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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE February 1997	
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					
<i>COST (\$ In Thousand\$)</i>	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	429,137	506,492	542,619	514,109	544,417	550,196	538,259	520,800	Continuing	Continuing
1155 Phenomonology Program	36,908	31,338	37,835	38,622	37,464	37,300	37,205	36,490	Continuing	Continuing
1161 Advanced Sensor Technology	1,270	3,334	3,364	3,208	3,199	3,151	3,148	3,153	Continuing	Continuing
1170 TMD Risk Reduction	41,521	23,184	35,267	25,045	24,920	24,803	24,773	24,817	Continuing	Continuing
1270 Applied Inert Mats and System Tech Program	9,137	0	0	0	0	0	0	0	TBD	TBD
1294 UAVBoost Phase Intercept	5,705	930	0	0	0	0	0	0	TBD	TBD
2160 TMD Existing System Mods	20,401	22,421	12,328	12,957	0	0	0	0	TBD	TBD
2259 Israeli Cooperative Project	59,352	43,892	38,715	38,662	38,624	38,591	0	0	TBD	TBD
3153 Architecture Analysis / BMC3I Initiatives	9,738	6,799	8,273	8,099	8,058	8,020	8,011	8,026	Continuing	Continuing
3157 Environmental, Siting, and Facilities	4,369	5,972	3,600	3,640	3,631	3,609	3,606	3,612	Continuing	Continuing
3160 TMD Readiness	1,112	1,709	1,730	1,692	1,687	1,676	1,674	1,677	Continuing	Continuing
3251 Systems Engineering and Technical Support	45,358	50,909	65,260	62,031	66,972	69,350	90,554	76,498	Continuing	Continuing
3261 TMD BM/C3I (BM/C3I Concepts)	0	32,357	34,094	35,864	43,717	44,576	43,210	43,286	Continuing	Continuing
3265 User Interface	15,286	14,031	14,680	21,976	22,060	22,113	22,048	22,118	Continuing	Continuing
3270 Threat and Countermeasures Program	19,865	21,419	27,986	29,154	27,981	27,891	28,779	27,898	Continuing	Continuing
3352 Modeling and Simulations	71,362	64,180	73,173	72,984	74,959	74,961	78,333	75,661	Continuing	Continuing

UNCLASSIFIED

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COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3354 Targets Support	23,046	22,842	27,603	18,721	42,755	42,226	42,463	42,578	Continuing	Continuing
3359 System Test and Evaluation	33,568	42,792	40,307	26,444	30,263	32,250	31,590	31,636	Continuing	Continuing
3360 Test Resources	31,139	35,507	30,888	30,201	29,942	29,793	30,312	30,363	Continuing	Continuing
4000 Operational Support	0	82,876	87,516	84,809	88,185	89,886	92,553	92,987	Continuing	Continuing

ARCHITECTURE

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 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).

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.

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.

Acquisition Strategy: See Individual R2 summaries.

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1997					
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B. Program Change Summary (\$ in Thousands)												
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u>							
Previous President's Budget	421,185	520,111	557,046	515,855	2,014,197							
Appropriated Value												
Adjustments to Appropriated Value:												
a. MEADS below threshold reprogramming			525,511									
b. General Reductions (FFRDC, Inflation etc.)			-14,125									
			-4,872									
Current Budget Submit/President's Budget	429,137	506,492	542,619	514,109	1,992,357							
Change Summary Explanation: See Individual R2 summaries.												
Funding:												
Schedule:												
Technical:												
C. Other Program Funding Summary (\$ in Thousands) See Individual R2 summaries.												
	<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>To</u>	<u>Total</u>		
									<u>Compl</u>	<u>Cost</u>		
D. Schedule Profile See Individual R2 summaries.												
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>								
	1	2	3	4	1	2	3	4	1	2	3	4

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1155		
<i>COST (\$ In Thousands)</i>	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
1155 Phenomonology Program	36,908	31,338	37,835	38,622	37,464	37,300	37,205	36,490	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>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.</p> <p>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). The MDDC is the primary repository of THAAD data. Both the MDDC and AMSC meet the statutory requirements for program data archiving.</p> <p>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 using 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.</p> <p>Analysis, Algorithms, and Modeling. This project performs analysis of radar and optical data on ballistic missile threat signatures and intercept events for the THAAD Radar, THAAD interceptor, and Navy TMD programs. This project develops and evaluates discrimination and kill assessment algorithms for THAAD Radar. This project develops signature models and modeling tools applicable to TMD threat profiles and flight regimes leveraging off investments made in TMD modeling and modeling tools.</p> <p>For 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 THAAD, 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 THAAD Dem/Val and User Operational Evaluation System UOES targets. Evaluate THAAD 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.</p>										
Project 1155		<i>Page 4 of 126 Pages</i>				Exhibit R-2 (PE 0603872C)				

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 1155
<p>For THAAD Radar 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) will be 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 development and evaluation of objective system algorithms to be installed on the THAAD Radar, THAAD Interceptor, and Navy TMD 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 THAAD and other 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>For 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 MESAR Radar; 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><u>FY 1996 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$6,513 Data Centers and Management: MDDC and AMSC received, archived, and distributed hardbody and plume target signature test data. Provided for required maintenance of hardware for MDDC and AMSC. - \$16,255 Data Collection Platform: Provided AST core operating costs to continue optical data collection in support of THAAD flight tests, the TMD Critical Measurements Program (TCMP) campaign, Navy SM-2 Block IVA tests, Combined Experiment Program (CEP/CPX) and Hera target flights. Provided for COBRA JUDY mission planning to support THAAD intercept events, the TCMP campaign, WD, CEP/CPX, and Hera target flights. Provided for termination of COBRA EYE sensor system. 		
Project 1155	Page 5 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	1155
<ul style="list-style-type: none"> - \$14,140 Analysis, Algorithms, and Modeling: Developed, refined, and demonstrated active and passive algorithm architectures of multiple targets and single sensors on LDS prototype. Developed multi-sensor data fusion algorithms which perform efficient data resource allocation. Updated integrated background and weather code to include cloud, terrain and UV to RF coverage for modeling and simulation of radar propagation, IR, visible, and laser models. Used LDS to develop and evaluate real-time algorithms for tumbling targets and high resolution imaging in support of THAAD Radar. Performed statistical evaluation of radar/optical discrimination algorithms using field test data. Continued simulation/analysis of TMD Dem/Val optical discrimination and aimpoint algorithms, and finalize prototype algorithms (target selection, aimpoint selection, and kill assessment). Continued to analyze Dem/Val data to support TMD algorithm development. Completed and distribute atmospheric clutter models to TMD system designers. Upgraded signature modeling to incorporate additional TMD threats, modeling of re-entry hardbody break-up, correlated radar-IR ground clutter and capability to merge data with simulations. Developed integrated handover/discrimination information for aimpoint selection using interceptor seeker and integrated radar hardbody and plume signatures for early detection of theater ballistic missiles (TBMs). Developed and provide new release of optical signature modeling with improvements to support optical discrimination algorithms for NMD and TMD intercept capability. Continued participation in international technical exchange programs (U.S./U.K. Scientific Cooperative Research Exchange (SCORE) Program - Target Signatures & Backgrounds Panel and Trials Group, 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, U.S./German Phenomenology Research) in the areas of optical and radar discrimination, reentry, and signature phenomenology. - \$36,908 Total 		
<u>FY 1997 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$5,310 Data Centers and Management: MDDC and AMSC will receive, archive, and distribute missile signature test data. Provide required upgrades to data storage and handling tools. - \$9,857 Data Collection Platform: Provide AST core operating costs for continued optical data acquisition of THAAD flight tests, Navy TMD tests, PAC-3 tests, and Willow Dune, TCMP tests. - \$16,171 Analysis, Algorithms, and Modeling: Continue radar and optical data analysis support for developmental TMD systems. Increase the capabilities of the LDS to include a scenario visualization tool, an interceptor engagement simulation, and incorporate data into the LDS Field Mission Data Base. Upgrade the LDS physical plant to include upgraded memory and rapid prototyping environments. Complete the LDS real-time multiple target handling capability. Develop and analyze higher order discrimination algorithms using LDS. Upgrade modeling of radar target signatures. Integrate laser signature modeling into the composite modeling framework for radar and infrared signature representations. 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 background and plume battlespace environment. - \$31,338 Total 		
Project 1155	Page 6 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
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4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	1155
<p><u>FY 1998 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$4,695 Data Centers & Management: MDDC and AMSC will receive, archive, and distribute missile signature test data. Provide required upgrades to data storage and handling tools. - \$16,585 Data Collection Platform: Provide AST core operating costs to collect optical data of TMD target development flights and intercepts. - \$16,555 Analysis, Algorithms, and Modeling: 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 penaids. 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. 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. - \$37,835 Total <p><u>FY 1999 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$6,256 Data Centers & Management: MDDC and AMSC will receive, archive, and distribute missile signature test data. Provide required upgrades to data storage and handling tools. - \$16,557 Data Collection Platform: Provide AST core operating costs to collect optical data of TMD target development flights and intercepts (i.e., THAAD DT, PAC-3 test, etc.) - \$15,809 Analysis, Algorithms, and Modeling : Continue data analysis support for TMD systems in Dem/Val and EMD. Continue demonstration of TMD radar/optical discrimination algorithms to finalize EMD algorithms. Demonstrate real-time algorithms for battlefield learning using neural networks, field data, and simulations on LDS. Continue development of real-time sensor algorithms for resource allocation and multi-sensor fusion. Incorporate new field data sets from the transportable radar into the TMD bulk classifiers to adjust parameters for objective system. Maintain and refine signature modeling to run with higher resolution at enhanced computational speed. Deliver validated signature models for high priority engagement scenarios. Continue participation in international technical exchange programs in the areas of optical and radar discrimination, TBM reentry, MESAR tactical trials and signature phenomenology. - \$38,622 Total <p><u>Acquisition Strategy:</u> This project funds data centers, data collection platforms, and algorithm and model development through executing agents in the Air Force (Phillips Laboratory and Arnold Engineering Development Center), Army (Space and Strategic Defense Command), Navy (Naval Research Laboratory) and OSD (Institute for Defense Analysis) via existing contracts. With the executing agents, free and open competitive contracts will be used to the maximum extent possible.</p>		
Project 1155	Page 7 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					PROJECT 1155		
B. <u>Program Change Summary (\$ in Thousands)</u>												
											Total Cost	
Previous President's Budget											157,436	
Current Budget Submit/President's Budget											144,703	
Change Summary Explanation:												
Funding: Decrease in FY97 funds was due to reduction of the AST program to offset part of the higher priority Department unfunded requirement.												
Schedule: None												
Technical: None												
C. <u>Other Program Funding Summary (\$ in Thousands)</u>												
											To Total Cost	
2400 NMD Program, PE 0603871C											Cont Cont	
1155 Phenomenology Program, PE 0603173C											Cont Cont	
D. <u>Schedule Profile</u>												
Navy Area TBMD (formerly Lower Tier)	1	2	3	4	1	2	3	4	1	2	3	4
Deliver software releases (optical/radar discrimination)	X											
CORPS SAM, Sea-based Theater-wide (Upper Tier) - Deliver software releases(algorithms, plumes, backgrounds, optical/radar discrimination algorithms)	X											
Deliver new software releases (OSC)	X		X					X	X	X	X	X
Support BMDO test flight programs		X		X		X		X		X		X
Project 1155												
Page 8 of 126 Pages												
Exhibit R-2 (PE 0603872C)												

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE								
											February 1997								
BUDGET ACTIVITY						PE NUMBER AND TITLE						PROJECT							
4 - Demonstration and Validation						0603872C Joint Theater Missile Defense						1155							
		<u>FY 1996</u>					<u>FY 1997</u>					<u>FY 1998</u>					<u>FY 1999</u>		
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
TMD-GBR - Deliver software releases (radar discrimination algorithms)				X															
THAAD - Deliver software releases (backgrounds, optical discrimination algorithms)						X													
TMD GBR - Deliver software releases (radar discrimination algorithms)							X				X								
Deliver new software releases (SSGM)								X					X				X		
THAAD - Deliver software releases (background, optical discrimination algorithms)											X								
Upgrade MDDC and AMSC data retrieval and data analysis tools																	X		
Initiate BMDO sponsorship of Cobra Gemini system																	X		
Cobra Gemini - provide mission planning and data analysis costs																			

UNCLASSIFIED

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1997					
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1155			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Prime Contracts				28,329	21,352	27,069	28,631				
OGA				2,109	2,109	2,109	2,109				
Support Contracts				4,505	5,887	6,763	5,990				
Program Management				1,965	1,990	1,894	1,892				
Total				36,908	31,338	37,835	38,622				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
<u>Support and Management Organizations</u>											
Sverdrop					800	890	910	910			3,510
Teledyne Brown					11,231	7,645	7,598	9,272			35,746
Colsa					923	1,503	1,565	1,560			5,551
Boeing					13,452	6,826	13,932	14,057			48,267
MIT/Lincoln Lab					2,581	2,791	2,343	2,253			9,968
Xontech					1,291	1,596	1,171	1,126			5,184
Nichols Research					711	1,596	1,171	1,126			4,604
Photon Research					2,211	2,810	2,671	2,626			10,318
Soarta					701	1,294	1,211	1,202			4,408
Project 1155					Page 10 of 126 Pages			Exhibit R-3 (PE 0603872C)			

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
4 - Demonstration and Validation										February 1997	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
4 - Demonstration and Validation					0603872C Joint Theater Missile Defense					1155	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
Miscellaneous						3,007	4,387	5,263	4,490		17,147
<u>Test and Evaluation Organizations</u>											
B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Property</u>											
<u>Support and Management Property</u>											
<u>Test and Evaluation Property</u>											
Subtotal Product Development											
Subtotal Support and Management						36,908	31,338	37,835	38,622		144,703
Subtotal Test and Evaluation											
Total Project						36,908	31,338	37,835	38,622		144,703
Project 1155						Page 11 of 126 Pages			Exhibit R-3 (PE 0603872C)		

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1161	
<i>COST (\$ In Thousands)</i>	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
1161 Advanced Sensor Technology	1,270	3,334	3,364	3,208	3,199	3,151	3,148	3,153	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>The goal of this program is to develop and demonstrate survivability technologies to insure that Theater Ballistic Missile Defense (TMD) systems can perform their mission in all required environments. Ballistic missile defenses must be able to operate in nuclear environments and against countermeasure threats. The requirements for the Survivability program are: define, develop and demonstrate Survivability Enhancement Options (SEO) for TMD systems; develop and transfer SEO technology base to research and development centers and laboratories; provide risk reductions to support THAAD Radar Milestone II.</p> <p>This program develops and demonstrates survivability technologies to ensure that TMD elements can perform their mission in all expected hostile threats. Approaches include: studies/analyses; defense suppression threat mitigation technologies development; developing enhanced shelters applying camouflage, concealment and deception (CCD), SEO development; Electromagnetic Environmental Effects (E3) engineering support, survivability/operability demonstrations, development of issue resolution approaches; development of Anti-Radiation Missile (ARM) Countermeasure Evaluator (ACE); and hardened technology integration. ACE combines the desirable effects of low-cost digital simulations and hardware testing of actual ARM hardware in open- and closed-loop simulations. ACE will be used to develop initial ARM Electronic Counter-Countermeasure (ECCM) techniques for THAAD/GBR and PAC-3. The multi-spectral signature of the deployed THAAD Radar system requires application of extensive CCD technologies which have been developed by the Army Labs. Technologies will be available for incorporation into core missile defense systems at Engineering Manufacturing Development (EMD), will provide near-term improvements to existing systems, and will provide necessary risk reduction evidence to support THAAD Radar, and Medium Extended Air Defense System (MEADS) system milestone decisions.</p> <p>This program has developed tools to evaluate THAAD Radar performance under defense suppression threats and in hostile environments. These evaluations support the THAAD Radar Milestone II decisions. The ACE operational capability was demonstrated. Countermeasures for precision guided missiles and cruise missiles continued to be developed. CCD techniques applied to the THAAD Radar were evaluated for effectiveness in battlefield conditions. Requirements for the THAAD Radar to be protected against electromagnetic environmental effects were reviewed and design guidelines were identified.</p> <p><u>FY 1996 (\$ in Thousands)</u></p> <p>– \$1,270 This program has developed tools to evaluate THAAD Radar performance under defense suppression threats and in hostile environments. These evaluations support the THAAD Radar Milestone II decisions. The ACE operational capability was demonstrated. Countermeasures for precision guided missiles and cruise missiles continued to be developed. CCD techniques applied to the THAAD Radar were evaluated for effectiveness in battlefield conditions. Requirements for the THAAD Radar to be protected against electromagnetic environmental effects were reviewed and design guidelines were identified.</p>										
Project 1161			<i>Page 12 of 126 Pages</i>				Exhibit R-2 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997																		
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 1161																		
<p>– \$1,270 Total</p> <p><u>FY 1997 (\$ in Thousands)</u></p> <p>– \$3,334 Conduct ACE evaluation of PATRIOT and MEADS TMD radars against countermeasures. Repaired ACE to allow testing of THAAD radar waveforms. Implement E(3) program and develop NBC guidelines to optimize protection to TMD systems while minimizing cost and weight. Conduct analysis of vulnerability to Precision Guided Munitions (PGM), and analysis of PGM SEO designs. Continued development of TMD survivability technologies in CCD.</p> <p>– \$3,334 Total</p> <p><u>FY 1998 (\$ in Thousands)</u></p> <p>– \$3,364 Develop CCD/technologies for THAAD Radar and THAAD Systems signature management. Utilize ACE for integrated ARM/ECCM evaluation for THAAD Radar. Support THAAD Radar EMD testing. Evaluate THAAD Radar software for survivability. Conduct SEO proof of principle test. Continue environmental model development and enhancements.</p> <p>– \$3,364 Total</p> <p><u>FY 1999 (\$ in Thousands)</u></p> <p>– \$3,208 Demonstrate and validate Pre-Planned Product Improvement SEOs for THAAD radar. Utilize ACE for THAAD/GBR radar evaluation. Multi-spectral decoys for TMD systems. Continue E3 programs..</p> <p>– \$3,208 Total</p> <p><u>Acquisition Strategy</u> The survivability technology program supports the tailored and streamlined acquisition strategy employed by the TMD acquisition managers. Survivability technologies chosen for evaluation/development will be based on requirements. Within the executing agents, free and open competitive contracts will be used to the maximum extent possible to accomplish specific work packages in accordance with field laboratory acquisition procedures. Contract proposals will be evaluated according to innovative technology approaches, responsiveness to program requirements, quality of proposed deliverables, and cost.</p> <p>B. Program Change Summary (\$ in Thousands)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY 1996</u></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>Total</u> <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td style="text-align: center;">921</td> <td style="text-align: center;">3,531</td> <td style="text-align: center;">3,498</td> <td style="text-align: center;">3,353</td> <td style="text-align: center;">11,303</td> </tr> <tr> <td>Current Budget Submit/President's Budget</td> <td style="text-align: center;">1,270</td> <td style="text-align: center;">3,334</td> <td style="text-align: center;">3,364</td> <td style="text-align: center;">3,208</td> <td style="text-align: center;">11,176</td> </tr> </tbody> </table>				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u> <u>Cost</u>	Previous President's Budget	921	3,531	3,498	3,353	11,303	Current Budget Submit/President's Budget	1,270	3,334	3,364	3,208	11,176
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u> <u>Cost</u>															
Previous President's Budget	921	3,531	3,498	3,353	11,303															
Current Budget Submit/President's Budget	1,270	3,334	3,364	3,208	11,176															
Project 1161		Page 13 of 126 Pages																		
		Exhibit R-2 (PE 0603872C)																		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					PROJECT 1161		
<p>Change Summary Explanation: Funding: OSD reduction</p> <p>Schedule: None</p> <p>Technical: None</p>												
C. <u>Other Program Funding Summary (\$ in Thousands)</u>												
		<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>	To <u>Compl</u>	Total <u>Cost</u>	
2260 THAAD System, PE 0603861C		565,818	341,307	294,647	16,778	0	0	0	0	TBD	TBD	
D. <u>Schedule Profile</u>												
		<u>FY 1996</u>			<u>FY 1997</u>			<u>FY 1998</u>		<u>FY 1999</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
ACE eval of GBR		X										
CCD shelter POP			X						X			
E3-THAAD Radar susceptibility guide				X								
THAAD Milestone II					X							
CCD SEO test/trades					X							
ACE eval of MEADS					X							
CCD SEO POP			X	X				X	X			
E3 guidelines update								X				
PAC-3 Milestone III								X				
ACE test of BM/C3 SEO suite									X			
SEO design to counter PGM									X			
ARM/ECCM for THAAD Radar									X			
ACE/ECCM for THAAD Radar									X			
Upgrade CCD technologies											X	
SEO integration experiment												X
Project 1161												
Page 14 of 126 Pages												
Exhibit R-2 (PE 0603872C)												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1161			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Demonstration & Validation				1270	3334	3364	3208				
Total				1,270	3,334	3,364	3,208				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
BDM	CPFF	21 Dec 90				431	1000	1000	1000	Cont	3,431
BDM	CPFF					0	1127	1159	1003	Cont	3,289
NRC	CPFF	14 Feb 92				216	0	0	0	0	216
BAH	CPFF	10 Jul 92				175	0	0	0	0	175
TBE	CPAF	6 Mar 92				50	0	0	0	0	50
MICOM	MIPR	Multiple				0	1000	1000	1000	Cont	3,000
<u>Support and Management Organizations</u>											
SSDC	PMA	Multiple				392	200	200	200	Cont	992
Misc		Multiple				6	7	5	5	Cont	23
<u>Test and Evaluation Organizations</u>											
B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1161		
Government Furnished Property:										
<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>									Cont.	
<u>Support and Management Property</u>									Cont.	
<u>Test and Evaluation Property</u>										
Subtotal Product Development					872	3,127	3,159	3,003		10,161
Subtotal Support and Management					398	207	205	205		1,015
Subtotal Test and Evaluation										
Total Project					1,270	3,334	3,364	3,208		11,176

