1170
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COST (In Thousands)	FY 1999 Actual	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	25820	0	0	0	0	0	0	TBD	TBD

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 during 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 principle 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 Kiernan Reentry Measurement System (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.

Funding for this project was transferred to PMA 3155 beginning in FY00. Subsequently, the funding for this Project will transfer to the PE 0603873C – Family of Systems Engineering and Integration beginning in FY01.

FY 1999 Accomplishments:

- 8497 Range and sensor support for TCMP 3A flight test
 - 6439 Completed payload development/fabrication, documentation, technical support/mission planning for TCMP 3A flight test
 - 7257 Conducted TCMP 3A flight test - launch vehicle / launch services
 - 490 Continued to plan and execute collection of intercept data. Assessed NTW Blk II sensor alternatives for kill assessment.
 - 3137 Government project personnel and support
- Total 25820

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 2160
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COST (In Thousands)	FY 1999 Actual	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 Modifications	2447	0	0	0	0	0	0	TBD	TBD

A. Mission Description and Budget Item Justification

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.

FY 1999 Accomplishments:

- 2447 SHIELD: Continued SHIELD development, test and evaluation activities; continued to incrementally developed test and demonstrated improved processing capabilities and fusion of other intelligence and sensor data sources with DSP. Infrared and data fusion efforts were culminated with operational code for ALERT and Space Based Infrared System Increment 1 capabilities.

Total 2447

B. Other Program Funding Summary	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
N/A										

C. Acquisition Strategy: N/A

D. Schedule Profile	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
N/A										

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3155
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COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3155 System Engineering & Integration	0	46433	0	0	0	0	0	TBD	TBD

A. Mission Description and Budget Item Justification

This purpose of this project is to provide system engineering, analysis, and technical support for the development of a joint Theater Air and Missile Defense (TAMD) Family of Systems (FoS) architecture. Joint Theater Air and Missile Defense (JTAMD) is the integrated capability to detect, classify, intercept and destroy or negate the effectiveness of enemy aircraft and missiles prior to launch or while in flight, to protect US and coalition forces, selected assets, and populations centers within an assigned theater of operations. The TAMD FoS architecture will focus on the integration of theater ballistic missile defense, cruise missile defense, air defense, and attack operations.

This project funds the development, operation, and Verification, Validation and Accreditation (VV&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.

This project also funds the TMD Critical Measurements Program (TCMP). The purpose of the 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.

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BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL				PROJECT 3155					
<p>This project provides support for UK developed sensor data fusion methodology, specifically, UK sensor data fusion efforts including Target Oriented Tracking System (TOTS) integration testing and development and testing of TOTS applications.</p> <p>Funding from various projects within PE 0603872C were transferred to project 3155 in FY 00 due to the Program Element restructure. Funding in this project then transferred to PE 0603873C (PMA 3155) starting in FY01.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 14992 TCMP – Conduct data analysis for T+30 day review as well as the T+180 day data analysis workshop for TCMP 3A. Conduct user and experiment requirements reviews as well as preliminary and critical design reviews for TCMP 3B. Complete design and purchase of payload and launch hardware for TCMP 3B. Initiate UDS documentation and technical support for TCMP 3B. Initiate mission planning for TCMP 4A&B. Conduct sensor planning for TCMP 3B. • 12673 TMD Program Support - 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. 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. • 10388 EADTB - Deliver EADTB enhancements to meet formal BMDO approved study/test requirements. Perform EADTB Final Formal Qualification Testing and as required, commence continued improvement of EADTB. Provide limited on-site support to a select group of EADTB sites. Continue limited EADTB VV&A activities. Provide EADSIM baseline maintenance. • 4667 Govt Project Personnel & Support - Provide funding for government personnel and project management • 895 International Programs - Continue UK sensor data fusion efforts including Target Oriented Tracking System (TOTS) integration testing and development and testing of TOTS applications. • 2828 BMD Impact Analysis and Engineering – Delivers short notice engineering and analytical recommendations and proposed solutions associated with broad ballistic missile defense issues. Provides congressional, OSD, and BMDO leadership with a range of options for dealing with threat, architectural, and system elements influencing the design and composition of US ballistic missile defenses. Includes resources to foster improvements in BMD command and control leading towards a coordinated engagement capability (CEC) and single integrated air picture. <p>Total 46443</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • Funding has been transferred to Program Element 0603873C/Project 3155 beginning in FY 01 													
B. Other Program Funding Summary				<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>
Project 3155				Page 8 of 35 Pages				Exhibit R-2A (PE 0603872C)					

