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MDA Exhibit R -2RDT&E Item Justification	Date February 2003
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APPROPRIATION/BUDGET ACTIVITY 5. System Development and Demonstration (SDD)	R-1 NOMENCLATURE 0604865C Patriot PAC -3 Theater Missile Defense Acquisition -EMD
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COST (\$ in Thousands)	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
Total PECOst	130630	176155						
2014 PATRIOT Advanced Capability 3 (PAC -3)	130630	176155	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The MDA develops the Ballistic Missile Defense System (BMDS) using biennial capability blocks. This approach is the most efficient and effective way to get missile defense assets into the hands of the warfighters as quickly as possible while allowing for rapid insertion of emerging technology in the most affordable manner. These capability blocks will subsequently build on and be integrated with the predecessor blocks. Block capabilities are built by using complete elements and their individual components to integrate a single BMDS and provide layered defense against ballistic missiles during all flight phases, Boost, Midcourse, and Terminal, using multiple basing modes and phenomenology.

As part of the total BMDS, this PATRIOT PAC -3 Program Element (PE) funds the PAC -3 developmental efforts for FY2002 and 2003 as part of the overall Terminal Defense System (TDS). The US Army is programming funding for PAC -3 beginning in FY2004 in PE 0604865A. The overall Terminal Defense System elements and activities include Theater High Altitude Area Defense (THAAD), Medium Extended Air Defense System (MEADS), and the Israeli Arrow Program. The BMDS elements in Terminal Defense pursue development and selective upgrades of missile defense capabilities that engage short to medium-range ballistic missiles in the terminal phase of their trajectory, when the missile or warhead reenters the atmosphere, and short-range ballistic missile that operate only in the atmosphere.

The Terminal Defense Elements provide the final opportunity to engage short and medium range ballistic missiles not engaged or destroyed in the boost or mid-course phases of trajectory. Upon direction of the Ballistic Missile Defense System (BMDS) Command, Control, and Battle Management (C2BM) and in conjunction with the fielded Patriot System, the THAAD and Patriot Systems, provide the only capability to defend deployed US forces from short and medium-range ballistic missiles, and protect broadly dispersed assets and population centers or selected U.S. sites (Homeland Defense) from short to medium-range ballistic missile attacks. The flowdown of BMDS System capability specifications resulting from Missile Defense national team efforts in C2BM and Systems Engineering & Integration will guide the integration of PAC -3 into the BMDS system, the BMDS C2BM architecture, and the BMD Test Bed.

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B.ProgramChangeSummaryTable	FY2002	FY2003	FY2004	FY2005
PreviousPresident'sBudget(FY2003PB)	128199	0	0	0
CurrentPresident'sBudget(FY2004 PB)	130630	176155	0	0
TotalAdjustments	2431	176155	0	0
CongressionalSpecificProgramAdjustments	0	180819	0	0
CongressionalUndistributedAdjustments	-913	-3196	0	0
Reprogrammings	6030	-1468	0	0
SBIR/STTRTransfer	-2686	0	0	0

TheFY2003Presiden t'sBudgetof\$150.819Mwasincreasedby\$30.000MforadditionaltestingbytheFY2003AppropriationsConferencetoprovideforatotalof\$180.819M.Inaccordancewith theFY2003AppropriationsConference,thePAC -3resourcesforFY2003whichwerepre viouslyaddressedinPE0604865AhavebeentransferredtothisPE.

PAC-3wasprogrammedtotransfertothetheArmyinFY2003butperCongressionaldirectionremainedwithMDA.

TheFY2003PAC -3fundingwasreducedby\$3.196Mduringtheappropriationscyc leforCongressionalUndistributedReductions.

TheFY2003PAC -3fundingwasalsoreducedby\$1.468Mforinflation.