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1170		
COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
1170 TMD Risk Reduction	41,521	23,184	35,267	25,045	24,920	24,803	24,773	24,817	Continuing	Continuing
A. <u>Mission Description and Budget Item Justification</u>										
<p>This project is the primary BMDO risk mitigation program addressing TMD target/threat signature and the sensor-to-system interface issues for all TMD systems. How potential targets appear to radar and infrared seekers is an important issue which allows TMD acquisition programs to limit costs by concentrating designs on narrow bands of key threat signature characteristics. This project consists of five elements: TMD Critical Measurements Program (TCMP) which builds, flies, observes, and analyzes targets with signature characteristics similar to those anticipated on foreign threats; the Target Signature Measurements Program which observes and directs the analysis of signatures from BMDO test targets (STORM, HERA, etc.) to obtain target signature insights, and which exploits other similar threat signature opportunities; the TMD Seeker Test/Measurements Program which uses an experimental seeker test bed to evaluate emerging missile seeker technologies and to support resolution of unexpected critical problems that emerge during their engineering and testing phases; Kill Assessment Program which investigates the signatures and results of a target intercept; and the Sapphire Statistical Characterization and Risk Reduction (SSCARR) program which determines window/dome reliability and fabrication techniques. In all cases, the target signature data and the analyses address specific questions relating to how a radar first identifies a missile (discrimination), how the radar passes the missile location to a seeker (sensor to seeker handover), how the seeker determines the best place to hit the target (aim point selection), and how the defender can tell if a missile is destroyed (kill assessment). The core sensor costs used in this project to collect target signature data will be provided under projects 1155 and 3360. This project funds the specific sensor tasks for each mission.</p> <p>TMD Critical Measurements Program. This program supports the risk mitigation efforts in TMD signatures. TCMP is a flight test program where threat representative targets are flown at the Kwajalein Missile Range (KMR) or other facilities to observe typical threat-like objects in flight with a sophisticated suite of sensors. These sensors give both target data and representative signature data as seen by TMD system sensors. The TCMP program performs the analysis on the data obtained in these flights. In all cases, the target and threat data and the analysis address the specific areas of discrimination, target object map handover and aim point selection. The hardware, flight instrumentation and data analysis of the TCMP flights are all included in the TCMP budget. TCMP 2 will consist of three medium range flights, in the fourth quarter of Fiscal Year96 and two in the second quarter Fiscal Year97.</p> <p>Kill Assessment. This program is developing the technical basis for the TMD architecture battle management decision kill assessment capability. This capability will enable the battle manager to respond nearly "real-time" following a target intercept engagement to ceasefire, to order a second shot, or to cue the lower tier for appropriate action. This kill assessment capability will also help measure defense system effectiveness and identify threat warhead type. In support of this shoot-look-shoot doctrine, the program is conducting a series of specialized sensor data collections of TMD interceptor tests, follow-on data analysis, and algorithm development. The most challenging aspect is gathering enough pertinent data from various types of intercept scenes to identify and evaluate those observable characteristics serving this decision process. Since opportunities to observe actual TMD missile intercepts are rare, this program will emphasize ground test measurements and construction of analytical models and tools for developing and validating algorithms for the TMD acquisition program.</p>										
Project 1170			Page 17 of 126 Pages				Exhibit R-2 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 1170
<p>TMD Seeker Test/Measurements: This program provides for the application, integration, and testing of the latest available seeker technologies into on-going TMD seeker designs. The program is divided into two parts; the first supports the Seeker Experimental System (SES) which is used to evaluate missile seeker performance functions and the second is a seeker window sapphire material characterization effort designed to provide a critical database for designers to evaluate seeker window performance in the high temperature, low altitude flight regime. The SES provides BMDO with independent evaluation of emerging seeker technologies in a realistic system context, allowing for risk assessment prior to acquisition commitment. In supporting the solution of technical problems arising in seeker acquisition programs, the SES can address a wide range of design and implementation issues such as hardware/software integration and evaluation of seeker functional algorithms. The sapphire material test activities serve as risk mitigation for Theater High Altitude Area Defense (THAAD), Navy Standard Block IVA Missile and the ARROW Programs for improved survivability confidence of the seeker window.</p> <p>Target Signature Measurements. This program funds the per mission costs to acquire data using sophisticated sensor platforms (Airborne Surveillance Testbed, HALO, Sealite Beam Director, etc.) on BMDO interceptor target flights (LANCE, STORM, HERA, etc.). This program also provides the tasking through the Target Signatures Working Group (TSWG) and the funding for each mission to the sensor platforms for each flight. The data collected is utilized by the acquisition programs, the TSWG, and the Targets Program to establish target in-flight signature characteristics for use in hardware development and interceptor algorithm assessment.</p> <p>SSCARR is a joint effort involving the THAAD, Navy SM Block IVA, and ARROW programs. Due to its mechanical strength, high thermal conductivity, and high transparency in the mid-wave infrared, sapphire has become the material of choice for TMD seeker windows and domes. SSCARR employs statistical procedures to determine window/dome reliability for the participating programs. This probability of failure data will allow designers and battle planners to more fully exploit the interceptors' available battle-space. In addition, diagnostic techniques are being used in an attempt to demonstrate correlation's between sapphire surface and volume features and "weak" sapphire, thus providing a sapphire screening technique. Potential follow-on activities to SSCARR include a computational fluid dynamics validation effort with emphasis on problems relating to predicting jet interaction effects, an assessment of advanced seeker window technology to remove blur where extreme accuracy in angle-rate measures are required, and an investigation of the utility of reactive materials on hit-to-kill interceptors.</p> <p><u>FY 1996 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$30,223 Fiscal Year 1996 accomplishments included fabrication and testing of TCMP 2 payload and FASP hardware. Planning for TCMP 3 continued throughout Fiscal Year 1996. A successful July launch of TCMP 2B allowed for extensive data collection and analysis. Preparation and planning for TCMP 3 continued. - \$6,145 Upgraded sensor assets to optimize data collections on intercept events, collected intercept data on Marine Corps HAWK-Lance mission. - \$2,195 Enhanced and tested Seeker System performance in support of THAAD; continued to support TMD seeker related improvements and used the seeker experimental system for seeker functional testing, initiated sapphire window material tests to improve seeker performance reliability. - \$2,958 Collected data to characterize STORM and HERA targets; collect static Radar Cross Section (RCS) data on items, observe Navy flight tests. - \$41,521 Total 		
Project 1170	Page 18 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1997
BUDGET ACTIVITY 4 - Demonstration and Validation			PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense		PROJECT 1170
<u>FY 1997 (\$ in Thousands)</u>					
– \$15,144	Conduct TCMP 2A and 2C experimental flight test; analyze, and report test results. Continue TCMP 3 experimental flight test planning for long and mid-range flights to support THAAD EMD and Navy Upper Tier, and to evaluate potential countermeasures and tactics. Purchase and integrate TCMP 3 payload hardware. Expected launch during first quarter Fiscal Year 1999.				
– \$3,353	Continue to collect and analyze sensor data of intercept tests and transfer kill assessment technology to TMD Major Defense Acquisition Programs (MDAPS); evaluate and upgrade, as required, kill assessment algorithm performance.				
– \$2,510	Continue electro-optical infrared support testing of missile seekers with Seeker Experimental System (SES) and complete the sapphire material test program. Continue SSCARR joint effort.				
– \$2,177	Continue target measurements and observe and characterize interceptor targets and flight tests.				
– \$23,184	Total				
<u>FY 1998 (\$ in Thousands)</u>					
– \$26,131	Purchase boosters and remaining payload hardware for TCMP 3 flights, focusing on countermeasures and longer range threats. Conduct final preparations for TCMP launches.				
– \$6,904	Continue to collect intercept 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.				
– \$2,232	Continue target measurements and observe and characterize interceptor targets.				
– \$35,267	Total				
<u>FY 1999 (\$ in Thousands)</u>					
– \$21,495	Conduct TCMP 3 flight tests, data collection and analysis. Plan and prepare for TCMP 4 experiments.				
– \$3,550	Continue to collect intercept data and test the primary kill assessment algorithms for EMD in support of Navy Upper Tier.				
– \$25,045	Total				
B. Program Change Summary (\$ in Thousands)					
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>
Previous President's Budget	41,521	22,954	35,267	25,045	
Current Budget Submit/President's Budget	41,521	23,184	35,267	25,045	125,017
Change Summary Explanation:					
Project 1170					
<i>Page 19 of 126 Pages</i>					
Exhibit R-2 (PE 0603872C)					

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1997																																																																																																																		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1170																																																																																																																	
<p>Funding: The FY97 and FY98 funding was reduced by \$13.5M to fund higher priority projects.</p> <p>Schedule: None</p> <p>Technical: None</p> <p>C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th><u>FY 1996</u></th> <th><u>FY 1997</u></th> <th><u>FY 1998</u></th> <th><u>FY 1999</u></th> <th><u>FY 2000</u></th> <th><u>FY 2001</u></th> <th><u>FY 2002</u></th> <th><u>FY 2003</u></th> <th style="text-align: center;"><u>To Compl</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>1266, Navy Theater Wide TBMD 0603868C</td> <td align="right">200,442</td> <td align="right">304,171</td> <td align="right">194,898</td> <td align="right">192,073</td> <td align="right">191,229</td> <td align="right">190,930</td> <td align="right">145,190</td> <td align="right">149,444</td> <td></td> <td></td> </tr> </tbody> </table> <p>D. <u>Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3"><u>FY 1996</u></th> <th colspan="3"><u>FY 1997</u></th> <th colspan="3"><u>FY 1998</u></th> <th colspan="3"><u>FY 1999</u></th> </tr> <tr> <th></th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>TCMP Campaign 2B</td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TCMP Campaign 2A, 2C</td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TCMP Campaign 3 Planning</td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Conduct TCMP Campaign 3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Provide Kill Assessment Algorithms</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> </tr> </tbody> </table>										<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>To Compl</u>	<u>Total Cost</u>	1266, Navy Theater Wide TBMD 0603868C	200,442	304,171	194,898	192,073	191,229	190,930	145,190	149,444				<u>FY 1996</u>			<u>FY 1997</u>			<u>FY 1998</u>			<u>FY 1999</u>				1	2	3	4	1	2	3	4	1	2	3	4	TCMP Campaign 2B				X									TCMP Campaign 2A, 2C					X								TCMP Campaign 3 Planning					X								Conduct TCMP Campaign 3								X					Provide Kill Assessment Algorithms										X		
	<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>To Compl</u>	<u>Total Cost</u>																																																																																																															
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Project 1170			Page 20 of 126 Pages			Exhibit R-2 (PE 0603872C)																																																																																																																			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1170			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Engineering				36,938	21,920	31,170	22,692				
Studies				3,013	1,264	4,097	2,353				
Support				1,570	0	0	0				
Total				41,521	23,184	35,267	25,045				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Multiple	Multiple	Multiple				39,938	23,184	35,267	25,045	Cont	123,434
<u>Support and Management Organizations</u>											
SSDC	Alloc					1,583	0	0	0	Cont	1,583
<u>Test and Evaluation Organizations</u>											
B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>											
Government Furnished Property:											
Project 1170											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1170		
<u>Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development					39,938	23,184	35,267	25,045		123,434
Subtotal Support and Management					1,583					1,583
Subtotal Test and Evaluation										
Total Project					41,521	23,184	35,267	25,045		125,017

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1270		
COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
1270 Applied Inert Mats and System Tech Program	9,137	0	0	0	0	0	0	0	TBD	TBD
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p><u>Atmospheric Interceptor Technology (AIT) Program</u> The AIT program will develop, integrate and demonstrate the critical technologies for performing hypersonic hit-to-kill intercepts of TBMs within the atmosphere. The demonstrations will validate the solution to critical KKV technologies and will provide: (1) new capabilities with reduced costs/risks compared to current interceptor weapons systems, and enhancements to other interceptors under development; (2) reduction of technical risks and costs in support of acquisition programs through direct technology insertions; and (3) technical solutions to provide theater defense interceptor capabilities for contingencies not currently addressed by the TMD system programs. The program uses existing contracts and technologies currently under development to reduce schedule and cost, and will be planned and conducted with BMDO, Air Force, Navy, and Army elements to make maximum use of existing Service infrastructures. The AIT project will participate in the UAV/BPI Studies (PMA 2259) and the Navy Theater Wide requirements studies.</p> <p>The AIT program has successfully developed and demonstrated critical technologies for hypersonic endoatmospheric kill vehicles that perform hit-to-kill intercepts of TBMs in the atmosphere. A number of cooled window concepts have been developed and demonstrated, prototype strap-down seeker hardware has been developed and tested, and kill vehicle design concepts have been completed. The program will complete prototype seeker hardware and testing, develop a solid propellant divert and attitude control system (DACS), and integrate complete ground and potential flight test hardware. Aero-optical shock tunnel tests were completed on an externally cooled window concept. A downselect to a single prime contractor was conducted in first quarter Fiscal Year 1996.</p> <p><u>FY 1996 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$9,137 Atmospheric Advanced Interceptor Technology: Continue prototype strapdown seeker validations and tests. Complete downselect to single prime contractor. Conduct cooled window and forebody aero-optical shock tunnel tests. Conduct forebody and airframe vibration tests and field joint validation, and initiate development of solid propellant divert and attitude control system (DACS) components. Continue detailed design of KKV vehicle. - \$ - \$ - \$9,137 Total <p><u>FY 1997 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$0 										
Project 1270		Page 23 of 126 Pages				Exhibit R-2 (PE 0603872C)				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)				DATE February 1997																		
BUDGET ACTIVITY 4 - Demonstration and Validation		PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense		PROJECT 1270																		
<ul style="list-style-type: none"> - \$ - \$ - \$0 Total <p><u>FY 1998 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$0 - \$ - \$ - \$0 Total <p><u>FY 1999 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$0 - \$ - \$ - \$0 Total <p><u>Acquisition Strategy</u> The AIMST Project uses U.S. Army Space and Strategic Defense Command (USASSDC), DoD and DoE laboratories to fund contractors supported by relevant in-house expertise to meet the AIMST milestones. Weapons systems prime contractors acquire license agreements to use advanced manufacturing/producibility processes (e.g., composite materials, baffles and nozzles) developed by the AIMST Project. International funding (e.g., UK and Japan) and joint agency coalitions (e.g., NASA, DoE and ARPA) are assembled to obtain critical level of effort (e.g., US/UK STRV-2, BMDO/AF/ARPA Smart Structures, US/Japan Composites and superconducting materials programs). The AIT program plan will consist of development and validation of endoatmospheric kill vehicle technologies for potential use in advanced TMD systems, such as advanced NTWD THAAD, MEADS and UAV/BPI; and options for the design, fabrication, and test of the KKV; options for KKV/booster integration and flight tests. USASSDC will provide technical and contract management of the AIT prime contract. On-going, competitively-awarded, CPFF contracts for the kill vehicle technologies within the AIT program will continue through the completion of ground testing and potential flight tests.</p> <p>B. <u>Program Change Summary (\$ in Thousands)</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;"></th> <th style="width: 15%; text-align: center;"><u>FY 1996</u></th> <th style="width: 15%; text-align: center;"><u>FY 1997</u></th> <th style="width: 15%; text-align: center;"><u>FY 1998</u></th> <th style="width: 15%; text-align: center;"><u>FY 1999</u></th> <th style="width: 10%; text-align: center;">Total Cost</th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td style="text-align: center;">9,708</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">9,708</td> </tr> <tr> <td>Current Budget Submit/President's Budget</td> <td style="text-align: center;">9,137</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">9,137</td> </tr> </tbody> </table>						<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	Total Cost	Previous President's Budget	9,708	0	0	0	9,708	Current Budget Submit/President's Budget	9,137	0	0	0	9,137
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	Total Cost																	
Previous President's Budget	9,708	0	0	0	9,708																	
Current Budget Submit/President's Budget	9,137	0	0	0	9,137																	
Project 1270		Page 24 of 126 Pages		Exhibit R-2 (PE 0603872C)																		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1997					
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1270				
<p>Change Summary Explanation:</p> <p>Funding: Changes in funding resulted in realigning of interceptor & sensor technologies within Projects 1270 and 1161 to better reflect the technologies principle application. The AIT Program was transferred to Project 1270 in FY96 from Project 1265 (BPI), PE 0603870, without funding. Execution of the STRV-2 Program was transferred to Project 1270 starting in FY97.</p> <p>Schedule: Delay in program milestones due to cancellation of BPI program and transfer of AIT Technology development to Project 1270 and other funding reductions.</p> <p>Technical: None</p>												
C. <u>Other Program Funding Summary (\$ in Thousands)</u>												
		<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>	To <u>Compl</u>	Total <u>Cost</u>	
2400 NMD Program PE 0603871C		730,656	828,864	504,091	393,085	309,748	309,584	391,585	392,433	Cont	Cont	
D. <u>Schedule Profile</u>												
		<u>FY 1996</u>			<u>FY 1997</u>			<u>FY 1998</u>		<u>FY 1999</u>		
AIT Downselect to single prime contractor.	1	2	3	4	1	2	3	4	1	2	3	4
	*											

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE February 1997	
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					PROJECT 1294	
COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
1294 UAVBoost Phase Intercept	5,705	930	0	0	0	0	0	0	TBD	TBD
<p>A. <u>Mission Description and Budget Item Justification</u> The Unmanned Aerial Vehicle (UAV)-Based Boost Phase Intercept (BPI) project covers two tasks; Task 1: Cooperative UAV-Based BPI project with Israel, and Task 2: Development of a US UAV-Based BPI Concept. Task 1 is a cooperative U.S./Government of Israel (GOI) BPI program which involves future development and refinement (risk mitigation) of the Israeli Boost Phases Intercept System (IBIS) concept which is planned to destroy tactical ballistic missiles in the boost phase of flight, before engine cutoff, preferably while in enemy territory. This project is based on the use of UAVs armed with on-board interceptors to provide the means of destroying enemy missiles in their boosting phase of flight. The first task of this two-part project will provide risk mitigation in the development of the GOI's UAV BPI. Task 2 of this effort develops a U.S. UAV-based BPI system concept. It will develop the system requirements, to include: kinetic energy interceptors, UAVs, search and track sensors, Battle Management, Command, Control, Communications, Computers and Intelligence (BMC4I), and the concept of operations (CONOPS) based on readily available U.S. technologies.</p> <p><u>FY 1996 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$5,705 UAV-based BPI: Developed U.S. requirements and concept for UAV-based kinetic energy BPI. Generated and evaluated U.S. technologies available for a UAV platform, interceptor, and search and track systems. Developed related BMC4I Technologies. Analyzed available UAVs and develop requirements. Developed preliminary CONOPS for a US UAV concept. Worked with the Israelis to develop a cooperative risk mitigation effort in the areas of interceptors, sensors, and BMC4I. - \$5,705 Total <p><u>FY 1997 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$930 See PE0603870C: Continue the risk mitigation effort with the GOI and initiate interoperability efforts. - \$930 Total <p><u>FY 1998 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$0 See PE0603870C - \$0 Total 										
Project 1294			Page 27 of 126 Pages				Exhibit R-2 (PE 0603872C)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE February 1997																																									
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense			PROJECT 1294																																								
<p><u>FY 1999 (\$ in Thousands)</u></p> <p>– \$ Project continuation decision expected in FY98.</p> <p>– \$0 Total</p> <p><u>Acquisition Strategy</u> This project is risk integration for the ABL program. Task 1 of this PMA is a cooperative US/Government of Israel (GOI) risk mitigation effort addressing further MOAB interceptor development, BMC3I, along with intraconstellation communications. The effort is being done under a firm fixed price contract. The US and GOI share costs. Task 2 is being accomplished by BMDO tri-service Integrated Product Teams (IPT). Additional support is provided by industry.</p> <p>B. <u>Program Change Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY 1996</u></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td style="text-align: right;">9,706</td> <td style="text-align: right;">9,296</td> <td style="text-align: right;">9,436</td> <td style="text-align: right;">0</td> <td style="text-align: right;">28,438</td> </tr> <tr> <td>Current Budget Submit/President's Budget</td> <td style="text-align: right;">5,705</td> <td style="text-align: right;">930</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">6,635</td> </tr> </tbody> </table> <p>Change Summary Explanation: See PE 0603870C for FY97/98 Funding Funding: Project funding, structure, and objective directed by Congress</p> <p>Schedule: None</p> <p>Technical: None</p> <p>C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY 1996</u></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>To Compl</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>3359 System Test and Evaluation, PE 0603872C</td> <td style="text-align: right;">33,355</td> <td style="text-align: right;">42,792</td> <td style="text-align: right;">40,307</td> <td style="text-align: right;">26,444</td> <td style="text-align: right;">25,763</td> <td style="text-align: right;">29,793</td> <td style="text-align: right;">30,312</td> <td style="text-align: right;">30,363</td> <td></td> <td></td> </tr> </tbody> </table>									<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>	Previous President's Budget	9,706	9,296	9,436	0	28,438	Current Budget Submit/President's Budget	5,705	930	0	0	6,635		<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>To Compl</u>	<u>Total Cost</u>	3359 System Test and Evaluation, PE 0603872C	33,355	42,792	40,307	26,444	25,763	29,793	30,312	30,363		
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Project 1294		Page 28 of 126 Pages			Exhibit R-2 (PE 0603872C)																																										

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 1294
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D. Schedule Profile

	<u>FY 1996</u>				<u>FY 1997</u>				<u>FY 1998</u>				<u>FY 1999</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Complete IBIS Follow-On Report		X														
Contract Milestone (Israeli) Risk Mitigation							X									
Preliminary US UAV BPI Concept						X										
Israeli Risk Mitigation Final Report														X		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				1294			
A. Project Cost Breakdown (\$ in Thousands)											
					<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>			
IBIS Systems Engineering											
US Systems Engineering											
Total											
					5,705	930					
					5,705	930					
B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
SMC	MIPR	Jan 97	157	157		1,350	157	0	0	TBD	1,507
Navy PEO TADB	MIPR	Jan 97	250	250		2,025			0	TBD	2,025
NAWC	MIPR					466	250	0	0	TBD	716
DARPA	MIPR					650	0	0	0	TBD	650
<u>Support and Management Organizations</u>											
WJSA	CPFF	Apr 96				1,171	523	0	0	TBD	1,694
SSDC	MIPR	Sep 96				25	0	0	0	TBD	25
<u>Test and Evaluation Organizations</u>											
Project 1294											
Page 30 of 126 Pages											
Exhibit R-3 (PE 0603872C)											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 1294		
B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)										
Government Furnished Property:										
<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
Govt Property	FP	Jul			18	0	0	0	TBD	18
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development					4,509	407				4,916
Subtotal Support and Management					1,196	523				1,719
Subtotal Test and Evaluation										
Total Project					5,705	930				6,635