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BUDGET ACTIVITY
4 - Demonstration and Validation

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

3155 System Engr & Integration, PE 0603873C				42208	49263	50327	42860	42474	Continue	Continue
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C. Acquisition Strategy: N/A

D. Schedule Profile	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
TCMP 3A Data Analysis Review					1Q					
TCMP 3A Data Assessment Workshop					3Q					
TCMP-3B Experiments Requirements Review					2Q					
TCMP-3B Payload Design Review					3Q					
TCMP-3B Critical Design Review					4Q					
Final Delivery of TOTS					4Q					

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BMDO RDT&E COST ANALYSIS (R-3)

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BUDGET ACTIVITY
4 - Demonstration and Validation

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

PROJECT
3155

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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, 3B		MIT/LL, Lexington, Mass.		5890	1Q00				5890	
b. TCMP Payload 4A& 4B		MIT/LL, Lexington, Mass		1902	1Q00				1902	
c. TCMP Launch Vehicle		OSC, Chandler, AZ		2200	1Q00				2200	
d. TCMP Booster Mods		Aerojet, CA		1950	1Q00				1950	
e. EADTB Development	CPAF	TBD (HSV)		10388	1Q00				10388	
f. TOTS UK/MOD				895	1Q00				895	
g.										
Subtotal Product Development:				23225					23225	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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		300	1Q00				300	
b. TCMP Data Analysis		PRA, Huntsville, AL		200	1Q00				200	
c. TCMP Technical Support		NRC, Huntsville, AL		150	1Q00				150	
d. TCMP Flight Analysis		AF-TRW		600	1Q00				600	
e. TCMP Flight Analysis		MIT/LL		1300	1Q00				1300	
f. Missile Def Data Center		CAS		100	1Q00				100	
g. SETA Support	CPAF	Sparta, Arlington, VA		4745	1Q00				4745	
h. POET Support		FFRDCs		5579	1Q00				5579	
i. Mission Support				2349	1Q00				2349	
j. BMD Analysis Support		Various		1400	1Q00				1400	
Subtotal Support Costs:				16723					16723	

Remark:

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BMDO RDT&E COST ANALYSIS (R-3)

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3155
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III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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		0						
b. TCMP Range/Flight Ops		KMR/Raytheon		200	1Q00				200	
c. TCMP Range/Flight Ops		CDC, Wake Island		200	1Q00				200	
d. Sensor Deployment		Various		0						
e.										
f.										
Subtotal Test and Evaluation:				400					400	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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				4667	1Q00				4667	
b. BMD Analysis Support		Various		1428	1Q00				1428	
c.										
d.										
e.										
f.										
Subtotal Management Services:				6095					6095	

Remark:

Project Total Cost:				46443					46443	
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Remark:

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3251
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COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3251 System Engineering & Tech Support	16485	0	0	0	0	0	0	TBD	TBD

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.

Funding for this project transferred to Project 3155 beginning in FY00. Subsequently, the funding for this project transferred to the PE 0603873C – Family of Systems Engineering and Integration beginning in FY01.