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COST (\$ in Thousands)	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
2014 PATRIOT Advanced Capability 3 (PAC -3)	130630	176155	0	0	0	0	0	0
RDT & E Articles Qty	0	0	0	0	0	0	0	0
<u>A. Mission Description and Budget Item Justification</u>								
<p>Note: The US Army is programming funding for PAC -3 beginning in FY2004 in PE0604865A. MDA will continue to program funding for BMDS interoperability.</p> <p>PATRIOT is a mobile, field Army and Corps air defense system, using guided missiles to simultaneously engage and destroy multiple target types at varying ranges. The PATRIOT Advanced Capability 3 (PAC -3) Upgrade Program is the latest evolution of the phased materiel change improvement program to PATRIOT. PATRIOT PAC -3 provides the first fieldable missile defense capability in the near term to defeat both conventional and weapons of mass destruction warheads as a terminal defense element of the ballistic missile defense system. The materiel changes will provide improved performance across the spectrum for system and threat intercept performance. In addition to modernization of the ground support equipment, funding resources a new missile design providing a high velocity, hit to kill, surface to air missile with the range, accuracy, and lethality necessary to effectively intercept and destroy tactical missiles with Nuclear Biological Chemical/High Explosive (NBC/HE) warheads and air breathing threats. The full capability will provide defense against short to medium range theater ballistic missiles (TBMs), cruise missiles (CMs), unmanned aerial vehicles (UAVs) and other air breathing threats as part of the Ballistic Missile Defense (BMD) systems, a multi-layered Theater Air and Missile Defense Architecture. Funds will ensure PAC -3 will remain interoperable in the BMDS. The Army requirement for PAC -3 supports the Current to Objective transition path of the Transformation Campaign Plan (TCP).</p> <p>No RDT & E articles were required during FY2003. The articles under test were previously funded, procured, and accepted.</p>								
<u>B. Accomplishments/Planned Program</u>								
	FY2002	FY2003	FY2004	FY2005				
Complete PAC -3 Missile Engineering and Manufacturing Development (EMD) Program.	50661	0						
Completion of PAC -3 EMD OT Test program and continuation of cost reduction efforts (Advanced IMU, Advanced Master Frequency Generator, and Multiband Radio Frequency Downlink).								
	FY2002	FY2003	FY2004	FY2005				
Complete Operational Test & Evaluation	31923	2000						
Flight tests completed 3Q FY2002 with regression tests conducted 4Q FY2002.								
	FY2002	FY2003	FY2004	FY2005				
Continue PAC -3 Target and Test Support	6390	15560						
Target planning and support to the EMD and follow on test programs.								

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	FY2002	FY2003	FY2004	FY2005
THAAD/PATRIOT Launcher	9916	0		

Development efforts for THAAD launcher with PATRIOT interface.

	FY2002	FY2003	FY2004	FY2005
Evolutionary Development	31740	88319		

Development efforts for improvement to system capabilities.

	FY2002	FY2003	FY2004	FY2005
Block Test Program with LMMFC and Raytheon		70276		

Follow-on Block test program.

C. Other Program Funding Summary

	FY2002	FY2003	FY2004	FY2004	FY2006	FY2007	FY2008	FY2009	To Complete	Total Cost
PEC49200 PATRIOT PAC -3	0	0	561555	490754	490892	490814	620451	626573		
PEC50700 PATRIOT Mods	24819	148671	176304	52525	30014	47883	50993	27354		
PECA0267 PATRIOT Modification Initial Spares	722	39946	18426	10763	10746	5379	4842	3935		
PE0603869C Meads Concepts -Dem/Val	0	114781	0	0	0	0	0	0		
PE0603175C Ballistic Missile Defense Technology	145021	151130	240820	205791	200956	247990	287864	306472		
PE0603879C Advanced Concepts, Evaluations and Systems	0	0	151696	216778	166308	193949	241947	234484		
PE0603880C Ballistic Missile Defense System Segment	790535	1046652	0	0	0	0	0	0		
PE0603881C Ballistic Missile Defense Terminal Defense Segment	195800	136399	810440	924356	985514	805785	558071	371649		
PE0603882C Ballistic Missile Defense Midcourse Defense Segment	3655089	3103844	3613266	3841412	2078522	1908511	1482389	1437923		

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PE0603883C Ballistic Missile Defense Boost Defense Segment	583463	718036	626264	653612	755163	665772	477109	354346		
PE0603884C Ballistic Missile Defense Sensors	312973	350436	438242	562752	706514	1043454	1152740	1261906		
PE0603886C Ballistic Missile Defense System Interceptors	0	0	301052	541178	1127180	1729613	2558327	2904096		
PE0603890C Ballistic Missile Defense System Engineering and Integration	0	0	483996	522458	604445	628594	703055	706501		
PE0603888C Ballistic Missile Defense Test and Targets	0	0	611522	711181	661416	643302	639839	672396		
PE0603889C Ballistic Missile Defense Products	0	0	343644	384763	333636	343447	349335	360951		
PE0604861C Theater High -Altitude Area Defense System -TMD -EMD	818632	888323	0	0	0	0	0	0		
PE0604867C Navy Area Theater Missile Defense -EMD	96121	0	0	0	0	0	0	0		
PE0605502C Small Business Innovative Research -MDA	145102	0	0	0	0	0	0	0		
PE0901598C Management Headquarters -MDA	30191	25365	93441	101373	114107	121743	128972	133499		
PE0901585C Pentagon Reservation	6381	7432	14481	13384	12758	12850	13158	13476		

D. Acquisition Strategy

The PAC -3 will follow the Missile Defense Agency's capability -based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two -year capability blocks. The design objective of the PATRIOT system is to provide an element of an integrated Ballistic Missile Defense system capable of being modified to cope with the evolving threat. This strategy minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. The PATRIOT program consists of two interrelated acquisition programs - the PATRIOT PAC -3 Growth Program and the PAC -3 Missile Program. Growth Program modifications are grouped into configurations which are scheduled to be fielded in the same time frame. However, incremental increases in performance are determined for each configuration in order to provide benchmarks for configuration testing and for the development of user doctrine and tactics. The PAC -3 Missile Program focuses on developing, fabricating and testing the high velocity, hit to kill, surface to air missile and associated ground support equipment to provide essential increases in battlespace, accuracy, lethality and firepower to counter and destroy evolving air defense threats. Funds will ensure PAC -3 will remain interoperable in the BMD. The missile performance is demonstrated through a series of flight tests and modeling and simulation activities. PAC -3 Block Evolutionary development efforts will further improve system interoperability, commonality, and capabilities against emerging and active threats.

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MDAExhibitR -3RDT&EProjectCostAnalysis	Date February2003
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I.ProductDevelopmentCost(\$inThousands)												
CostCategories:	Contract Method &Type	Performing Activity& Location	Total PYs Cost	FY2003 Cost	FY2003 Award Date	FY2004 Cost	FY2004 Award Date	FY2005 Cost	FY2005 Award Date	Cost to Complete	Total Cost	Target Valueof Contract
CompletePAC -3Missile Engineeringand ManufacturingDevelopment (EMD)Program.												
PAC-3MissileEMD	SS/CPIF	LMMFC/TX	978342	0							978342	
PAC-3MissileIntegration	SS/CPIF	Raytheon/MA	181545	0							181545	
RDEC		MRDEC/AL	71695	0							71695	
THAAD/PATRIOTLauncher												
T/PLauncher	CPFF	LMSSC/CA	9916	3000							12916	
RSCIntegration	CPFF	Raytheon/MA		2000							2000	
EvolutionaryDevelopment												
LMMFCED	CPAF	LMMFC/Dallas	23747	35629							59376	
RaytheonED	CPAF	Raytheon/MA	13959	21365							35324	
RDECED	CPFF	MRDEC/AL	1914	9786							11700	
BlockTestProgramwith LMMFCandRaytheon												
LMMFCFOT	CPAF	LMMFC,Dallas		25380							25380	
RSCIntegration	CPAF	Raytheon,MA		15640							15640	
RDECFOFOT	MIPR	MRDEC,AL		4214							4214	
SubtotalProductDevelopment			1281118	117014		0		0			1398132	

Remarks

FY2003effortsinclude:

- ContinuingdevelopmentofcommonlauncherelectronicsforaTHAAD/PATRIOTlauncher.
- Developmentandintegrationofcostreductioninitiatives(AdvancedMasterFrequencyGenerator,MultibandRadioFrequencyDataLink,andAdvanceInertialMeasurement Unit)forimplementation.
- Testplanning,preparation,andanalysisoftheCongressionallydirectedRippleFireTestandfuturetestefforts.

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II.SupportCostsCost(\$inThousands)												
CostCategories:	Contract Method &Type	Performing Activity& Location	Total PYs Cost	FY2003 Cost	FY2003 Award Date	FY2004 Cost	FY2004 Award Date	FY2005 Cost	FY2005 Award Date	Costto Complete	Total Cost	Target Valueof Contract
CompletePAC -3Missile Engineeringand ManufacturingDevelopment (EMD)Program.												
SETA	CPAF	CAS/AL	54233	0							54233	
OGA/In-House		Various	89865	0							89865	
EngineeringSupport	SS/CPIF	Raytheon/MA	83875	0							83875	
EvolutionaryDevelopment												
SETA	CPAF	CAS/AL	1420	3110							4530	
OGA		PO/AL	200	4000							4200	
BlockTestProgramwith LMMFCandRaytheon												
SETA	CPAF	CAS/AL		4300							4300	
OGA		PO		4882							4882	
EngineeringSpt	CPAF			8976							8976	
SubtotalSupportCosts			229593	25268		0		0			254861	

Remarks

FY2003effortsinclude:
 -Testplanning,conduct,preparation,andanalysisoftheCongressionalldirectRippleFireTestandfuturetestefforts.
 -SystemEngineeringanalysisissupportingthecontinuingMDA -BMDSdevelopmentefforts(CCB,ICS,Test&Integration).

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III.TestandEvaluationCost(\$inThousands)												
CostCategories:	Contract Method &Type	Performing Activity& Location	Total PYs Cost	FY2003 Cost	FY2003 Award Date	FY2004 Cost	FY2004 Award Date	FY2005 Cost	FY2005 Award Date	Costto Complete	Total Cost	Target Valueof Contract
CompletePAC -3Missile Engineeringand ManufacturingDevelopment (EMD)Program.												
WhiteSandsMissileRange	MIPR	WSMR/NM	106361	0							106361	
ADSAM	MIPR		4668	0							4668	
Impact			3467	0							3467	
CompleteOperationalTest& Evaluation												
OperationalTestSupport			67202	2000							69202	
ContinuePAC -3Targetand TestSupport												
Targets		SMDC/AL	108371								108371	
Lethality		SMDC/AL	37628								37628	
BlockTestProgramwith LMMFCandRaytheon												
WhiteSandsMissileRange	MIPR	WSMR,NM		8520							8520	
Targets	MIPR	SMDC/AL		12534							12534	
EvolutionaryDevelopment												
WSMR				5819							5819	
Targets				5000							5000	
SubtotalTestandEvaluation			327697	33873		0		0			361570	

Remarks
 FY2003effortsinclude: -Testplanning, conduct,preparation,targets,andanalysisoftheCongressionallydirectedRippleFireTestandfuturetestefforts.

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IV.ManagementServicesCost(\$inThousands)												
CostCategories:	Contract Method &Type	Performing Activity& Location	Total PYs Cost	FY2003 Cost	FY2003 Award Date	FY2004 Cost	FY2004 Award Date	FY2005 Cost	FY2005 Award Date	Costto Complete	Total Cost	Target Valueof Contract
SubtotalManagementServices												

Remarks

ProjectTotalCost			1838408	176155		0		0			2014563	
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Remarks

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MDAExhibitR -4ScheduleProfile	Date February2003
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FiscalYear	2002				2003				2004				2005				2006				2007				2008				2009											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
TestingMilestones																																								
Configuration3InitialOperationalT&E (IOT&E)																																								
PAC-3MissileFOT								▲																																
Decisions																																								
InitiatePAC-3EvolutionaryBlock Upgrades	▲																																							
PAC-3IOC																▲																								
PAC-3MissileBlock00ProductionDAB																																								

ExhibitR -4reflectsonlythosedecisions/milestonesapplicabletoMDA funding.Futuredecisions/milestones(FY04 -09)arereflectedintheArmysubmissionforPE0604865A.

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MDAExhibitR -4AScheduleDetail						Date February2003		
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ScheduleProfile	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
TestingMilestones								
Configuration3InitialOperationalT&E(IOT&E)	2Q-4Q							
PAC -3MissileFOT		4Q						
Decisions								
InitiatePAC -3EvolutionaryBlockUpgrades	1Q							
PAC -3IOC				4Q				
PAC -3MissileBlock00ProductionDAB	1Q							

ExhibitR -4reflectsonlythosedecisions/milestonesapplicabletoMDAfunding.Futuredecisions/milestones(FY04 -09)arereflectedintheArmysubmissionforPE0604865A.