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 2160	
<i>COST (\$ In Thousands)</i>	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
2160 TMD Existing System Mods	20,401	22,421	12,328	12,957	0	0	0	0	TBD	TBD
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>This project implements non-major defense acquisition program modifications to current and existing warning and surveillance systems that result in fielded improvements to TMD capabilities. This project consists of three programs: Cueing and Netting, SHIELD, and the Extended Airborne Global Launch Evaluator (EAGLE).</p> <p>CUEING AND NETTING. The overarching objective of the cueing and netting task is 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 will consist of the development, testing, and operational demonstration of hardware and software improvements to the radar and other supporting systems.</p> <p>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 system is co-located at the Joint National Test Facility, Falcon Air Force Base, CO with ALERT.</p> <p>Extended Airborne Global Launch Evaluator (EAGLE). The EAGLE is a Commercial Off The Shelf (COTS) and Non-Developmental Item (NDI) program that will field a detection, tracking, and cueing system against TBM. EAGLE will be compatible with any Boeing 707 type or larger class aircraft. The prototype is currently planned for installation in the Air Force E-3 Airborne Warning and Control System (AWACS) aircraft. EAGLE represents the integration of several existing technologies into a new sensor suite that will add significant leverage to the overall TBM defense architecture as well as provide significant complementary support to the US and NATO AWACS missions. The principal components of EAGLE are a Wide Area Surveillance Sensor (WASS) from the B-1B program, a High Accuracy Reacquisition Sensor (HARS) from the F-117A Nighthawk program, and a laser range finder from the Navy's Radiant Mist/Outlaw projects. The overall integrator and prime contractor is Boeing in Seattle, Washington. The major sub-contractors are Texas Instruments in Dallas, Texas and Rockwell International of California. International participation is at the second tier sub-contractors. Operationally, the EAGLE system will acquire a boosting TBM and track it until shortly after burnout to establish very precise trajectory, launch point, and impact point estimates. This information will be broadcast as a Joint Tactical Information Distribution System (JTIDS) message which will be used to cue active defense radar, support attack operations against the launchers, and provide improved warning for passive defense. The trajectory cue will enable fire control radar from a variety of interceptor systems to efficiently focus their energy into a single beam allowing acquisition much sooner than normally achievable with autonomous operations. This capability maximizes the defended area footprint as required by the Joint Requirements</p>										
Project 2160			<i>Page 32 of 126 Pages</i>				Exhibit R-2 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	2160
<p>Oversight Council (JROC). EAGLE can greatly improve the defended area against long range theater ballistic missiles versus autonomous operation. In addition, the improved situational awareness provided through BMC3I to the Joint Force Air Component Commander greatly enhances the coordination of the theater air battle and ballistic missile defenses.</p> <p>FY97 Congressional Language mandated that 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)} provide a plan to congressional defense committees for developing an airborne sensor capability for ballistic missile tracking not later than 19 Jan 97. The language directed that operational user requirements and perspectives and total program cost be given priority consideration in selecting a system to provide this capability. To meet this mandate, the FY97 funds for Task 3 - EAGLE was moved to Task 4 - Airborne Sensor for Ballistic Missile Tracking, the report to Congress written, and program plan developed for the chosen airborne sensor. The EAGLE program will be allowed to proceed at a slower pace due to the funding limitation while the study is conducted and the report written. The Rivet Joint Technology Transfer program will be given initially \$400,000 to participate in the study. Depending on the USD (A&T) decision, an airborne sensor may be chosen to proceed through engineering, manufacturing, and development (EMD) and production.</p> <p><u>FY 1996 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$4,704 SHIELD. Complete SHIELD processor and calibration upgrades; continue to incrementally develop, test and demonstrate added capability of fusing DSP data with other classified sensor data. - \$15,600 EAGLE. Finalize the design, commence sensor rapid prototyping; complete modifications to sensor components and integrate sensor subsystems; conduct tests in contractor laboratories to characterize components and subsystems. - \$097 EAGLE. Update Air Force Theater Air Command and Control Facility (TACCSF) EAGLE simulation and demonstrate modeling. - \$20,401 EAGLE cost analysis of procurement options and studies from simulations in Europe. - \$20,401 Total <p><u>FY 1997 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$1,393 CUEING AND NETTING. Develop AN/TPS-59 hardware and software modifications to accept and pass an external cue and conduct developmental testing of cueing and netting capability. - \$3,808 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. - \$93 EAGLE. Complete efforts initiated in FY 1996. Characterize sensor performance under conditions more characteristic of the operational environment against TBM targets of opportunity and surrogate targets prior to prototype integration on the AWACS TS-3 test aircraft. - \$17,127 Airborne Sensor for Ballistic Missile Tracking - \$22,421 Total 		
Project 2160	Page 33 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 2160
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FY 1998 (\$ in Thousands)

- \$1,361 CUEING AND NETTING. Conduct an operational demonstration of the TPS-59 capability to accept and pass an external cue.
- \$1,815 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.
- \$9,152 EAGLE. Continue FY 1997 activities; install and integrate the EAGLE prototype sensor aboard the TS-3 aircraft; conduct EAGLE prototype flight testing.
- \$12,328 Total

FY 1999 (\$ in Thousands)

- \$12,957 EAGLE. Complete prototype testing and pre-EMD activities initiated in FY98.
- \$12,957 Total

B. Program Change Summary (\$ in Thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>
Previous President's Budget	20,006	24,166	12,860	13,593	70,625
Current Budget Submit/President's Budget	20,401	22,421	12,328	12,957	68,107

Change Summary Explanation:

Funding: Funding adjustments made to support higher priority projects.

Schedule: None

Technical: None

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

	<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>To Compl</u>	<u>Total Cost</u>

D. Schedule Profile

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 1997					
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense										PROJECT 2160	
	FY 1996				FY 1997				FY 1998				FY 1999			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CUEING AND NETTING																
Acquisitions milestones						X										
Engineering milestones							X		X							
Test and Demos								X		X	X					
EAGLE																
Acquisition Milestone																
Design Review Technical Interchanges	X	X	X	X	X	X	X	X	X	X	X	X				
Engineering Milestone																
Component Ground Lab Test	X	X	X	X	X	X	X									
Lab and Field Ground Test							X	X	X							
Prototype Flight Test									X	X	X					
Contract Milestone																
Other Program Events																
International Participation Negotiations	X	X	X	X												
TALON SHIELD																
Acquisition Milestones																
Engineering Milestones																
Upgrade Reviews	X	X	X	X	X	X	X	X	X	X						
T&E Milestone																
Test and Demos	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				2160			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Engineering				18,156	21,223	11,328	12,097				
Studies				2,245	1,198	1,000	860				
Total				20,401	22,421	12,328	12,957				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
ESC/XR	MIPR					15,487	16,680	9,547	12,957	0	54,671
SMC/XR	MIPR					4,815	5,648	2,781	0	0	13,244
<u>Support and Management Organizations</u>											
ESC/XR	MIPR					99	93	0	0	0	192
<u>Test and Evaluation Organizations</u>											
B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>											
Government Furnished Property:											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 2160		
<u>Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development					20,302	22,328	12,328	12,957		67,915
Subtotal Support and Management					99	93				192
Subtotal Test and Evaluation										
Total Project					20,401	22,421	12,328	12,957		68,107

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 2259
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COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
2259 Israeli Cooperative Project	59,352	43,892	38,715	38,662	38,624	38,591	0	0	TBD	TBD

A. Mission Description and Budget Item Justification

This project includes the Arrow Continuation Experiments (ACES) Project, the Arrow Deployability Project (ADP), the Israeli Test Bed (ITB), Israeli Cooperative Research & Development (R&D), and the Israeli System Architecture and Integration (ISA&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.

The Israeli / Arrow program consists of efforts to develop a ballistic missile defense system. 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 development of the fire control radar, fire control center and launch control center by the Israelis without U.S. participation. Comprised of three phases, this initiative began with the Arrow Experiments project (Phase I) that developed the preprototype Arrow I interceptor. The ACES project (Phase II) is a continuation of Phase I, and consists of critical lethality tests using the Arrow II interceptor upgraded development and test of the 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.

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&D stage). This effort will include system-level flight tests of the U.S.-Israeli cooperatively developed Arrow II interceptor supported by the Israeli-developed fire control radar, fire control center and launcher control center (LCC). 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&D on other ballistic missile defense concepts may occur in the future.

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.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 2259
<p>Completed experiments identified additional enhancements needed to improve the ITB as an analysis tool. The enhancements incorporated in the ITB to date include radar and weapons models, and a BPI simulation capability. The BPI enhancement benefited the Israeli BPI study completed in January 1996. The planned Adaptive Battle Management Center (ABMC) enhancement will benefit the U.S. by enabling the ITB to simulate a wide variety of command and control and interoperability issues.</p> <p>The Israeli Cooperative R&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&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&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. Also, the Test bed Product Office at the Space and Strategic Defense Command benefited from the application of ITB Project experience to the U.S. and United Kingdom Extended Air Defense Test Bed (EADTB) Projects.</p> <p>The ISA&I Project activities demonstrated that defense of the State of Israel from tactical ballistic missile (TBM) attacks is feasible and cost-effective. The ISA&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	<i>Page 39 of 126 Pages</i>	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 2259
<u>FY 1996 (\$ in Thousands)</u>		
– \$31,493	Completed Arrow Continuation Experiments (ACES) and Support. Completed Arrow II interceptor design, development and fabrication. Initiate Arrow II interceptor flight tests. Continued to transfer Arrow data for risk reduction in the THAAD and SM-2 Block IVA programs. Developed and used high fidelity seeker models to analyze seeker performance.	
– \$24,075	Arrow Deployability Project and Support. Program implementation of procurement of long lead items. Conducted interoperability studies.	
– \$1,911	ITB. Awarded contract for continuation of ITB effort. Initiated Adaptive Battle Management Center enhancements.	
– \$1,666	ISA&I. Analyzed technical issues associated with TMD system performance including Kill Assessment and Lethality. Evaluated the performance of the near-term TMD against near-term and evolutionary threats. Awarded follow-on contract modification. Continued architecture analysis work for near term and future threats.	
– \$207	Cooperative R&D. Identified and assessed key technologies. Assessed technologies and interoperability.	
– \$59,352	Total	
<u>FY 1997 (\$ in Thousands)</u>		
– \$1,701	ACES Support. Complete lethality analysis of Arrow II. Evaluate Arrow II performance against surrogate threat High Explosive and bulk chemical warhead targets. Complete analysis of Arrow II flight test data. Provide Arrow II flight data to U.S. TMD interceptor developers.	
– \$38,653	Arrow Deployability Project and Support. Begin production of Arrow II UOES and targets. Evaluate Arrow interoperability with other TMD systems. Evaluate expected Arrow Weapon System (AWS) test performance. Provide AWS test plans and flight data to U.S. TMD developers.	
– \$1,898	ITB. Complete Adaptive Battle Management Center enhancements. Conduct experiments on near-term improvements to the TMD system. Continue HIL experiments	
– \$1,498	ISA&I. Provide independent oversight and assessment of near-term TMD system to include capability conformance with operational requirements and test plan traceability with operational specifications. Conduct architecture effectiveness/cost/risk trade study to examine evolution from near-term TMD system.	
– \$142	Gov Project Personnel & Support. Provide project support for USASSDC personnel.	
– \$43,892	Total	
<u>FY 1998 (\$ in Thousands)</u>		
– \$35,184	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.	
– \$1,894	Continue experiments on near-term improvements to the TMD system and on deployability. Provide improved threat model and Arrow II update enhancements.	
Project 2259	Page 40 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997																		
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 2259																		
<ul style="list-style-type: none"> - \$1,495 ISA&I. Analyze results of ITB Interoperability experiments. Continue evaluations of the performance of the near-term TMD system based on ADP system engineering flight tests. Continue analysis of TMD refinements for future threats. - \$142 Gov Project Personnel & Support. Provide project support for USASSDC personnel. - \$38,715 Total <p><u>FY 1999 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$35,137 Arrow Deployability Project and Support. Conduct Benefits Review to determine future ADP plans. Continue AWS integrated flight tests. Continue transfer of the AWS test results to U.S. TMD systems. Continue interoperability, lethality, kill assessment and producibility studies. - \$1,891 Complete experiments on near-term improvements to the TMD system and on deployability. Provide improved threat model and Arrow II update enhancements. Conduct joint US/IS experiments. - \$1,493 Continue to analyze results of ITB Interoperability experiments. Continue performance evaluations of the near-term TMD system based on ADP system engineering flight tests. Continue analysis of TMD refinements for future threats. - \$141 Gov Project Personnel & Support. Provide project support for USASSDC personnel. - \$38,662 Total <p><u>Acquisition Strategy</u> 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 IBIS will provide requirements and concept of operations needed for further acquisition strategy development. 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.</p> <p>B. Program Change Summary (\$ in Thousands)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;"></th> <th style="text-align: center;"><u>FY 1996</u></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>Total</u> <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td style="text-align: center;">52,906</td> <td style="text-align: center;">37,180</td> <td style="text-align: center;">37,874</td> <td style="text-align: center;">37,402</td> <td style="text-align: center;">165,362</td> </tr> <tr> <td>Current Budget Submit/President's Budget</td> <td style="text-align: center;">59,352</td> <td style="text-align: center;">43,892</td> <td style="text-align: center;">38,715</td> <td style="text-align: center;">38,662</td> <td style="text-align: center;">180,621</td> </tr> </tbody> </table> <p>Change Summary Explanation: Funding: The FY1997 Congressional Appropriation contained an additional \$2.7M for the Israeli Cooperative Programs. The program was reduced by \$46K in Department of Defense-Wide RDT&E reductions. Negotiations for an extended ADP reduced the Cooperative R&D budget after the U.S.-GOI agreement to cap</p>				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u> <u>Cost</u>	Previous President's Budget	52,906	37,180	37,874	37,402	165,362	Current Budget Submit/President's Budget	59,352	43,892	38,715	38,662	180,621
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u> <u>Cost</u>															
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Project 2259	Page 41 of 126 Pages	Exhibit R-2 (PE 0603872C)																		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 1997																																																																																																																																																									
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					PROJECT 2259																																																																																																																																																									
<p>Israeli Cooperative programs at \$40M per year starting in FY1998. Inflation reductions impacted FY1998 and beyond to levels below the \$40M per year specified in the US/Israel Memorandum of Agreement (Kaminski-Eilam).</p> <p>Schedule: Out of six flight tests planned in FY96, three occurred in FY96, and three will occur in FY97.</p> <p>Technical: None</p> <p>C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th><u>FY 1996</u></th> <th><u>FY 1997</u></th> <th><u>FY 1998</u></th> <th><u>FY 1999</u></th> <th><u>FY 2000</u></th> <th><u>FY 2001</u></th> <th><u>FY 2002</u></th> <th><u>FY 2003</u></th> <th>To <u>Compl</u></th> <th>Total <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>3359 - System Test & Evaluation, PE 603872C</td> <td align="right">33,568</td> <td align="right">42,792</td> <td align="right">40,307</td> <td align="right">26,444</td> <td align="right">25,763</td> <td align="right">27,750</td> <td align="right">27,090</td> <td align="right">27,136</td> <td align="center">Cont</td> <td align="center">Cont</td> </tr> </tbody> </table> <p>D. <u>Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3"><u>FY 1996</u></th> <th colspan="3"><u>FY 1997</u></th> <th colspan="3"><u>FY 1998</u></th> <th colspan="3"><u>FY 1999</u></th> </tr> <tr> <th></th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>U.S./Israel ADP Agreement signed</td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Complete Arrow Interceptor Development</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Complete ITB Enhancements</td> <td></td> <td></td> <td align="center">X</td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Complete six Arrow II Flight Tests (ACES)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> </tr> <tr> <td>Initiate Arrow Weapon System Flight Tests</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> </tr> <tr> <td>Initiate Interoperability Requirements</td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Interoperability Tests</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td align="center">X</td> <td align="center">X</td> </tr> <tr> <td>U.S. Benefits Review</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> </tr> </tbody> </table>													<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>	To <u>Compl</u>	Total <u>Cost</u>	3359 - System Test & Evaluation, PE 603872C	33,568	42,792	40,307	26,444	25,763	27,750	27,090	27,136	Cont	Cont		<u>FY 1996</u>			<u>FY 1997</u>			<u>FY 1998</u>			<u>FY 1999</u>				1	2	3	4	1	2	3	4	1	2	3	4	U.S./Israel ADP Agreement signed		X											Complete Arrow Interceptor Development									X				Complete ITB Enhancements			X		X				X				Complete six Arrow II Flight Tests (ACES)										X			Initiate Arrow Weapon System Flight Tests											X		Initiate Interoperability Requirements			X										Interoperability Tests										X	X	X	U.S. Benefits Review												X
	<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>	To <u>Compl</u>	Total <u>Cost</u>																																																																																																																																																									
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Project 2259			Page 42 of 126 Pages				Exhibit R-2 (PE 0603872C)																																																																																																																																																												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				2259			
 A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Prime Contract (Israel Ministry of Defense)				19950	33,000	33,000	33,000				
Other U.S. Government Activities				3975	5,647	2,173	2,121				
US Government Flight Test				31493	1,703	0	0				
Software Development				1911	1,900	1,900	1,900				
Systems Engineering				1666	1,500	1,500	1,500				
Miscellaneous				357	142	142	141				
Total				59,352	43,892	38,715	38,662				
 B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
<u>Support and Management Organizations</u>											
<u>Test and Evaluation Organizations</u>											
 B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>											
Government Furnished Property:											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 2259		
<u>Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development										
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project										

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3153
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COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3153 Architecture Analysis / BMC3I Initiatives	9,738	6,799	8,273	8,099	8,058	8,020	8,011	8,026	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project, which began in FY95, supports two offices within BMDO to ensure that appropriate issues relating to system architecture and Battle Management/Command, Control, and Communications (BM/C3) are addressed in a coordinated and synergistic manner across all BMDO National Missile Defense (NMD) and Theater Missile Defense (TMD) efforts. The offices of Architecture Integrator and the BM/C3 Office report directly and independently to the BMDO Director to provide the necessary mission-area oversight of critical BMDO technical issues.

In this project, BMDO supports systems analysis work to determine the expected operational performance and effectiveness of missile defense systems under development. Computer simulation models are developed and 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 in detail to determine the most cost effective approach for a particular missile defense mission. The work is performed on a continuing basis in order to determine the impact of changing threats, mission requirements, and advances in technology. The project provides BMDO with an independent assessment of the expected effectiveness of major programs under development and requirements for supporting technology. The work is separated into two program elements, one for TMD and the other for NMD.

In this program element the focus is on TMD systems and technology. The primary thrust of the work is to show, through analysis, the need for and the expected performance of different defense systems under development to handle current and projected missile threats, both ballistic and cruise. Issues such as warhead lethality, system degradation in a severe countermeasure environment, target handover from tracking sensor to missile seeker, effects of netting sensors, etc. are some of the technical issues addressed in this project.

Future BM/C3 activities in this project will provide for the mission-area oversight and coordination of all BMDO BM/C3 development and acquisition activities. This effort will provide for the synergistic evaluation of relevant BM/C3 technical issues; the formulation of appropriate plans, programs, and policies to facilitate the coordination of all BMD Advanced Development BM/C3 research, development, and acquisition activities across TMD and NMD program activities; promote appropriate reuse strategies to maximize BMD reuse capabilities; and minimize the duplication of BM/C3 research and development efforts across all NMD and TMD development efforts.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3153
<u>FY 1996 (\$ in Thousands)</u>		
- \$5,707	Architecture Analysis: Performed analyses of architectures and systems using new (validated) simulation tools. Conducted 3 month study (PROGRUS III) to determine impact of any change in threat, requirements, or development programs on the TMD architecture. Analyzed unresolved technical issues identified in the TMD COEA Study. Determined the ability of TMD systems to respond to proposed countermeasures. Studied active defense in the context of overall defenses including passive and counterforce options. Evaluate the capability of potential Russian and Allied missile defense systems with TMD systems.	
- \$4,031	BM/C3 Initiatives: Provided the mission-area capability to address emerging BM/C3 system requirements and concerns and facilitate their resolution in a synergistic manner across all TMD and NMD development efforts. Defined TMD and NMD BM/C3 development process requirements to facilitate the translation of operational BM/C3 requirements to joint and combined interoperable systems. Coordinated BMDO participation in the analysis, development, and implementation of various BMDO, DoD, Allied, and other Government and commercial initiatives relating to BMDO TMD/NMD BM/C3 development. Developed a concise definition of BM/C3 and a simple description of its components, relative to TMD/NMD/Theater Air Defense (TAD) architectures. Developed a Cost Analysis Requirements Document (CARD) type document to support cost and investment analysis.	
- \$9,738	Total	
<u>FY 1997 (\$ in Thousands)</u>		
- \$4,591	Architecture Analysis: Conduct annual program update study (PROGRUS IV). Continue systems analysis of architecture/system performance and related technical issues as directed by the BMDO Architecture Integrator and the Deputy for Acquisition/TMD.	
- \$2,208	BM/C3 Initiatives: Provide BMDO system-level capability to address emerging BM/C3 system requirements and concerns in a synergistic manner across all NMD and TMD development efforts and facilitate the translation of operational BM/C3 requirements to joint and combined interoperable systems. Coordinate BMDO participation in the analysis, development, and implementation of various BMDO, DoD, Allied, and other Government and commercial initiatives relating to BMDO NMD/TMD BM/C3 development.	
- \$6,799	Total	
<u>FY 1998 (\$ in Thousands)</u>		
- \$5,295	Architecture Analysis: Conduct annual program update study (PROGRUS IV). Continue systems analysis of architecture/system performance and related technical issues as directed by the BMDO Architecture Integrator and the Deputy for Acquisition/TMD	
- \$2,978	BM/C3 Initiatives: Provide BMDO system-level capability to address emerging BM/C3 system requirements and concerns in a synergistic manner across all NMD and TMD development efforts and facilitate the translation of operational BM/C3 requirements to joint and combined interoperable systems. Coordinate BMDO participation in the analysis, development, and implementation of various BMDO, DoD, Allied, and other Government and commercial initiatives relating to BMDO NMD/TMD BM/C3 development.	
- \$8,273	Total	
Project 3153	Page 46 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997																		
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3153																		
<p><u>FY 1999 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$5,182 Architecture Analysis: Conduct annual program update study (PROGRUS IV). Continue systems analysis of architecture/system performance and related technical issues as directed by the BMDO Architecture Integrator and the Deputy for Acquisition/TMD. - \$2,917 BM/C3 Initiatives: Provide BMDO system-level capability to address emerging BM/C3 system requirements and concerns in a synergistic manner across all NMD and TMD development efforts and facilitate the translation of operational BM/C3 requirements to joint and combined interoperable systems. Coordinate BMDO participation in the analysis, development, and implementation of various BMDO, DoD, Allied, and other Government and commercial initiatives relating to BMDO NMD/TMD BM/C3 development. - \$8,099 Total <p><u>Acquisition Strategy</u> 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 tenmember corporate team led by SPARTA, Inc., Laguna Hills, Calif. For BM/C3 Initiatives 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 Strategic Defense Command (USASSDC) 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 BM/C3 activities and Institute for Defense Analysis (IDA) 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.</p> <p>B. Program Change Summary (\$ in Thousands)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;"></th> <th style="text-align: center;"><u>FY 1996</u></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td style="text-align: center;">8,876</td> <td style="text-align: center;">8,062</td> <td style="text-align: center;">8,629</td> <td style="text-align: center;">8,496</td> <td style="text-align: center;">Continuing</td> </tr> <tr> <td>Current Budget Submit/President's Budget</td> <td style="text-align: center;">9,738</td> <td style="text-align: center;">6,799</td> <td style="text-align: center;">8,273</td> <td style="text-align: center;">8,099</td> <td style="text-align: center;">Continuing</td> </tr> </tbody> </table> <p>Change Summary Explanation:</p> <p style="padding-left: 20px;">Funding: None</p> <p style="padding-left: 20px;">Schedule: None</p> <p style="padding-left: 20px;">Technical: None</p>				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>	Previous President's Budget	8,876	8,062	8,629	8,496	Continuing	Current Budget Submit/President's Budget	9,738	6,799	8,273	8,099	Continuing
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>															
Previous President's Budget	8,876	8,062	8,629	8,496	Continuing															
Current Budget Submit/President's Budget	9,738	6,799	8,273	8,099	Continuing															
Project 3153	Page 47 of 126 Pages	Exhibit R-2 (PE 0603872C)																		