FY 1999 Accomplishments:

- 900 Continued UK sensor data fusion efforts including Target Oriented Tracking System (TOTS) integration testing and development and testing of TOTS applications.
 - 5407 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.
 - 5103 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.
 - 4104 Provided funding for government personnel and project management
- Total 15514

FY 2000 Planned Program:

- Funding has been transferred to Project 3155 beginning in FY 00

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BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL				PROJECT 3265		
COST (In Thousands)	FY 1999 Actual	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	15266	0	0	0	0	0	0	TBD	TBD	
A. <u>Mission Description and Budget Item Justification</u>										
<p>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 CINCs 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.</p> <p>This project includes the following specific efforts:</p> <p>Support for the warfighting CINCs 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 CINCs 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.</p> <p>Support of FoS interoperability by assisting CINCs' efforts to develop JTAMD doctrine, Concepts of Operations (CONOPS) and Tactics, Techniques, and Procedures (TTPs). This task is linked to Task 1 (JTMD Requirements) 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.</p> <p>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 (JTMD Requirements under project 3359).</p> <p>Support 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. Funding for this project was transferred to project 3359 starting in FY 00.</p>										
FY 1999 Accomplishments:										
Project 3265			<i>Page 14 of 35 Pages</i>				Exhibit R-2A (PE 0603872C)			

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3265
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- 2946 Supported CINC USEUCOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results from Joint Project Optic Windmill.
 - 2946 Supported CINC USCENTCOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results from Lucky Sentinel and Ultimate Resolve.
 - 2746 Supported CINC USACOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results from Roving Sands.
 - 2720 Supported USFK by adding TAMD overlays to selected exercises, collecting data, and analyzing results from Foal Eagle and Ulchi Focus Lens.
 - 2611 Supported CINC USPACOM by adding TAMD overlays to selected exercises, collecting data, and analyzing results from Northern Edge, Fleet Battle Experiment Echo, JTFEX 99-1 and Foal Eagle.
 - 169 Supported development of JTAMD doctrine, CONOPS, and TTPs needed for FoS Interoperability.
 - 423 Promoted development of allied involvement in TAMD doctrine, CONOPS, TTPs, and exercises.
 - 705 Supported conduct of JTAMD FoS simulations, seminars and desktop/interactive and planning activities in Alaska Command, US Joint Forces Japan and CENTCOM.
- Total 15266

FY 2000 Planned Program:

- Funding has been transferred to Project 3359 beginning in FY 00

FY 2001 Planned Program:

- Funding has been transferred to Program Element 0603873C/Project 3359 beginning in FY 01

B. Other Program Funding Summary	<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
3359 Test, Eval, and Assessment, PE 0603872C			21363						TBD	TBD
3359 Test, Eval, and Assessment, PE 0603873C				61299	34045	50090	37803	38868	CONT	CONT

C. C. Acquisition Strategy: 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.

D. Schedule Profile	<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						
FoS Interoperability Procedures	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q						
Allied Involvement in TAMD	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q						
TAMD FoS Preparation Events	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q						

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3352
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COST (In Thousands)	FY 1999 Actual	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 & Simulation	16539	0	0	0	0	0	0	TBD	TBD

A. Mission Description and Budget Item Justification

This project ensures timely availability of reliable, cooperative, and cost-effective BMDO and Service-provided Modeling, Simulation, & Networks (MS&N) tools and capabilities responsive to BMDO requirements. This project provides for the planning, coordination, program management, and technical oversight of system level MS&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.

This project funds the development, operation, and Verification, Validation and Accreditation (VV&A) of the Extended Air Defense Bed (EADTB) and 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

Starting in FY 00, funding associated with Project 3352, EADTB have been transferred to Project 3155, Systems Engineering and Integration.

FY 1999 Accomplishments:

- 16539 Delivered EADTB development and enhancements. Performed EADTB Final Formal Qualification Testing and deliver EADTB Version 4.4R at the end of 1st quarter. Provided limited on-site support to a select group of EADTB sites. Continued limited EADTB VV&A activities. Closeout and transition to new prime contract. Provided EADSIM baseline maintenance.