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3153
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C. Other Program Funding Summary (\$ in Thousands)

	<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>To Compl Cont</u>	<u>Total Cost Cont</u>
2400 NMD Program, PE 0603871C	730,656	828,864	504,091	393,085	309,748	309,584	391,858	392,433		

D. Schedule Profile

	<u>FY 1996</u>			<u>FY 1997</u>			<u>FY 1998</u>			<u>FY 1999</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
Define BM/C3 elements		X										
Assess TMD/NMD/TAD Architectures	X											
Assess Global Command and Control System (GCCS) Interoperability in support of the Technical Architecture		X										
Develop Commander-in-Chief (CINC)/User BM/C3 Feedback Plan in support of the Technical Architecture			X									
Establish BMD BM/C3 CARD like document			X									
Establish Technical Architecture BM/C3 Policy Update				X				X				X
Quarterly Program Review				X	X	X		X	X	X		X
Annual Contract Program Review			X				X			X		X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3153			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Support Contracts				9,738	6,799	8,273	8,099				
Total				9,738	6,799	8,273	8,099				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
<u>Contractor or</u>	<u>Contract</u>										
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>	<u>Total</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Prior to</u>	<u>FY 1996</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Complete</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1996</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>											
<u>Support and Management Organizations</u>											
SETA	CPFF/CPAF	27 Dec 94		BMDO		2,916	1,750	2,500	2,500	continuing	9,666
Other Support		Multiple				6,822	5,049	5,773	5,599	continuing	23,243
Cont											
<u>Test and Evaluation Organizations</u>											
B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>											
Government Furnished Property:											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3153		
<u>Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development										
Subtotal Support and Management					9,738	6,799	8,273	8,099		32,909
Subtotal Test and Evaluation										
Total Project					9,738	6,799	8,273	8,099		32,909

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3157		
COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3157 Environmental, Siting, and Facilities	4,369	5,972	3,600	3,640	3,631	3,609	3,606	3,612	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification</u></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&E construction programs. Provides guidance and supports BMDO TMD 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><u>FY 1996 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$3,378 Supported TMD programs with siting analyses, basing deployment plans, environmental analyses and documentation, environmental compliance and pollution prevention programs, and test range studies. TMD systems being emphasized are the PATRIOT Advance Capability Level 3 (PAC-3), Theater High Altitude Area Defense (THAAD), Navy Lower Tier (Area) systems and Family of Systems System Integration Tests. - \$77 Conducted facility planning and developed preliminary facility design concepts for TMD test and evaluation facilities, and for deployment locations. - \$914 Executed and managed TMD's FY 96-98 MILCON, Minor MILCON, and RDT&E facility design, construction projects, and related activities. The emphasis is on the PAC-3 and THAAD EMD test and deployment facilities, such as THAAD Test Facilities at USAKA, TMD Target Launch Facilities at Wake Island and Fort Wingate, and THAAD 1st Objective Battalion Facilities at Fort Bliss. - \$4,369 Total <p><u>FY 1997 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$1,878 Support TMD programs with siting analyses, basing deployment plans, environmental analyses and documentation, environmental compliance and pollution prevention programs, and test range studies. The project covers costs associated with maturing acquisition programs, fielding of systems, integrated system testing, and test and evaluation programs. - \$144 Continues facility planning for fielding the PAC-3 and THAAD systems. It also continues facility planning support for test and evaluation programs. 										
Project 3157			Page 51 of 126 Pages				Exhibit R-2 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3157
<ul style="list-style-type: none"> - \$3,915 Provides funds to execute and manage TMD's FY 97-99 MILCON, Minor MILCON, and RDT&E facility design, construction projects and other related activities providing program support. Design projects include: the THAAD Test Facilities at USAKA, Facility Upgrades at Pacific Missile Range Facility (PMRF), Utilities Repairs at Wake Island , Extended Range Target Launch Complex facilities, and possible Air Launch facilities in the Pacific. Construction projects include PAC-3, THAAD, and Navy Lower Tier (Area) facility projects, such as: TMD Target Launch Facilities at Wake Island and Fort Wingate, and construction of THAAD 1st Objective Battalion Facilities at Fort Bliss. - \$35 OSD and SBIR Reductions - \$5,972 Total 		
<u>FY 1998 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$1,784 Support TMD programs with siting analyses, basing deployment plans, environmental analyses and documentation, environmental compliance and pollution prevention programs, and test range studies. Begin work on the System Integrated Tests requirements development and continue on the Navy Lower Tier (Area), THAAD and PAC-3 systems. The program manages activities associated with maturing acquisition programs, fielding of systems, integrated system tests, and test and evaluation programs. - \$62 Complete facility planning for PAC-3 and THAAD facilities. Begin planning and development of unique range test facilities for both Atlantic and Pacific requirements. Complete planning for the FY00 and FY01 System Integration Tests. - \$1,754 Provides funds to execute overall FY98-00 MILCON, Minor MILCON, and RDT&E facility design, construction projects and related activities. Construction projects include: THAAD Test Facilities at USAKA, Utilities Repairs at Wake Island, and Facility Upgrades at PMRF. Continual improvements to TMD's test and evaluation facilities are required to support the ever increasing complexity of test scenarios. Initial requirements to meet improvements to PAC-3, THAAD and Navy Lower Tier (Area) system will enter the design phase. - \$3,600 Total 		
<u>FY 1999 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$1,800 Support TMD programs with siting analyses, basing deployment plans, environmental analyses and documentation, environmental compliance and pollution prevention programs, and test range studies. Work continues on new TMD requirements as well as on Navy Lower Tier (Area), Navy Upper Tier (Theater Wide), THAAD, and PAC-3 systems to meet their requirements. The program manages activities associated with maturing acquisition programs, fielding of systems, integrated system tests, and test and evaluation programs. - \$63 Complete facility planning for PAC-3 and THAAD basic system facilities. Continue planning and development of unique range test facilities for both Atlantic and Pacific requirements as well as follow-on improvements to THAAD and the Navy Upper Tier (Theater Wide) systems. Complete planning for the FY00 and FY02 System Integration Tests. - \$1,777 Provides funds to execute overall FY98-00 MILCON, Minor MILCON, and RDT&E design and construction. The design emphasis will be on completing facility requirements for PAC-3. Provides for TMD test and evaluation facilities improvements to support increasingly complex test scenarios. Final requirements to meet improvements to PAC-3, THAAD and Navy Lower Tier (Area) system will enter the design phase. The construction emphasis will be on the Facility Upgrades at PMRF. 		
Project 3157	Page 52 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3157
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– \$3,640 Total

Acquisition Strategy 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. Program Change Summary (\$ in Thousands)

	FY 1996	FY 1997	FY 1998	FY 1999	Total Cost
Previous President's Budget	3,399	3,768	3,754	3,818	14,739
Current Budget Submit/President's Budget	4,369	5,972	3,600	3,640	17,581

Change Summary Explanation:

Funding: Funding adjustments in FY97 made to support additional environmental analysis requirements.

Schedule: None

Technical: None

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

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
3157 Minor MILCON & Design, Joint TMD Dem/Val, PE 0603872C	1,642	1,404	1,965	1,885	1,444	341	1,643	1,650	Cont.	Cont

D. Schedule Profile

	FY 1996			FY 1997			FY 1998			FY 1999		
1	2	3	4	1	2	3	4	1	2	3	4	

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 1997								
BUDGET ACTIVITY 4 - Demonstration and Validation						PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense						PROJECT 3157							
	<u>FY 1996</u>					<u>FY 1997</u>					<u>FY 1998</u>					<u>FY 1999</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4			
PAC-3 and THAAD Target Launch Facilities, Ft Wingate and Wake Island	X	X	X	X															
PAC-3 Missile Assembly Bldg, White Sands Missile Range		X	X	X	X	X	X												
THAAD Test Facilities, Kwajalein Atoll				X	X	X	X	X	X	X	X	X							
THAAD 1st Objective Battalion, Ft Bliss				X	X	X	X	X	X	X	X								
Manage Environmental Analysis for Eglin Gulf Test Range			X	X	X	X	X	X	X	X									
Manage Environmental Analysis for Pacific Missile Range Facility			X	X	X	X	X	X	X	X	X	X							
Manage Environmental Analysis for Alternate Air Launch				X	X	X	X												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3157			
A. Project Cost Breakdown (\$ in Thousands)											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Environmental, Siting & Facilities				4,369	5,972	3,600	3,640				
Total				4,369	5,972	3,600	3,640				
B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
Product Development Organizations											
AF/SMC	PMA	FY96				25	10	10	10	Cont.	55
Huntsville Corps of Engr	MIPR	FY95				167	130	130	130	Cont.	557
Navy Civil Engr/Environ Staff	CPFF	FY94				27	50	50	50	Cont.	177
Pac Ocean Div Corp of Engr	MIPR	FY97				0	1,600	0	0	Cont.	1,600
USASSDC	CPFF	FY96				125	0	279	588	Cont.	992
Fish & Wildlife Service	MIPR	FY92				6	30	0	0	Cont.	36
WSMR Environ Staff	MIPR	FY96				225	175	0	0	Cont.	400
MICOM-RDEC	MIPR	FY96				25	25	25	25	Cont.	100
PEO-AMD-TSD- Civil	PMA	FY96				30	30	30	30	Cont.	120
Project 3157				Page 55 of 126 Pages				Exhibit R-3 (PE 0603872C)			

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1997	
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					PROJECT 3157	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
SETA (SSDC)	CPFF	FY97				488	450	445	445	Cont.	1,828
PEO-AMD-TSD	CPFF	FY95				167	130	130	130	Cont.	557
Support											
MEVATEC	CPFF	FY96				100	100	100	100	Cont.	400
USASSDC	CPFF	FY94				983	1,929	1,078	757	Cont.	4,747
Environ. Support											
Navy Environ. Support	CPFF	FY97				0	275	274	280	Cont.	829
SETA (BMDO)	CPFF	FY95				2,001	1,038	1,049	1,095	Cont.	5,183
<u>Test and Evaluation Organizations</u>											
B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Property</u>											
<u>Support and Management Property</u>											
<u>Test and Evaluation Property</u>											
Project 3157					Page 56 of 126 Pages				Exhibit R-3 (PE 0603872C)		

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3157		
<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Subtotal Product Development					630	2,050	524	833		4,037
Subtotal Support and Management					3,739	3,922	3,076	2,807		13,544
Subtotal Test and Evaluation										
Total Project					4,369	5,972	3,600	3,640		17,581

UNCLASSIFIED

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE February 1997	
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					PROJECT 3160	
COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3160 TMD Readiness	1,112	1,709	1,730	1,692	1,687	1,676	1,674	1,677	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>This project supports Theater Missile Defense projects in the functional areas of manufacturing, logistics supportability and metrology design and support. These diverse functions map directly into meeting operational suitability and affordability goals. By focusing on all TMD (BMD) activities and coordinating these efforts between the Services and projects, common cost avoidance is realized. TMD readiness activities include producibility and planning for manufacturing, acquisition logistics, metrology, and training. The efforts will concentrate on identifying and analyzing critical TMD systems level deployment, support, producibility and manufacturing (P&M) risks, industrial base capability issues and developing mitigation plans for these areas to ensure operational requirements and BMDO affordability objectives are met. In addition, TMD operational suitability and availability advances and lessons learned are applied to NMD projects. This effort will also focus on the identification of critical TMD metrology requirements; and the development of national/DOD measurement standards and calibration support for TMD technology and acquisition programs.</p> <p><u>FY 1996 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$723 Completed development of Long Wave Infrared (LWIR) transfer standard detectors. Continued National Institute of Standards & Technology (NIST) support of THAAD Radar antenna calibration and field diagnostics. Continued development of IR standards for detectors, sources, optical materials characterization, and focal plane arrays (FPA). Continued to support the TMD program offices, their contractors, Government laboratories and test centers with Infrared (IR) calibration and measurement services. - \$349 Integrated producibility issues. Resolved TMD system common support and producibility problems. Developed mitigation strategies (both element specific and TMD wide). Reviewed manufacturing planning. - \$40 Updated operational suitability planning, to address issues related to TMD concepts of operations, BM/C3, inter-Service operations, and systems readiness and functional requirements. - \$1,112 Total <p><u>FY 1997 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$808 Complete the NIST medium background IR calibration facility. Continue development of IR standards for MWIR detectors, focal plane array testing, and IR filter measurements. Continue NIST support of THAAD Radar antenna field diagnostics and calibration. Continue to support the TMD program offices, their contractors, Government laboratories and test centers with IR calibration and measurement services. - \$485 Support completion and insertion of producibility and manufacturing mitigation programs developed in FY95 and 96, including non-BMDO programs. Support element program offices in risk mitigation development and assessment. 										
Project 3160			Page 58 of 126 Pages				Exhibit R-2 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3160
– \$416	Update operational suitability planning, to address issues related to TMD concepts of operations, BM/C3, inter-Service operations, and systems readiness and functional requirements.	
– \$1,709	Total	
<u>FY 1998 (\$ in Thousands)</u>		
– \$820	Complete Medium Wave Infrared (MWIR) detector transfer standard and standards for IR filter spectral measurements. Continue development of standards for testing IR focal plane arrays and IR scene projections. Continue NIST support of THAAD. Continue to support the TMD program offices, their contractors, Government laboratories and test centers with IR calibration and measurement services.	
– \$490	Continue insertion of producibility and manufacturing mitigation programs from FY97, including non-BMDO programs; support producibility and manufacturing aspects of PATRIOT Advanced Capability Level 3 (PAC-3) and Sea-based Area TBMD milestones. Support element program offices in development of exit criteria resolution and assessment.	
– \$420	Update operational suitability planning, to address issues related to TMD concepts of operations, BM/C3, inter-Service operations, and systems readiness and functional requirements. Complete plans for the transition of system management of current TMD acquisition programs from BMDO to the Services.	
– \$1,730	Total	
<u>FY 1999 (\$ in Thousands)</u>		
– \$811	Continue MWIR/LWIR detector transfer standard and standards for IR filter spectral measurements. Continue development of standards for testing IR focal plane arrays and IR scene projections. Continue NIST support of THAAD. Continue to support the TMD program offices, their contractors, Government laboratories and test centers with IR calibration and measurement services.	
– \$461	Continue insertion of producibility and manufacturing mitigation programs from FY97, including non-BMDO programs; support producibility and manufacturing aspects of PAC-3 and Sea-based Area TBMD milestones. Support element program offices in development of exit criteria resolution and assessment.	
– \$420	Update operational suitability planning, to address issues related to TMD concepts of operations, BM/C3, inter-Service operations, and systems readiness and functional requirements. Complete plans for the transition of system management of current TMD acquisition programs from BMDO to the Services.	
– \$1,692	Total	
<p><u>Acquisition Strategy:</u> a. Efforts to develop and implement metrology standards will be executed by the NIST. BMDO funding will be administered by the AF Metrology Center in Newark OH. The AF Metrology Center staff also have the responsibility of helping BMDO identify metrology needs and implementing and distributing developed standards through-out US industry.</p> <p>b. Efforts in producibility and manufacturing , industrial base analyses, and operational suitability will be worked through a series of government managed working groups and IPTs. Efforts may be executed by BMDO SETAs, Service Industrial base Analyses organizations, Service training and planning organizations. Unless a significant</p>		
Project 3160	Page 59 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 1997																																																						
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					PROJECT 3160																																																						
<p>multi-year effort is required on a particular issue, these areas will be worked via MIPRs to services and by funding tasks with existing BMDO and service SETAs. These limited funds will go to the organization with the expertise on a topic -by-topic basis.</p> <p>B. <u>Program Change Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:40%;"></th> <th align="center"><u>FY 1996</u></th> <th align="center"><u>FY 1997</u></th> <th align="center"><u>FY 1998</u></th> <th align="center"><u>FY 1999</u></th> <th align="center"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td align="right">1,106</td> <td align="right">1,822</td> <td align="right">1,805</td> <td align="right">1,776</td> <td align="right">6,509</td> </tr> <tr> <td>Current Budget Submit/President's Budget</td> <td align="right">1,112</td> <td align="right">1,709</td> <td align="right">1,730</td> <td align="right">1,692</td> <td align="right">6,243</td> </tr> </tbody> </table> <p>Change Summary Explanation:</p> <p style="padding-left: 20px;">Funding: None</p> <p style="padding-left: 20px;">Schedule: None</p> <p style="padding-left: 20px;">Technical: None</p> <p>C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"></th> <th align="center"><u>FY 1996</u></th> <th align="center"><u>FY 1997</u></th> <th align="center"><u>FY 1998</u></th> <th align="center"><u>FY 1999</u></th> <th align="center"><u>FY 2000</u></th> <th align="center"><u>FY 2001</u></th> <th align="center"><u>FY 2002</u></th> <th align="center"><u>FY 2003</u></th> <th align="center"><u>To Compl</u></th> <th align="center"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>D. <u>Schedule Profile</u></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>IR and improved IR dynamic range spectral calibration services are provided throughout other milestones (TBD)</td> <td align="center">1</td> <td align="center">2</td> <td align="center">3</td> <td align="center">4</td> <td align="center">1</td> <td align="center">2</td> <td align="center">3</td> <td align="center">4</td> <td align="center">1</td> <td align="center">2</td> <td align="center">3</td> <td align="center">4</td> </tr> </tbody> </table>													<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>	Previous President's Budget	1,106	1,822	1,805	1,776	6,509	Current Budget Submit/President's Budget	1,112	1,709	1,730	1,692	6,243		<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>To Compl</u>	<u>Total Cost</u>	D. <u>Schedule Profile</u>											IR and improved IR dynamic range spectral calibration services are provided throughout other milestones (TBD)	1	2	3	4	1	2	3	4	1	2	3	4
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>																																																											
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Project 3160			Page 60 of 126 Pages				Exhibit R-2 (PE 0603872C)																																																									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3160
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A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Integrated Logistics Support	1,112	1,709	1,739	1,692
Total	1,112	1,709	1,739	1,692

B. Budget Acquisition History and Planning Information (\$ in Thousands)

Performing Organizations:

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
<u>Support and Management Organizations</u>											
<u>Test and Evaluation Organizations</u>											

B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

Government Furnished Property:

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3160		
<u>Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development										
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project										

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3251
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COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3251 Systems Engineering and Technical Support	45,358	50,909	65,260	62,031	66,972	69,350	90,554	76,498	Continuing	Continuing

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 1996 (\$ in Thousands)

- \$2,470 Supported completion of a UK developed concept of operations test bed. Support continued in the testing and fielding of the UK developed Target Oriented Tracking System (TOTS).
- \$9,775 Provided scientific, engineering, and technical support for the acquisition, integration, and fielding of TMD systems including: reviewed products in comparison to standards, specifications, and requirements; provided modeling and simulation support of architecture analyses and trade-off studies; installed and completed operational configuration of the BMDO node of the Extended Air Defense Test Bed (EADTB); continued analytic and programmatic support of the TMD Capstone Cost and Operational Effectiveness Analysis (COEA); provided risk reduction and acquisition streamlining support; provided engineering and technical support for international programs and BM/C3 efforts; developed and maintained technical and programmatic databases; and prepared technical reports, briefings, and programmatic documentation.
- \$814 Provided support to WALEX, THAAD, HAWK and TMD Conference
- \$13,856 Using Federally Funded Research and Development Center (FFRDC) resources, performed independent technical and engineering assessments of TMD system architectures including: system concept development and assessment; COEA support; 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; specific studies and analyses of critical issues.
- \$3,728 Provided technical support to the TMD COEA, individual system COEAs, and congressionally-directed studies.
- \$9,596 Provided minimum-level system engineering and integration support at the TMD system level to include the following efforts: continued to identify inter-Service integration interfaces; prepared engineering documents that identify changes required in theater air defense C3I systems to incorporate TBMD; updated TMD Integrated Test Plan; updated system description documents; completed TMD integration trade studies; and planned, coordinated, and analyzed C2 wargames for CINC CONOPS development.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3251
– \$1,794	Provided continued support to intra-Service integration, interoperability, and resolution of interface issues; supported review of SEI contractor integration and assessment documentation; evaluated threat-generated requirements; initiated environmental modeling and simulation tool improvements; continued refinement of Survivability Enhancement Options (SEOs) for BM/C3; supported the EADTB effort and supported the Joint Surveillance and Target Attack Radar System (JSTARS) effort.	
– \$1,500	Provided technical support to Combat Developments Directorate-Ft Bliss, TX.	
– \$100	Supported BMDO services (e.g., security, contracting, supplies).	
– \$1,374	Supported BMDO operations and personnel management.	
– \$351	Provided personnel management support to Program Executive Officer, Missile Defense, Huntsville, AL.	
– \$45,358	Total	
<u>FY 1997 (\$ in Thousands)</u>		
– \$1,107	Continue UK sensor data fusion efforts including Target Oriented Tracking System (TOTS) integration testing and development and testing of TOTS applications. Begin use of TOTS in test analysis at various BMD test ranges.	
– \$442	Provide support to TMD conference, HAWK and Marine Corps combat development support.	
– \$8,953	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; conduct EADTB distributed analyses and operations; development and maintenance of technical and programmatic databases; and preparation of technical reports, briefings, and programmatic documentation.	
– \$13,781	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.	
– \$1,879	Provide technical support to the TMD Joint Effectiveness Analysis (JEA), individual system JEAs, and congressionally directed studies.	
– \$11,695	Increase system engineering and integration support at the TMD system level. Continue to identify inter-Service integration interfaces; prepare engineering documents to identify changes required in theater air defense C3I systems to support TBMD; update TMD Integrated Test Plan; update system description documents; and plan, coordinate, and analyze C2 wargames for CINC CONOPS development.	
– \$4,608	Provide support to Service integration, interoperability, and resolution of interface issues; determine adequacy of threshold/objective hardness specifications for C4I support equipment; identify SEOs for C4I/support equipment to meet/exceed identified exposure levels to ensure critical operational effectiveness; continue environmental modeling and simulation tool improvements; assist in coordinating technology infusion to support pre-planned product improvements; continue 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.	
– \$300	Support for BMDO services (e.g., security, contracting, supplies).	
Project 3251	Page 64 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3251
<ul style="list-style-type: none"> - \$466 Support for Blue Team Analysis to study counter-countermeasures to TMD system. - \$1,999 Provide technical support to Combat Developments Directorate-Ft Bliss, TX. - \$5,458 Support BMDO operations and personnel management. - \$221 Provided personnel management support to Program Executive Officer, Missile Defense, Huntsville, AL. - \$50,909 Total 		
<u>FY 1998 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$1,134 Continue utilization of TOTS at US BMD test ranges. - \$13,915 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; conduct Extended Air Defense Testbed (EADTB) distributed analyses and operations; development and maintenance of technical and programmatic databases; and preparation of technical reports, briefings, and programmatic documentation. - \$14,030 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. - \$3,986 Provide technical support to the TMD JEA, individual system JEAs, and congressionally-directed studies. - \$19,038 Increase system engineering and integration support at the TMD system level. Continue to identify inter-Service integration interfaces; prepare engineering documents to identify changes required in theater air defense C3I systems to support TBMD; update TMD Integrated Test Plan; update system description documents; and plan, coordinate, and analyze C2 wargames for CINC CONOPS development. - \$5,575 Provide support to Service integration, interoperability, and resolution of interface issues; determine adequacy of threshold/objective hardness specifications for C4I support equipment; identify SEOs for C4I/support equipment to meet/exceed identified exposure levels to ensure critical operational effectiveness; continue environmental modeling and simulation tool improvements; assist in coordinating technology infusion to support pre-planned product improvements; continue 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. - \$409 Support for BMDO services (e.g., security, contracting, supplies). - \$1,000 Support for Blue Team Analysis to study counter-countermeasures to TMD system. - \$5,817 Support BMDO operations and personnel management. - \$356 Provided personnel management support to Program Executive Officer, Missile Defense, Huntsville, AL. - \$65,260 Total 		
Project 3251	Page 65 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3251
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FY 1999 (\$ in Thousands)

- \$1,113 Continue utilization of TOTS at US BMD test ranges.
- \$14,263 Provide Scientific, Engineering and Technical Assistance (SETA) support of TMD systems acquisition.
- \$14,250 Using FFRDC resources, perform independent and technical engineering assessment and studies to support fielding TMD systems.
- \$2,257 Provide technical support to congressional directed studies (e.g. JEA).
- \$5,314 Inter-Service Integration Efforts.
- \$315 Technical Support for BMDO services.
- \$950 Support Blue Team analysis to study counter-countermeasures to TMD systems.
- \$17,234 SEI Contract, system software and engineering, and TMD system survivability.
- \$5,970 Support BMDO operations and personnel management.
- \$365 Provided personnel management support to Program Executive Officer, Missile Defense, Huntsville, AL.
- \$62,031 Total

Acquisition Strategy This project uses a combination of FFRDC, competitively awarded SETA contracts, and a Memorandum of Understanding (MOU) with the United Kingdom Ministry of Defense.

B. Program Change Summary (\$ in Thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>
Previous President's Budget	47,919	55,669	67,892	60,858	232,338
Current Budget Submit/President's Budget	45,358	50,909	65,260	62,031	223,558

Change Summary Explanation:

- Funding: Funding transferred to higher priority projects.
- Schedule: None
- Technical: None

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

	<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>To Compl</u>	<u>Total Cost</u>
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UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)												DATE February 1997							
BUDGET ACTIVITY 4 - Demonstration and Validation						PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense						PROJECT 3251							
D. <u>Schedule Profile</u>																			
		<u>FY 1996</u>					<u>FY 1997</u>					<u>FY 1998</u>					<u>FY 1999</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4			
Engineering Milestone																			
T&E Milestone																			
Tech Demo Milestone																			
Contract Milestone																			
- Deliver TMD Sys RD				X				X				X					X		
- Deliver TMD Sys Assessment Doc				X				X				X					X		
- Deliver TMD Int Test Plan				X				X				X					X		
- Deliver TMD C3I Int Assessment				X				X				X					X		
- Deliver TMD Surv Assessment				X				X				X					X		
- TMD BMC3 WG Plan/Exec			X	X			X	X			X	X			X		X		
- TIBS/TRAP Msg Int				X				X				X					X		
BMDO EADTB Node Development																			
- Node IOC				X															
- Full distributed Operations							X				X				X				
Support through delivery of integration engineering analysis the following TMD events:																			
- Navy Area TBMD Def COEA comp			X																
- Navy Area TBMD Defense MS II				X															
- THAAD Flight Test					X	X	X	X											
- Complete NATO Mag Set Tests					X														
- TMD-GBR Target Tests							X	X											
- PAC-3 CDR							X												
- BPI PDR							X												
- C3I Integration Test								X				X				X			
- System Integration Test									X				X				X		
- THAAD MS II											X								
- PAC-3 LRIP Decision													X						
Project 3251																			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)													DATE February 1997				
BUDGET ACTIVITY 4 - Demonstration and Validation						PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense						PROJECT 3251					
						<u>FY 1996</u>		<u>FY 1997</u>		<u>FY 1998</u>		<u>FY 1999</u>					
						1	2	3	4	1	2	3	4	1	2	3	4
- BPI KKV CDR												X					
- MEADS SRR													X				
- Navy Theater-wide Informed Decision														X			
- Navy Theater-wide TBMD MS I															X		
- BPI Integration Tests															X		
- THAAD UCT															X		
- UOES Delivery																X	
- PAC-3 MS III																	X
- MEADS MS II/III																X	

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1997					
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				3251			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Developmental Test & Evaluation				2,470	1,107	1,134	1,113				
Program Management Support				29,134	25,821	33,340	32,035				
Systems Engineering				10,529	16,303	24,613	22,548				
Program Management Personnel				3,225	7,678	6,173	6,335				
Total				45,358	50,909	65,260	62,031				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
<u>Support and Management Organizations</u>											
SETA	CPAF	Nov 96				9,775	8,953	13,915	14,263	ONGOING	46,906
Other Supt. Cont.		Multiple				28,094	28,563	38,463	35,006	ONGOING	130,126
OGA's	MIPR	Multiple				5,019	12,286	11,748	11,649	ONGOING	40,702
<u>Test and Evaluation Organizations</u>											
DT&E						2,470	1,107	1,134	1,113	ONGOING	5,824
Project 3251				Page 69 of 126 Pages				Exhibit R-3 (PE 0603872C)			

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997			
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				3251		
B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)										
Government Furnished Property:										
<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development										
Subtotal Support and Management					42,888	49,802	64,126	60,918		217,734
Subtotal Test and Evaluation					2,470	1,107	1,134	1,113		5,824
Total Project					45,358	50,909	65,260	62,031		223,558
Project 3251				Page 70 of 126 Pages				Exhibit R-3 (PE 0603872C)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3261
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COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3261 TMD BM/C3I (BM/C3I Concepts)	0	32,357	34,094	35,864	43,717	44,576	43,210	43,286	Continuing	Continuing

A. Mission Description and Budget Item Justification

The primary mission of this project is to provide the warfighter with an integrated and interoperable Theater Missile Defense (TMD) Battle Management/Command, Control, Communications, and Intelligence (BM/C3I) capability having the flexibility to meet a wide range of threats and expected needs. The BM/C3I architecture for TMD is built upon the existing command and control (C2) structure for Theater Air Defense (TAD) and adds the communications linking TMD C2 nodes, weapons, and sensors, and the TMD interfaces to intelligence systems and other supporting capabilities. The BMDO, from its joint perspective, uses this project to oversee independent weapon systems development and to provide guidance, standards, equipment, integration, and analysis to maximize the performance of a multitude of sensors, interceptors, and C2 nodes and to synergize their individual contributions to an integrated Joint theater-wide TMD system. BMDO has three major thrusts to the TMD BM/C3I integration program.

The first thrust establishes the links and means for receipt of and in-theater dissemination of early warning and launch warning information from space-based and intelligence systems external to TMD. This project supports the system engineering of their capability and prototype development of items such as improved displays for early in-theater warning information. This project focuses on linking separate external systems into the theater.

The second thrust of the BM/C3I program focuses on communication and interoperability among TMD weapon systems. Interoperability includes both the communications equipment, and protocols as well as the common command and control procedures among different weapons systems to ensure a truly integrated theater-wide ballistic missile defense system. The cornerstone of TMD interoperability is the Joint Data Net (JDN) which uses the Joint Tactical Information Distribution System (JTIDS) and the Tactical Data Information Link-JTIDS (TADIL-J) message format. This project integrates JTIDS terminals into existing Theater Ballistic Missile Defense (TBMD) C2 platforms and provides the necessary software upgrades. This funding is critical for timely inter-Service interoperability.

The third thrust of the BM/C3I program directs attention to upgrades of Service C2 centers. Various command center upgrades are included in this project to reduce decision-making time necessary to effectively engage ballistic missiles. Again, BMDO leverages off several existing Service-funded theater air defense command center upgrades and this project funds only the specific TMD-related aspects of these upgrades. BMDO's central direction and support of hardware and software developments will produce an integrated C2 capability for TMD.

The joint warfighters and BM/C3I developers evaluate the effects of early warning, improved interoperability, integration, and command center upgrades on joint TBMD doctrine through BM/C3I work shops and analysis.

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3261
<p>All of the efforts in this project are designed to provide a seamless interoperable architecture to provide timely warning and information necessary to reduce decision times and allow more opportunities to efficiently and effectively engage hostile missiles. The end result will kill more missiles and will reduce casualties to U.S. and other friendly forces.</p>		
<u>FY 1996 (\$ in Thousands)</u>		
– \$0	There is no funding under this project in this PE for FY96. This project was transferred from PE 0603864 per Congressional Direction.	
– \$0	Total	
<u>FY 1997 (\$ in Thousands)</u>		
– \$5,390	BM/C3I Integration - Army: Integrate JTIDS into Army systems; develop terminal initialization parameters; demonstrate enclave interoperability; integrate User Operational Evaluation System (UOES) upper/lower tier; continue TMD Cell/TOC automation.	
– \$14,515	BM/C3I Integration - Air Force: Continue JTIDS integration efforts, initiate integration into two additional existing platforms; Air Operations Center/Command Reporting Center (AOC/CRC) upgrades for TMD; begin development of JTIDS Range Extension (JRE) capability.	
– \$5,400	BM/C3I Integration - USMC: Complete development of AN/TPS-59 cue acceptance software; commence development of TAOM BM/C3I TMD software.	
– \$283	BM/C3I Integration - Navy: Support joint development of JTIDS Range Extension (JRE).	
– \$4,394	BM/C3I Integration - Joint/Combined: Obtain/approve additional TADIL-J TMD messages; transition MIDS development to the Army; conduct evaluations of JTIDS networks to determine value of JTIDS Time Slot Reallocation (TSR); begin software integration of TMD messages; obtain NATO approval of additional TADIL-J messages; perform an integrated engineering analysis for the joint composite tracking network (JCTN) including the cooperative engagement capability.	
– \$2,375	BM/C3I Integration - Joint National Test Facility (JNTF): Conduct TMD BMC3I work shop; conduct C2 tests to refine C2 procedures; deploy joint TMD planning capability to command centers for initial user testing.	
– \$32,357	Total	
<u>FY 1998 (\$ in Thousands)</u>		
– \$9,995	BM/C3I Integration - Army: Field two Tactical Operations Centers (TOC) to active Army brigades; support JTIDS Range Extension (JRE) efforts; participate in JTIDS network management activities; initiate Joint TMD Planner (JTMDP) integration into Army host platforms.	
– \$12,654	BM/C3I Integration - Air Force: Develop an automated intelligence database function; continue JTIDS platform integration; initiate one additional platform; continue JRE development; technology development of distributed battle management; and validate TMD battlefield situation display software.	
– \$291	BM/C3I Integration - Navy: Continue support of joint development of JRE.	
– \$2,500	BM/C3I Integration - USMC: Complete testing of AN/TPS-59 cue capability; and continue TAOM BMC3I software development.	
Project 3261	Page 72 of 126 Pages	Exhibit R-2 (PE 0603872C)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1997
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT
4 - Demonstration and Validation		0603872C Joint Theater Missile Defense			3261
<ul style="list-style-type: none"> - \$6,098 BM/C3I Integration - Joint/Combined: Update TADIL-J message set approval and initiate definition and development of joint composite tracking network (JCTN). - \$2,556 BM/C3I Integration - JNTF: Continue BMC3I work shops; update Joint TMD Planner (JTMDP) based on initial user test results; and provide Global Command and Control System (GCCS) capability for TMD applications evaluations. - \$34,094 Total <p><u>FY 1999 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$7,916 BM/C3I Integration - Army: Continue integration of THAAD EMD and Navy TMD systems into brigade TOC planner; continue JRE support. - \$11,701 BM/C3I Integration - Air Force: Start JTIDS TMD integration to AOC; continue installation on AWACS, test integration on Airborne Battlefield Command and Control Center (ABCCC); perform TMD BSD SW modification to AOC; upgrade Intelligence Preparation of the Battlespace (IPB) GCCS decision support tool; continue JRE development. - \$290 BM/C3I Integration - Navy: Continue support of JRE - \$13,666 BM/C3I Integration - Joint: Continue JCTN development and update TMD TADIL message sets. - \$2,291 BM/C3I Integration - JNTF: Continue BM/C3I work shops; perform user assessments of TMD GCCS TMD applications; and identify product improvements to the JTMDP. - \$35,864 Total <p><u>Acquisition Strategy</u> 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.</p>					
B. Program Change Summary (\$ in Thousands)					
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>
Previous President's Budget	0	31,388	36,562	39,018	106,968
Current Budget Submit/President's Budget	0	32,357	34,094	35,864	102,315
Change Summary Explanation:					
Funding: Congressional direction eliminated the TMD BM/C3I program elements 0603864/0604864C and placed this project under the Joint TMD activities program element. Consistent with this direction, a determination was made that this program is more appropriately funded with Dem/Val funds. Navy tasks directly supporting the Navy Area TBMD program were deleted from this project for FY1997 and beyond, and funded under the Navy Area TBMD program element (Project 2263) to unify control. Additional FY1997 funds were authorized and appropriated for cooperative engagement capability (CEC) integration.					
Project 3261		Page 73 of 126 Pages		Exhibit R-2 (PE 0603872C)	

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 1997																																																																																																																																																
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense						PROJECT 3261																																																																																																																																																
<p>This will be addressed in an integrated engineering analysis for the joint composite tracking network. In FY1997, Project 3261 was cut to pay various PBD reductions including those for COBRA JUDY and MEADS. In FY1997-2003, Project 3261 was cut as part of a reallocation of BMDO funds to support the JNTF.</p> <p>Schedule: None Technical: None</p> <p>C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <p>While this program is not dependent upon funding from other programs, it supports other programs by providing capstone systems engineering, common BM/C3I guidance, government furnished equipment, interface support, joint network design analysis, and other actions necessary to achieve interoperability among independent systems.</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th><u>FY 1996</u></th> <th><u>FY 1997</u></th> <th><u>FY 1998</u></th> <th><u>FY 1999</u></th> <th><u>FY 2000</u></th> <th><u>FY 2001</u></th> <th><u>FY 2002</u></th> <th><u>FY 2003</u></th> <th><u>To Compl</u></th> <th><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>D. <u>Schedule Profile</u></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td> <td></td><td style="text-align: center;"><u>FY 1996</u></td><td></td><td style="text-align: center;"><u>FY 1997</u></td><td></td><td style="text-align: center;"><u>FY 1998</u></td><td></td><td style="text-align: center;"><u>FY 1999</u></td><td></td><td></td> </tr> <tr> <td></td> <td style="text-align: center;">1</td><td style="text-align: center;">2 3</td><td style="text-align: center;">4</td><td style="text-align: center;">1</td><td style="text-align: center;">2 3</td><td style="text-align: center;">4</td><td style="text-align: center;">1</td><td style="text-align: center;">2 3</td><td style="text-align: center;">4</td><td style="text-align: center;">1</td> </tr> <tr> <td>Engineering Milestone</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Data link handbook published (Army)</td> <td></td><td></td><td style="text-align: center;">X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>TMD software library & re-use database established (Army)</td> <td></td><td></td><td style="text-align: center;">X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Two CIC/SAAWF prototypes demonstrated (USAF/USMC)</td> <td></td><td></td><td style="text-align: center;">X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>AWACS TMD message implementation (AF)</td> <td></td><td></td><td></td><td></td><td style="text-align: center;">X</td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Brigade TOC fielding (Army)</td> <td></td><td></td><td></td><td></td><td style="text-align: center;">X</td><td></td><td></td><td style="text-align: center;">X</td><td></td><td></td> </tr> <tr> <td>Initiate three additional AF platform TMD message set implementations (AF)</td> <td></td><td></td><td></td><td></td><td></td><td style="text-align: center;">X</td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Joint TMD Planner prototype for initial user testing</td> <td></td><td></td><td></td><td></td><td></td><td></td><td style="text-align: center;">X</td><td></td><td></td><td></td> </tr> <tr> <td>TMD Battlefield Situation display (AF)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td style="text-align: center;">X</td><td></td><td></td> </tr> </tbody> </table>														<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>To Compl</u>	<u>Total Cost</u>	D. <u>Schedule Profile</u>													<u>FY 1996</u>		<u>FY 1997</u>		<u>FY 1998</u>		<u>FY 1999</u>				1	2 3	4	1	2 3	4	1	2 3	4	1	Engineering Milestone											Data link handbook published (Army)			X								TMD software library & re-use database established (Army)			X								Two CIC/SAAWF prototypes demonstrated (USAF/USMC)			X								AWACS TMD message implementation (AF)					X						Brigade TOC fielding (Army)					X			X			Initiate three additional AF platform TMD message set implementations (AF)						X					Joint TMD Planner prototype for initial user testing							X				TMD Battlefield Situation display (AF)								X		
	<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>To Compl</u>	<u>Total Cost</u>																																																																																																																																																	
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Project 3261			Page 74 of 126 Pages					Exhibit R-2 (PE 0603872C)																																																																																																																																																			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 1997						
BUDGET ACTIVITY						PE NUMBER AND TITLE						PROJECT					
4 - Demonstration and Validation						0603872C Joint Theater Missile Defense						3261					
						<u>FY 1996</u>		<u>FY 1997</u>		<u>FY 1998</u>		<u>FY 1999</u>					
						1	2	3	4	1	2	3	4	1	2	3	4
Complete AF platform TMD message set implementations (AF)														X			
AN/TPS-59 cue capability (USMC)														X			
Software modifications to AOC during GCCS update																X	
ABCCC TMD integration on C-130 test platform																	X
Fielding of USMC TAOM TMD upgrades																	X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3261			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
a.	Hardware Development			0	5,677	10,460	17,322				
b.	Software Development			0	19,258	13,837	10,274				
c.	Project Management			0	300	307	318				
d.	System Engineering			0	7,122	9,490	7,950				
	Total				32,357	34,094	35,864				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
OGA	MIPRs/Allot	Multiple					32,357	34,094	35,864	Cont	Cont
<u>Support and Management Organizations</u>											
<u>Test and Evaluation Organizations</u>											
Project 3261				Page 76 of 126 Pages				Exhibit R-3 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3265
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COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3265 User Interface	15,286	14,031	14,680	21,976	22,060	22,113	22,048	22,118	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project provides the Joint Staff and the warfighting Commanders-in-Chief (CINCs) with the means to ensure that the Theater Missile Defense (TMD) development reflects evolving military needs and the combined warfare capabilities of allies and friends. To accomplish this, there must be clearly articulated tactics, doctrine, policies, and procedures. The three areas which provide the information base to effectively transition TMD capabilities into the existing and planned operational activities and war plans are described below.

The project's primary area is focused on the refinement of existing and near-term TMD capabilities. This is accomplished through the CINC's TMD Assessments Program, which involves the execution of numerous operationally realistic military exercises. These exercises provide the basis for the assessment, development, and improvement of TMD capabilities. Specific activities include the integration of new technology and hardware into the CINC operations, and the integration of User Operational Evaluation Systems (UOES) to examine the effectiveness of architectures and operational concepts. UOES is a prototype operational system of hardware and procedures which will be user-operated for field evaluation purposes. Through the Assessments Program, the CINCs develop Battle Management Command, Control, and Communications (BM/C3) architectures, formulate and test operational concepts, and determine or refine operational requirements. This program exercises communications architectures and develops operational concepts that will enable rapid integration of the PATRIOT Advanced Capability (PAC-3), Theater High Altitude Area Defense (THAAD), and Navy Area Theater Ballistic Missile Defense (TBMD) into the theater's warfighting capability. In future years, the CINCs' TMD Assessment Program will continue to develop ways to improve the CINCs' warfighting capabilities and integrate emerging TMD capabilities through simulation and employment of UOES hardware. Within the context of Combined Warfare, the Assessments Program focuses on providing the means for the U.S. and its allies to develop an understanding of each other's doctrine and common concepts of operation, and to determine equipment compatibility and interoperability.

The second area focuses on understanding the changing threat and how to best counter that threat. This is accomplished through the conduct of Warfare Analysis Laboratory Exercises (WALEX). Relying primarily on computer simulation tools and real experiences from the CINC's Assessment program, these exercises are performed to educate the TMD development community concerning the challenges presented by the theater missile threat. The WALEX provide forums for discussion of complex issues associated with concepts of operation for existing and future capabilities.

The third area focuses on the integration of warfighter operational requirements with near and far term Ballistic Missile Defense (BMD) program development. TMD programs (e.g. THAAD, Navy TBMD, etc.) are in various stages of development, and are scheduled for future deployment. This project area ensures that the experiences gleaned from such programs as the CINC's Assessment program are factored into all TMD programs. These programs are to develop and acquire TMD systems and architectures to (a) deploy theater missile defense capability to protect forward-deployed armed forces of the U.S., friends, and allies; and, (b)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
--	------------------------------

BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3265
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demonstrate advanced technologies for near-term insertion options and concept development of new systems. Analyses and simulations address systems effectiveness of proposed TMD system architectures against ballistic missile threats to U.S. deployed forces, our allies and friends. Analytical results are also used to support activities required for the Defense acquisition process. Theater gaming with the CINCs is also supported to identify roles, missions, and requirements for TMD.

FY 1996 (\$ in Thousands)

- \$3,000 Supported USEUCOM Joint Project Optic Needle.
- \$3,000 Supported USCENTCOM Joint Project Optic Cobra.
- \$2,900 Supported USFK Joint Project Ornate Impact.
- \$1,654 Supported USACOM TMD Exercises.
- \$1,628 Supported USPACOM TMD Exercises.
- \$318 Integrated improved TMD model supporting Command Post Exercises and allies/friends.
- \$325 Reviewed Operational Requirement Documents.
- \$500 Developed operational concept(s) of operations for BMD.
- \$268 Conducted theater and strategic wargaming, including GLOBAL 96.
- \$293 Conducted mission analysis for BMD (including allies/friends).
- \$400 Conducted four Warfare Analysis Laboratory Exercises.
- \$1,000 Integrated capability to display simulated TBMs on PATRIOT Engagement Control System radar scopes supporting Field Training Exercises.
- \$15,286 Total

FY 1997 (\$ in Thousands)

- \$3,000 Support USEUCOM Joint Project Optic Needle.
- \$3,200 Support USCENTCOM Joint Project Optic Cobra.
- \$3,250 Support USFK Joint Project Ornate Impact.
- \$2,440 Support USACOM TMD Exercises.
- \$613 Support USPACOM TMD Exercises.
- \$400 Review ORDs.
- \$139 Conduct theater and strategic wargaming, including GLOBAL 97.
- \$250 Conduct mission analysis for TMD (including allies/friends).
- \$739 Conduct five Warfare Analysis Laboratory Exercises.
- \$14,031 Total

FY 1998 (\$ in Thousands)

- \$3,000 Support USEUCOM Joint Project Optic Needle.

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3265
<ul style="list-style-type: none"> - \$3,000 Support USCENTCOM Joint Project Optic Cobra. - \$2,750 Support USFK Joint Project Ornate Impact. - \$2,000 Support USACOM TMD Exercises. - \$1,900 Support USPACOM TMD Exercises. - \$576 Integrate capability to display simulated TBMs on developing operator radar scopes supporting Field Training Exercises. - \$100 Review ORDs/CRD - \$94 Conduct theater and strategic wargaming, including GLOBAL 98. - \$485 Conduct mission analysis for TMD (including allies/friends) - \$775 Conduct five Warfare Analysis Laboratory Exercises. - \$14,680 Total 		
<u>FY 1999 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$4,900 Support USEUCOM Joint Project Optic Needle. - \$4,000 Support USCENTCOM Joint Project Optic Cobra. - \$4,000 Support USFK Joint Project Ornate Impact. - \$3,800 Support USACOM TMD Exercises. - \$3,500 Support USPACOM TMD Exercises. - \$292 Integrate capability to display simulated TBMs on developing operator radar scopes supporting Field Training Exercises. - \$100 Review ORDs/CRD - \$93 Conduct theater and strategic wargaming, including GLOBAL 99. - \$484 Conduct mission analysis for TMD (including allies/friends). - \$807 Conduct six Warfare Analysis Laboratory Exercises. - \$21,976 Total 		
<p><u>Acquisition Strategy</u> 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/CRD and CONOPs are updated throughout the year.</p>		
Project 3265	Page 79 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3265
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B. Program Change Summary (\$ in Thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>
Previous President's Budget	15,293	13,869	15,128	22,725	67,015
Current Budget Submit/President's Budget	15,286	14,031	14,680	21,976	65,973

Change Summary Explanation:

Funding: Additional funds received in FY97 for Roving Sands support

Schedule: None

Technical: None

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

	<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>To Compl Cont.</u>	<u>Total Cost Cont.</u>
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D. Schedule Profile

	<u>FY 1996</u>				<u>FY 1997</u>				<u>FY 1998</u>				<u>FY 1999</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Joint Projects	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Model and Wargame			X				X				X				X	
Refine ORD/CONOPS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				3265			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
CINC Exercise Assessment Support				14,240	12,501	13,226	20,205				
Allied interface, wargaming, WALEX, Rqmts Document Spt				1,046	1,530	1,454	1,771				
Total				15,286	14,031	14,680	21,976				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
<u>Support and Management Organizations</u>											
CINCs	MIPRs	Multiple				15286	14031	14680	21976	Cont	65,973
<u>Test and Evaluation Organizations</u>											
B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>											
Government Furnished Property:											
Project 3265											
Page 81 of 126 Pages											
Exhibit R-3 (PE 0603872C)											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3265		
<u>Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development										
Subtotal Support and Management					15,286	14,031	14,680	21,976		65,973
Subtotal Test and Evaluation										
Total Project					15,286	14,031	14,680	21,976		65,973

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3270		
<i>COST (\$ In Thousands)</i>	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3270 Threat and Countermeasures Program	19,865	21,419	27,986	29,154	27,981	27,891	28,779	27,898	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>Threat and Countermeasures Program. The BMDO Theater Missile Defense (TMD) Threat Program defines potential adversary military forces, principally Theater Ballistic Missile (TBM) 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, Countermeasures Integration, and System Threat Scenario Generation.</p> <p>Intelligence Threat Task. The purpose of this task is to provide an Intelligence Community-Validated TMD 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 TBM operational and technological environments and projects the effects of developments and trends on TMD mission capability. The Targets category includes a projection of foreign TBM systems and countermeasures that enhance their performance. This includes force structure, performance characteristics, and sample signatures. SST addresses threats to the TMD "family of systems" including reconnaissance, surveillance, and target acquisition; lethal and non-lethal threats; and regional integrated SST assessments. The Reactive Threats category includes those that an adversary may develop as a result of deployment of the TMD "family of systems."</p> <p>System Threat Scenario Generation 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 TMD 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"> Identifies user needs for threat scenario descriptions. Identifies analyses needed to fully specify and characterize the threat missile systems, penetration aids, tactics, etc., and ensures the analyses are accomplished. Provides the analysis results to all interested agencies for review and comment. Addresses critical threat issues which arise during the analysis process. Ensures all supporting agencies' views on threat issues are fully aired. 										
Project 3270			<i>Page 83 of 126 Pages</i>				Exhibit R-2 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3270
<p>Reviews, approves, produces, and distributes all System Threat Scenario Descriptions. Produces threat computer digital media and supporting documentation for use by the development and acquisition communities.</p> <p>Countermeasures Integration Task. The BMDO Countermeasure Integration (CMI) Program assists TMD acquisition program offices in developing theater 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 CMI Program support to the TMD threat development process and advance warning to BMDO system designers. The BMDO CMI Program reviews TMD 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 system designers with advance warning of potential countermeasures, and assists TMD 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 CMI Program takes a "rest-of-world" perspective in developing credible, potential countermeasures.</p> <p><u>FY 1996 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$4,981 Intelligence Threat Task: Provided Capstone System Threat Assessment Report (STAR), specialty threats, targets analyses, operational threat environment intelligence assessments, management, and planning support. - \$4,737 System Threat Scenario Generation Task: Continued development of threat system characterizations and scenario descriptions in response to the analysis needs of the system/element developers. Upgraded the threat modeling capability and produce digital media and supporting documentation through the Joint National Test Facility (JNTF). Developed scenarios depicting threat systems employed in theater environments. - \$10,147 Countermeasures (CM) Integration Task: Performed TMD CM Red/Blue activities and counter-countermeasure parametric studies and TMD CM technical experiments and evaluations. Supported CM Skunkworks teams in conducting CM concept, design, fabrication, tests. Conducted non-technical analysis, oversight, and database management. - \$19,865 Total <p><u>FY 1997 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> - \$5,327 Intelligence Threat Task: Provide Capstone STAR, specialty threats, targets analyses, operational threat environment intelligence assessments, management, and planning support. - \$4,438 System Threat Scenario Generation 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. - \$11,654 Countermeasures (CM) Integration Task: Perform TMD CM Red/Blue activities and counter-countermeasure parametric studies and TMD CM technical experiments and evaluations. Support CM Skunkworks teams in conducting CM concept, design, fabrication, tests. Conduct non-technical analysis, oversight, and database management. 		
Project 3270	Page 84 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997																		
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3270																		
<ul style="list-style-type: none"> - \$21,419 Total <u>FY 1998 (\$ in Thousands)</u> - \$6,944 Intelligence Threat Task: Provide Capstone STAR, specialty threats, targets analyses, operational threat environment intelligence assessments, management, and planning support. - \$5,389 System Threat Scenario Generation 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. - \$15,653 Countermeasures (CM) Integration Task: Perform TMD CM Red/Blue activities and counter-countermeasure parametric studies and TMD CM technical experiments and evaluations. Support CM Skunkworks teams in conducting CM concept, design, fabrication, tests. Conduct non-technical analysis, oversight, and database management. - \$27,986 Total <u>FY 1999 (\$ in Thousands)</u> - \$7,282 Intelligence Threat Task: Provide Capstone STAR, specialty threats, targets analyses, operational threat environment intelligence assessments, management, and planning support. - \$5,648 System Threat Scenario Generation 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. - \$16,224 Countermeasures (CM) Integration Task: Perform TMD CM Red/Blue activities and counter-countermeasure parametric studies and TMD CM technical experiments and evaluations. Support CM Skunkworks teams in conducting CM concept, design, fabrication, tests. Conduct non-technical analysis, oversight, and database management. - \$29,154 Total <p><u>Acquisition Strategy</u> 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.</p> <p>B. Program Change Summary (\$ in Thousands)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY 1996</u></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>Total</u> <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td style="text-align: center;">19,684</td> <td style="text-align: center;">23,170</td> <td style="text-align: center;">28,930</td> <td style="text-align: center;">30,438</td> <td style="text-align: center;">102,222</td> </tr> <tr> <td>Current Budget Submit/President's Budget</td> <td style="text-align: center;">19,865</td> <td style="text-align: center;">21,419</td> <td style="text-align: center;">27,986</td> <td style="text-align: center;">29,154</td> <td style="text-align: center;">98,424</td> </tr> </tbody> </table>				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u> <u>Cost</u>	Previous President's Budget	19,684	23,170	28,930	30,438	102,222	Current Budget Submit/President's Budget	19,865	21,419	27,986	29,154	98,424
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u> <u>Cost</u>															
Previous President's Budget	19,684	23,170	28,930	30,438	102,222															
Current Budget Submit/President's Budget	19,865	21,419	27,986	29,154	98,424															
Project 3270	Page 85 of 126 Pages	Exhibit R-2 (PE 0603872C)																		

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3270
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Change Summary Explanation:
 Funding: Funding adjustments made to support revisions in TMD core program schedules and requirements.

 Schedule: None

 Technical: None

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

	<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>	To <u>Compl</u> Cont	Total <u>Cost</u> Cont
2400 NMD Program, PE 0603871C	730,656	828,864	504,091	393,085	309,748	309,584	391,858	392,433		

D. Schedule Profile

	<u>FY 1996</u>				<u>FY 1997</u>				<u>FY 1998</u>				<u>FY 1999</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Skunkworks Mission #2	X	X	X	X	X	X	X	X	X	X	X	X				
Skunkworks Mission #3			X				X				X					
Skunkworks Mission #5	X		X				X	X			X					
Skunkworks Mission #6	X															
Skunkworks Mission #7			X													
Skunkworks Mission #8				X												
Skunkworks Mission #9							X									
Skunkworks Mission #10										X						
TMD Capstone STAR			X				X				X					
Countermeasures Risk Assessment															X	
Process																
Semi-Annual Update																
(Starting 3Q/FY96)																

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3270			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
a. Intelligence Threat				4,788	5,327	6,944	7,282				
b. System Threat Scenario Generation				4,869	4,438	5,389	5,648				
c. Countermeasures Integration				10,208	11,654	15,653	16,224				
Total				19,865	21,419	27,986	29,154				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
<u>Support and Management Organizations</u>											
DOE Sandia Lab					0	0	1,988	1,575	2,200		5,763
JNTF-SPC					0	0	1,250	2,000	0		3,250
MIT Lincoln Lab					0	0	2,133	2,850	2,850		7,833
CM Tech Eval											
Physitron					0	430	0	0	0		430
USASSDC					0	0	0	0	1,136		1,136
Sandia TDP					0	1,500	0	0	0		1,500
<u>Test and Evaluation Organizations</u>											
Dynetics					0	2,340	400	400	0		3,140
SPC CM					0	0	2,213	3,300	3,300		8,813
Project 3270				Page 87 of 126 Pages				Exhibit R-3 (PE 0603872C)			

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
										February 1997	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
4 - Demonstration and Validation					0603872C Joint Theater Missile Defense					3270	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
Booz-Allen					0	2,223	1,966	0	0		4,189
SPC-Threat					0	1,906	2,000	2,000	2,000		7,906
Nichols-Threat					0	2,014	2,351	2,960	2,960		10,285
CHOP/Phillips					0	0	3,642	4443	6,358		14,443
MSIC					0	0	125	131	450		706
NAIC					0	0	125	131	450		706
TRW					0	3,720	1,944	1,148	1,460		8,272
Loral					0	1,130	532	353	450		2,465
Dept of Commerce					0	750	750	0	0		1,500
TBE					0	3,720	0	0	0		3,720
NGIC					0	0	0	1,250	0		1,250
IDA					0	0	0	2,000	0		2,000
Miscellaneous					0	132	0	3,445	5540		9,117
B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program	
<u>Product Development Property</u>											
<u>Support and Management Property</u>											
Project 3270											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3270		
<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Test and Evaluation Property</u>										
Subtotal Product Development										
Subtotal Support and Management					1,930	5,371	6,425	6,186		19,912
Subtotal Test and Evaluation					17,935	16,048	21,561	22,968		78,512
Total Project					19,865	21,419	27,986	29,154		98,424

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense			PROJECT 3352		
COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3352 Modeling and Simulations	71,362	64,180	73,173	72,984	74,959	74,961	78,333	75,661	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>This project provides for the development/modification and validation of modeling and simulation (M&S) techniques and tools that are critical in assessing the projected, alternative, and demonstrated performance capabilities of Theater Missile Defense (TMD) and National Missile Defense (NMD) systems. These large and complex M&S tools require high-performance vector and parallel processing super-computers, scalar processors, and advanced graphic workstations for operation. Portions of this processing capability are housed at the Joint National Test Facility (JNTF) in Colorado Springs, CO, and the Advanced Research Center/Simulation Center (ARC/SC) in Huntsville, AL. These facilities operate in a distributed integrated simulation environment and host the modeling and simulation wargames that provide analysis, integration, demonstration, and performance verification of BMD systems. The JNTF and ARC/SC facilities and the Joint Missile Defense Network (JMDN), which links BMD Contractors, Services and other DoD government facilities, are utilized by all Services. Procedures are established to ensure efficient utilization of these facilities and to provide verification, validation, and accreditation (VV&A) of the models, simulations, and systems portrayed. This cost effective approach reduces the need for more costly live fire missile test programs and establishes requirements for future technology needs. It promotes enhancements of M&S technologies that support: the acquisition process; the development and fielding of operational capabilities; and the development of common tools, methodologies, and protocols beneficial to data exchange, integration of various modeling and simulations, and software reusability of M&S applications.</p> <p>This project funds the development, operation, and VV&A of the Extended Air Defense Test Bed (EADTB) and the Extended Air Defense Simulation (EADSIM) which support the analysis required for TMD 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-node 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> <p>M&S activities also funded by this project include: development, enhancement, and maintenance of the theater test beds and conduct of wargames that provide the analysis, integration, demonstration, and performance verification for TMD systems. It ensures joint usage of simulation tool resources, supports allied and friendly international participation and cooperation in wargaming exercises. This project focuses M&S support in five primary areas: standardization, assessments, development/modification, computer architectures/networks, and program management for BMDO and Service M&S programs.</p>										
Project 3352			Page 90 of 126 Pages				Exhibit R-2 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3352
<p>Funding for these facilities is distributed through Project 3352. Three Program Elements (PEs), (NMD,TMD, and Support Technology) provided funding. This cost sharing approach ensures cooperation, contributes to achieving synergy across the efforts, and minimizes duplication of modeling and simulation resources. The total funding profile remains flat on an annual basis, with adjustments for inflation. For example, the decrease in TMD funding for JNTF in FY97 is offset by a corresponding increase in NMD funding. These PEs include the costs for operations and maintenance of the JNTF and ARC/SC facilities, and the JMDN which includes: computer hardware and software, communications networks, security, and other essential capabilities necessary to develop and operate reconfigurable, and multiple experiment test bed environments. This document describes the TMD portion of funding for these activities.</p>		
<p><u>FY 1996 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> – \$31,983 Provided super-computing and wargaming resources at JNTF. Continued use of the JNTF for threat scenario generation and threat tape production for U.S. and international Wargames and Exercises. Continued to provide studies and analysis expertise and resources to BMDO and the BMD community to address BMD issues across the entire development and operational spectrum. Continued support as the central hub of the JMDN linking Services, contractors, and other DoD/government facilities. Began the development of the BMD Simulation Support Center (SSC). – \$1,695 Provided JNTF TMD M&S support in six primary areas: standardization, assessments, development/modification, accreditation, computer architecture/networks, and program management for BMDO and Service M&S programs. – \$22,749 Delivered EADTB Version 3 (this provides basic simulation capability for small TMD scenarios to support BM/C3 special studies) and Version 4 (upgrades include ground clutter, reporting responsibility, functional sensor, and terrain following algorithms); incorporation of DIS capability; provided EADTB support to STC, THAAD, and BM/C3 studies and analysis. Provided EADSIM baseline maintenance; continued EADTB VV&A activities; provided EADTB site support to all nodes, including the STC node. Began the development of Service certified Specific System Representations (SSRs) for EADTB. This figure also included civilian salaries. – \$8,204 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 (THAAD, PATRIOT, and BM/C3 components), EADTB, EADSIM, and the THAAD Test Bed. Continued to support 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 include Army civilian salaries. – \$3,515 Provided Army TMD M&S support in six primary areas: standardization, assessments, development/modification, accreditation, computer architecture/networks, and program management for BMDO and Service M&S programs. – \$1,271 Provided Air Force TMD M&S support in six primary areas: standardization, assessments, development/modification, accreditation, computer architecture/networks, and program management for BMDO and Service M&S programs. – \$1,330 Provided Navy TMD M&S support in six primary areas: standardization, assessments, development/modification, accreditation, computer architecture/networks, and program management for BMDO and Service M&S programs. – \$615 Provided TMD M&S support in six primary areas: standardization, assessments, development/modification, accreditation, computer architecture/networks, and program management for BMDO and Service M&S programs. – \$71,362 Total 		
Project 3352	Page 91 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3352
<u>FY 1997 (\$ in Thousands)</u>		
– \$15,310	Deliver 4.1, 4.2, and 4.3 (upgrades include threat tape enhancements, EADTB site support - including JNTF, Ft. Bliss, NSWC, TACCSF, and NC3A). Continue development of EADTB Service certified SSRs and EADTB deliver Version 5 (upgrades include limited ground force interactions, and additional space based sensor enhancements). Limited EADSIM and EADTB site support. Continue EADTB VV&A activities. Provide EADSIM baseline maintenance. This figure also includes civilian salaries.	
– \$26,075	Provide infrastructure and core capability funding for the JNTF. This includes: operations and maintenance of the facilities, personnel, computer hardware and software, communications, networks, systems engineering, security, and other capabilities essential to common system support to the BMDO; super-computing and wargaming resources for TMD Wargame and Workshop efforts; studies and analysis expertise and resources to the BMD community to address BMD issues across the entire development and operational spectrum; and development and operation of the Joint TMD Planning Tool; development of the BMD Simulation Support Center; contribution to the JNTF Modernization/Rolling Technology Update; and continued support to the Information System Security Engineering/Multi-Level Security program. Continue support as the central hub of the JMDN linking Services, contractors, and other DoD/government facilities. This figure also includes JNTF civilian salaries.	
– \$3,853	Provide JNTF Project funding to support: one TMD Wargame, one TMD Workshop, Human in Control Test Bed modifications, and the development of the BMD SSC. This area also provides JNTF support in five primary M&S areas: standardization, assessments, development/modification, computer architecture/networks, and program management for BMDO and Service M&S programs. Also support the development of DPS and JDN Common Rule Sets SSRs for the EADTB program.	
– \$12,864	Provide 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, and the THAAD Test Bed. Major areas of support include maintenance, modification, and enhancements of/to: CFD analysis; COEA of TMD systems; technical base analysis; concept studies; and alternative trade-off analysis.	
– \$1,537	Provide BMDO M&S support in five primary areas: standardization, assessments, development/modification, computer architecture/networks and program management for BMDO and Service M&S programs.	
– \$2,078	Provide Army M&S support in five primary areas: standardization, assessments, development/modification, computer architecture/networks, and program management for BMDO and Service M&S programs. Also support the development of Army certified THAAD, JTAGS, Corps SAM, PAC-2 and PAC-3 SSRs for the EADTB program.	
– \$666	Provide Air Force M&S support in five primary areas: standardization, assessments, development/modification, computer architecture/networks, and program management for BMDO and Service M&S programs. Also support the development of Air Force certified AWACS SSR for the EADTB program.	
– \$599	Provide Navy M&S support in five primary areas: standardization, assessments, development/modification, computer architecture/networks, and program management for BMDO and Service M&S programs. Also support the development of a Navy certified TBMD Aegis SSR for the EADTB program.	
– \$1,198	Modernize JNTF's computer capabilities based on supporting BMD program priorities.	
Project 3352	Page 92 of 126 Pages	Exhibit R-2 (PE 0603872C)

DATE
February 1997

BUDGET ACTIVITY
4 - Demonstration and Validation

PE NUMBER AND TITLE
0603872C Joint Theater Missile Defense

- \$64,180 Total

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3352
<u>FY 1998 (\$ in Thousands)</u>		
– \$40,722	Provide infrastructure and core capability funding for the JNTF. This includes: operations and maintenance of the facilities, personnel, computer hardware and software, communications, networks, systems engineering, security, and other capabilities essential to common system support to the BMDO; super-computing and wargaming resources for TMD Wargame and Workshop efforts; studies and analysis expertise and resources to the BMD community to address BMD issues across the entire development and operational spectrum; and development and operation of the Joint TMD Planning Tool; development of the BMD Simulation Support Center; contribution to the JNTF Modernization/Rolling Technology Update; and continued support to the Information System Security Engineering/Multi-Level Security program. Continue support as the central hub of the JMDN linking Services, contractors, and other DoD/government facilities. This figure also includes JNTF civilian salaries.	
– \$13,257	Deliver EADTB Phase I SSRs and user required enhancements to support SSR development, and Version 6. Provide limited site support to all EADTB users. Provide EADSIM baseline maintenance. Continue limited EADTB VV&A activities. Port EADTB to an affordable Silicon Graphic platform. This area also funds civilian salaries.	
– \$7,907	Provide 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 include maintenance, modification, and enhancements of/to: CFD analysis; COEA of TMD systems; technical base analysis; concept studies; and alternative trade-off analysis.	
– \$7,173	Provide M&S support in five primary areas: standardization, assessments, development/modification, computer architecture/networks, and program management for BMDO and Service M&S programs.	
– \$1,203	Continue to modernize BMDO's computer capabilities based on supporting BMD program priorities. Continue upgrade of host processing resources to address inadequate user response time; establishment of a WAN; upgrade supercomputers to support modeling and simulations; implementation of new technology to support multimedia applications replace obsolete computational resources; and implement nearline and online mass storage to support user software analysis.	
– \$2,911	Provide JNTF Project funding to support: one TMD Wargame, one TMD Workshop, Human in Control Test Bed modifications, and the development of the BMD SSC. This area also provides JNTF support in five primary M&S areas: standardization, assessments, development/modification, computer architecture/networks, and program management for BMDO and Service M&S programs.	
– \$73,173	Total	
Project 3352	Page 93 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3352
<p><u>FY 1999 (\$ in Thousands)</u></p> <ul style="list-style-type: none"> – \$40,443 Provide infrastructure and core capability funding for the JNTF. This includes: operations and maintenance of the facilities, personnel, computer hardware and software, communications, networks, systems engineering, security, and other capabilities essential to common system support to the BMDO; super-computing and wargaming resources for TMD Wargame and Workshop efforts; studies and analysis expertise and resources to the BMD community to address BMD issues across the entire development and operational spectrum; and development and operation of the Joint TMD Planning Tool; development of the BMD Simulation Support Center; contribution to the JNTF Modernization/Rolling Technology Update; and continued support to the Information System Security Engineering/Multi-Level Security program. Continue support as the central hub of the JMDN linking Services, contractors, and other DoD/government facilities. This figure also includes JNTF civilian salaries. – \$14,409 Deliver EADTB development and enhancements. Provide limited site support to all EADTB users. Provide EADSIM baseline maintenance. Continue limited EADTB VV&A activities. This area also funds civilian salaries. – \$7,754 Provide 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 include maintenance, modification, and enhancements of/to: CFD analysis; COEA of TMD systems; technical base analysis; concept studies; and alternative trade-off analysis. – \$6,068 Provide M&S support in five primary areas: standardization, assessments, development/modification, computer architecture/networks, and program management for BMDO and Service M&S programs. – \$1,409 Continue to modernize BMDO's computer capabilities based on supporting BMD program priorities. Continue upgrade of supercomputers to support modeling and simulations; implementation of new technology to support multimedia applications: replace obsolete computational resources. – \$2,901 Provide JNTF Project funding to support: one TMD Wargame, one TMD Workshop, Human in Control Test Bed modifications, and the development of the BMD SSC. This area also provides JNTF support in five primary M&S areas: standardization, assessments, development/modification, computer architecture/networks, and program management for BMDO and Service M&S programs. – \$72,984 Total <p><u>Acquisition Strategy</u> The tasks in this project are met through full and open competition. Primary M&S support is performed at the JNTF, ARC/SC, and other test bed facilities. The JNTF support contracts were awarded to Loral (Operations & Maintenance) and TRW (Research & Development) in FY95; both contracts are Cost Plus Award Fee. The ARC/SC contractor is a Cost Plus Fixed Fee (CPFF) with COLSA, first awarded in June of 1989. The prime contractor for development and operation of the EADTB is Hughes Aircraft, which was awarded a Cost Plus Award Fee (CPAF) contract in September 1989.</p>		
Project 3352	Page 94 of 126 Pages	Exhibit R-3 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense						PROJECT 3352		
B. <u>Program Change Summary (\$ in Thousands)</u>													
			<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u>						
							<u>Cost</u>						
Previous President's Budget			69,409	53,042	61,204	62,318	245,973						
Current Budget Submit/President's Budget			71,362	64,180	73,173	72,984	281,699						
Change Summary Explanation:													
Funding: None													
Schedule: None													
Technical: None													
C. <u>Other Program Funding Summary (\$ in Thousands)</u>													
			<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>To</u>	<u>Total</u>	
											<u>Compl</u>	<u>Cost</u>	
3352 Modeling and Simulation, PE 0603173C			0	2,002	1,554	1,898	643	1,512	1,544	1,582	Cont'd		
3352 Modeling and Simulation, PE 0603171C			16,041	32,803	22,308	22,535	17,744	18,876	19,798	19,722	Cont'd		
D. <u>Schedule Profile</u>													
			<u>FY 1996</u>			<u>FY 1997</u>			<u>FY 1998</u>			<u>FY 1999</u>	
Delivery of EADTB Version 3	1		2	3	4	1	2	3	4	1	2	3	4
GBR/THAAD Integration Testing	X												
NMD/TMD Wargame 96-A/B			X		X								
Delivery of EADSIM Ver 6.0			X										
Delivery of German EADTB Software					X								
Delivery of EADTB Version 4.1						X							
Simulation Support Center PDR					X								
Conduct TMD GBR Software Testing						X			X				
Complete EADTB TBMD SSR Dvmt						X							
EADTB SSR Development PDR						X							
Project 3352			Page 95 of 126 Pages						Exhibit R-2 (PE 0603872C)				

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)													DATE February 1997										
BUDGET ACTIVITY						PE NUMBER AND TITLE								PROJECT									
4 - Demonstration and Validation						0603872C Joint Theater Missile Defense								3352									
		<u>FY 1996</u>						<u>FY 1997</u>						<u>FY 1998</u>						<u>FY 1999</u>			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4						
Conduct ARGUS Assessment						X																	
Conduct "ARGUS 2000" PDR						X																	
JTMDP Interim Release - Ver 0.5						X																	
Initial JTMDP Software Rqmts Review						X																	
Coordinate Wargame 2000 Requirements Document (PDR)							X																
Complete V&V of EADTB TBMD SSR							X																
TPT Requirement Scrubber (Assessment)							X																
Simulation Support Center CDR							X																
EA TAD BMC4I Wargame								X			X					X							
Begin Wargame 2000 design/development								X															
Form BMDO Wargame Federation for the Wargame 2000 CDR								X															
Delivery of EADTB Version 4.2								X															
Complete EADTB CMD SSR Dvmt								X															
EADTB SSR Development CDR								X															
SI&I Tool Assessment								X															
Complete BMD M&S Roadmap								X															
Host TMD Workshop									X			X					X						
Conduct "ARGUS 2000" CDR									X														
JTMDP System Specifications Review									X				X										
Delivery of EADTB Version 4.3										X													
JTMDP Software Requirements Review														X									
Deliver EADTB Version 5																							
Host EA TAD C4I Workshop																	X						
Complete V&V of EADTB CMD SSR																	X						
JTMDP Ver 1.0 Release																	X						
Conduct Wargame 2000 Integration Testing/Demo																	X						
Complete EADTB SSR Dvmt Phase I																	X						
Deliver EADSIM Version 7.0																	X						
Simulation Support Center IOC																	X						

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)													DATE February 1997						
BUDGET ACTIVITY						PE NUMBER AND TITLE						PROJECT							
4 - Demonstration and Validation						0603872C Joint Theater Missile Defense						3352							
		<u>FY 1996</u>					<u>FY 1997</u>					<u>FY 1998</u>					<u>FY 1999</u>		
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Update M&S Roadmap												X					X		
Conduct Wargame 2000 Integration														X					
Testing with ARGUS																			
Deliver EADTB Version 6													X						
JTMDP Ver 2.0 Release														X					
Deliver Wargame 2000; IOC																X			
TMD GBR S/W Testing																X			
Deliver EADTB Version 7																	X		
EADTB Final FQT																		X	

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				3352			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
a.	Extended Air Defense Test Bed Development			20,963	12,906	10,798	11,831				
b.	Army Civilian Salaries			3,903	2,404	2,459	2,578				
c.	Navy Civilian Salaries			722	466	670	657				
d.	JNTF Civilian Salaries			2,014	3,081	2,957	2,910				
e.	Service (Army, Navy, Air Force) M&S Support			6,116	3,343	0	0				
f.	JNTF M&S Support			1,695	3,853	2,911	2,901				
g.	BMDO M&S Support			820	1,537	7,173	6,068				
h.	BMDO Computer Modernization			0	0	1,203	1,409				
i.	JNTF Computer Modernization			0	1,198	0	0				
j.	Advanced Research Center			4,565	9,648	5,930	5,816				
k.	Simulation Center			1,522	3,216	1,977	1,939				
l.	JNTF O&M (Loral)			15,007	10,976	25,797	25,774				
m.	JNTF R&D (TRW)			8,200	8,452	6,631	6,515				
n.	JNTF Contractor Support			5,835	3,100	4,667	4,586				
	Total			71,362	64,180	73,173	72,984				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Colsa Corp -ARC	SS/CPFF					4,565	9,648	5,930	5,816	Cont'd	25,959
Project 3352				Page 98 of 126 Pages				Exhibit R-3 (PE 0603872C)			

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1997	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
4 - Demonstration and Validation					0603872C Joint Theater Missile Defense					3352	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
Madison Research Corp - Sim Center	Comp/CPFF					1,522	3,216	1,977	1,938	Cont'd	8,653
Hughes Aircraft - EADTB Dvmt	CPAF	Sep-89				20,963	12,906	10,798	11,831	Cont'd	56,498
Loral - JNTF						15,007	10,976	25,797	25,774	Cont'd	77,554
TRW - JNTF						7,478	8,452	6,631	6,516	Cont'd	29,077
BMDO M&S						615	1,537	7,173	6,068	Cont'd	15,393
Service M&S						7,811	7,196	2,911	2,901	Cont'd	20,819
BMDO Computer Mods						0	0	1,203	1,409	Cont'd	2,612
JNTF Computer Mods						0	1,198	0	0	Cont'd	1,198
<u>Support and Management Organizations</u>											
Army Civilian						3,903	2,404	2,459	2,578	Cont'd	11,344
JNTF Civilian						2,941	3,081	2,957	2,910	Cont'd	11,889
Navy Civilian						722	466	670	657	Cont'd	2,515
JNTF - NAAS						5,835	3,100	4,667	4,586	Cont'd	18,188
<u>Test and Evaluation Organizations</u>											
B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3352		
<u>Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development					57,961	55,129	62,420	62,253		237,763
Subtotal Support and Management					13,401	9,051	10,753	10,731		43,936
Subtotal Test and Evaluation										
Total Project					71,362	64,180	73,173	72,984		281,699

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3354
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COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3354 Targets Support	23,046	22,842	27,603	18,721	42,755	42,226	42,463	42,578	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project provides core funding for targets and services needed to support the testing and evaluation of all Theater Missile Defense (TMD) programs, in particular THAAD, PATRIOT, PAC3, Navy Area TBMD and Navy Theater -Wide TBMD, USMC Hawk, and the US Air Force Air Borne 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 reconfigured to meet unique mission requirements for each test. This project funds the development and demonstration of target systems and Foreign Military Acquisition (FMA) targets to support TMD test and evaluation. The TMD programs fund the actual acquisition of Theater targets development of this program. The Theater High-Altitude Area Defense (THAAD) system, Patriot Advanced Capability - 3 (PAC-3) system, Navy Area TBMD (Lower Tier) and Navy Theater-Wide TBMD (Upper Tier) systems require target system support to accomplish their planned test and evaluation. The THAAD program intends to use the HERA target system with planned launches at White Sands, NM and from Wake Island into the Kwajalein Missile Range (KMR) impact area. Additionally, THAAD testing in the Pacific requires short range (200-600 Km) and long range (1000-2900 KM) target presentations which require development of a long range air launch target system. The PAC-3 program will use STORM and HERA targets launched from White Sands and Wake Island. The Navy will use the air launch target launched at Pacific Missile Range Facility (PMRF) (Barking Sands, Kauai, HI). This project is developing a short range (200-600 Km) air drop ballistic target and a long range (1000-2900 Km) winged air-launched target to satisfy the collective target requirements of THAAD and both Navy programs for multiple simultaneous engagements, multi-axis scenarios, and short range and long-range threat target presentations. The project is also developing reentry vehicles to simulate the full range of threat targets.

FY 1996 (\$ in Thousands)

- \$6,800 Continued support of FMA target systems and development to support TMD EMD test and evaluation.
- \$2,646 Continued development and demonstration of new HERA and STORM target configurations, supporting THAAD Dem/Val, PAC-3 EMD and Navy Area.
- \$5,800 Developed short range air drop target capability to meet requirements.
- \$4,995 Provided technical support for targets program operations at the executing agent.
- \$2,805 Initiated development of advanced payload (modular target reentry vehicle) for PAC3, THAAD EMD.
- \$23,046 Total

FY 1997 (\$ in Thousands)

- \$8,500 Continue support of FMA target systems and target development to support TMD test and evaluation.

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3354
<ul style="list-style-type: none"> - \$4,862 Continue development and demonstration of HERA and STORM target configurations. - \$2,208 Demonstrate short range air drop target capability to meet requirements. - \$7,172 Technical support for targets program operations at executing agent. - \$100 Initiate development of advanced payload (long range threat representative target) for THAAD , Navy Theater Wide. - \$22,842 Total 		
<u>FY 1998 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$2,000 Initiate EMD of Short Range air drop ballistic missile target for Navy Area Wide and THAAD. - \$9,000 Initiate Dem/Val of Long Range target for Navy Theater Wide THAAD. - \$1,362 Continue development and sensor characterization of advanced target payloads for THAAD, Navy Theater Wide. - \$10,241 Continue development of targets capability to meet additional requirements for Navy, THAAD, EMD. - \$2,000 Continue support of FMA target systems. - \$3,000 Provide technical support for targets program operations at the executing agent. - \$27,603 Total 		
<u>FY 1999 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$3,300 Continue EMD of Short Range air drop ballistic missile target for Navy Area Wide and THAAD - \$6,800 Initiate EMD of Long Range target for Navy Theater Wide and THAAD. - \$1,500 Continue development and sensor characterization of advanced target payloads for THAAD and Navy Theater Wide. - \$3,121 Continue development of target capability to meet additional target requirements for Navy Theater/Area and THAAD EMD. - \$1,000 Continue support of FMA target systems - \$3,000 Provide technical support for targets program operations at the executing agent. - \$18,721 Total 		
<p><u>Acquisition Strategy</u> The Hera and Storm target systems are being developed by the executing agent: U.S. Army, Space and Strategic Defense Command (SSDC), Targets and Test and Evaluation (TT&E) office in Huntsville, AL. The Hera target system, being developed by Coleman Research Corporation (Orlando, FL) is being procured with a contract for a quantity of 25 targets. Two additional options are available for procurement of 25 targets in each option. Orbital Sciences Corporation has delivered three Storm Maneuvering Tactical Target Vehicles (MTTV). Additional targets include the Lance target system and Foreign Material Acquisition. The development and demonstration of the air drop ballistic target system is being managed by the executing agent: National Air Intelligence Center, Wright Patterson AFB, OH. The air drop demonstration contractor team is Xontech and Space Vector Corporation. The first demonstration is planned for January 1997. A possible second launch will support a Pacific TMD exercise in FY97. Follow-on acquisition of short range and long range Alternate Air Ballistic target systems will begin in FY98 to meet a delivery requirement in FY00. The acquisition will be conducted by the executing agent: USA/SSDC/TT&E office with an Air Force sub-agency arrangement.</p>		
Project 3354	Page 102 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3354
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B. Program Change Summary (\$ in Thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>
Previous President's Budget	20,259	22,939	28,443	19,359	91,000
Current Budget Submit/President's Budget	23,046	22,842	27,603	18,721	92,212

Change Summary Explanation:

Funding: Funding adjustments made to support higher priority projects

Schedule: None

Technical: None

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

	<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>To Compl</u>	<u>Total Cost</u>
2257 PATRIOT, PE 0604865C	352,547	381,092	206,057	101,430	0	0	0	0	TBD	TBD
2260 THAAD, PE 0603861C	565,818	341,307	294,064	16,778	0	0	0	0	TBD	TBD
2260 THAAD, PE 0604861C	0	277,508	261,480	578,467	603,213	584,561	413,884	372,674	Cont	Cont
2263 Navy Area System, PE 0603867C	277,565	59,315	0	0	0	0	0	0	TBD	TBD
1266 *Navy Theater-Wide System, PE 0603868C	200,442	304,171	194,898	192,073	191,229	190,930	145,490	149,444	Cont	Cont
3360 Test Resources, PE 0603872C	31,139	35,507	30,888	30,201	29,942	29,793	30,312	30,363	Cont	Cont

D. Schedule Profile

		<u>FY 1996</u>														
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
HERA supporting TMD-RST 1				X												
HERA Pile Driver Demo		X														
Lance support to Navy Lower Tier (Area)			X	X												
Tests																

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)												DATE February 1997										
BUDGET ACTIVITY						PE NUMBER AND TITLE								PROJECT								
4 - Demonstration and Validation						0603872C Joint Theater Missile Defense								3354								
						FY 1996				FY 1997				FY 1998				FY 1999				
						1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
HERA supporting THAAD Dem/Val flight testing						X			X	X	X	X										
Lance supporting USMC TBMD tests								X	X													
HERA Blk-2B Demo											X											
Willow Dune #1											X											
Willow Dune #2											X											
Air Drop target Demo									X													
STORM/HERA supporting PAC-3 EMD flight testing												X	X	X	X		X	X				
HERA supporting THAAD LUT													X									
Navy Lower Tier (Area) target support															X							
THAAD EMD target support																			X	X		
THAAD AUT																		X				
Storm supporting PAC-2												X										
HERA MTV Demo											X											
HERA Wake Demo																	X					

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				3354			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
FMA Prep/presentation				6,800	8,500	0	0				
Hardware Development				16,246	14,342	27,603	18,721				
Total				23,046	22,842	27,603	18,721				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
<u>Contractor or</u>	<u>Contract</u>										
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>	<u>Total</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Prior to</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1996</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>											
USASSDC						17,196	20,584	15,553	6,671	Cont	60,004
USAF NAIC						5,800	2,208	12,000	12,000	Cont	32,008
<u>Support and Management Organizations</u>											
<u>Test and Evaluation Organizations</u>											
NAWC						50	50	50	50	Cont	200
B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>											
Government Furnished Property:											
Project 3354											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3354		
<u>Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development					22,996	22,792	27,553	18,671		92,012
Subtotal Support and Management										
Subtotal Test and Evaluation					50	50	50	50		200
Total Project					23,046	22,842	27,603	18,721		92,212

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3359
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COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3359 System Test and Evaluation	33,568	42,792	40,307	26,444	30,263	32,250	31,590	31,636	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project provides for BMDO planning, oversight, and coordination of integrated Test and Evaluation activities, as well as inter-service Test and Evaluation efforts for assessment of the Family of Systems (FoS). Once the test plans are developed, test resource and target development and support is provided. (Test resources located in Project 3360 include test facilities, ranges and test instrumentation; target development and support is found in Project 3354). The program provides for support to the Major Defense Acquisition Program (MDAP) mandatory Live-Fire Test and Evaluation (LFT&E). This 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. Additionally, this project provides the following: independent assessments of the JTMD system; maturity evaluation of technology programs; multiple-fidelity models and simulation to support system development testing; and execution of independent technical reviews, system analyses and performance evaluations which contribute to new or enhanced capabilities; management of the development process, and the decision-making process related to the allocation of resources. The performance evaluation has as its primary goals the identification and understanding of system-level performance drivers and the mitigation of technical risk, and to provide timely answers to critical issues and questions required by decision authorities through an annual Consolidated Evaluation Report (CER).

FY 1996 (\$ in Thousands)

- \$18,662 Completed Build 1 development of the Theater Missile Defense System Exerciser (TMDSE). Integrated PATRIOT, AEGIS, Joint Tactical Ground Station (JTAGS), Shield and Command and Control components into the basic TMDSE architecture. Completed test planning for scheduled FoS System Integration Tests (SITs). Performed a Hardware-in-the Loop (HWIL) test for early interoperability assessment. Performed post HWIL analysis. Began Build 2 TMDSE development which adds THAAD and TPS-59 (HAWK) Radar to the Build 1 architecture. Supported Build 1 transition to the Joint National Test Facility (JNTF).
- \$8,656 Performed atmospheric chemical dispersion experiments that allowed validation data to determine post-intercept chemical transport to the ground. Developed prototype intercept-to-ground model Post Engagement Ground Effect Model (PEGEM). Determined biological agent demise mechanisms from UV irradiation, heat/pressure at intercept.
- \$2,656 Executed consolidated evaluation program. Conducted special studies and technical investigations. Participated in THAAD, PATRIOT and NTWDS Test Readiness Reviews. Conducted assessments of TMDSE testing. Monitored FoS MDAP flight testing and confirmed attainment of test objectives. Participated in SIT planning activities. Developed assessment plans for of FoS activities. Developed TMD consolidated Evaluation Plan.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3359
<ul style="list-style-type: none"> - \$2,655 Participated in SIT planning activities by chairing the Data Management and Assessment subgroup of the SIT planning team and by coordinating Operational Test Agency activities with regard to TMD operational assessments. Monitored MDAP flight testing and attainment of test objectives. Provide CER detailing current maturity of TMD Family of Systems architecture. - \$939 Provided technical support for System Test activities at the Executing Agent. - \$33,568 Total 		
<u>FY 1997 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$18,210 Execute SIT-97. Perform HWIL tests and analysis, and perform-SIT analysis. Integration tests of the Family of System will be performed. Complete Build 2 development of TMDSE to include PATRIOT, AEGIS, JTAGS, Shield, TPS-59 (HAWK) Radar, THAAD and Command and Control components. Perform test planning for scheduled SITs. - \$15,203 Develop generic lethality targets for sled testing of interceptor lethality to support development and live fire test and evaluation. Provide a consistent documentation source for threat lethality target designs. Provide lethality data analyses for target response of HTIC and fragmentation engagements with threat targets to evaluate the effectiveness of TMD interceptors. Initial Verification & Validation of the Post Engagement Ground Effect Model (PEGEM) model for low altitude intercepts. - \$2,301 Execute integrated evaluation plan and methodology. Conduct special studies and technical investigations. Participate in FoS MDAP Test Readiness Reviews. Participate in PAC-3 Test Readiness reviews. Conduct independent assessments of TMDSE testing. Monitor THAAD, PAC-3, and NTWDS testing. - \$3,500 Conduct operational assessment activities for the TMD FoS. Develop critical operational issues, measures of effectiveness, and measures of performance. Develop operational assessment plan for the FoS Command and Control architecture. Perform operational assessment of the FoS System Integration Test. - \$2,300 Manage operational assessment activities for the TMD FoS and MDAPs. Continue monitoring of THAAD, PAC-3, and NTWDS testing. Provide updated Comprehensive Evaluation Report (CER) utilizing current test data from MDAPs, SITs, CINC Assessments, and Wargames, as well as analytical techniques to estimate the TMD system maturity. - \$1278 Provided technical support for System Test activities at the Executing Agent. - \$42,792 Total 		
<u>FY 1998 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$19,077 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 Perform test planning for scheduled SITs. Perform HWIL tests and analysis in conjunction with the schedule. Plan SIT 98 and plan post SIT analysis. Integration and interoperability testing of the TMD Family of Systems will be performed. 		
Project 3359	Page 108 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603872C Joint Theater Missile Defense	3359
<ul style="list-style-type: none"> - \$15,492 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. - \$2,445 Maintain support to execute the Consolidated Evaluation Program and methodology and conduct special studies and technical investigations. Participate in THAAD, PAC-3, and NTWDS Test Readiness Reviews. Provide evaluation support to the BMD Acquisition Review Council (BMDARC) prior to PAC-3 MS III. Participate in SM-2 Blk IVA Flight Test Readiness Reviews. Provide evaluation support to BMDARC for the Navy Area TBMD UOES. Assess results of HWILT 98 events and TMDSE testing. Monitor THAAD Pre-Production Qualification test (PPQT). - \$2,445 Manage operational assessment activities for the TMD FoS. Continue monitoring of THAAD testing. Monitor PAC-3 EMD testing and Navy Area testing. Provide updated CER utilizing current test data from MDAPs, SITs, CINC Assessments, and Wargames, as well as analytical techniques to estimate the TMD system maturity. - \$848 Provide technical support for System Test activities at Executing Agent - \$40,307 Total 		
<u>FY 1999 (\$ in Thousands)</u>		
<ul style="list-style-type: none"> - \$8,475 Execute SIT-99. Complete TMDSE Build 3 transition to the Joint National Test Facility. Additional integration and interoperability testing of the TMD FoS will be conducted. Plan and perform HWIL test 99. Perform Post SIT and HWIL test analysis. - \$11,981 Maintain endgame (PEELS) and post engagement (PEGEM) model simulations at current state of knowledge of lethality phenomena. Provide realistic model based on test data and analyses for atmospheric transport, diffusion, and deposition and evaporation of 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. - \$2,571 Execute Consolidated Evaluation Program and methodology. Conduct special studies and technical investigations. Participate in PAC-3 Test Readiness Reviews. Provide evaluation support to the BMD Acquisition Review Council (BMDARC) prior to PAC-3 MS III. Participate in SM-2 Blk IVA Flight Test Readiness Reviews. Provide evaluation support to BMDARC for the Navy Area TBMD UOES. Assess results of TMDSE FoS HWIL testing. - \$2,571 Manage operational assessment activities for the TMD system. Continue monitoring of THAAD testing. Monitor PAC-3 EMD testing and Navy Area testing. Provide updated CER utilizing current test data from MDAPS and SITs, CINC Assessments, and Wargames as well as analytical techniques to estimate the TMD system maturity. - \$846 Provide technical support for System Test activities at Executing Agent - \$26,444 Total 		
Project 3359	Page 109 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 1997	
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					PROJECT 3359	
<p><u>Acquisition Strategy</u> This effort will use Service executing agents through existing contracts to construct a TMD Family of Systems HWIL capability, TMD System Exerciser (TMDSE) and conduct TMD system level live flight testing. The strategy provides for lethality sled testing managed by BMDO and executed by Service labs against TMD targets. It also provides Service and BMDO system evaluation funding. The evaluation process is an iterative process which should begin early in the development cycle to add value to the development of the system. Critical system characteristics and issues should be identified early in the process and be evaluated to allow for informed decision-making. Family of System evaluations and assessments will be performed by Service OTAs and JHU/APL.</p>											
B. Program Change Summary (\$ in Thousands)											
		<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u>					
		35,117	43,421	42,789	27,741	<u>Cost</u>	149,068				
Previous President's Budget		33,568	42,792	40,307	26,444		143,111				
Current Budget Submit/President's Budget											
Change Summary Explanation:											
Funding: Funding transferred to higher priority projects.											
Schedule: Changing funding priorities in FY1996 resulted in a TMDSE hardware-in-the-loop Build 2 slip of approximately 6 months. Beginning development of Build 3 slips to FY1998. Completion of Build 3 to FY99.											
Technical: None											
C. Other Program Funding Summary (\$ in Thousands)											
		<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>To</u>	<u>Total</u>
										<u>Compl</u>	<u>Cost</u>
D. Schedule Profile											
		<u>FY 1996</u>		<u>FY 1997</u>		<u>FY 1998</u>		<u>FY 1999</u>			
	1	2	3	4	1	2	3	4	1	2	3
TMDSE Build 1			X								4
HWIL				X							
SIT					X						
Project 3359											
Page 110 of 126 Pages											
Exhibit R-2 (PE 0603872C)											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)													DATE February 1997			
BUDGET ACTIVITY 4 - Demonstration and Validation						PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense						PROJECT 3359				
<u>FY 1996</u>						<u>FY 1997</u>				<u>FY 1998</u>				<u>FY 1999</u>		
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
JT&E						X										
TMDSE Build 2							X									
SM2 Blk IVA								X								
HWIL									X							
THAAD PPQT										X						
JT&E												X				
SIT													X			
HWIL															X	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3359			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Family of Systems Test and Evaluation				33,568	42,792	40,307	26,444				
Total				33,568	42,792	40,307	26,444				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
TMDSE					12,689	10,072	10,189	2,418	Cont	35,368	
<u>Support and Management Organizations</u>											
SRS Tech		CPFF	1 June 94		3,402	3,200	3,500	3,500	Cont	13,602	
<u>Test and Evaluation Organizations</u>											
BMDO					15,927	26,920	24,018	18,676	Cont	85,541	
AFOTEC					200	200	200	200	Cont	800	
OPTEC					750	1500	300	300	Cont	2,850	
OPTEVFOR					300	300	1500	750	Cont	2,850	
JITC					300	600	600	600	Cont	2,100	
B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>											
Government Furnished Property:											
Project 3359											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3359		
<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development					12,689	10,072	10,189	2,418		35,368
Subtotal Support and Management					3,402	3,200	3,500	3,500		13,602
Subtotal Test and Evaluation					17,477	29,520	26,618	20,526		94,141
Total Project					33,568	42,792	40,307	26,444		143,111

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1997		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3360	
<i>COST (\$ In Thousands)</i>	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
3360 Test Resources	31,139	35,507	30,888	30,201	29,942	29,793	30,312	30,363	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification</u></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 infrastructure for common ground test facilities, ranges and instrumentation. Project 3360 funds the common TMD test infrastructure costs including BMDO use. Individual programs pay only the direct costs associated with their specific testing efforts.</p> <p>The mission common ground test facilities include:</p> <ul style="list-style-type: none"> Kinetic Kill Vehicle Hardware-in-the-Loop Simulator (KHILS) at Eglin AFB, FL Aero-Optic Evaluation Center (AOEC) located at Calspan Corp, Buffalo, NY Hypervelocity Wind Tunnel Number 9 (Tunnel 9) at the Naval Surface Warfare Center, White Oak, MD National Hover Test Facility (NHTF) at Edwards AFB, CA Army Missile Optical Range (AMOR) at the U.S. Army Missile Command, Redstone Arsenal, AL 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 Captive Carry Capability at the Nevada Test Site 7V and 10V Space Chambers at the Arnold Engineering Development Center, Tullahoma, TN Portable Optical Sensor Tester (POST) and the Characterization of Low Background Mosaics (CALM) at Rockwell International, Anaheim, CA Naval Research and Development (NRaD) facility IR Devices Branch located at the Naval Command, Control and Ocean Surveillance Center, San Diego, CA The Center for Research Support (CERES) at the Joint National Test Facility, Falcon AFB, CO <p>The mission common range facilities include national ranges such as:</p> <ul style="list-style-type: none"> White Sands Missile Range (WSMR) located in Las Cruces, NM Kwajalein Missile Range (KMR) and the Wake Island Complex located in the South Ocean Pacific Missile Range Facility (PMRF) located at Kauai, HI Gulf Test Range (GTR) located at Eglin AFB, Fort Walton Beach, FL. 										
Project 3360			Page 114 of 126 Pages				Exhibit R-2 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3360
<p>The range instrumentation special test equipment, data collection assets, and range instrumentation include:</p>		
<p>High Altitude Observatory (HALO) with the Infrared Imaging System (IRIS) sensor, based at Aeromet, Inc., Tulsa, OK Sea-Lite Beam Director (SLBD), based at White Sands Missile Range, Las Cruces, NM High Altitude Optical Imaging System (HAOIS), based at White Sands Missile Range, Las Cruces, NM. Mobile Range Safety System and Kwajalein Range Safety Control System Upgrades NP-3 Aircraft upgrade for remote area safety support. Miscellaneous improvements to BMDO infrastructures and support systems</p>		
<p>These ground test, range and instrumentation assets provide valuable risk reduction and test implementation capability in support of the TMD 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, BMDO 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><u>FY 1996 (\$ in Thousands)</u></p>		
<ul style="list-style-type: none"> - \$14,198 - \$7,724 - \$9,199 - \$18 - \$31,139 	<ul style="list-style-type: none"> Provided ground test facility infrastructure and upgrades for BMDO testing including: digital emulation at KDEC, end game hardware-in-the-loop testing of integrated IR sensor systems at KHILS, wind tunnel testing at Tunnel 9 in support of THAAD, sensor testing at CALM, POST NRaD, and AEDC 7V/10V, propellant loading expertise in support of THAAD and hover test capability from the NHTF, complete development of a light gas gun capability for Lethality testing at AEDC Range G, IR phenomenology characterization at Tunnel 9, AMOR and KHILS, and primary IR standards, and black body and optical materials calibrations at the NIST. Completed full operational capability of the WISP system, and conducted SHARRP and THAAD HWIL testing at KHILS. Demonstrated real-time data capability link at CERES. Conducted THAAD DemVal window stress tests at Tunnel 9. Performed AIT aero-optic/seeker tests and Navy Lower Tier (Area) system aero-optic testing at AOEC. Installed a new spectral calibration chamber and conducted THAAD window emissivity tests at NIST. Provided test range infrastructure, upgrades including provision of caretaker activities at Wake Island, WSMR/Ft Wingate and development of TMD launch sites and range facilities at WSMR and Wake Island, and associated range instrumentation sites. Provided range instrumentation, upgrades, data collection, and analyses for BMDO testing including: Full Operational Capability (FOC) of Kwajalein Missile Range Safety System (KMRSS) at KMR, IOC of P-3 Range Safety System, and data collecting and processing by SLBD at WSMR and HALO/IRIS sensor. Provided technical support for Resources activities at the Executing Agent. Total 	
Project 3360	Page 115 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3360
<u>FY 1997 (\$ in Thousands)</u>		
– \$13,944	Provide ground test facility infrastructure and upgrades for BMDO testing including: end game hardware-in-the-loop testing of integrated IR sensor systems at KHILS, wind tunnel testing at Tunnel 9 to support THAAD and Navy Sea-Based TBMD programs, EKV and SMTS sensor testing at CALM, POST and NRaD, EKV sensor testing at AEDC 7V/10V, propellant loading expertise and EKV hover test capability from the NHTF, Patriot and Navy lethality testing at AEDC Range G, IR phenomenology characterization at Tunnel 9, AMOR and KHILS; primary IR standards and black body optical materials calibrations at the NIST. Provide LBIR spectral broadband calibration and THAAD window characterization at NIST. Perform THAAD HWIL testing at KHILS. Conduct AIT and Navy Area seeker aero-optic tests at AOEC. Provide orbital experiment and satellite operations support at CERES.	
– \$12,076	Provide test range infrastructure including caretaker activities at Wake Island and WSMR/Ft Wingate, upgrades, and development of TMD launch and range facilities, and associated range instrumentation sites, includes environmental shelter for Wake Island. Continue development of a range standard for intercept debris analysis.	
– \$9,195	Provide range instrumentation, upgrades, data collection, and analyses for BMDO testing including: data collecting and processing by SLBD at WSMR and HALO/IRIS sensor. Achieve FOC of HAOIS at WSMR and P3 Remote Area Safety Aircraft (RASA). Support upgraded KMRSS and KMR Range Safety System to support Multiple Shot Engagements. Support System Integration tests (SIT 97).	
– \$292	Provide technical support for Resource activities at the Executing Agent.	
– \$35,507	Total	
<u>FY 1998 (\$ in Thousands)</u>		
– \$14,036	Provide 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 at KHILS, wind tunnel testing at Tunnel 9 to support AIT, sensor testing at CALM, POST, NRaD, and AEDC 7V/10V, propellant loading expertise and GBI hover test support from the NHTF, THAAD and Navy TBMD lethality testing at AEDC Range G, IR phenomenology characterization at Tunnel 9, AMOR and KHILS, and primary IR standards, and black body and optical materials calibrations at the NIST. Support THAAD flight test anomaly investigation and objective window testing at Tunnel 9. Provide orbital experiment and satellite operations support at CERES	
– \$9,113	Provide test range infrastructure including provision caretaker activities at Wake Island, WSMR and Ft Wingate, and upgrades for BMDO testing including development of TMD launch and range facilities, and associated range instrumentation sites, including new development at PMRF and second environmental shelter at Wake Island..	
– \$7,456	Provide range instrumentation, upgrades, data collection, and analyses for BMDO testing including: data collecting and processing by SLBD, HAOI at WSMR and HALO/IRIS sensor. Support FOC of upgraded KMRSS to support Multiple Shot Engagements. Achieve FOC of second NP-3 RASA.	
– \$283	Provide technical support for Resources activities at the Executing Agent.	
– \$30,888	Total	
Project 3360	Page 116 of 126 Pages	Exhibit R-2 (PE 0603872C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
--	------------------------------

BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 3360
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FY 1999 (\$ in Thousands)

- \$13,735 Provide ground test facility infrastructure and upgrades for BMDO testing including: end game hardware-in-the-loop testing of integrated IR sensor systems at KHILS, wind tunnel testing at Tunnel 9 to support AIT, sensor testing at CALM, POST, NRaD, and AEDC 7V/10V, propellant loading expertise and hover test capability from the NHTF, lethality testing at AEDC Range G, IR phenomenology characterization at AMOR and KHILS, and primary IR standards, black body and optical materials, calibrations at the NIST. Support THAAD flight test anomaly investigation and objective window testing at Tunnel 9. Provide orbital experiment and satellite operations support at CERES.
- \$9,139 Provide test range infrastructure including caretaker activities at Wake Island, WSMR and Ft Wingate, and upgrades for BMDO testing including development of TMD launch and range facilities, and associated range instrumentation sites, including new development at PMRF.
- \$7,044 Provide range instrumentation, upgrades, data collection, and analyses for BMDO testing including: data collecting and processing by SLBD, HAOI at WSMR and HALO/IRIS sensor. Support SIT 99.
- \$283 Provide technical support for Resource activities at Executing Agent.
- \$30,201 Total

Acquisition Strategy In using ranges and test facilities, BMDO implements a Reliance process which: a) maintains perspective of national technical test capabilities; b) responds to program requirements; c) uses existing test resources where possible; d) requires coordination prior to development of new resources; and e) 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 Strategic Defense Command (USASSDC); the U.S. Navy Office of Naval Research; Navy Ballistic Missile Defense Technology; and the U.S. Air Force Phillips Laboratory. The majority of the ground test facilities are government owned and operated, with some degree of contractor support, which support multiple BMDO users. The test ranges are part of the DoD Major Range and Test Facility Base (MRTFB). The HALO/IRIS sensor are operated by competitively awarded contracts. The ROBS laser radar is undergoing analysis for future application. SLBD is operated by the U.S. Army (government and contractor personnel). Data from SLBD is collected and processed by FFRDC personnel.

B. Program Change Summary (\$ in Thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u> <u>Cost</u>
Previous President's Budget	30,162	33,322	33,082	32,546	129,112
Current Budget Submit/President's Budget	31,139	35,507	30,888	30,201	127,735

Change Summary Explanation:
 Funding: None
 Schedule: None

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 1997							
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense					PROJECT 3360							
Technical: None																	
C. Other Program Funding Summary (\$ in Thousands)																	
		<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>	To <u>Compl</u>	Total <u>Cost</u>						
1155	Phenomenology Program, PE 0603872C	36,908	31,338	37,835	38,622	34,464	37,300	37,205	36,490	Cont	Cont						
1266	Navy Theater-wide TBMD, PE 0603868C	200,442	304,171	194,898	192,073	191,229	190,930	145,190	149,444	Cont	Cont						
2400	NMD Program, PE 0603871C	730,656	828,864	504,091	393,085	309,748	309,584	391,858	392,433	Cont	Cont						
1270	Advanced Interceptors, PE 0603173C	26,788	68,409	31,492	29,412	42,890	46,133	49,460	42,449	Cont	Cont						
2257	PATRIOT, PE 0604865C	352,547	381,092	206,057	101,430	0	0	0	0	TBD	TBD						
2259	Israeli Cooperative Projects, PE 0603872C	59,352	43,892	38,715	38,662	38,624	38,591	0	0	TBD	TBD						
2260	THAAD System, PE 0603861C	565,818	341,307	294,647	16,778	0	0	0	0	TBD	TBD						
2260	THAAD System, PE 0604861C	0	277,508	261,480	578,467	603,213	584,561	413,884	372,674	Cont	Cont						
2263	Navy Area TBMD, PE 0604867C	0	241,330	267,822	226,748	222,145	158,271	52,433	38,089	Cont	Cont						
3157	Environmental Siting & Fac, PE 0603872C	4,369	5,972	3,600	3,640	3,631	3,609	3,606	3,612	Cont	Cont						
3354	Targets, PE 0603872C	23,046	22,842	27,603	18,721	42,755	42,226	42,463	42,578	Cont	Cont						
3359	System Test and Evaluation, PE 0603872C	33,568	42,792	40,307	26,444	30,263	32,250	31,590	31,636	Cont	Cont						
D. Schedule Profile																	
		<u>FY 1996</u>			<u>FY 1997</u>				<u>FY 1998</u>				<u>FY 1999</u>				
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	KDEC Support to THAAD	X															
	AMOR KHILS Support	X															
	NHTF Support to THAAD	X	X	X													
	TMD Target Sensing at AMOR	X	X	X	X	X	X	X	X								
	AIT tests at AOEC	X	X	X	X	X	X	X	X	X							
	WSMR THAAD Dem/Val Tests	X	X	X	X	X	X	X	X								
	Tunnel 9 THAAD Support	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	HALO/IRIS WSMR Data Coll	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Navy Area TBMD tests at AOEC		X	X	X		X	X									
	KMRSS IOC			X													
	KMR TCMP Launch			X			X										
Project 3360		Page 118 of 126 Pages										Exhibit R-2 (PE 0603872C)					

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)													DATE February 1997				
BUDGET ACTIVITY					PE NUMBER AND TITLE									PROJECT			
4 - Demonstration and Validation					0603872C Joint Theater Missile Defense									3360			
		<u>FY 1996</u>				<u>FY 1997</u>					<u>FY 1998</u>				<u>FY 1999</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
AEDC Range G FOC			X			X	X	X	X	X	X	X	X	X	X	X	
HALO/IRIS KMR Data Coll			X														
WSMR Navy SM2-Blk IV Testing			X	X													
Tunnel 9 Phenomenology Support			X	X	X	X		X				X					
THAAD Dem/Val window stress tests at Tunnel 9			X	X	X	X											
THAAD EMD wind tunnel testing at Tunnel 9										X	X	X		X	X	X	
Lethality testing at AEDC Range G			X	X	X	X	X	X	X	X	X	X					
NIST Spectral IR Primary Standard IOC				X													
HAOIS IOC								X									
KHILS WISP FOC				X													
NIST THAAD Window Characterization		X		X	X	X											
NIST 7V Black Body Calibration				X													
10V Chamber IOC				X													
KHILS HWIL for THAAD				X	X	X	X	X	X	X	X	X	X	X	X	X	
KMR Willow Dune Launch						X											
SIT 97						X											
Navy Shroud Deployment at Tunnel 9							X										
NP-3 RASA IOC						X											
Second NP-3 RASA IOC												X					
PAC-3 WSMR Launch						X	X	X	X	X	X	X	X	X	X		
THAAD LUT									X					X			
SIT														X	X	X	
AIT @ Tunnel 9											X	X					
AIT @AOEC						X	X			X	X		X	X			
AIT @ Captive Carry								X	X								
CERES FOC				X													
CERES Satellite Operations Support					X	X	X	X	X	X	X	X	X	X	X	X	
CERES SMTS FOS Support									X	X	X	X					

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				3360			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Test Facilities				14,198	13,616	14,036	13,735				
Test Ranges				7,724	12,076	9,113	9,139				
Test Resources				9,217	9,815	7,739	7,327				
Total				31,139	35,507	30,888	30,201				
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
<u>Support and Management Organizations</u>											
<u>Test and Evaluation Organizations</u>											
USASSDC						12,681	13,386	12,722	12,427	Cont	51,216
Air Force						7,688	7,121	9,687	9,546	Cont	34,042
NSWC White Oak						3,463	3,350	0	0	Cont	6,813
SPAWAR						1,414	1,185	1,169	1,150	Cont	4,918
BMDO						5,893	10,465	7,310	7,078	Cont	30,746
Project 3360				Page 120 of 126 Pages				Exhibit R-3 (PE 0603872C)			

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense				PROJECT 3360		
B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)										
Government Furnished Property:										
<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>	<u>Total Prior to FY 1996</u>	<u>Budget FY 1996</u>	<u>Budget FY 1997</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
Subtotal Product Development										
Subtotal Support and Management										
Subtotal Test and Evaluation					31,139	35,507	30,888	30,201		127,735
Total Project					31,139	35,507	30,888	30,201		127,735
Project 3360				Page 121 of 126 Pages			Exhibit R-3 (PE 0603872C)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 4000
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COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
4000 Operational Support	0	82,876	87,516	84,809	88,185	89,886	92,553	92,987	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.

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 4000
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FY 1996 (\$ in Thousands)

- \$0
- \$0 Total

FY 1997 (\$ in Thousands)

- \$82,876 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies.
- \$82,876 Total

FY 1998 (\$ in Thousands)

- \$87,516 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies.
- \$87,516 Total

FY 1999 (\$ in Thousands)

- \$84,809 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies.
- \$84,809 Total

B. Program Change Summary (\$ in Thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>
Previous President's Budget	0	88,179	88,928	85,741	262,848
Current Budget Submit/President's Budget	0	82,876	87,516	84,809	255,201

Change Summary Explanation:

Funding: Management costs realigned to technical program elements effective with FY 1997.
Schedule: None
Technical: None

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

	<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>To Compl</u>	<u>Total Cost</u>
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1997
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603872C Joint Theater Missile Defense	PROJECT 4000
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	<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>To</u>	<u>Total</u>
									<u>Compl</u>	<u>Cost</u>

D. Schedule Profile

		<u>FY 1996</u>			<u>FY 1997</u>			<u>FY 1998</u>		<u>FY 1999</u>		
N/A	1	2	3	4	1	2	3	4	1	2	3	4

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1997				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
4 - Demonstration and Validation				0603872C Joint Theater Missile Defense				4000			
A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>			
Total											
B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1996	Budget FY 1996	Budget FY 1997	Budget FY 1998	Budget FY 1999	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
<u>Support and Management Organizations</u>											
<u>Test and Evaluation Organizations</u>											
B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>											
Government Furnished Property:											
Project 4000											