Total 16539

FY 2000 Planned Program:

- Funding has been transferred to Project 3155 beginning in FY 00

FY 2001 Planned Program:

- Funding has been transferred to Program Element 0603873C/Project 3155 beginning in FY 01

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BUDGET ACTIVITY
4 - Demonstration and Validation

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

B. Other Program Funding Summary	<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 0603871C	8099	700	0	0	0	0	0	0
3155 Sys Engr & Integration, PE 0603872C			46443					
3155 Sys Engr & Integration, PE 0603873C		19150	62488	71873	84586	104004	157137	164866
3352 Modeling & Simulation, PE 0603173C	5015	0	0	0	0	0	0	0
3352 Modeling & Simulation, PE 0603874C	0	45059	39585	27920	29379	26241	26512	26788

C. Acquisition Strategy: This funding for this effort has been transferred to PMA 3155.

D. Schedule Profile	<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>
Deliver EADTB Capability 4.4R				1Q						
EADTB Final Formal Qualification				2Q						

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL				PROJECT 3354		
COST (In Thousands)	FY 1999 Actual	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	17615	48056	0	0	0	0	0	TBD	TBD	
A. <u>Mission Description and Budget Item Justification</u>										
<p>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:</p> <ul style="list-style-type: none"> • 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). <p>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.</p> <p>The THAAD program uses the Hera target system for launches at White Sands Missile Range (WSMR) including FT. Wingate Launch complex in New Mexico and pending launches 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, a long range (1000-3000 Km) air-launch target, and a short range liquid fueled 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 (called MBRV for Matching Ballistic Re-Entry Vehicle) to simulate a set of baseline threats.</p> <p>All funding in Project 3354 has been transferred to PE 0603874C starting in FY 01.</p>										
FY 1999 Accomplishments:										
<ul style="list-style-type: none"> • 7684 Provided for validation of TMD targets; which includes support for program management, maintenance & refurbishment, and research & development. 										
Project 3354			<i>Page 19 of 35 Pages</i>				Exhibit R-2A (PE 0603872C)			

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3354
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- 96 Continued development and sensor characterization of FMAs.
 - 2447 Provided for government project personnel and support.
 - 7388 Provided for development of a MBRVs threat representative.
- Total 17615

FY 2000 Planned Program:

- 18445 Provide technical support and booster hardware for target program operation.
 - 21934 Continue development of LRALT, and Technical Engineering Support.
 - 2157 Continue development and sensor characterization of FMAs and advanced target payloads.
 - 3020 Provide for government project personnel and support
 - 2500 Conduct development of liquid fueled targets and technical engineering support
- Total 48056

FY 2001 Planned Program:

- Funding has been transferred to Program Element 0603874C beginning in FY 01

B. Other Program Funding Summary	<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</u>	<u>Total</u>
								<u>Compl</u>	<u>Cost</u>
2257 PATRIOT, PE 0604865C	237345	179139	81016	0	0	0	0	TBD	TBD
2260 THAAD, PE 0604861C	0	79462	549945	685168	789736	755134	591049	CONT	CONT
2260 THAAD, PE 0603861C	429266	523525	0	0	0	0	0	TBD	TBD
1266 NAVY THEATER WIDE, PE 0603868C	364284	375764	382671	287274	214301	246657	429674	CONT	CONT
2263 NAVY AREA, 0604867C	241782	307274	274234	228596	85866	33293	29369	CONT	CONT
3354 TARGETS, PE 0603874C	1936	2300	49135	36211	38081	40260	40882	CONT	CONT
3360 TEST RESOURCES, PE 0603874C	41005	66237	69555	64211	54314	54375	54975	CONT	CONT
3360 TEST RESOURCES, PE 0603872C	45846	13734	0	0	0	0	0	CONT	CONT

C. Acquisition Strategy: : The Hera and Storm target systems are 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.

D. Schedule Profile	<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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Project 3354

DATE

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BUDGET ACTIVITY

4 - Demonstration and Validation

PE NUMBER AND TITLE

0603872C Joint TMD - DEM/VAL

SRALT Demo		2Q						
Navy Area			4Q					
Navy Theater Wide		1Q	4Q					
PATRIOT		1 - 4Q	2-4Q					
THAAD		1 - 4Q						
Others (support of Technology Programs)		2 - 4Q						

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BMDO RDT&E COST ANALYSIS (R-3)

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3354
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Target Acquisition	Allot	USASMDC (Huntsville, AL)	15168	45036	1Q00			Cont Effort	60204	
Subtotal Product Development:			15168	45036					60204	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal Support Costs:										

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 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	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Gov Project Per & Supt	Allot	USASMDC (Huntsville, AL)	2447	3020	1Q99			Cont Effort	5467	
Subtotal Management Services:			2447	3020					5467	

Remark:

Project Total Cost:			17615	48056					65671	
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Remark:

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3359
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COST (In Thousands)	FY 1999 Actual	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	3966	21363	0	0	0	0	0	TBD	TBD

A. Mission Description and Budget Item Justification

This project supports the following efforts:

System Lethality: System Lethality requires the development, testing, and verification of instruments to characterize the post impact cloud resulting from a hit-to-kill impact of a chemical warhead. Specifically, system lethality entails: analyzing the problem to determine what should be measured, establishing the range of expected values, identifying instruments and postulating instrument suites that may be used, and performing a series of tests to demonstrate the ability of the instrument suites to perform the task.

Lethality: Lethality supports the development of standard lethality threat-representative targets, tests, and experiments to obtain lethality data for development of interceptor targets, and models using that data. BMDO participates in Service, DoD and multi-national lethality panels, and supports development and maintenance of high velocity sled and hypervelocity gun test capabilities. Resources also support BMDO TEWG subcommittees, and Defense committees and boards with shared interest in lethality.

CINCs Experiments: This effort funds BMDO's Commanders In Chiefs (CINCs') Experiments. (The long-term goal is to ensure the successful transition of interoperable Theater Air Missile Defense (TAMD) Family of Systems (FoS) to the warfighting customers). The CINCs' Experiments program is directed toward enabling the warfighters to employ TAMD systems as they are delivered. In addition, CINCs' Experiments support the development of joint interoperability TAMD doctrine, Concepts of Operations (CONOPS), and Tactics, Techniques, and procedures (TTPs); and provides Joint/Coalition/Allied TAMD interoperability data.

FY 1999 Accomplishments:

- 3966 Completed and distributed the Post Engagement Ground Effects Model (PEGEM) Version 3.0. Executed Ground tests to understand the impact response of a Thickened Chemical Simulant at New Mexico Tech. Continued to gather aerodynamic break-up data on live chemical agent at the DERA facilities at Porton Down, England. Began work on understanding agent evaporation rates to determine the amount of droplet mass that is lost during the fall to the ground using a vertical windtunnel facility at Battelle Memorial Institute. Experiments were executed at the University of Minnesota to understand the reaction of chemical simulants being introduced to a supersonic flow environment. These shock tube experiments provided insight into the amount of chemical payload that is lost to the atmosphere when released or intercepted by a BMD system.
- Total 3966

FY 2000 Planned Program:

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3359
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- 1822 Support CINC USACOM by adding TAMD overlays to selected exercises, collecting data, analyzing results, and developing CONOPS &TTP.
- 1822 Support CINC USFK by adding TAMD overlays to selected exercises, collecting data, analyzing results, and developing CONOPS &TTP.
- 1783 Support CINC USPACOM by adding TAMD overlays to selected exercises, collecting data, analyzing results, and developing CONOPS &TTPs.
- 1922 Support CINC USEUCOM by adding TAMD overlays to selected exercises, collecting data, analyzing results, and developing CONOPS &TTPs.
- 1822 Support CINC USCENTCOM by adding TAMD overlays to selected exercises, collecting data, analyzing results, and developing CONOPS &TTP.
- 4734 This task provides support for the BMDO lethality program. It supports the performance of necessary tests and experiments to obtain lethality data, and the development of interceptor/target lethality models with those data. It supports participation in Service, DoD and multi-national lethality panels. It provides direct support to the UK agent lethality work done at Porton Down, and to the Lethality Experts under the NATO CNAD Missile Defense Ad Hoc Group and supports the Netherlands Prins Maurits Laboratory for secondary evaporation experiments and studies. It supports development and maintenance of high velocity sled and hypervelocity gun test capabilities. It supports BMDO TEWG subcommittees and other Defense committees and boards pertaining to lethality.
- 7458 This task supports performing a series of flight tests to adequately demonstrate the ability of Ka-band radar and lidar instruments to track and characterize a cloud of chemical simulant to determine whether these systems have a high enough keep out altitude to protect against TBMs armed with persistent chemical payloads.

Total 21363

FY 2001 Planned Program:

- Funding has been transferred in FY01 to Projects 3359 (PE 0603873C) and 3156 (PE0603874C)

B. Other Program Funding Summary	<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>
3359 System Test & Eval, PE 0603873C			61299	34045	50090	37803	38868	Cont	Cont
3156 System Lethality, PE 0603874C			7950	11915	11906	19819	19800	Cont	Cont

C. Acquisition Strategy:

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

D. Schedule Profile	<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 Experiments	1Q - 4Q	1Q - 4Q					

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BMDO RDT&E COST ANALYSIS (R-3)

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BUDGET ACTIVITY
4 - Demonstration and Validation

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

PROJECT
3359

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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 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 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. CINC's Experiments	SubAllocation	Theater CINC's		9171	1Q00				9171	
b. Lethality	SubAllocation	Joint Combined	3966	4734	1Q00				8700	
c. System Lethality	SubAllocation	Joint Combined		7458	1Q00				7458	
Subtotal Test and Evaluation:			3966	21363					25329	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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:										

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BUDGET ACTIVITY

4 - Demonstration and Validation

PE NUMBER AND TITLE

0603872C Joint TMD - DEM/VAL

Project Total Cost:

3966

21363

25329

Remark:

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3360
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COST (In Thousands)	FY 1999 Actual	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	45846	13734	0	0	0	0	0	TBD	TBD

A. Mission Description and Budget Item Justification

This project provides for BMDO planning, oversight and coordination of integrated test and evaluation facilities. The project includes inter-element as well as inter-service test and evaluation efforts, and provides for 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.

The ground test facilities, which support JTMD, include:

- Kinetic Kill Vehicle Hardware in the Loop Simulator (KHLS) at Eglin AFB in Fort Walton Beach, FL
- AEDC Hypervelocity Wind Tunnel Number 9 (Tunnel 9) at White Oak, MD
- Infrared and Blackbody Standards at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD.
- Hypervelocity Ballistic Range G Light Gas Gun/Von Karman Facilities (VKF) at the Arnold Engineering and Development Center (AEDC) in Tullahoma, TN
- 7V and 10V Space Chambers at AEDC, Tullahoma, TN
- Portable Optical Sensor Testbed (POST) at Anahiem, CA
- National Hover Test Facility (NHTF) located at Edwards AFB, CA
- Holloman High Speed Test Track at Holloman AFB, NM

The test range facilities include national ranges such as:

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

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

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 common range facilities provide a cost-effective method of flight testing missile and target components applicable to the TMD program and FoS, BMC³ 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.

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BUDGET ACTIVITY		February 2000
4 - Demonstration and Validation	PE NUMBER AND TITLE	PROJECT
	0603872C Joint TMD - DEM/VAL	3360
<p>In FY99, this program element and project also provided 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. This project plans, programs, budgets, and oversees facility acquisition through the Military Construction (MILCON) and RDT&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>All funding in Project 3360 has been transferred to Program Element 0603874C starting in FY 01.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 3164 Provided 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. • 5809 Provided planning, test range infrastructure, and caretaker activities at Wake Island in preparation for Family of Systems (FoS) and TMD testing in FY00. • 5506 Provided HALO core-operating costs to collect optical data of BMDO development flights, target development flights and flight test intercepts. • 1324 Integrated 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. • 1181 Ensured 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. • 28862 Provided planning, instrumentation upgrades, and facility improvements at PMRF as well as test planning and infrastructure support for the KTF in preparation for JTMD related test activities. <p>Total 45846</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2300 Provide ground test facility infrastructure for BMDO testing at KHILS to support endgame HWIL testing at integrated IR sensors systems including THAAD, AIT, and Navy Theater Wide TBMD. • 6830 Provides for the caretaker activities to maintain Wake Island facilities to support TMD target launch operations. Provides lease of Defense Information Systems Agency provided relay satellite bandwidth and the receiver earth station at Hickam AFB, Hawaii. Provides for the payment of shipments to and from Wake Island via air and sea. Provides fuel purchases. Provides environmental compliance for Wake Island. • 4604 Provides core funding to perform all activities required to maintain a mission-ready optical data collection test asset (HALO/IRIS) to support TMD data collection missions required/requested by BMDO, MDAPs, and other Programs/Projects. 		
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3360
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Total 13734

FY 2001 Planned Program:

- Funding has been transferred to Program Element 0603874C beginning in FY 01

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
2257 PATRIOT, PE 0604865C	237345	179139	81016	0	0	0	0	TBD	TBD
2260 THAAD, PE 0604861C	0	79462	549949	685168	789736	755134	591049	CONT	CONT
2260 THAAD, PE 0603861C	429266	523525	0	0	0	0	0	TBD	TBD
1266 NAVY THEATER WIDE, PE 0603868C	364284	375764	382671	287274	214301	246657	429674	CONT	CONT
2263 NAVY AREA, PE 0604867C	241782	307274	274234	228596	85866	33293	29369	CONT	CONT
3354 TARGETS, PE 0603874C	1936	2300	49135	36211	38081	40260	40882	CONT	CONT
3354 TARGETS, PE 0603872C	17615	48056	0	0	0	0	0	TBD	TBD
3360 TEST RESOURCES, PE 0603871C	1680	494	474	470	466	476	486	CONT	CONT
3360 TEST RESOURCES, PE 0603874C	41005	66237	69555	64211	54314	54375	54975	CONT	CONT

C. Acquisition Strategy:

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

In providing range and test facilities support to the MDAP Program managers, as well as, technical assistance concerning facilities construction, siting, and environmental activities, BMDO implements a Reliance Process which:

- maintains perspective of national technical test capabilities relative to all BMD developmental programs,
- responds to MDAP program requirements,
- makes maximum use of existing test resources where possible,
- requires full coordination prior to development of new resources,
- and consolidates management of existing resources where possible and practicable.

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

- U.S. Army Space and Missile Defense Command (USASMDC)
- U.S. Air Force Materiel Command
- U.S. Navy Office of Naval Research
- U.S. Air Force Research Laboratory
- U.S. Army Corps of Engineers,
- and the U.S. Army Program Executive Officer-Missile Defense.

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

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BUDGET ACTIVITY
4 - Demonstration and Validation

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

PROJECT
3360

D. Schedule Profile	<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>FY 2006</u>
KHILS – DITP (Quantum Well, Integration Tests)		1-4Q	1-4Q						
KHILS – DTRA (Nuclear Requirements)			1-4Q						
KHILS – BPI (System Studies)		1-4Q	1-4Q						
KHILS – NMD HWIL Support		4Q	1-4Q						
KHILS – Target VV&A		1-4Q	1-2Q						
HALO/IRIS Data Collection	1-4Q	1-4Q	1-4Q						
AST Data Collection	1-4Q	1-4Q							
KMR TCMP Launch		4Q	2Q						
Environmental Analysis for Eglin Gulf Test Range		1-2Q							
Environmental Analysis for Pacific Missile Range Facility		1-3Q							
Environmental Analysis for Target Missile Air Drop		1Q							
Environmental Analysis for Long Range Air Launch		1-4Q							
Environmental Analysis for Advanced Interceptor Technology		1-4Q	1Q						
THAAD 1 st Objective Battalion, Ft Bliss		1-2Q							
PAC-3 Missile Assembly Bldg, White Sands		1-2Q							
Launch Facilities Infrastructure Modernization, USAKA		1-4Q	1Q						
Fire Protection System Modernization, USAKA		1-4Q	1Q						

UNCLASSIFIED

BMDO RDT&E COST ANALYSIS (R-3)

DATE
February 2000

BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3360
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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	20668						20668	
b. Optical Sensor Upgrade	Allot	Navy, PMRF	4893						4893	
c. Army TMD Facility/ Environmental Programs Development	Allot	Army PEO, Huntsville	490						490	
d. Navy TMD Facility/ Environmental Programs Development	Allot	Navy PEO TAD, Arlington VA	147						147	
e. Air Force TMD Facility/Environmental Programs Development	Allot	AF SMC, Los Angeles CA	10						10	
f. Environmental, Safety & Health Initiatives		TBD	166						166	
Subtotal Product Development:			26374						26374	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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	0					4893	
b. HALO/IRIS Support	Allot	SMDC, Huntsville, AL	5506	4604	10/01/99			TBD	10110	
c. Wake Island Support	Allot	SMDC, Wake Island	5809	6830	10/01/99			Continue	12639	
d. KHILS Support	Allot	Air Force, Florida	3164	2300	10/01/99			Continue	5464	
e. Facility Acquisition Life-Cycle Management		U.S. Army Corps of Engineers, Huntsville AL	100	0	10/01/00			Continue	100	
f.										
Subtotal Support Costs:			19472	13734					33206	

Remark:

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 3360
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III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 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	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal Management Services:										

Remark:

Project Total Cost:			45846	13734				Continuin g	59580	
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Remark:

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL				PROJECT 4000		
COST (In Thousands)		FY 1999 Actual	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	60229	66970	0	0	0	0	0	TBD	TBD

A. Mission Description and Budget Item Justification

Starting in FY 01, all projects in the JTMD program element have been transferred to either the Family of Systems program element (0603872C) or to the Technical Operations program element (0603874C). The decision to transfer the funds from the JTMD program element was to ensure and maintain adequate visibility into all Theater Missile Defense efforts.

This project funds three basic areas: personnel and related facility support costs; statutory and fiscal requirements; and support service contracts.

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

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

Finally, assistance required to support BMD program-wide management functions is also contained in this project. This assistance ranges from operational contracts to support functions such as ADP operations, Access control offices and graphics support, to efforts required to supplement BMDO and Executing Agent government personnel. Typical efforts include cost estimating, security management, information management, technology integration across BMDO projects and assessment of schedule, cost and performance, with attendant documentation of the many related programmatic issues. The requirements for this area are based on most economical and efficient utilization of contractors versus government personnel.

FY 1999 Accomplishments:

- 60229 Provided management support for overhead/indirect fixed costs such as payroll, travel, rents, & utilities and supplies.

Total

FY 2000 Planned Program:

Project 4000

BMDO RDT&E COST ANALYSIS (R-3)

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BUDGET ACTIVITY
4 - Demonstration and Validation

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

PROJECT
4000

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.										
b.										
c.										
d.										
e.										
f.										
Subtotal Product Development:										

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.										
b.										
c.										
d.										
e.										
f.										
Subtotal Support Costs:										

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.										
b.										
c.										
d.										
e.										
f.										
Subtotal Test and										

BMDO RDT&E COST ANALYSIS (R-3)	DATE February 2000
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint TMD - DEM/VAL	PROJECT 4000
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Evaluation:										
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Remark:

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

Remark:

Project Total Cost:										
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Remark: