		]	<b>Jate</b>						
MDA Exhibit R-2 RDT&E Budget Item Justification	n		]	February 20	004				
APPROPRIATION/BUDGET ACTIVITY	R-1 N	IOMENCLA	TURE						
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) 0603884C Ballistic Missile Defense Sensors									
COST (\$ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009		
Total PE Cost	327,013	425,421	591,957	790,265	1,453,679	1,122,189	1,232,893		
5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS)	249,896	0	0	0	0	0	0		
0812 Space Tracking and Surveillance System (STSS) Block 2006	0	266,601	273,938	259,620	182,856	47,274	51,503		
0912 Space Tracking and Surveillance System (STSS) Block 2008	0	0	0	0	24,905	29,770	19,687		
0012 Space Tracking and Surveillance System (STSS) Block 2010	0	22,263	47,833	253,828	637,215	919,830	1,112,973		
5049 Russian-American Observation Satellite(s) Program (RAMOS)	25,761	0	0	0	0	0	0		
0403 Russian-American Observation Satellite(s) Program (RAMOS)	0	29,285	0	0	0	0	0		
5011 Ballistic Missile Defense Radars Block 2006	12,000	0	0	0	0	0	0		
0811 Ballistic Missile Defense Radars Block 2006	0	99,848	256,101	260,114	487,212	216	221		
0911 Ballistic Missile Defense Radars Block 2008	0	0	0	0	100,620	102,207	22,130		

Note: The Space Tracking and Surveillance System (STSS) has been broken into three STSS capability blocks (STSS Block 2006 -- Project 0812, STSS Block 2008 -- Project 0912, and STSS Future Blocks -- Project 0012). Two of the other projects in this PE are not block specific, but have undergone project code changes. Russian-American Observation Satellites (RAMOS) (Project 5049) has been changed to Project 0403. Program-Wide Support (Project 5090) has been changed to Project 0602. Forward Deployable Radar project efforts beginning in FY 2003 (Project 5011) have been changed and divided into two Forward Deployable Radar capability blocks (Forward Deployable Radar Block 2006 -- Project 0811 and Forward Deployable Radar Block 2008 -- Project 0911).

34.878

7,424

14,085

The Test and Evaluation (Project 5060) activity was transferred to Project 0812 in FY 2004.

Due to the lack of progress on the RAMOS Government-to-Government agreement with Russia, and the uncertainty this causes, MDA intends to terminate the RAMOS program. MDA received the Russian Government's draft MOU in July 2002 and despite 17 months of discussions, have been unable to complete a government-to-government agreement. Without this agreement, which includes the fundamental issue of taxes and liabilities, the RAMOS program cannot be executed beyond the design stage.

MDA will continue to discuss an overarching MOU to govern defense cooperation with Russia, and is actively exploring alternative more beneficial missile defense cooperative projects with Russia, that enjoy the support of the Government of the Russian Federation.

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

5060 Test & Evaluation

5090 Program-Wide Support

0602 Program-Wide Support

Our goal is to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight. By the beginning of FY 2005, we will put the BMDS on alert and, for the first time, we will have a capability to defeat a ballistic missile threatening the United States. In FY 2005 and the remainder of the FYDP, we will increase the breadth and depth of our defense by adding forward-deployed, networked sensors, by adding interceptors at sea and on land, and by adding layers of increasingly capable weapons and sensors. Throughout this documentation, therefore, every activity can be tied to one of our four objectives: complete, verify and test the Initial Defensive Capability; put the Ballistic Missile Defense System on alert; develop procedures and logistics to perform and sustain concurrent testing and operations; and enhance the BMDS capability.

MDA Exhibit R-2 (PE 0603884C)

0

26,379

22,892

0

20,871

16,703

MDA Exhibit R-2 RDT&E Budget Item Justification	Date February 2004
APPROPRIATION/BUDGET ACTIVITY R-1	-1 NOMENCLATURE 603884C Ballistic Missile Defense Sensors

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

As a part of the total BMDS, the Sensors Program Element (PE) funds the sensor-related element portions of Blocks 2006, 2008, and 2010 and other sensor-related mission area investment activities. Technologies and capabilities developed under the Sensors Program Element include: the STSS, RAMOS, Forward Deployable Radar, and related sensor initiatives. The BMDS spiral development approach allows these sensor technologies and capabilities to be incorporated as they mature and evolve into a network of sensors at the BMDS level. Sensor elements in this PE have been developed in coordination with Missile Defense National Team (MDNT) cooperation to help ensure that the elements are focused as a single, integrated system. This sensor data is used to detect, track, and discriminate ballistic missile threats; to control interceptors; and to support kill assessment and re-targeting. The STSS project will be evaluating the utility of infrared (IR) surveillance capabilities with the specific intent to enhance BMDS engagement sequences.

Based on Presidential direction, MDA is developing an initial defensive operational capability that is based on the BMDS Test Bed and augmented with additional development assets. MDA will continue to employ the Test Bed for testing beyond initial fielding to evolve an integrated, layered Ballistic Missile Defense capability. Each of the Sensor Program Elements will be integrated into the BMDS Test Bed to ensure the technology is mature and ready for inclusion in a BMDS Block upgrade.

The efforts in this Sensors Program Element have been structured to take advantage of opportunities previously prohibited by the ABM Treaty. The treaty's demise allows MDA to extend and network land, sea, air, and space based sensors for ballistic missile defense. Therefore, MDA is investing in an integrated, layered approach to sensors that includes diversity in spectra, basing modes and technologies, as well as flexibility in sensor locations, to form a sensor network that is integrated with the BMDS through the Command & Control, Battle Management, and Communication (C2BMC) system. This strategy will minimize gaps in sensor coverage to improve track continuity and situational awareness. Overlapping sensor coverage with a diversity of sensor types will improve track discrimination and kill assessments. The extended sensor coverage and accuracy provided by a network of layered sensors makes the BMDS more efficient, thereby reducing the number of target engagements needed to ensure a sufficient probability of success.

This capability will be delivered using the BMDS Block approach by integrating and incrementally improving current sensor capabilities, initiating RDT&E programs to fill gaps in the global sensor network, and improving sensor performance, flexibility and survivability.

The STSS project is expected to provide the BMDS with the capability to globally track and discriminate ballistic missiles from the boost phase through the midcourse phase up until intercept or reentry. STSS sensors will provide data to close the fire control loop with BMDS interceptors allowing earlier and if necessary additional shots. STSS's infrared sensors, when combined with radars, provide robustness against countermeasures. The STSS project will develop a series of R&D satellites beginning in Block 2006, and a common ground station infrastructure for all Blocks. Successive R&D satellites will field increasingly advanced technology. When an STSS constellation is adequately populated and integrated into the C2BMC system, the BMDS will have a global 24-hour, 7-day-a-week capability to track all ballistic missiles extending the kinematic range of the BMDS interceptor inventory. Block 2006 provides proof of concept to the BMDS with two satellites derived from existing hardware. Block 2008 provides an incremental upgrade to the satellite ground network and software. Funding for Block 2008 capability begins in FY 2007.

The Forward Deployable Radar project will significantly enhance BMDS effectiveness by expanding the battlespace. The Forward Deployable Radar project will be a land based component but will have potential for a sea based configuration. The Forward Deployable Radar will provide early detection, tracking, and discrimination of threat missiles, providing data to the BMDS sensor network. The Forward Deployable Radar project will evaluate advanced algorithms and prototype the interfaces to the BMDS C2BMC using the TPS-X radar. In parallel, the Sensor Program will define improvements or modifications to both MDA and non-MDA owned sensors that have been identified for performance enhancement of the BMDS.

Current plans call for the initial Forward Deployable Radar to be available in CY 2006. Contract options for three additional forward based radars will be executed in FY 2005, FY 2006, and FY 2007 respectively. These additional radars will be integrated into BMDS in Block 06 and beyond. Evolving radar configurations will use additional algorithms and provide enhanced capabilities to

	Date
MDA Exhibit R-2 RDT&E Budget Item Justification	February 2004
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missile Defense Sensors

support the BMDS. The Forward Deployable Radar initiative, beginning in FY 2006, will provide for continued sensor research to improve the capabilities and for a BMDS configuration(s) for Block 2008 and beyond.

Program-Wide Support under this project covers personnel and related support costs, statutory and fiscal requirements. May include funding for government civilians performing program-wide oversight functions such as contracting, program integration, safety, quality and mission assurance at Missile Defense Agency (MDA); cost estimating; audit; technology integration across all MDA projects; and assessment of schedule, cost and performance, documentation of related programmatic issues and, foreign currency fluctuations on limited number of foreign contracts. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510.

B. Program Change Summary	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2004 PB)	350,436	438,242	562,752
Current President's Budget (FY 2005 PB)	327,013	425,421	591,957
Total Adjustments	-23,423	-12,821	29,205
Congressional Specific Program Adjustments	0	-8,000	0
Congressional Undistributed Adjustments	0	-4,821	0
Reprogrammings	1,238	0	29,205
SBIR/STTR Transfer	-24,661	0	0

The FY 2003 Sensors Program Element budget request in the FY 2004 budget compared to the FY 2005 budget showed a reduction of \$23,423,000. This resulted from a reduction of \$24,661,000 based on a transfer to the Small Business Innovative Research Program; and an increase of \$1,238,000 based on reprogramming that is consistent with priorities.

The FY 2004 Sensors Program Element budget request in the FY 2004 budget compared to the FY 2005 budget showed a reduction of \$12,821,000. This resulted from a reduction of \$4,821,000 based on Congressional Undistributed Adjustments; and a reduction of \$8,000,000 based on the Congressional Specified Adjustments.

The FY 2005 Sensors Program Element budget request in the FY 2004 budget compared to the FY 2005 budget showed an increase of \$29,205,000. This increase reflects the Missile Defense Agency's realignment of resources to support higher Agency priorities.

	]	Date					
MDA Exhibit R-2A RDT&E Project Justification			]	February 20	004		
APPROPRIATION/BUDGET ACTIVITY	R-	-1 NOMENCLA	TURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&	(P) 00	603884C Ballis	stic Missile	Defense Se	nsors		
COST (\$ in Thousands)	FY 200	03 FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS)	249,8	396 0	0	0	0	0	0
RDT&E Articles Qty		0 0	0	0	0	0	0
N. T. AGGG GRING I. GERGG I. I I. II. I. I. D. I. TOLLE EVAGGA	1.1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	raa 1 1	cc : 1	.1 1 . 1	D : 001	12 00 12 1

Note: The 2003 SBIRS Low/STSS development is described in a single Project, 5041. For FY 2004 and beyond, the continued STSS development effort is described in three Projects: 0812, 0912, and 0012.

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

The STSS is an element of the BMDS. Through a spiral development process it will provide space-based infrared capability to acquire, track and discriminate ballistic missiles and supply over-the-horizon fire control to BMDS weapon systems extending their effective range. The near-term emphasis for STSS is on tracking performance, followed by improvements in the sensor's discrimination capability.

This development activity provides progressive improvements in ground station and experimental satellites, aligned with the BMDS two-year capability Blocks:

The Block 2006 STSS uses largely existing satellite hardware as a low risk opportunity to bring a space based capability into the Block 2006 BMDS Test Bed. Block 2006 consists of two satellites, to be put in low earth orbit, ground station and software to support communication of data from these satellites to the BMDS. These two satellites will be launched on a single Delta II launch vehicle in the FY 2007 timeframe. Key activities in the 2003 timeframe included initiation of a new single contract for the Block 2006 program, hardware checkout and initial testing. FY 2004 and beyond activity is described in Project 0812. The Block 2006 program also develops the STSS Surrogate Test Bed (SSTB), which will be integrated with the BMD Test Bed. The SSTB demonstrates data fusion processing of data from surrogate infrared and visible sensors such as the AF Maui Optical Station (AMOS) telescopes, and High Altitude Observatory (HALO) II aircraft, replicating the processing and interfaces of the Block 2006 satellite ground station. The SSTB is a key pathfinder for the Block 2006 integration into the BMDS. Activity in the 2003 timeframe demonstrates functionality in key BMDS tests. The FY 2004 and beyond activity is described in Project 0812.

The Block 2008 STSS upgrades the ground station and software aspects of the Block 2006 STSS configuration. There is no near-term funding for this activity. FY 2004 and beyond activity is described in Project 0912.

#### B. Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Block 2006	203,041		
RDT&E Articles (Quantity)			

#### FY 2003 accomplishments:

- Continued surrogate sensor data collection with the AF Maui Optical Station (AMOS) telescope and High Altitude Observatory (HALO) II aircraft.
- Continued further integration with the BMDS Test Bed.
- Conducted full inventory and check-out of Flight Demonstration System hardware required for Block 2006.
- Performed analysis of the benefits of including an improved acquisition sensor on second satellite.
- Conducted Delta System Definition Review (SDR).
- Conducted Delta Preliminary Design Review (PDR).

FY 2004 and 2005 plans and schedules are described in Project 0812.

Project: 5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS)

	Date				
MDA Exhibit R-2A RDT&E Project Justi	fication		Febr	ruary 2004	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCL	ATURE		
RDT&E, DW/04 Advanced Component Development and Prototypes	(ACD&P)	0603884C Bal	listic Missile Defe	ense Sensors	;
	FY 2003		FY 2004	4	FY 2005
Future Block Development		46,855			
RDT&E Articles (Quantity)					

FY 2003 accomplishments:

- Conducted trades for Block 2010 program.
- Continued other risk reduction efforts.\*

Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.

C. Other Program Funding Summary

								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing
PE 0603175C Ballistic Missile Defense Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing

Project: 5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS)

5 of 71

UNCLASSIFIED

<sup>\*</sup> Other risk reduction activities includes cryocoolers, batteries, Radiation Hardened Parts, phenomenology, optical filters, Midcourse Space Experiment (MSX) data reduction, contamination control, focal plane arrays {visible and long-wave} and survivability.

MDA I APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Compone									
	FY 2003 FY 2004 FY 2005 FY 2006 FY 2007 FY 2008 FY 2009 Complete								Total Cost
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing

#### **D.** Acquisition Strategy

The STSS follows 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 STSS effort is being pursued through a single prime contractor, Northrop Grumman Space Technology (NGST), formerly TRW, with subcontractors playing key roles in systems engineering, satellite bus development and sensor payloads. The program develops a ground station and series of R&D satellites aligned to the BMDS capability blocks. A contract for the Block 2006 activity and the initial definition work on Block 2010 was awarded in fourth quarter FY 2002.

The restructured program implements MDA's capability-based acquisition strategy by a) using largely existing satellite hardware as a low risk opportunity, b) building upon the lessons learned from previous development efforts and c) establishing a series of planned enhancements to bring added capability to the BMDS. From an overall system standpoint, MDA will measure the capabilities of each development cycle and make decisions about the sensor complex for eventual integration into the BMDS.

Project: 5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS)

	MDA Exhi	bit R-3 RDT&E Pro	ject Cost Ana	lysis			Date <b>Februa</b>	ry 2004		
APPROPRIATION/BUDGET A	CTIVITY				R-1 NOMEN	ICLATURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					0603884C	Ballistic Mis	ssile Defens	e Sensors		
I. Product Development Cost (\$ i	in Thousands )									
	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Block 2006										
		NGST/								
Capability Based R&D Contract	SS/CPAF	CA	187,897					CONT.	187,897	CONT.
Future Block Development										
		NGST/								
Capability Based R&D Contract	SS/CPAF	CA	41,670					CONT.	41,670	CONT.
Subtotal Product Development			229,567	0		0		0	229567	

#### Remarks

Capability Based R&D Contract is a multi-year contract covering the testing, integration, and on-orbit operations of 2 Block 2006 satellites and system architecture trade studies of the Block 2010 effort. This contract may be extended to add the Block 2008 effort.

Beginning in FY 2004, this contract in Block 2006 continued in Project 0812. Future Block Development (Block 2010) efforts continued in Project 0012.

II. Support Costs Cost (\$ in Thousands)

11. Support Costs Cost (\$ III 1110)	11. Support Costs Cost (\$\pi\$ in Thousands)											
	Contract	Performing	Total		FY 2004		FY 2005			Target		
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of		
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract		
Block 2006												
Program Support (OGC)	Various	Various	12,934					TBD	12,934	CONT.		
Program Definition Support	Various	Various	10,149					TBD	10,149	CONT.		
SBIRS Low Surrogate Test Bed	Various	Various	7,170					TBD	7,170	CONT.		
Future Block Development												
Risk Reduction	Various	Various	14,000					TBD	14,000	CONT.		
Subtotal Support Costs			44,253	0		0		0	44253			

#### Remarks

All program support and program definition support costs have been allocated to Block 2006, through the launch in FY07. Program definition support has been redefined as Advanced Algorithm Development in Project 0812 under SE/PM.

Project: 5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS)

			UNC	LASSIF	IED						
							Date	•••			
	MDA Exhi	ibit R-3 RDT&E Proj	ject Cost Ana	lysis			Februa	ry 2004			
APPROPRIATION/BUDGET AC				,	R-1 NOMENCLATURE						
RDT&E, DW/04 Advanced (	Component I	Development and Pr	rototypes (A	.CD&P)	0603884C I	Ballistic Mis	ssile Defens	e Sensors			
III. Test and Evaluation Cost (\$ i	n Thousands )										
	Contract	Performing	Total		FY 2004		FY 2005			Target	
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of	
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract	
Subtotal Test and Evaluation				1		, ,					
Remarks											
W. M	ф • ПП	`									
IV. Management Services Cost (\$	Contract	Performing	Total		FY 2004	T	FY 2005	Г		Target	
·	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of	
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Cost to	Cost	Contract	
Block 2006	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract	
Block 2006	<u> </u> '	A ED CGD A CE /		<del> </del>		<del> </del> '	<u> </u>				
	FEDDG	AEROSPACE/	26.510	1	1	'	'	GOVE	2 < 510	TTD D	
FFRDC	FFRDC	CA	36,519	1		<u> </u>	ļ!	CONT.	36,519	TBD	
Subtotal Management Services	<u> </u>		36,519	0		0		0	36519		
Remarks											
All FFRDC costs have been allocated	1 to Block 2006,	through the launch in FY	707.								
Project Total Cost	<u> </u>		310,339	0	T	0			310,339		
Remarks				-							

Project: 5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS)

MDA	Exh	ibit	R-4 S	Sche	dule	Pro	file											Date F <b>ebr</b>	uar	y 20	04							
APPROPRIATION/BUDGET ACTIVITY  RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)						<b>'</b> )	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors																					
Fiscal Year		20	003			20	04			20	005			20	06			20	07			20	80			20	09	
	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
BLOCK 2006																												
STSS Design, Fab, Test, Ops (FYDP detail see 0812)	<b>△</b>				_	Δ																					$\equiv$	<b>_</b> △
Block 2010	_																											
Architecture Trade Studies	<u> </u>			$\triangle$																								
Future Blocks (See Proj 0012)					Δ		<u> </u>																			$\blacksquare$	ightharpoons	≜
Risk Reduction Efforts	<u>_</u>			4																						Ш		
																										Ш	$\dashv$	
																										$\square$	$\dashv$	
																										$\vdash \vdash$	$\dashv$	
																										$\vdash \vdash$		
																										$\vdash\vdash$	$\dashv$	-
																										$\vdash \vdash$	$\dashv$	
																										$\square$		
																										$\square$		

Project: 5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS)

MDA H	Exhibit R-4A Sch	edule Detail				Date <b>February 20</b>	04	
APPROPRIATION/BUDGET ACTIVITY  RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)  R-1 NOMENCLATURE 0603884C Ballistic Missile							sors	
Schedule Profile	FY 2003	FY 2004	FY 2	2005	FY 2006	FY 2007	FY 2008	FY 2009
BLOCK 2006								
STSS Design, Fab, Test, Ops (FYDP detail see 0812)	1Q-4Q	1Q-4Q	1Q	-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Block 2010								
Architecture Trade Studies	1Q-4Q							
Future Blocks (See Proj 0012)		1Q-4Q	1Q	-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Risk Reduction Efforts	1Q-4Q							

Project: 5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS)

10 of 71 **UNCLASSIFIED** 

	Date											
MDA Exhibit R-2A RDT&E Project Justification	February 2004											
APPROPRIATION/BUDGET ACTIVITY	R-	-1 NOMENCLA	TURE									
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) 0603884C Ballistic Missile Defense Sensors												
COST (\$ in Thousands)	FY 200	3 FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009					
0812 Space Tracking and Surveillance System (STSS) Block 2006		0 266,601	273,938	259,620	182,856	47,274	51,503					
RDT&E Articles Qty		0 0	0	1	4	2	0					

Note: In FY 2003 STSS development is described in a single Project, 5041. For FY 2004 and beyond, the continued STSS development effort is described in three Projects: 0812, 0912, and 0012. This development activity provides progressive improvements in ground station and experimental satellites, aligned with the BMDS two-year capability Blocks.

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

STSS is an element of the BMDS. Through a spiral development process it will provide space-based infrared capability to acquire, track and discriminate ballistic missiles and supply over-the-horizon fire control to BMDS weapon systems to extend its effective range. The near term emphasis for STSS is on tracking performance, followed by improvements in the sensor's discrimination capability.

The Block 2006 STSS uses largely existing satellite hardware from the Flight Demonstration System (FDS) as a low risk opportunity to bring a space based capability into the Block 2006 BMDS Test Bed. Block 2006 STSS consists of two satellites with visible and infrared sensor suites, to be put in low earth orbit for initial testing. These two satellites will provide valuable risk reduction and concept demonstration information about acquisition, tracking, and discrimination functionality including stereo data fusion, cueing radars over the horizon and providing interceptor handovers. Ultimately, Block 2006 STSS will include a performance assessment of the STSS contribution to over-the-horizon fire control to BMDS interceptors. All on-orbit testing with ballistic missile targets will be orchestrated to allow BMDS participation. The budget includes launch services for the two Block 2006 STSS satellites to be launched on a single Delta II launch vehicle in FY 2007.

Block 2006 STSS also develops the ground segment and software algorithms required to operate and process data from the Block 2006 STSS satellites with growth path to the ground system required for an expanding constellation of R&D satellites developed over subsequent blocks.

Block 2006 also provides program support and program definition support through the end of FY 2007. Funding for targets to be used in Block 2006 is included beginning in FY 2005.

The Block 2006 program also develops the STSS Surrogate Test Bed (SSTB), which will be integrated with the BMD Test Bed. The SSTB demonstrates data fusion processing of data from surrogate infrared and visible sensors such as the AF Maui Optical Station (AMOS) telescopes and High Altitude Observatory (HALO) II aircraft, replicating the processing and interfaces of the Block 2006 satellite ground station. The SSTB is a key pathfinder for the Block 2006 integration into the BMDS. The SSTB will be primarily performed by the government program office.

The STSS Surrogate Test Bed will leverage the work done on the Airborne Infrared Surveillance (AIRS) effort.

#### **B.** Accomplishments/Planned Program

Diffeed manner of the transfer										
	FY 2003	FY 2004	FY 2005							
Space		120,427	159,950							
RDT&E Articles (Quantity)										

FY 2004 Planned Program:

- Complete Track Sensor Assembly Integration and Test (AI&T)
- Conduct Delta CDR

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

# APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) APPROPRIATION/BUDGET ACTIVITY ROT &E, DW/04 Advanced Component Development and Prototypes (ACD&P) Date February 2004 R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors

- Complete Payload Software Build 2
- Complete Closed Loop testing of Sensor Payload Software
- Initial payment to NASA toward Launch Services for the 2 Block 2006 satellites

FY 2005 Planned Program:

- Complete Payload Software Build 3
- Conduct System Compatibility Tests (Payload and Satellite Bus)
- Initiate Space Vehicle Integration
- Continue payment to NASA toward Launch Services for the 2 Block 2006 satellites

	FY 2003	FY 2004	FY 2005
Ground		44,075	22,834
RDT&E Articles (Quantity)			

FY 2004 Planned Program:

- Mature Ground System Design
- Initiate Satellite Operation Training Plan

FY 2005 Planned Program:

- Ground Hardware Integration
- Conduct Initial Crew Training

	FY 2003	FY 2004	FY 2005
Government		21,345	23,620
RDT&E Articles (Quantity)			

FY 2004 Planned Program:

- FFRDC Requirements includes Aerospace and Mitre Personnel Support
- Program Office Support includes Security Support, TDY, Cost Estimating Support, Management Services, Hardware and Software purchases and maintenance, Computer Network Support, and Supplies

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

		Date
MDA Exhibit R-2A RDT&E Project Justification	February 2004	
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missil	le Defense Sensors

FY 2005 Planned Program:

- FFRDC Requirements includes Aerospace and Mitre Personnel Support
- Program Office Support includes Security Support, TDY, Cost Estimating Support, Management Services, Hardware and Software purchases and maintenance, Computer Network Support, and Supplies

	FY 2003	FY 2004	FY 2005
SE/PM		68,459	61,848
RDT&E Articles (Quantity)			

FY 2004 Planned Program:

- Perform ground test data analysis.
- Conduct initial System Compatibility Tests (Payload and Satellite Bus and Ground System)
- Advanced Algorithm Development

FY 2005 Planned Program:

- Conduct System Compatibility Tests (Payload, Satellite Bus and Ground System)
- Advanced Algorithm Development

FY 2003	FY 2004	FY 2005
	12,295	5,686
	FY 2003	12 295

FY 2004 Planned Program:

- Perform HALO II aircraft modifications to enhance tracking and operational performance in support of the Airborne Infrared Surveillance (AIRS) acquisition strategy
- Evaluate the utility of IR/Vis sensors in BMDS Engagement sequences using HALO II measurements
- Develop acquisition strategy for next generation airborne IR/Vis capability if supported by HALO II performance
- Continue developing connectivity and algorithms toward providing near real time IR and IR-RADAR fused data to the BMDS
- The STSS Surrogate Test Bed (SSTB) will be integrated with the Command and Control Battle Management Center(C2BMC) X-Lab at the Joint National Integration Center (JNIC)

FY 2005 Planned Program

- Continue evaluation of IR/Vis sensors' utility in BMDS Engagement sequences using HALO II measurements
- Continue developing connectivity and algorithms toward providing near real time IR and IR-RADAR fused data to the BMDS
- The SSTB Fusion Workstation will physically move from the MHPCC at Maui to the STSS Joint Satellite Control Facility (JSCF) at the Joint National Integration Center (JNIC) and become a part of the STSS Ground Segment.

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

		Date
MDA Exhibit R-2A RDT&E Project Justification		February 2004
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missil	e Defense Sensors

C. Other Program Funding Summary									
								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603175C Ballistic Missile Defense									
Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts,									
Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense									
System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense									
Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense	2.056.025	2.744.055	4 40 4 225	2 0 5 7 0 0 0	2 005 1 45	1 001 200	1 000 055	g .: .	g
Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost	705.642	(17.270	400 614	555.667	611.726	472 602	455.061	g .: .	G .: :
Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603886C Ballistic Missile Defense	0	117.710	511.262	1 110 500	1 717 400	2 106 521	2 440 222	g .: .	a .: :
System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test	0	(25.792	716 427	672 476	(5( 15)	CE 4 015	699 110	Ctii	Gtii
and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense		205 200	419 609	421.040	445 071	456 220	460 621	Continuing	Continuing
Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
	U	443,330	4/9,/04	472,700	327,341	339,210	308,303	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile	007,010	0	U	0	U	U	U	Continuing	Continuing
Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative	130,722	- V	- V	- V	- V		- V	Continuing	Continuing
Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters -	7,432	17,527	13,001	12,750	12,000	13,130	13,470	Continuing	Communic
MDA	35,331	92,449	141,923	146.099	145.112	151,727	154,583	Continuing	Continuing
MBH	33,331	72,117	111,723	110,077	113,112	131,727	15 1,5 05	Continuing	Continuing

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

		Date
MDA Exhibit R-2A RDT&E Project Justification		February 2004
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missil	e Defense Sensors

#### D. Acquisition Strategy

STSS follows 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 STSS effort is being pursued through a single prime contractor, Northrop Grumman Space Technology (NGST), formerly TRW, with subcontractors playing key roles in systems engineering, satellite bus development and sensor payloads. The program develops a ground station and series of R&D satellites aligned to the BMDS capability blocks. A contract for the Block 2006 activity and the initial definition work on Block 2010 was awarded in fourth quarter FY 2002.

The restructured program implements MDA's capability-based acquisition strategy by a) using largely existing satellite hardware as a low risk opportunity, b) building upon the lessons learned from previous development efforts and c) establishing a series of planned enhancements to bring added capability to the BMDS. From an overall system standpoint, MDA will measure the capabilities of each development cycle and make decisions about the sensor complex for eventual integration into the BMDS.

Acquisition Strategy For the AIRS Program:

- Phase I-A and Phase I-B run concurrently
- Phase I-A: HALO II demonstration effort
- Phase I-B: AIRS Acquisition Strategy Development
- Phase II (AIRS Procurement) implemented if results of Phase I warrant next step

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

	MDA Exhi	bit R-3 RDT&E Pro	oiect Cost Ana	lvsis			Date <b>Februa</b> i	rv 2004		
APPROPRIATION/BUDGET AC			9000 0000 11110	1,515	R-1 NOMEN	ICLATURE	1 0 2 1 1 1 1	1 <b>j =</b> 0 0 1		
RDT&E, DW/04 Advanced (		Development and F	Prototypes (A	CD&P)	0603884C I		sile Defens	e Sensors		
I. Product Development Cost (\$ in		-								
•	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Space										
		NGST/								
Capability Based R&D Contract	SS/CPAF	CA		116,434		117,050		CONT.	233,484	CONT.
		Various/								
Launch Vehicle Integration	Various	Various		3,993	1/3Q	42,700	1/3Q	TBD	46,693	TBD
		Various/								
Target Acquisition	Various	Various				200	1/3Q	TBD	200	TBD
Ground										
		NGST/								
Capability Based R&D Contract	SS/CPAF	CA		44,075		22,834		CONT.	66,909	CONT.
SE/PM										
		NGST/								
Capability Based R&D Contract	SS/CPAF	CA		63,694		56,202		CONT.	119,896	CONT.
		Various/								
Advanced Algorithm Development	Various	Various		4,765	1/3Q	5,646	1/3Q	TBD	10,411	TBD
IR Engagement Sequence										
Airborne Infrared Surveillance		Various/								
(AIRS)	Various	Various		7,500	3Q			TBD	7,500	TBD
		Various/								
STSS Surrogate Test Bed	Various	Various		4,795	1/3Q	5,686	1/3Q	TBD	10,481	TBD
Subtotal Product Development			0	245,256		250,318		0	495574	
Remarks										

#### Remarks

The Capability Based R&D contract was awarded in FY 2002. Prior year and FY 2003 costs are described in Project 5041.

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

	MDA E-l-S	L4 D 2 DDT 0 E D	inat Cart Ama	I			Date <b>Februa</b> i	2004		
APPROPRIATION/BUDGET AC		bit R-3 RDT&E Pro	ject Cost Ana.	lysis	R-1 NOMEN	ICI ATUDE	rebruai	ry 2004		
RDT&E, DW/04 Advanced		Novelenment and D	rototypos (A	CD &D)		Ballistic Mis	sila Dofonsa	Concore		
, , , , , , , , , , , , , , , , , , ,		Development and F	rototypes (A	CD&F)	0003664C I	Danisuc Iviis	she Defense	e Sensors		
II. Support Costs Cost (\$ in Thou		Performing	Total		FY 2004		FY 2005	1	1	Target
	Contract Method	Activity &	PYs	FY 2004		FY 2005		Cost to	Total	Value of
Cost Categories:	& Type	Activity &  Location	Cost	Cost	Award Date	Cost	Award Date	Cost to	Cost	Contract
Government	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Government		Various/								
System Program Office Support	Various	CA		9,905	1/40	9,500	1/40	TBD	10.405	TDD
	various	CA	0	9,905	1/4Q	9,500	1/4Q	0	19,405 19405	TBD
Subtotal Support Costs			0	9,905		9,500		U	19405	
Remarks										
All system program office support co	sts have been all	ocated to Block 2006, th	rough the launcl	n in FY07.						
system programs state suppose										
III. Test and Evaluation Cost (\$ i	n Thousands )		<del>.</del>			<u> </u>				
	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Subtotal Test and Evaluation										
Remarks										
W. W										
IV. Management Services Cost (\$	Contract	Performing	Total		FY 2004		FY 2005	1	1	Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Government	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Government		AEROSPACE/								
FFRDC	EEDDC	CA		11 440	1/20	14 120	1/20	CONT	25.500	CONT
	FFRDC	CA	0	11,440 11,440	1/2Q	14,120 14,120	1/2Q	CONT.	25,560 25560	CONT.
Subtotal Management Services			0	11,440		14,120		0	25500	
Remarks										
All FFRDC costs have been allocated	l to Block 2006,	through the launch in FY	707.							
Project Total Cost			0	266,601		273,938			540,539	
Remarks	1		1	·	1					

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

Fiscal Year	1.		003				004			20					006	Π.			07	Ι.	Ι.	_	800	I .		20		
DI O CIVI Anna	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	Ľ
BLOCK 2006 IR Engagement Sequence						Δ.														$\Box_{\Lambda}$	Г	т	П	Г				
STSS Initial Hardware Checkout																				$\stackrel{\leftarrow}{\vdash}$								
STSS Capability Review			Δ																									
STSS Capability Review STSS Delta PDR			<u> </u>																			T						$\vdash$
STSS Delta TDR					Δ																							$\vdash$
System Compatibility Tests							Δ	Δ			Δ	Δ	Δ															Г
System Test/Operational Planning	<u>_</u>				$\Delta$	Δ						$\Delta$																Г
Operational and Test Readiness																												
Spacecraft Testbed	<u>_</u>				$\Delta$	Δ		1																				
Spacecraft Integration and Test					Δ							Δ																
Payload Redesign	<b>△</b>			1																								
Payload Fabrication and Integration & Test	<b>△</b>				1	Δ																						
Satellite Integration and Test										4							$\vdash$											
Ground Station Design					$\triangle$																							
Ground Software Development					1	Δ							$\Delta$															
																												Ĺ

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

MDA	Exh	ibit I	R-4 S	Sche	dule	Pro	file											Date F <b>ebr</b>	uar	y 20	04							
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component De	velo	pme	nt a	nd I	Prot	otyp	es (	ACI	D&F	<b>P</b> )				NCLA Balli			sile	Defe	ense	Sen	sors	S						
Fiscal Year		20	03			20	04			20	005			20	06			20	07			20	800			200	)9	
	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
BLOCK 2006																												
Ground Hardware/Segment Integration & Test	<u> </u>				$\triangle$	Δ	$\vdash$							<u> </u>													$\perp \downarrow$	
Launch Integration and Test																	4	$\triangle$									$\dashv$	
Launch (2 Satellites)																			Δ								_	
STSS On-Orbit Operations																			Δ							#		
																											_	
																											_	
																											$\dashv$	
																											$\dashv$	
																											$\dashv$	
																											_	
																											$\dashv$	
																										$\dashv$	$\dashv$	
																										-	$\dashv$	
																										$\dashv$	$\dashv$	_
																										$\dashv$	$\dashv$	

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

MD	A Exhibit R-4A Sch	edule Detail			Date <b>February 20</b>	004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component D	evelopment and l	Prototypes (ACI		NOMENCLATURE  3884C Ballistic Mis	sile Defense Ser	nsors	
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
BLOCK 2006							
IR Engagement Sequence	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
STSS Initial Hardware Checkout	1Q-4Q						
STSS Capability Review	3Q						
STSS Delta PDR	3Q						
STSS Delta CDR		1Q					
System Compatibility Tests		3Q,4Q	3Q,4Q	1Q			
System Test/Operational Planning	1Q-4Q	1Q-4Q	1Q-4Q				
Operational and Test Readiness			3Q-4Q	1Q-4Q	1Q-3Q		
Spacecraft Testbed	1Q-4Q	1Q-4Q					
Spacecraft Integration and Test		1Q-4Q	1Q-4Q				
Payload Redesign	1Q-4Q						
Payload Fabrication and Integration & Test	1Q-4Q	1Q-4Q	1Q-4Q	1Q-2Q			
Satellite Integration and Test			2Q-4Q	1Q-4Q	1Q		
Ground Station Design	1Q-4Q	1Q-3Q					
Ground Software Development	1Q-4Q	1Q-4Q	1Q-4Q	1Q			
Ground Hardware/Segment Integration & Test	1Q-4Q	1Q-4Q	1Q-4Q	1Q-3Q			
Launch Integration and Test					1Q-2Q		
Launch (2 Satellites)					3Q		
STSS On-Orbit Operations					3Q-4Q	1Q-4Q	1Q-3Q

Project: 0812 Space Tracking and Surveillance System (STSS) Block 2006

01,0212	, o							
				]	Date			•
MDA Exhibit R-2A RDT&E Project Justification				]	February 20	004		
APPROPRIATION/BUDGET ACTIVITY	R	R-1 NO	MENCLA.	ΓURE				•
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&	(P) 0	)60388	84C Ballis	tic Missile	Defense Ser	nsors		
COST (\$ in Thousands)	FY 200	003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
0912 Space Tracking and Surveillance System (STSS) Block 2008		0	0	0	0	24,905	29,770	19,687
RDT&E Articles Qty		0	0	0	0	0	0	0
N . I EV 2002 GEGG 1 1 1 1 1	1 .1		amaa 1 1		1 11 11	1 D	0012 0012	1.00.10

Note: In FY 2003 STSS development is described in a single Project, 5041. For FY 2004 and beyond, the continued STSS development effort is described in three Projects: 0812, 0912, and 0012. This development activity provides progressive improvements in ground station and experimental satellites, aligned with the BMDS two-year capability Blocks.

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

STSS is an element of the BMDS. Through a spiral development process it will provide space-based infrared capability to acquire, track and discriminate ballistic missiles and supply over-the-horizon fire control to BMDS weapon systems extending their effective range. The near-term emphasis for STSS is on tracking performance to extend the effective range of BMDS interceptors, followed by improvements in the sensor's discrimination capability.

The Block 2008 STSS upgrades the ground station and software aspects of the Block 2006 STSS configuration. There is no near term funding for this activity. Funding for this Project is not programmed until FY07.

The Block 2008 STSS continues integrated operations with other BMD Elements and Test Bed activities with visible and IR tracking of a variety of short and long range test targets. All testing will be orchestrated to allow BMDS participation. Refinements will be made to ground station software to achieve near-real-time mission data processing and connectivity to the C2BMC elements.

As the Block 2008 activity builds on the Block 2006 ground segment, and operates, collects and analyses data from the Block 2006 satellites, funding in this project is not programmed until FY07.

**B.** Accomplishments/Planned Program

B: Accompnishments/1 lanned 1 log1am			
	FY 2003	FY 2004	FY 2005
Funding in this project is not programmed until FY07.			
RDT&E Articles (Quantity)			

C. Other Program Funding Summary

C. Other Program Funding Summary									
	Ţ	1	1					То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603890C Ballistic Missile Defense			1						
System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing

Project: 0912 Space Tracking and Surveillance System (STSS) Block 2008

MDA Exhib	bit R-2A R	DT&E Proje	ct Justification				Date <b>February 200</b> 4	4	
APPROPRIATION/BUDGET ACTIVITY					R-1 NOMENO	CLATURE			
RDT&E, DW/04 Advanced Component D	evelopme	nt and Prot	otypes (ACD&	kP)	0603884C Ba	allistic Missile	Defense Sense	ors	
								To	Total

								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0605502C Small Business Innovative									
Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing
PE 0603175C Ballistic Missile Defense Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing

#### D. Acquisition Strategy

STSS 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 STSS effort is being pursued through a single prime contractor, Northrop Grumman Space Technology (NGST), formerly TRW, with subcontractors playing key roles in systems engineering, satellite bus development and sensor payloads. The program develops a ground station and series of R&D satellites aligned to the BMDS capability blocks. A contract for the Block 06 activity and the initial definition work on Block 10 was awarded in fourth quarter FY 2002. Additional options or new contracts will be awarded to accomplish future work on Block 08 and out.

Project 0912 activity is not included in the Block 06 contract. Work planned for the upgrades to the Block 06 ground configuration and software may be accomplished through modification to the Block 2006 contract. Based on the Block 2006 plan, such modification may take place in the FY 2007 timeframe.

Project: 0912 Space Tracking and Surveillance System (STSS) Block 2008

MDA	Exh	ibit ]	R-4 S	Sche	dule	Pro	file											Date F <b>ebr</b>	uar	y 20	004							
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component De	velo	pme	nt a	nd l	Prot	otyp	oes (	ACl	D&I	<b>P</b> )					ATU istic		ssile	Def	ense	Ser	sor	S						
Fiscal Year		20	03			20	004			20	005			20	006			20	07			20	800			200	09	
	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
BLOCK 2008																												
Contract Modification																	Δ											
Ground Station Upgrades													L		L			Δ			느	느			$\boxminus$	$\Rightarrow$	_	$\Rightarrow$
Studies & Analyses																		·										
Data Analysis																		Δ								╧┤		
																										_		
							-			<u> </u>																$\dashv$		
																										$\dashv$		
							-			-											-					$\dashv$		
																										$\dashv$		$-\parallel$
																										$\dashv$		
										$\vdash$																$\dashv$		$-\ $
																										-		
																										$\dashv$		-
																				<u> </u>								

Project: 0912 Space Tracking and Surveillance System (STSS) Block 2008

					Date	0.4	
APPROPRIATION/BUDGET ACTIVITY	Exhibit R-4A Sch	edule Detail	R-1 NO	MENCLATURE	February 20	04	
RDT&E, DW/04 Advanced Component De	evelopment and P	Prototypes (ACD&P		4C Ballistic Mis	sile Defense Sen	sors	
Schedule Profile	FY 2003		FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
BLOCK 2008							
Contract Modification					1Q		
Ground Station Upgrades					2Q-4Q	1Q-4Q	1Q-4Q
Studies & Analyses							
Data Analysis					2Q-4Q	1Q-4Q	1Q-2Q

Project: 0912 Space Tracking and Surveillance System (STSS) Block 2008

#### Date MDA Exhibit R-2A RDT&E Project Justification February 2004 APPROPRIATION/BUDGET ACTIVITY R-1 NOMENCLATURE RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) 0603884C Ballistic Missile Defense Sensors COST (\$ in Thousands) FY 2003 FY 2004 FY 2005 FY 2006 FY 2007 FY 2009 FY 2008 0012 Space Tracking and Surveillance System (STSS) Block 2010 22,263 253,828 47,833 637,215 919,830 0 1,112,973 RDT&E Articles Qty 0 0 0 0 0

Note: Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.

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

Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.

**B.** Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Future Block Development		22,263	47,833
RDT&E Articles (Quantity)			

Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.

C. Other Program Funding Summary

								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603175C Ballistic Missile Defense									
Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing

Project: 0012 Space Tracking and Surveillance System (STSS) Block 2010

MDA	uary 2004												
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Compon	RE Missile Defe	nse Sensors											
								То	Total				
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost				
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,59	9 1,717,480	2,196,531	2,449,322	Continuing	Continuing				
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,47	6 656,152	654,015	688,119	Continuing	Continuing				
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,04	9 445,971	456,339	469,621	Continuing	Continuing				
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,98	8 527,541	539,210	568,365	Continuing	Continuing				

0

0

0

13,884

141.923

0

0

0

12,958

146,099

0

0

0

12,850

145,112

0

0

0

13,158

151.727

0

0

0

13,476

154,583

Continuing

Continuing

Continuing

Continuing

Continuing

Continuing

Continuing

Continuing Continuing

Continuing

## **D.** Acquisition Strategy

PE 0604861C Theater High-Altitude Area

PE 0605502C Small Business Innovative

PE 0901598C Management Headquarters -

PE 0901585C Pentagon Reservation

PE 0604865C Patriot PAC-3 Theater Missile

Defense System - TMD - EMD

Defense Acquisition - EMD

Research - MDA

MDA

Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.

887,616

138,922

138,791

7,432

35.331

0

0

0

14,327

92,449

Project: 0012 Space Tracking and Surveillance System (STSS) Block 2010

				Date			
MDA Exhibit R-2A RDT&E Project Justification			]	February 2	004		
APPROPRIATION/BUDGET ACTIVITY	R-	NOMENCLA	TURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&	<b>P</b> ) 06	03884C Ballis	stic Missile	Defense Se	nsors		
COST (\$ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
5049 Russian-American Observation Satellite(s) Program (RAMOS)	25,76	0	0	0	0	0	0
RDT&E Articles Qty		0 0	0	0	0	0	0

Note: The FY04 funding for RAMOS is captured in PE 0603884C in Project 0403.

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

Due to the lack of progress on the RAMOS Government-to-Government agreement with Russia, and the uncertainty this causes, MDA intends to terminate the RAMOS program. MDA received the Russian Government's draft MOU in July 2002 and despite 17 months of discussions, have been unable to complete a government-to-government agreement. Without this agreement, which includes the fundamental issue of taxes and liabilities, the RAMOS program cannot be executed beyond the design stage.

MDA will continue to discuss an overarching MOU to govern defense cooperation with Russia, and is actively exploring alternative more beneficial missile defense cooperative projects with Russia that enjoy the support of the Government of the Russian Federation.

#### **B.** Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Design and Development	19,469	0	0
RDT&E Articles (Quantity)			

#### FY 2003 accomplishments:

- Completed preliminary design of the payload, satellite, and science experiment program
- Conducted a US-only Preliminary Design Review of the US payload, and a Joint Preliminary Design Review of the RAMOS system
- Continued preliminary design of the ground system
- Began detailed design of the satellite sensors, payload support equipment, ground support equipment, and all associated projects to accomplish the space experiments

	FY 2003	FY 2004	FY 2005
RAMOS Solar Arrays	6,292	0	0
RDT&E Articles (Quantity)			

Activities are aimed at demonstrating improved efficiencies associated with amorphous silicon substrate based solar cell technology, space-qualification of prototype units, and successful integration of a "blanket" of solar cells for test and evaluation of future space vehicle applications. The goal is to increase the specific power of a Si solar cell from 400 W/kg to greater than 500 W/kg.

#### FY 2003 accomplishments:

- Optimized front and back bus bar design and materials to minimize mass and electrical losses
- Began trials to reduce substrate thickness to 0.5 mil
- Developed automated interconnect technology

Project: 5049 Russian-American Observation Satellite(s) Program (RAMOS)

		Date
MDA Exhibit R-2A RDT&E Project Justification		February 2004
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missilo	e Defense Sensors
C. Othor Duogram Funding Summour		

C. Other Program Funding Summary									
								To	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603175C Ballistic Missile Defense Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing

<u>**D. Acquisition Strategy**</u> This program has been terminated.

Project: 5049 Russian-American Observation Satellite(s) Program (RAMOS)

	MDA Fyh	nibit R-3 RDT&E Proje	ect Cost Ana	lveic			Date <b>Februa</b>	ry 2004						
APPROPRIATION/BUDGET A		non K-3 KD1 &E 110je	ct Cost Ana	19515	R-1 NOMENCLATURE									
RDT&E, DW/04 Advanced	Component 1	Development and Pr	ototypes (A	CD&P)	0603884C Ballistic Missile Defense Sensors									
I. Product Development Cost (\$	in Thousands )													
	Contract	Performing	Total		FY 2004		FY 2005			Target				
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of				
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract				
Design and Development														
		Utah State Univ/SDL/												
U.S. Hardware Development	SS/CPFF	Logan, UT	41,167						41,167					
R.F. Hardware Development	SS	Rosoboronexport, RF	33,828						33,828					
		Ball Aerospace & Tech Corp/												
Engineering & Integration Supt	C/CPAF	Broomfield, CO	21,561						21,561					
RAMOS Solar Arrays														
		AFRL/Kirtland AFB,												
Design and Development	MIPR	NM	6,292						6,292					
Subtotal Product Development			102,848	0		0		0	102848					
D	1	1			1				I.					

#### Remarks

Follow-on FY 2004 contract activity involves termination of this program and is described in this PE's Project 0403 R3 Remarks. The RAMOS program has been terminated in FY 2004 due to continuing lack of progress with Russia. The funds originally designated for this program have been used to fund the Agency's Block 2006 fielding increment as described in the President's Budget FY 2005 Overview.

II. Support Costs Cost (\$ in Thousands)

11. Support Costs Cost (\$ III Thou	isanus <i>j</i>									
	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Design and Development										
		AFRL/								
Development Support	MIPR	Hansom AFB, MA	1,946						1,946	
Subtotal Support Costs			1,946	0		0		0	1946	

#### Remarks

Provide support to US and Joint US-RF data management and data system definition, coordination, development, testing, and operations efforts. Includes support to the RAMOS Program Office with scientific analysis, modeling and simulation, user-community coordination, data processing and database development, and calibration method definition and execution to assure that RAMOS measurement data and scientific data products satisfy the overall RAMOS mission objectives.

Project: 5049 Russian-American Observation Satellite(s) Program (RAMOS)

Subtotal Test and Evaluation				UNC	LASSIF	<b>IED</b>										
APPROPRIATION/BUDGET ACTIVITY  RDT & DW/04 Advanced Component Development and Prototypes (ACD&P)  R-1 NOMENCLATURE  0603884C Ballistic Missile Defense Sensors  III. Test and Evaluation			_				1									
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)    Management Services   Contract   Performing   Total   Performing   Total   Performing   Prys   Prys			it R-3 RDT&E Pro	ject Cost Ana	lysis			Februa	ry 2004							
Contract   Performing   Total   FY 2004   Award   FY 2005   Award   Cost to   Total   Value of   Cost Categories:   Location   Cost   Cost   Date   Cost   Date   Complete   Cost   Contract   Cost					ļ											
Contract   Performing   Total   PY 2004   Award   FY 2005   Award   Cost to   Total   Value of   Value of   Cost Categories:   By 2004   Award   FY 2005   Award   Cost to   Total   Value of   Cost Categories:   Cost   Cost   Date   Cost   Date   Complete   Cost   Contract   Cost   Cost   Cost   Date   Cost   Date   Complete   Cost   Contract   Cost	RDT&E, DW/04 Advanced	Component De	evelopment and P	'rototypes (A	.CD&P)	0603884C Ballistic Missile Defense Sensors										
Method & Activity & PYs FY 2004 Award FY 2005 Award Cost to Total Value of Cost Categories:	III. Test and Evaluation Cost (\$															
Cost Categories: & Type Location Cost Cost Date Cost Date Complete Cost Contract Subtotal Test and Evaluation Remarks  IV. Management Services Cost (\$ in Thousands)  Contract Performing Total Pys FY 2004 Award FY 2005 Award Cost to Total Value of Cost Categories: & Type Location Cost Cost Date Cost Date Complete Cost Contract Design and Development  Security Monitoring Supt MIPR DTSA 230 Cost Date Date Cost Date Date Cost Date Date Cost Date Date Date Date Date Date Date Dat		1	-			FY 2004	'	FY 2005			_					
Subtotal Test and Evaluation  Remarks  IV. Management Services Cost (\$ in Thousands)  Contract Performing Total PY's FY 2004 Award FY 2005 Award Cost to Total Value of Cost Categories: & Type Location Cost Cost Date Cost Date Complete Cost Contract Design and Development  Security Monitoring Supt MIPR DTSA 230 Difference Support MIPR DOS 480 Difference Support Subtotal Management Services Design Suptorial MIPR DTSA 230 Difference Support MIPR DOS 480 Difference Support MIPR DOS 480 Difference Support Subtotal Management Services Design Support Services during US-RF technical interchange meetings in the United States and Russian Federation.  BOS provides Russian-English interpreting support during US-RF technical interchange meetings in the United States and Russian Federation.  Project Total Cost 105.504 0 0 0 105.504			·													
Remarks  IV. Management Services Cost (\$ in Thousands)  Contract Performing Total FY 2004 FY 2005 Award Cost to Total Value of Method Activity & PYs FY 2004 Award FY 2005 Award Cost to Total Value of Cost Categories:  Cost Categories: Cost Type Location Cost Cost Date Cost Date Complete Cost Contract Design and Development  Security Monitoring Supt MIPR DTSA 230 Date Complete Cost Contract Design and Development Supt MIPR DOS 480 DOS 480 DOS	Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract					
IV. Management Services Cost (\$ in Thousands)  Contract Performing Total FY 2004 Award FY 2005 Award Cost to Total Value of Method Activity & PYs FY 2004 Award FY 2005 Award Cost to Total Value of Cost Categories: & Type Location Cost Cost Date Cost Date Complete Cost Contract  Design and Development Security Monitoring Supt MIPR DTSA 230 Subtotal Management Services MIPR DOS 480 Subtotal Management Services Total Cost Total Cost Cost Cost Date Cost Date Complete Cost Contract Design and Development Security Monitoring Supt MIPR DOS 480 Subtotal Management Services Total Cost Total Cost Total Cost Dos Total Cost Cost Contract DoS provides security monitoring (ITAR and TAA compliance) support services during US-RF technical interchange meetings in the United States and Russian Federation.  Project Total Cost 105,504 0 0 0 10 105,504	Subtotal Test and Evaluation			T'		Τ	<u> </u>									
Contract Method Activity & PYs FY 2004 Award FY 2005 Award Cost to Total Value of Cost Categories: & Type Location Cost Cost Date Cost Date Complete Cost Contract  Design and Development Security Monitoring Supt MIPR DTSA 230 Date Complete Cost Date Complete Cost Contract  MIPR DOS 480 DOS 480 DOS DOS DOS DOS DOS DOS DOS DATE CONTROL DESIGNATION OF THE CONTROL DESIGNATI	Remarks															
Contract Method Activity & PYs FY 2004 Award FY 2005 Award Cost to Total Value of Cost Categories: & Type Location Cost Cost Date Cost Date Complete Cost Contract  Design and Development Security Monitoring Supt MIPR DTSA 230 Date Complete Cost Date Complete Cost Contract  MIPR DOS 480 DOS 480 DOS DOS DOS DOS DOS DOS DOS DATE COMPLETED DATE COMPLETED DATE CONTRACT DATE DATE DATE DATE DATE DATE DATE DAT	W. Marriago Cont.	ф • (ПП														
Method Activity & PYs FY 2004 Award FY 2005 Award Cost to Total Value of Cost Categories: & Type Location Cost Cost Date Complete Cost Contract  Design and Development Security Monitoring Supt MIPR DTSA 230 Subtotal Management Services MIPR DOS 480 Subtotal Management Services Description MIPR DOS 480 Subtotal Management Services Description MIPR DOS 480 Subtotal Management Services DTSA Provides security monitoring (ITAR and TAA compliance) support services during US-RF technical interchange meetings in the United States and Russian Federation.  DOS provides Russian-English interpreting support during US-RF technical interchange meetings in the United States and Russian Federation.  Project Total Cost 105,504 0 0 0 105,504	1V. Management Services Cost (		Performing	Total		T FY 2004	T	FV 2005	T		Target					
Cost Categories: & Type Location Cost Cost Date Cost Date Complete Cost Contract  Design and Development			•		FY 2004		FY 2005		Cost to	Total	_					
Design and Development Security Monitoring Supt MIPR DTSA DOS 480 Subtotal Management Services NERMARKS  DTSA Provides security monitoring (ITAR and TAA compliance) support services during US-RF technical interchange meetings in the United States and Russian Federation.  DOS provides Russian-English interpreting support during US-RF technical interchange meetings in the United States and Russian Federation.  Project Total Cost  105,504 0 0 105,504	Cost Categories		•													
Security Monitoring Supt MIPR DTSA 230 230 230 230 230 230 230 230 230 230	_	α Type	Location		Cost	Dute	Cost	Dute	Complete		Communic					
Interpreter Support MIPR DOS 480 480 480 480 50 480 480 50 710 50	2	MIPR	DTSA	230	<del>                                     </del>	+		<del> </del>	+	230						
Subtotal Management Services 710 0 0 0 710  Remarks  DTSA Provides security monitoring (ITAR and TAA compliance) support services during US-RF technical interchange meetings in the United States and Russian Federation.  DOS provides Russian-English interpreting support during US-RF technical interchange meetings in the United States and Russian Federation.  Project Total Cost 105,504 0 0 105,504						+	<del>                                     </del>	<del>                                     </del>	+							
Remarks  DTSA Provides security monitoring (ITAR and TAA compliance) support services during US-RF technical interchange meetings in the United States and Russian Federation.  DOS provides Russian-English interpreting support during US-RF technical interchange meetings in the United States and Russian Federation.  Project Total Cost  105,504  0  105,504	1 11	WIII IX			<del>                                     </del>	<u>,                                    </u>	0	<u> </u>	0							
DTSA Provides security monitoring (ITAR and TAA compliance) support services during US-RF technical interchange meetings in the United States and Russian Federation.  DOS provides Russian-English interpreting support during US-RF technical interchange meetings in the United States and Russian Federation.  Project Total Cost  105,504  0  105,504				/10			0		0	/10						
DOS provides Russian-English interpreting support during US-RF technical interchange meetings in the United States and Russian Federation.  Project Total Cost 105,504 0 0 105,504	Kemarks															
Project Total Cost 105,504 0 0 105,504									ıd Russian Federati	ion.						
	DOS provides Russian-English inter	preting support dur	ring US-RF technical i	nterchange meet	ings in the U	nited States and	Russian Federa	ation.								
	Project Total Cost	<del></del>		105 504		<u>. T</u>	1 0	1	1	105 504						
Remarks	-			105,504			0	<u> </u>	<u> </u>	105,504						
	Remarks										I					
											ļ					

Project: 5049 Russian-American Observation Satellite(s) Program (RAMOS)

MDA Exhibit R-4 Schedule Profile											Date F <b>ebr</b>	uar	y 20	004														
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component De	velo	pme	nt a	nd I	Prot	otyp	es (	ACI	)&F	<b>P</b> )		NOI <b>388</b>					sile	Def	ense	Ser	ısor	S						
Fiscal Year	2003 2004 2005				005 2006					2007 2008					2009													
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	1 2 3 4 1 2 3						4 1 2			3	4
PDR																												
RAMOS Joint Preliminary Design Review	ш		Δ	ш					Ц								ш				Ц	Щ						
Decisions																												
Start Detailed Design				Δ																						$\square$		
									-												-	-						
																										$\longrightarrow$		-
																										$\dashv$		
																										$\dashv$		-
																										$\overline{}$		
																										$\dashv$		$\dashv$
																										$\dashv$		$-\ $
			•					•	•																			

Project: 5049 Russian-American Observation Satellite(s) Program (RAMOS)

		UNCL	ASSIT	11517				
				Date	0.4			
	A Exhibit R-4A Sch			February 20	04			
APPROPRIATION/BUDGET ACTIVITY		(D. 0. D.)		MENCLATURE				
RDT&E, DW/04 Advanced Component 1			ssile Defense Sen					
Schedule Profile	FY 2003	FY 2004	FY	2005	FY 2006	FY 2007	FY 2008	FY 2009
PDR								
RAMOS Joint Preliminary Design Review	3Q							
Decisions								
Start Detailed Design	4Q							

Project: 5049 Russian-American Observation Satellite(s) Program (RAMOS)

	Date						
MDA Exhibit R-2A RDT&E Project Justification			]	February 20	004		
APPROPRIATION/BUDGET ACTIVITY	R-1	NOMENCLA	TURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&	(P) 060	3884C Ballis	stic Missile	Defense Se	nsors		
COST (\$ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
0403 Russian-American Observation Satellite(s) Program (RAMOS)		29,285	0	0	0	0	0
RDT&E Articles Qty		0	0	0	0	0	0

Note: The FY03 funding for RAMOS is captured in PE 0603884C in Project 5049.

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

Due to the lack of progress on the RAMOS Government-to-Government agreement with Russia, and the uncertainty this causes, MDA intends to terminate the RAMOS program. MDA received the Russian Government's draft MOU in July 2002 and despite 17 months of discussions, have been unable to complete a government-to-government agreement. Without this agreement, which includes the fundamental issue of taxes and liabilities, the RAMOS program cannot be executed beyond the design stage.

MDA will continue to discuss an overarching MOU to govern defense cooperation with Russia, and is actively exploring alternative more beneficial missile defense cooperative projects with Russia that enjoy the support of the Government of the Russian Federation.

#### **B.** Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Design and Development	0	28,877	0
RDT&E Articles (Quantity)			

#### FY 2004 activities:

- Continue detailed design of the satellite sensors, payload support equipment, ground support equipment, and all associated projects to accomplish the space experiments
- Continue preliminary design of ground facilities
- Design and begin fabricating sensor prototypes to be used during interface testing
- Begin writing sensor software
- Continue development of models and simulations to test the design and concepts

	FY 2003	FY 2004	FY 2005
RAMOS Solar Arrays	0	408	0
RDT&E Articles (Quantity)			

Activities are aimed at demonstrating improved efficiencies associated with amorphous silicon substrate based solar cell technology, space-qualification of prototype units, and successful integration of a "blanket" of solar cells for test and evaluation of future space vehicle applications. The goal is to increase the specific power of a Si solar cell from 400 W/kg to greater than 500 W/kg.

#### FY 2004 activities:

- Optimize interconnect technology, minimizing both electrical and area losses
- Develop stowing/deployment mechanism for flexible thin-film photovoltaic blankets
- Develop new area design to optimize total area cell efficiency and minimize area losses
- Optimize substrate thinning process

Project: 0403 Russian-American Observation Satellite(s) Program (RAMOS)

		Date
MDA Exhibit R-2A RDT&E Project Justification		February 2004
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missil	e Defense Sensors

C. Other Program Funding Summary									
								To	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603175C Ballistic Missile Defense Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing

<u>**D. Acquisition Strategy**</u> This program has been terminated.

Project: 0403 Russian-American Observation Satellite(s) Program (RAMOS)

	MDA Evi	nibit R-3 RDT&E Proje	Date Februa	rv 2004						
APPROPRIATION/BUDGET A RDT&E, DW/04 Advanced	ACTIVITY	-		R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors						
I. Product Development Cost (\$	-	_ · · · · · · · · · · · · · · · · · · ·	(	)						
Σίτιοματο Σόγοιορποπο Θόρο (φ	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Design and Development										
		Utah State Univ/SDL/								
U.S. Hardware Development	SS/CPFF	Logan, UT	41,267	14,177				12,400	67,844	
R.F. Hardware Development	SS	Rosoboronexport, RF	33,828	7,510				0	41,338	
		Ball Aerospace &								
		Tech Corp/								
Engineering & Integration Supt	C/CPAF	Broomfield, CO	21,561	5,400				1,000	27,961	
RAMOS Solar Arrays										
		AFRL/Kirtland AFB,								
Design and Development	MIPR	NM	6,292	408					6,700	
Subtotal Product Development			102 049 1	27.405		Λ I		Λ	1/20/2	
			102,948	27,495		0		0	143843	
Remarks	ousands )	<u> </u>	102,946	21,493		0		0	143643	
Remarks	ousands ) Contract	Performing	Total	21,493	FY 2004		FY 2005	0	143643	Target
Remarks		Performing Activity &	· .	FY 2004	FY 2004 Award	FY 2005	FY 2005 Award	Cost to	Total	_
Remarks  II. Support Costs Cost (\$ in Tho	Contract Method		Total	· ·						Value of
Remarks  II. Support Costs Cost (\$ in Tho	Contract	Activity &	Total PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Remarks  II. Support Costs Cost (\$ in Tho  Cost Categories:	Contract Method	Activity &	Total PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Remarks  II. Support Costs Cost (\$ in Tho  Cost Categories:	Contract Method	Activity & Location	Total PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	
Remarks  II. Support Costs Cost (\$ in Tho  Cost Categories:  Design and Development  Development Support	Contract Method & Type	Activity & Location  AFRL/	Total PYs Cost	FY 2004 Cost	Award	FY 2005	Award	Cost to	Total Cost	Value of
Remarks  II. Support Costs Cost (\$ in Tho  Cost Categories:  Design and Development  Development Support	Contract Method & Type	Activity & Location  AFRL/	Total PYs Cost	FY 2004 Cost	Award	FY 2005 Cost	Award	Cost to Complete	Total Cost	Value of
Remarks  II. Support Costs Cost (\$ in Tho  Cost Categories:  Design and Development  Development Support  Subtotal Support Costs  Remarks	Contract Method & Type MIPR	Activity & Location  AFRL/	Total PYs Cost	FY 2004 Cost	Award	FY 2005 Cost	Award	Cost to Complete	Total Cost	Value of
Remarks  II. Support Costs Cost (\$ in Tho  Cost Categories:  Design and Development  Development Support  Subtotal Support Costs  Remarks	Contract Method & Type MIPR sin Thousands)	Activity & Location  AFRL/ Hansom AFB, MA	Total PYs Cost  1,946 1,946	FY 2004 Cost	Award Date	FY 2005 Cost	Award Date	Cost to Complete	Total Cost	Value of Contrac
Remarks  II. Support Costs Cost (\$ in Tho  Cost Categories:  Design and Development  Development Support  Subtotal Support Costs  Remarks	Contract Method & Type MIPR  sin Thousands) Contract	Activity & Location  AFRL/ Hansom AFB, MA  Performing	Total PYs Cost  1,946 1,946 Total	FY 2004 Cost 1,440 1,440	Award Date  FY 2004	FY 2005 Cost	Award Date	Cost to Complete	Total Cost 3,386 3386	Value of Contract
Remarks  II. Support Costs Cost (\$ in Tho  Cost Categories:  Design and Development  Development Support Subtotal Support Costs  Remarks  III. Test and Evaluation Cost (\$	Method & Type  MIPR  in Thousands )  Contract Method	Activity & Location  AFRL/ Hansom AFB, MA  Performing Activity &	Total PYs Cost  1,946 1,946  Total PYs	FY 2004 Cost 1,440 1,440 FY 2004	Award Date  FY 2004 Award	FY 2005 Cost 0	Award Date  FY 2005 Award	Cost to Complete  0	Total Cost 3,386 3386	Value of Contract
Remarks  II. Support Costs Cost (\$ in The Cost Categories:  Design and Development  Development Support Subtotal Support Costs  Remarks	Contract Method & Type MIPR  sin Thousands) Contract	Activity & Location  AFRL/ Hansom AFB, MA  Performing	Total PYs Cost  1,946 1,946 Total	FY 2004 Cost 1,440 1,440	Award Date  FY 2004	FY 2005 Cost	Award Date	Cost to Complete	Total Cost 3,386 3386	Value of Contract

Project: 0403 Russian-American Observation Satellite(s) Program (RAMOS)

	MDA Exhi	bit R-3 RDT&E Pro	lysis			Date <b>Februa</b>	ry 2004				
APPROPRIATION/BUDGET A	CTIVITY		R-1 NOMENCLATURE								
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)						Ballistic Mi	ssile Defens	e Sensors			
IV. Management Services Cost (											
	Contract	Performing	Total		FY 2004		FY 2005			Target	
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of	
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract	
Design and Development											
Security Monitoring Supt	MIPR	DTSA	230	50					280		
Interpreter Support	MIPR	DOS	480	300					780		
Subtotal Management Services			710	350		0		0	1060		
Remarks											
Project Total Cost			105,604	29,285		0			148,289		
Remarks	L L		- 1		1	1	1	L.			

Remarks

Project: 0403 Russian-American Observation Satellite(s) Program (RAMOS)

	A Exi	nibit	R-4 \$	Sche	dule	Prof	ïle											Date F <b>ebr</b>		y 20	004							
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component D	evelo	pme	nt a	nd I	Prote	otyp	es (A	ACI	)&P	<b>P</b> )		NO] <b>388</b>					sile	Def	ense	Ser	sor	S						
Fiscal Year		20	003			20	04			20	005			20	06			20	07			20	800			20	009	
	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
PDR																												
RAMOS Joint Preliminary Design Review	丄	L	Δ	Ш	Ш				Ш	L			ш	Ш	L					L	L	L				Ш	Ш	
Decisions	_																											
Program Termination					4			$\Delta$																		Ш		
Start Detailed Design	_			Δ																						Ш		
	-	-								-																$\sqcup$	$\square$	
	_																									igwdapprox	$\square$	
	-																									$\vdash \vdash \vdash$	$\square$	
	-																									$\vdash\vdash$	$\vdash\vdash$	
	-																									$\vdash\vdash$	$\vdash\vdash$	
	-	1																								$\vdash\vdash$	$\vdash\vdash$	
	-																									$\vdash\vdash$	$\vdash$	
																										$\vdash \vdash$	$\vdash$	
	+																									$\vdash \vdash$		
	+																									$\vdash \vdash$		
																										$\vdash \vdash$		
																												ļ

Project: 0403 Russian-American Observation Satellite(s) Program (RAMOS)

MDA	Exhibit R-4A Sch	edule Detail			Date February 20	004	
APPROPRIATION/BUDGET ACTIVITY  RDT&E, DW/04 Advanced Component De			R-1 NO <b>060388</b>	MENCLATURE 4C Ballistic Mis	ssile Defense Sen		
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
PDR							
RAMOS Joint Preliminary Design Review	3Q						
Decisions							
Program Termination		1Q-4Q					
Start Detailed Design	4Q						

Project: 0403 Russian-American Observation Satellite(s) Program (RAMOS)

n					004		
]			TURE	v			
		FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
12	2,000	0	0	0	0	0	0
	0	0	0	0	0	0	0
	<b>D&amp;P</b> ) FY 2	R-1 N	R-1 NOMENCLA <b>0603884C Ballis</b> FY 2003 FY 2004	R-1 NOMENCLATURE   0603884C Ballistic Missile   FY 2003   FY 2004   FY 2005	R-1 NOMENCLATURE  0603884C Ballistic Missile Defense Ser  FY 2003 FY 2004 FY 2005 FY 2006	R-1 NOMENCLATURE   Défense Sensors   FY 2003   FY 2004   FY 2005   FY 2006   FY 2007	R-1 NOMENCLATURE   O603884C Ballistic Missile Defense Sensors   FY 2003   FY 2004   FY 2005   FY 2006   FY 2007   FY 2008

Note: The FY 2003 Forward Deployable Radar development is described in Project 5011. For FY 2004 and beyond, the Forward Deployable Radar effort is described in two Projects: 0811 and 0911.

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

Block 2006. The Forward Deployable Radar will enhance the BMDS capability to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight. The objective of the Forward Deployable Radar project is to validate the BMDS sensor-layering concept and to validate and integrate forward-based algorithms. This effort makes use of existing radar configurations. The BMDS Radar provides a sensor with capability for detection of ballistic missiles early in their flight and for providing precise tracking information for use by other elements of the BMD System for engagement of targets.

Due to the demise of the ABM Treaty the BMDS can deploy forward based radars (both land and sea based) supporting a layered sensor strategy. This approach provides overlapping sensor coverage and the potential for BMDS weapons to extend their effective range beyond local sensors by using more sophisticated engagement strategies. The Forward Deployable Radar will pass target data to the command and control system for use by mid-course sensors and weapons for tracking and subsequent interception. Earlier detection with forward based radars coupled with layered sensors, gives the BMDS a continuous tracking and discrimination capability with more time and opportunities to engage the target, resulting in an increased probability of success.

The forward based radar broadens BMDS capability in the near future, adding robustness against a wide range of threats and may be used to provide support for increased protection of forward based military assets, allies, and friends. In recognition of the difficulty in predicting our adversaries or the location of future battlefields, the Forward Deployable Radar is planned to be ground based with the potential for sea basing. The Forward Deployable Radar capability now under development will: extend the BMDS battlespace; allow for more sophisticated engagement strategies; allow for rapid reconfiguration of the BMDS; and reduce vulnerability to countermeasures, complicating an enemy's ability to penetrate the defense system. Analysis of the capabilities that the Forward Deployable Radar adds to the Ballistic Missile Defense System was coordinated with Missile Defense National Team (MDNT) assistance.

Forward Deployable Radar will consist of existing X-band radar hardware, modified software algorithms for tracking and discrimination, and a direct interface with the BMDS command and control system. The Forward Deployable Radar design leverages existing radar configurations and technologies. This commonality allows for the accelerated procurement/development of the Forward Deployable Radar to satisfy Block 2006 capability requirements. Hercules algorithms will be used to enhance the Forward Deployable Radar software. The TPS-X radar will serve as a Test Bed to validate the algorithms and interface with the C2BMC prior to their inclusion in the Forward Deployable radar design. The TPS-X may also support forward based capability and enhancement of the BMDS Block 2004, if required.

In FY 2003, Forward Deployable Radar executed \$32.219 million for the program and technical support used to establish the Forward Deployable Radar program, including SETA, FFRDC, UARC; and provide initial funding for the Forward Deployable Radar letter contract. In addition, the BMDS program executed \$12.0 million to improve the TPS-X as a Test Bed which will be use as a risk reduction asset to mature, validate and test the tracking and discrimination algorithms prior to the delivery of the Forward Deployable Radar equipment.

The project also provides analysis of multi-spectral sensor enhancements for the BMDS leading to a sensor architecture and roadmap defining the paths for future sensor capabilities. The roadmap includes the evaluation of EO-IR sensors as enhancements to BMDS.

Project: 5011 Ballistic Missile Defense Radars Block 2006

			Date	
MDA Exhibit R-2A RDT&E Project Justi	fication		February 2004	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCL	ATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes	(ACD&P)	0603884C Bal	listic Missile Defense Sensor	rs
B. Accomplishments/Planned Program				
	FY	7 2003	FY 2004	FY 2005
Capability Development		12,000		
RDT&E Articles (Quantity)				

FY 2003 Accomplishments:

- Completed Forward Deployable Radar project planning Initiated and completed definition of acquisition strategy for Block 2006 radar configuration
- Awarded letter contract to meet block 2006 delivery
- Identified and initiated TPS-X radar improvements for use as a test asset for advanced algorithm validation and risk reduction on C2BMC interfaces
- Finalized Concept Validation (CV) plans for the initial set of algorithms
- Identified additional sensors to enhance BMDS mission performance

FY 2004 and 2005 are described in Project 0811.

C. Other Program Funding Summary

e. other ringram running bunning									
								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603175C Ballistic Missile Defense									
Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing

Project: 5011 Ballistic Missile Defense Radars Block 2006

						Date			
MDA	Exhibit R-2A I	RDT&E Projec	ct Justification	I		Febru	ary 2004		
APPROPRIATION/BUDGET ACTIVITY				OMENCLATU		~			
RDT&E, DW/04 Advanced Compone	ent Developm	ent and Prote	otypes (ACD	&P) 06038	884C Ballistic	Missile Defe	nse Sensors		
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing

### **D.** Acquisition Strategy

MDA

PE 0901598C Management Headquarters -

The Forward Deployable Radar project will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

141,923

35,331

92,449

The Forward Deployable Radar project acquisition strategy leverages existing radar configurations and technologies as part of the development of the forward Deployable Radar. The project awarded a letter contract to build a radar using X-band technology and existing radar designs to minimize development costs and schedule. Design enhancements will focus on software changes for the forward based algorithms and modified C2BMC connectivity. The contract is a cost plus-award fee effort, and includes options for up to three additional radars.

146,099

145,112

151,727

154,583

Continuing

Continuing

An ECP to the TPS-X test instrumentation radar was funded to implement improvements so the radar could be used as Test Bed to support Forward Deployable Radar software development. This is a risk reduction asset that will be used to mature, validate and test the Hercules based tracking and discrimination algorithms. The TPS-X also will be used to test the C2BMC communications before they are integrated into the forward based radar. The TPS-X will allow testing to begin a year earlier providing more time for maturing the software prior to the Forward Deployable Radar equipment delivery.

The Forward Deployable Radar project is planned to include a research and development program to provide for upgrades to future radars or sensors as required to support BMDS spiral development.

Project: 5011 Ballistic Missile Defense Radars Block 2006

							Date				
	MDA Exhi	bit R-3 RDT&E Proj	ject Cost Ana	lysis			Februa	ry 2004			
APPROPRIATION/BUDGET A	CTIVITY				R-1 NOMEN	ICLATURE					
RDT&E, DW/04 Advanced	Component D	evelopment and P	0603884C	Ballistic Mis	sile Defens	e Sensors					
I. Product Development Cost (\$ in Thousands)											
	Contract	Performing	Total		FY 2004		FY 2005			Target	
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of	
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract	
Capability Development											
RADAR											
		Raytheon/									
Capability Based R&D Contract	SS/CPAF	MA	12,000	1					12,000		
Subtotal Product Development			12,000	0		0		0	12000		
Remarks											

Kemarks

In FY 2003, the Forward Deployable Radar project executed \$18.0 million for a Forward Deployable Radar contract to meet the Block 2006 delivery requirement schedule and \$6.0 million for improvements to the TPS-X for use as a Test Bed to validate algorithms and test C2BMC. The radar project was funded from PE 0603884C project 5011, \$12.0 million; PE 0604861C project 2018, \$10.5 million; and PE 0603882C project 3021, \$1.5 million. The \$1.5 million was part of the Congressional earmarked \$9.719 million.

II. Support Costs Cost (\$ in Thousands)

	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Capability Development										
Subtotal Support Costs			0	0		0		0	0	

#### Remarks

In FY 2003, Congressional earmark \$9.719 million from PE 0603882C project 3021 of which \$3.310 million, was used for program and engineering support to the Forward Deployable Radar project. The program and engineering efforts supported the completion of the Forward Deployable Radar project planning, the awarding of a letter contract to meet the block 2006 delivery, identified and initiated TPS-X radar improvement, and finalized Concept Validation (CV) plans for the initial set of algorithms.

III. Test and Evaluation Cost (\$ in Thousands)

222 2 000 min 2 / min 1012 0000 ( \$ 1	<u> </u>									
	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Subtotal Test and Evaluation										

### Remarks

Project: 5011 Ballistic Missile Defense Radars Block 2006

							Date			
	MDA Exh	ibit R-3 RDT&E Proj	ect Cost Ana	lysis			Februa	ry 2004		
APPROPRIATION/BUDGET AC	CTIVITY		R-1 NOMEN	ICLATURE						
RDT&E, DW/04 Advanced (	C <mark>omponent I</mark>	Development and Pr	CD&P)	0603884C1	Ballistic Mis	sile Defens	e Sensors			
IV. Management Services Cost (\$	in Thousands									
	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Subtotal Management Services										
Remarks										
Project Total Cost			12,000	0		0			12,000	

#### Remarks

Forward Deployable Radar project executed \$4.908 million from the \$9.719 million Congressional earmark from PE 0603882C project 3021 in FY 2003 for management services. These services were for the FFRDC/UARC support to the Forward Deployable Radar project. This effort supported the completion of the Forward Deployable Radar project planning, identified and initiated TPS-X radar improvement, and finalized Concept Validation (CV) plans for the initial set of algorithms.

Project: 5011 Ballistic Missile Defense Radars Block 2006

MDA	Exh	nibit	R-4	Sche	dule	Pro	file											Date <b>Feb</b>		rv 20	004						
APPROPRIATION/BUDGET ACTIVITY		11010			aure	7110					R-1	l NO	MEN	NCL.	ATU	RE	-	100		·							
RDT&E, DW/04 Advanced Component De	velo	pme	ent a	nd I	Prot	otyp	oes (	ACI	D&F	<b>P</b> )	060	0388	<b>34C</b>	Ball	istic	Mis	ssile	Def	ense	e Sei	nsor	·s					
Fiscal Year		20	003			20	004			20	005			20	06			20	07			20	008			20	09
115441 1041	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
Acquisition Milestones			, J				<u> </u>	_				7	1		J	_			3	_		2	3				J 7
Definitize Forward Deployable Radar Contract		Π			Δ			Ī			Π	Π						Ι		Π					П		$\overline{}$
Studies & Analyses																											
Evaluate FBR Algorithms (TPS-X)			Δ									$\bot$															
Sensor Architecture Analysis				$\mathbb{P}$												K											
<b>Development Milestones</b>																											
Forward Deployable Radar Software CDR										Δ																	
Forward Deployable Radar System Design Review							Δ																				
TPS-X FBR Algorithm Integration Complete												Δ															
<b>Testing Milestones</b>																	_										
Forward Deployable Radar Performance Demonstration														$\Diamond$													
TPS-X FBR Algorithm Flight Test												Δ														П	
Program Milestones																											
Forward Deployable Radar Capability Achieved															Δ												
Manufacturing Processes and Advanced Materia	als												_				_				_						
Forward Deployable Radar Integrated w/Release 1														Δ													
Mature FBR Algorithms												Δ															

Project: 5011 Ballistic Missile Defense Radars Block 2006

MDA E	Date <b>February 20</b>	004					
APPROPRIATION/BUDGET ACTIVITY  RDT&E, DW/04 Advanced Component Dev	elopment and l	Prototypes (ACI		OMENCLATURE  884C Ballistic Mis	sile Defense Sen	sors	
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Acquisition Milestones							
Award Forward Deployable Radar Letter Contract	3Q						
Definitize Forward Deployable Radar Contract		1Q					
Finalize TPS-X FBR Task Order		1Q					
Studies & Analyses							
Evaluate FBR Algorithms (TPS-X)	3Q-4Q	1Q-4Q	1Q-4Q				
Sensor Architecture Analysis	4Q	1Q-4Q	1Q-4Q	1Q-4Q			
Development Milestones							
Forward Deployable Radar Software CDR			2Q				
Forward Deployable Radar Software PDR		4Q					
Forward Deployable Radar System Design Review		3Q					
Forward Deployable Radar System Rqmts Review (SRR)		1Q					
TPS-X FBR Algorithm Integration Complete			4Q				
TPS-X FBR Algorithm PDR		1Q					
TPS-X RBR Algorithm CDR		3Q					
Testing Milestones							
Forward Deployable Radar Performance Demonstration				2Q			
TPS-X FBR Algorithm Flight Test		2Q					
Forward Deployable Radar Software Funct Qual Test			3Q				
Forward Deployable Radar Near Field Range Test			1Q				
Forward Deploy Radar High Power & Integration Test			2Q				
TPS-X FBR Algorithm Flight Test			1Q,2Q,3Q,4Q				
Program Milestones							
Forward Deploy Radar Integration & Test Complete			3Q				
Forward Deploy Radar System Rqmts Phase Complete		3Q					
Forward Deployable Radar Capability Achieved				3Q			

Project: 5011 Ballistic Missile Defense Radars Block 2006

MDA E	xhibit R-4A Scho	edule Detail	Date <b>February 2004</b>										
APPROPRIATION/BUDGET ACTIVITY			R-1 NON	MENCLATURE		<u> </u>							
RDT&E, DW/04 Advanced Component Dev	elopment and P	Prototypes (ACD&P)											
Schedule Profile	FY 2003	FY 2004 F	Y 2005	FY 2006	FY 2007	FY 2008	FY 2009						
TPS-X FBR Algorithm Progress Reviews		10	,3Q,4Q										
Manufacturing Processes and Advanced Materials													
Forward Deployable Radar Integrated w/Release 1				2Q									
Mature FBR Algorithms			4Q										

Project: 5011 Ballistic Missile Defense Radars Block 2006

MDA Exhibit R-2A RDT&E Project Justification					Date F <b>ebruary 2</b> 0	004		
APPROPRIATION/BUDGET ACTIVITY	R	-1 NO	OMENCLA'	TURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&	P) 0	6038	84C Ballis	tic Missile	Defense Ser	nsors		
COST (\$ in Thousands)	FY 20	03	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
0811 Ballistic Missile Defense Radars Block 2006		0	99,848	256,101	260,114	487,212	216	221
RDT&E Articles Qty		0	0	0	0	0	0	0

Note: In FY 2003 Forward Deployable Radar development is described in Project 5011. For FY 2004 and beyond, the BMDS development effort is described in two Projects: 8011 and 0911.

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

Block 2006. The Forward Deployable Radar will enhance the BMDS capability to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight. The objective of the Forward Deployable Radar project is to validate the BMDS sensor-layering concept. The Forward Deployable Radar provides a sensor with capability for detection of ballistic missiles early in their flight and for providing precise tracking information for use by other elements of the BMD System for engagement of targets.

Due to the demise of the ABM Treaty the BMDS can deploy forward based radars (both land and sea based) supporting a layered sensor strategy. This approach provides overlapping sensor coverage and the potential for BMDS weapons to extend their effective range beyond local sensors by using more sophisticated engagement strategies. The Forward Deployable Radar will pass target data to the command and control system for use by mid-course sensors and weapons for tracking and subsequent interception. Earlier detection with forward based radars coupled with layered sensors gives the BMDS a continuous tracking and discrimination capability with more time and opportunities to engage the target, resulting in an increased probability of success.

The forward based radar broadens BMDS capability in the near future, adding robustness against a wide range of threats and may be used to provide support for increased protection of forward based military assets, allies, and friends. In recognition of the difficulty in predicting our adversaries or the location of future battlefields, the Forward Deployable Radar is planned to be ground based with the potential for sea basing. The Forward Deployable Radar capability now under development will: extend the BMDS battlespace; allow for more sophisticated engagement strategies; allow for rapid reconfiguration of the BMDS; and reduce vulnerability to countermeasures, complicating an enemy's ability to penetrate the defense system. Analysis of the capabilities that the Forward Deployable Radar add to the Ballistic Missile Defense System was coordinated with Missile Defense National Team (MDNT) assistance.

The Forward Deployable Radar will consist of existing X-band radar hardware, modified software algorithms for tracking and discrimination, and a direct interface with the BMDS command and control system. The Forward Deployable Radar design leverages existing radar configurations and technologies. This commonality allows for the accelerated procurement/development of the Forward Deployable Radar to satisfy Block 2006 capability requirements. Hercules algorithms will be used to enhance the Forward Deployable Radar software. The TPS-X radar will serve as a Test Bed to validate the algorithms and interface with the C2BMC prior to their inclusion in the Forward Deployable radar design. The TPS-X may also support forward based capability and enhancement of the BMDS Block 2004, if required.

The addition of forward-based radars in the ESG for Block 06 adds to the BMDS by eliminating sensor coverage gaps in certain areas where a ballistic missile threat exists. Forward basing the radars gives the BMDS improved initial search, early detection and tracking capabilities in various forward locations as needed to counter ballistic missiles in the early or boost stage of flight, and hand off tracking responsibility to other BMDS sensors as part of a layered defense. This allows better information about the threat to improve system performance. Forward basing allows the radar to provide a cue to interceptors as a launch on remote capability. The mobility of the forward based radars gives the BMDS the flexibility to adjust sensor coverage to suite changes in the threat environments.

In FY 2003, Forward Deployable Radar executed \$32.219 million for program and technical support used to establish the Forward Deployable Radar program, including SETA, FFRDC, UARC; and provide initial funding for the Forward Deployable Radar letter contract. In addition, the BMDS program executed \$12.0 million to improve the TPS-X as a Test Bed which will be use as a risk reduction asset to mature, validate and test the tracking and discrimination algorithms prior to the delivery of the Forward Deployable Radar equipment.

The project also provides analysis of multi-spectral sensor enhancements for the BMDS leading to a sensor architecture and roadmap defining the paths for future sensor capabilities. The roadmap includes the evaluation of EO-IR sensors as enhancements to BMDS.

Project: 0811 Ballistic Missile Defense Radars Block 2006

			Date	
MDA Exhibit R-2A RDT&E Project Jus	tification		February 2004	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCI	ATURE	
RDT&E, DW/04 Advanced Component Development and Prototype	s (ACD&P)	0603884C Bal	listic Missile Defense Sensor	s
B. Accomplishments/Planned Program				
	FY	7 2003	FY 2004	FY 2005
Capability Development		0	99,848	256,10

FY 2003 Accomplishments: (Funded in Project 5011)

- Completed Forward Deployable Radar project planning
- Initiated and completed definition of acquisition strategy for Block 2006 radar configuration
- Awarded letter contract to meet block 2006 delivery
- Identified and initiated TPS-X radar improvements for use as a test asset for advanced algorithm validation and risk reduction on C2BMC interfaces
- Finalized Concept Validation (CV) plans for the initial set of algorithms
- Identified additional sensors to enhance BMDS mission performance

### FY 2004 Planned Program:

RDT&E Articles (Quantity)

- Define Forward Deployable Radar letter contract for Block 2006 radar configuration
- Continue Forward Deployable Radar integration
- Define a BMDS sensor architecture and roadmap
- Complete sensor analysis to support definition of BMDS sensor architecture
- Continue to evaluate tracking and discrimination algorithms
- Develop test plans and begin algorithm assessment with TPS-X radar

### FY 2005 Planned Program:

- Delivery of Forward Deployable Radar hardware for field-testing
- Delivery of engineering software release 1
- Continue Forward Deployable Radar integration and tests efforts
- Update sensor architecture and roadmap
- Deliver validated algorithms for Forward Deployable Radar
- Continue TPS-X advanced algorithm assessments
- Continue assessment of advanced algorithms in software release 1
- Execute Forward Deployable Radar C2BMC and platform integration efforts
- Initiate development of BMDS sensor enhancements to support BMDS spiral upgrades
- Execute contract option for 2nd Forward Deployable Radar

Project: 0811 Ballistic Missile Defense Radars Block 2006

	Date
MDA Exhibit R-2A RDT&E Project Justification	February 2004
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missile Defense Sensors
C Other Program Funding Summers	

							-	Total
FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
151 217	225.269	204 220	100.460	246 201	296.296	205 265	Garatia in a	Garatin in
		,		,	· ·		ŭ	Continuing
101,754	0	0	0	0	0	0	Continuing	Continuing
0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
1,028,016	0	0	0	0	0	0	Continuing	Continuing
134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
887,616	0	0	0	0	0	0	Continuing	Continuing
138,922	0	0	0	0	0	0	Continuing	Continuing
138,791	0	0	0	0	0	0	Continuing	Continuing
7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing
	887,616 138,922 138,791 7,432	151,217 225,268 101,754 0 0 149,993 1,028,016 0 134,093 874,527 3,056,035 3,744,066 705,643 617,270 0 117,719 0 635,782 0 305,309 0 445,356 887,616 0 138,922 0 138,791 0 7,432 14,327	151,217         225,268         204,320           101,754         0         0           0         149,993         256,159           1,028,016         0         0           134,093         874,527         937,748           3,056,035         3,744,066         4,404,335           705,643         617,270         492,614           0         117,719         511,262           0         635,782         716,427           0         305,309         418,608           0         445,356         479,764           887,616         0         0           138,922         0         0           138,791         0         0           7,432         14,327         13,884	151,217         225,268         204,320         199,468           101,754         0         0         0           0         149,993         256,159         229,512           1,028,016         0         0         0           134,093         874,527         937,748         993,048           3,056,035         3,744,066         4,404,335         3,067,800           705,643         617,270         492,614         555,667           0         117,719         511,262         1,118,599           0         635,782         716,427         673,476           0         305,309         418,608         421,049           0         445,356         479,764         492,988           887,616         0         0         0           138,922         0         0         0           7,432         14,327         13,884         12,958	151,217         225,268         204,320         199,468         246,291           101,754         0         0         0         0           0         149,993         256,159         229,512         232,463           1,028,016         0         0         0         0           134,093         874,527         937,748         993,048         1,117,657           3,056,035         3,744,066         4,404,335         3,067,800         3,087,147           705,643         617,270         492,614         555,667         611,736           0         117,719         511,262         1,118,599         1,717,480           0         635,782         716,427         673,476         656,152           0         305,309         418,608         421,049         445,971           0         445,356         479,764         492,988         527,541           887,616         0         0         0         0           138,791         0         0         0         0           7,432         14,327         13,884         12,958         12,850	151,217         225,268         204,320         199,468         246,291         286,286           101,754         0         0         0         0         0           0         149,993         256,159         229,512         232,463         231,583           1,028,016         0         0         0         0         0           134,093         874,527         937,748         993,048         1,117,657         570,000           3,056,035         3,744,066         4,404,335         3,067,800         3,087,147         1,881,298           705,643         617,270         492,614         555,667         611,736         473,602           0         117,719         511,262         1,118,599         1,717,480         2,196,531           0         635,782         716,427         673,476         656,152         654,015           0         305,309         418,608         421,049         445,971         456,339           0         445,356         479,764         492,988         527,541         539,210           887,616         0         0         0         0         0           138,791         0         0         0         0	151,217         225,268         204,320         199,468         246,291         286,286         305,365           101,754         0         0         0         0         0         0         0           0         149,993         256,159         229,512         232,463         231,583         224,626           1,028,016         0         0         0         0         0         0         0           134,093         874,527         937,748         993,048         1,117,657         570,000         410,324           3,056,035         3,744,066         4,404,335         3,067,800         3,087,147         1,881,298         1,802,257           705,643         617,270         492,614         555,667         611,736         473,602         455,961           0         117,719         511,262         1,118,599         1,717,480         2,196,531         2,449,322           0         635,782         716,427         673,476         656,152         654,015         688,119           0         305,309         418,608         421,049         445,971         456,339         469,621           0         445,356         479,764         492,988         527,541	151,217         225,268         204,320         199,468         246,291         286,286         305,365         Continuing           101,754         0         0         0         0         0         0         0         Continuing           0         149,993         256,159         229,512         232,463         231,583         224,626         Continuing           1,028,016         0         0         0         0         0         0         Continuing           134,093         874,527         937,748         993,048         1,117,657         570,000         410,324         Continuing           3,056,035         3,744,066         4,404,335         3,067,800         3,087,147         1,881,298         1,802,257         Continuing           705,643         617,270         492,614         555,667         611,736         473,602         455,961         Continuing           0         635,782         716,427         673,476         656,152         654,015         688,119         Continuing           0         305,309         418,608         421,049         445,971         456,339         469,621         Continuing           887,616         0         0         0

Project: 0811 Ballistic Missile Defense Radars Block 2006

· · · · · · · · · · · · · · · · · · ·		Date
MDA Exhibit R-2A RDT&E Project Justification		February 2004
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	· · · · · · · · · · · · · · · · · · ·
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missil	le Defense Sensors
	·	· · · · · · · · · · · · · · · · · · ·

#### **D.** Acquisition Strategy

The Forward Deployable Radar project will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

The Forward Deployable Radar project acquisition strategy leverages existing radar configurations and technologies as part of the development of the forward based Forward Deployable Radar. The project awarded a letter contract to build a radar using X-band technology and existing radar designs to minimize development costs and schedule. Design enhancements will focus on software changes for the forward based algorithms and modified C2BMC connectivity. The contract is a cost plus-award fee effort, and includes options for up to three additional radars. Contract options for three additional forward based radars will be executed in FY 2005, FY 2006 and FY 2007, respectively.

An ECP to the TPS-X test instrumentation radar was funded to implement improvements so the radar could be used as a Test Bed to support Forward Deployable Radar software development. This is a risk reduction asset that will be used to mature, validate and test the Hercules based tracking and discrimination algorithms. The TPS-X also will be used to test the C2BMC communications before they are integrated into the forward based radar. The TPS-X will allow testing to begin a year earlier providing more time for maturing the software prior to the Forward Deployable Radar equipment delivery.

The Forward Deployable Radar project is planned to include a research and development program to provide for upgrades to future radars or sensors as required to support BMDS spiral development.

Project: 0811 Ballistic Missile Defense Radars Block 2006

	MDA E-bil	s:4 D 2 DDT 8-E Duo	signt Coat Amo	lvaia			Date <b>Februa</b>	mr. 2004		
APPROPRIATION/BUDGET A		oit R-3 RDT&E Pro	ject Cost Ana	lysis	R-1 NOMEN	CLATURE	rebrua	ry 2004		
RDT&E, DW/04 Advanced		evelopment and P	Prototypes (A	CD&P)	0603884C I		ssile Defens	e Sensors		
I. Product Development Cost (\$1	<u> </u>	- · · · · · <b>F</b> · · · · · · · ·		)						
111 outet Development Cost (\$4.	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Capability Development										
RADAR										
		Raytheon/								
Capability Based R&D Contract	SS/CPAF	MA		79,125	1Q	149,477	1Q	CONT.	228,602	TBD
Additional Forward Deployable		Raytheon/								
Radars	SS/CPAF	MA				75,000	1Q	CONT.	75,000	TBD
TPS-X										
		Raytheon/								
Capability Based R&D Contract	SS/CPAF	MA		1,424	1Q	3,050	1Q	CONT.	4,474	TBD
		MIT/LL/								
Capability Based R&D Contract	MIPR	MA		10,009	1Q	9,650	1Q	CONT.	19,659	TBD
Capability Based R&D Contract	MIPR	PMRF				1,750	1Q		1,750	
TPS-X O&S										
		Raytheon/								
Maintain Test Asset	SS/CPAF	MA				4,200	1Q		4,200	
		MIT/LL/								
Maintain Test Asset	MIPR	MA				1,200	1Q		1,200	
Subtotal Product Development			0	90,558		244,327		0	334885	
Remarks	<u> </u>		'		1		•	'		
FY 2003 Project Costs are described	in Project 5011.									
II. Support Costs Cost (\$ in Thou	uganda )									
n. Support Costs Cost (\$ in Tho	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Capability Development	71		1					1		
Program Management	+		1							
<i>C C</i>	+	TASC/	1							
	FFP	VA		2,500	1Q	2,600	1Q		5,100	
			l	,	`	,	,		<u> </u>	

Project: 0811 Ballistic Missile Defense Radars Block 2006

	MDA Exh	ibit R-3 RDT&E Proj	ect Cost Ana	lysis			Februar	ry 2004		
APPROPRIATION/BUDGET	ACTIVITY	·			R-1 NOMEN	ICLATURE				
RDT&E, DW/04 Advance	d Component I	Development and Pr	ototypes (A	CD&P)	0603884C I	Ballistic Mis	sile Defense	Sensors		
	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Engineering Support										
		CSC/								
	FFP	VA		2,300	1Q	2,400	1Q		4,700	
Program Support										
	Various	Various		472	1Q	1,304	1Q		1,776	
Subtotal Support Costs			0	5,272		6,304		0	11576	
III. Test and Evaluation Cost (	\$ in Thousands ) Contract	Performing	Total		FY 2004		FY 2005			Target
FY 2003 Project Costs are describ	au in Floject 3011.									
m. Test and Evaluation Cost (		Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Subtotal Test and Evaluation								-		
Remarks								<u>'</u>		
	( d									
IV. Management Services Cost	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Capability Development	a Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Capability Development		MIT/LL, MITRE,								
FFRDC/UARC	Various	JHU/APL		4,018	1Q	5,470	1Q		9,488	
Subtotal Management Services			0	4,018		5,470		0	9488	
Bubliotai Management Bei vices			1 1	<u> </u>	1	· I				
Remarks										
	ed in Project 5011.									
Remarks FY 2003 Project Costs are describ	ed in Project 5011.		0 1	99.848		256.101			355,949	
Remarks FY 2003 Project Costs are describ Project Total Cost Remarks			0	99,848		256,101			355,949	
Remarks FY 2003 Project Costs are describ Project Total Cost			0	99,848		256,101			355,949	

Project: 0811 Ballistic Missile Defense Radars Block 2006

MDA	Exh	ibit	R-4	Sche	edule	Pro	file											Date <b>Feb</b> i		ry 20	004							
APPROPRIATION/BUDGET ACTIVITY										R-1 NOMENCLATURE																		
RDT&E, DW/04 Advanced Component Dev	velo	pme	ent a	ınd J	Prot	otyp	jes (	ACI	)&P	')	060	388	<b>4C</b>	Ball	istic	Mis	ssile	Def	ense	e Ser	asor	S						
Fiscal Year		20	003	2004 20				20	2005 2006							2007 2008					800			200	09			
	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
Acquisition Milestones																												
Definitize Forward Deployable Radar Contract					Δ																						$\Box$	
Exercise Option for Forward Deployable Radar #2			<u> </u>	<u> </u>		<u> </u>	<u>                                     </u>		Δ																		$\Box$	
Exercise Option for Forward Deployable Radar #3			<u> </u>	<u> </u>		<u> </u>	<u>                                     </u>						Δ												Ш		$\Box$	
Exercise Option for Forward Deployable Radar #4			<u> </u>	<u> </u>		<u> </u>											Δ											
Studies & Analyses									_																			
Evaluate FBR Algorithms (TPS-X)		<u> </u>	<u></u> —'	Ĺ_'		₩	=	=	$\boxminus$	$\models$	$\boxminus$	$\Delta$																
Sensor Architecture Analysis			<u> </u>	<u> </u>	<u> </u>	=	=	$\sqsubseteq$			$\sqsubseteq$					$\Delta$												
Development Milestones																												
Forward Deployable Radar Software CDR			'	<u> </u>		'	<u> </u>			Δ																	$\Box$	
Forward Deployable Radar System Design Review			<u> </u>	L'			Δ																					
TPS-X FBR Algorithm Integration Complete		L	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>					Δ	<u> </u>															
<b>Testing Milestones</b>																												
Forward Deployable Radar Performance Demonstration			'	'	<b>1</b> '	'	'							$\Diamond$														
TPS-X FBR Algorithm Flight Test						$\vdash$						Δ										H	-			П	$\exists$	

Project: 0811 Ballistic Missile Defense Radars Block 2006

MDA	Exh	ibit	R-4	Sche	dule	Pro	file											Date <b>Feb</b>	ruai	ry 20	004							
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component De	velo	pme	ent a	nd l	Prot	otyp	oes (	ACI	D&F	<b>P</b> )	R-1 NOMENCLATURE 0603884C Ballistic Missile						ssile Defense Sensors											
Fiscal Year		20	003			20	004			20	2006						2007 2008								200	)9		
	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
Program Milestones																												
Deliver Forward Deployable Radar #2																	Δ										$\perp$	
Deliver Forward Deployable Radar #3																					Δ							
Deliver Forward Deployable Radar #4																									Δ			
Forward Deployable Radar Capability Achieved	L	L	L		L				L				L		Δ		L				L						$\perp$	
Manufacturing Processes and Advanced Materia	als																											
Mature FBR Algorithms												Δ																
Forward Deployable Radar Integrated w/Release 1														Δ														
W/Kelease 1																											十	$\dashv$
																											十	$\dashv$
																											十	$\dashv$
																											+	$\dashv$
																											十	-
																											十	$\dashv$
																											十	$\dashv$
																										_	十	$\dashv$
																											$\dashv$	$\dashv$
																												_

Project: 0811 Ballistic Missile Defense Radars Block 2006

MDA E	xhibit R-4A Sch	edule Detail				Date <b>February 20</b>	04	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Deve	elopment and l	Prototypes (ACD			MENCLATURE <b>4C Ballistic Mis</b>	sile Defense Sen		
Schedule Profile	FY 2003	FY 2004	FY 2	005	FY 2006	FY 2007	FY 2008	FY 2009
Acquisition Milestones								
Finalize TPS-X FBR Task Order		1Q						
Definitize Forward Deployable Radar Contract		1Q						
Exercise Option for Forward Deployable Radar #2			10	Q				
Exercise Option for Forward Deployable Radar #3					1Q			
Exercise Option for Forward Deployable Radar #4						1Q		
Studies & Analyses								
Evaluate FBR Algorithms (TPS-X)		1Q-4Q	1Q-	4Q				
Sensor Architecture Analysis		1Q-4Q	1Q-	4Q	1Q-4Q			
<b>Development Milestones</b>								
BMDS Radar Software PDR		4Q						
BMDS Radar System Requirements Review (SRR)		1Q						
Forward Deployable Radar Software CDR			20	Q				
Forward Deployable Radar System Design Review		3Q						
TPS-X FBR Algorithm CDR		3Q						
TPS-X FBR Algorithm Integration Complete			40	Q				
TPS-X FBR Algorithm PDR		1Q						
Testing Milestones								
TPS-X FBR Algorithm Flight Test		2Q						
BMDS Radar Software Functional Qualification Test			30	Q				
Forward Deployable Radar Performance								
Demonstration					2Q			
TPS-X FBR Algorithm Flight Test			1Q,20					
BMDS Radar High Power & Integration Test			20	_				
BMDS Radar Near Field Range Test			10	-				
TPS-X FBR Algorithm Flight Test			40	Q				
Program Milestones								
BMDS Radar System Requirements Phase Complete		3Q						
BMDS Radar Integration and Test Complete			30	Q				
Deliver Forward Deployable Radar #2						1Q		
Deliver Forward Deployable Radar #3							1Q	
Deliver Forward Deployable Radar #4								1Q

Project: 0811 Ballistic Missile Defense Radars Block 2006

	Date <b>February 2004</b>
	ENCLATURE C Ballistic Missile Defense Sensors
FY 2005	FY 2006 FY 2007 FY 2008 FY 20
	3Q
1Q,3Q,4Q	
4Q	
	2Q

Project: 0811 Ballistic Missile Defense Radars Block 2006

							-
MDA Exhibit R-2A RDT&E Project Justification			Date <b>February 2</b> 0	004			
APPROPRIATION/BUDGET ACTIVITY  RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&		NOMENCLA <b>3884C Balli</b> s	_	Defense Se	nsors		
COST (\$ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
0911 Ballistic Missile Defense Radars Block 2008	0	0	0	0	100,620	102,207	22,130
RDT&E Articles Qty	0	0	0	0	0	0	0

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

Block 2008: This project will enhance the BMDS capability to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight. Enhancement of the existing sensor architecture will be based on continued sensor coverage gap analysis and architecture studies. The studies will take into account existing sensors (land, sea, air and space based), new sensor technologies and techniques to enhance sensor coverage and advanced sensor algorithms. The studies will examine integration of a Larger Phased Array, SBX Radar, dish radars, passive and active Electro-Optical/Infrared (EO/IR) sensors, and the Forward Deployable Radar into BMDS. The analysis will result in various options to increase coverage, the best of which will be subject to cost-study trade-offs and feasibility for inclusion in Block 08 acquisition, and follow-on spiral development efforts.

Continuing from the Block 2006 design effort, Block 2008 is a spiral enhancement of the BMDS with additional algorithms and software to increase the robustness of the radar. In parallel with new sensor hardware capabilities derived from the studies, the Forward Deployable Radar software will be upgraded to enhance discrimination and tracking as needed to support the BMDS Block 2008 sensor architecture. Options for additional radar or non-radar sensor hardware offer the potential to expand locations and sensor network.

**B.** Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Funding in this period is not programmed until FY07			
RDT&E Articles (Quantity)			

C. Other Program Funding Summary

c. Other frogram running building									
								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing

Project: 0911 Ballistic Missile Defense Radars Block 2008

MDA E	Exhibit R-2A I	RDT&E Proje	ct Justification				Date <b>Feb</b> i	ruary 2004		
APPROPRIATION/BUDGET ACTIVITY						ENCLATU				
RDT&E, DW/04 Advanced Componer	ķP)	06038840	C Ballistic	Missile Def	ense Sensors					
									То	Total

								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing
PE 0603175C Ballistic Missile Defense Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing

### **D.** Acquisition Strategy

The Forward Deployable Radar project will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

Planning for spiral upgrades for Blocks 2008 and 2010 will proceed consistent with the Block 2006 Forward Deployable Radar acquisition strategy and could be impacted by the decision to procure additional radars or sensors.

Project: 0911 Ballistic Missile Defense Radars Block 2008

MDA	Exh	ibit ]	R-4 S	Sche	dule	Pro	file											Date F <b>ebr</b>	uar	y 20	04							
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component De	velo	pme	nt a	nd I	Prot	otyp	es (	ACI	D&F	<b>P</b> )		NOI <b>388</b>					sile	Defe	ense	Sen	sor	S						
Fiscal Year		20	03			20	004			20	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
Acquisition Milestones																												
Initiate Acquisition of SBX 2	L			Ш	L		L		L	L			Ш						Δ			L						_
Development Milestones																												
Insert Mature Technologies into Existing Sensors																		Δ										
Sensor Diversity both in RF Radar and in OE/IR																					Δ							
																										$\dashv$	_	_
																												$\dashv$
																										$\dashv$		-
																												7
																											$\dashv$	_#
																										$\dashv$	$\dashv$	4
																											_	-

Project: 0911 Ballistic Missile Defense Radars Block 2008

MDA	Exhibit R-4A Scho	edule Detail			Date <b>February 20</b>	04	
APPROPRIATION/BUDGET ACTIVITY  RDT&E, DW/04 Advanced Component Dev			R-1 NO <b>06038</b>	OMENCLATURE <b>84C Ballistic Mis</b>			
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
<b>Acquisition Milestones</b>	'					1	
Initiate Acquisition of SBX 2	'				3Q	1	
<b>Development Milestones</b>							
Insert Mature Technologies into Existing Sensors					2Q		
Sensor Diversity both in RF Radar and in OE/IR						1Q	

Project: 0911 Ballistic Missile Defense Radars Block 2008

CITCLIN										
			]	Date						
MDA Exhibit R-2A RDT&E Project Justification			]	February 2	004					
APPROPRIATION/BUDGET ACTIVITY	R-1	NOMENCLA	TURE							
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) 0603884C Ballistic Missile Defense Sensors										
COST (\$ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009			
5060 Test & Evaluation	4,47	78 0	0	0	0	0	0			
RDT&E Articles Qty		0 0	0	0	0	0	0			
N. EVACCOCCUTE CONTRACTOR AND ADDRESS OF THE PROPERTY OF THE P	1. C .1		1 DE 0	(03000G: E	W 2002 FEI	FW 2002	c 1			

Note: FY 2002 funding is for Advanced Concept Studies under the Advanced Systems Deputate. Funding for this activity continues under PE 0603880C in FY 2003. The above FY 2003 funding is for the congressionally directed Airborne Infrared Surveillance (AIRS) Project. Funding for AIRS in FY 2002 was under the BMD Technology PE (0603175C).

### A. Mission Description and Budget Item Justification

The Advanced Concept Studies were managed under Project Hercules in FY 2002 and has become part of the Advanced Systems Deputate. The goal of this funding was to establish the Advanced Systems Innovation Cell, the Small Business Innovation Research evaluation group, and to allow the creation of a decision architecture prototype.

The Airborne Infrared Surveillance Project (AIRS) is a demonstration activity to provide a pathfinder for airborne infrared surveillance and fire control in the Ballistic Missile Defense (BMDS) Block 2006 or earlier. These activities will include maturing techniques and technologies that provide a bridge between the Test and Evaluation (T&E) data collection asset and a mature airborne infrared surveillance and fire control asset. Specifically, activities will include efforts on self-cueing, communications, and real-time discrimination.

### **B.** Accomplishments/Planned Program

STATE OF THE STATE	FY 2003	FY 2004	FY 2005
Airborne Infrared Surveillance System	4,478		
RDT&E Articles (Quantity)			

#### FY 2003 AIRS ACCOMPLISHMENTS

Continued sensor and pointing system improvements. Evaluated deploying the Heimdall sensor suite on platforms such as the Global Hawk and Predator B UAVs. Collected prelaunch and boost phase data on a TEL on the ADE 4 mission. Demonstrated the ability to develop fire control quality 3-D tracks on the ASFT (Red Dog) missions. Completed AIRS Software Critical Design Review (CDR) for integration of tracking system enhancements, integration of communications systems, and hosting GFE discrimination algorithms. (TRL 3-5)

#### C. Other Program Funding Summary

								To	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603175C Ballistic Missile Defense									
Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing

Project: 5060 Test & Evaluation

MDA Exhibit R-2A (PE 0603884C)

MDA Exhibit R-2A RDT&E Project Justification	Date <b>February 2004</b>
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missile Defense Sensors
	m m 1

			J F 42 (4-5-4	-				То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469,621	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing

### **D.** Acquisition Strategy

Acquisition strategy is to leverage existing T&E asset to mature necessary functions and aspects of surveillance and fire control and to serve as part of a contingency/emergency capability as a part of the BMDS Test Bed. Technology and techniques developed under AIRS will serve as a pathfinder for similar technologies in the high altitude, long endurance, stratospheric airship under study as well as the Spaced Based Infrared Radar (SBIR) technology. The contracting strategy for FY 2003 as a follow on effort to FY 2002 is the sole source of approximately 80% of the effort. They have met the necessary criteria in that no other source is available with the necessary technical expertise, the availability of access and modification of the HALO II aircraft.

Project: 5060 Test & Evaluation MDA Exhibit R-2A (PE 0603884C)

	MDA Evhih	oit R-3 RDT&E Pro	iost Cost Ano	lveje			Date <b>Februa</b>	rs: 2004		
APPROPRIATION/BUDGET A	CTIVITY		•		R-1 NOMEN	NCLATURE Ballistic Mi	-	•		
RDT&E, DW/04 Advanced		evelopment and P	rototypes (A	CD&P)	0003884C	Bainsuc Mi	ssile Delens	e Sensors		
I. Product Development Cost (\$	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Airborne Infrared Surveillance System	J. J.							T T		
AIRS	CPFF		4,478						4,478	
Subtotal Product Development			4,478	0		0		0	4478	
Remarks  II. Support Costs Cost (\$ in Tho						T				
	Contract	Performing	Total		FY 2004		FY 2005			Target
	Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total	Value of
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Complete	Cost	Contract
Carlatatal Carran ant Carta										
Subtotal Support Costs Remarks										
		Performing	Total		FY 2004	<u> </u>	FY 2005			Target
Remarks	Contract	Performing	Total PVs	FY 2004	FY 2004	FY 2005	FY 2005	Cost to	Total	Target Value of
Remarks  III. Test and Evaluation Cost (\$	Contract Method	Activity &	PYs	FY 2004	Award	FY 2005	Award	Cost to	Total Cost	Value of
Remarks  III. Test and Evaluation Cost (\$  Cost Categories:	Contract	•		FY 2004 Cost		FY 2005 Cost		Cost to Complete	Total Cost	Target Value of Contract
Remarks  III. Test and Evaluation Cost (\$  Cost Categories:  Subtotal Test and Evaluation	Contract Method	Activity &	PYs		Award		Award			Value of
Remarks  III. Test and Evaluation Cost (\$  Cost Categories: Subtotal Test and Evaluation  Remarks	Contract Method & Type	Activity &	PYs		Award		Award			Value of
Remarks  III. Test and Evaluation Cost (\$  Cost Categories: Subtotal Test and Evaluation  Remarks	Contract Method & Type	Activity &	PYs		Award		Award			Value of
Remarks  III. Test and Evaluation Cost (\$  Cost Categories: Subtotal Test and Evaluation  Remarks	Contract Method & Type  \$ in Thousands )	Activity & Location	PYs Cost		Award Date		Award Date			Value of Contract
Remarks  III. Test and Evaluation Cost (\$  Cost Categories: Subtotal Test and Evaluation  Remarks  IV. Management Services Cost (  Cost Categories:	Contract Method & Type  \$ in Thousands )  Contract	Activity & Location  Performing	PYs Cost	Cost	Award Date  FY 2004	Cost	Award Date	Complete	Cost	Value of Contract  Target Value of
Remarks  III. Test and Evaluation Cost (\$  Cost Categories: Subtotal Test and Evaluation  Remarks  IV. Management Services Cost (  Cost Categories:	Contract Method & Type  \$ in Thousands ) Contract Method	Activity & Location  Performing Activity &	PYs Cost Total PYs	Cost FY 2004	Award Date  FY 2004 Award	Cost FY 2005	Award Date  FY 2005 Award	Complete  Cost to	Cost	Value of Contract Target Value of
Remarks  III. Test and Evaluation Cost (\$  Cost Categories: Subtotal Test and Evaluation  Remarks  IV. Management Services Cost (  Cost Categories:	Contract Method & Type  \$ in Thousands ) Contract Method	Activity & Location  Performing Activity &	PYs Cost Total PYs	Cost FY 2004	Award Date  FY 2004 Award	Cost FY 2005	Award Date  FY 2005 Award	Complete  Cost to	Cost	Value of Contract
Remarks  III. Test and Evaluation Cost (\$  Cost Categories: Subtotal Test and Evaluation  Remarks  IV. Management Services Cost (  Cost Categories: Subtotal Management Services	Contract Method & Type  \$ in Thousands ) Contract Method	Activity & Location  Performing Activity &	PYs Cost Total PYs	Cost FY 2004	Award Date  FY 2004 Award Date	Cost FY 2005	Award Date  FY 2005 Award	Complete  Cost to	Cost	Value of Contract Target Value of

Project: 5060 Test & Evaluation

MDA Exhibit R-3 (PE 0603884C)

	OA Exl	nibit	R-4	Sche	edule		file											Date F <b>eb</b> r		y 20	04							
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component 1	Develo	pmo	ent a	nd l	Prot	totyj	pes (	ACI	)&P	<b>'</b> )					ATU. istic		sile	Def	ense	Sen	sor	S						
Fiscal Year		20	003			20	004			20	005			20	006			20	07			20	800			20	09	
	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
AIRS			Ι.					•			ı			1	1								1					
FBE Kilo		<u> </u>	▲												ļ													
First Tracking Upgrade	Δ			L .		1	_															_				Щ		<u> </u>
Geo Registration		ļ.,		Δ																								$\vdash$
Pointing System Upgrade		Δ	<u> </u>																							Щ		<u> </u>
Space Object Tracking		<u> </u>	<b>A</b>																									_
Space Track Demo		Δ				1																						
Celestial Alignment Upgrade				Δ																								<u> </u>
Image Enhancement		Δ																										<u> </u>
GFE CDC Installation				Δ																								<u> </u>
Integration & Test Iridium	<u> </u>	$\vdash$																										$\vdash$
																												<u>L</u>
																												<u> </u>
		ļ	<u> </u>																									<u> </u>
																												<u> </u>
																												<u> </u>
																												L

Project: 5060 Test & Evaluation

MDA Exhibit R-4 (PE 0603884C)

	MDA Exhibit R-4A Sch	edule Detail				Date <b>February 20</b>	04			
APPROPRIATION/BUDGET ACTIVIT <b>RDT&amp;E, DW/04 Advanced Compo</b>		Prototypes (AC		R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors						
Schedule Profile	FY 2003	FY 2004	FY 2	005	FY 2006	FY 2007	FY 2008	FY 2009		
AIRS										
FBE Kilo	3Q									
First Tracking Upgrade	1Q									
Geo Registration	4Q									
Pointing System Upgrade	2Q									
Space Object Tracking	3Q									
Space Track Demo	2Q									
Celestial Alignment Upgrade	4Q									
Image Enhancement	2Q									
GFE CDC Installation	4Q									
Integration & Test Iridium	1Q-2Q									

Project: 5060 Test & Evaluation MDA Exhibit R-4A (PE 0603884C)

Date MDA Exhibit R-2A RDT&E Project Justification February 2004										
APPROPRIATION/BUDGET ACTIVITY	R-1	NOMENCLA	TURE							
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&	RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) 0603884C Ballistic Missile Defense Sensors									
COST (\$ in Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009			
5090 Program-Wide Support	34,87	8 0	0	0	0	0	0			
RDT&E Articles Qty		0	0	0	0	0	0			

Note: Fiscal Year 2003 is reflected in project 5090 and Fiscal Years 2004 and out are in project 0602.

### A. Mission Description and Budget Item Justification

This project covers personnel and related support costs, statutory and fiscal requirements.

Personnel covers government civilians performing program-wide oversight functions such as contracting, program integration, safety, quality and mission assurance at Missile Defense Agency (MDA), Executing Agents within the US Army Space & Missile Defense Command, US Army PEO Air and Missile Defense, US Navy PEO for Theater Surface Combatants, Office of Naval Research, and US Air Force.

Assistance required to support Missile Defense Agency program-wide management functions is also contained in this project. Typical efforts include cost estimating; audit; technology integration across MDA projects; and assessment of schedule, cost and performance, with attendant documentation of the many related programmatic issues. The requirements for this area are based on most economical and efficient utilization of contractors versus government personnel.

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

#### B. Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Civilian Salaries and Support	34,878	0	0
RDT&E Articles (Quantity)			

#### Personnel:

Provides funding for government salaries and benefits at the Missile Defense Agency that are associated with program-wide support.

#### Management Support:

Funds the contract SETA support costs directly associated with Missile Defense Agency program-wide support organizations. This effort provides the funding for the Missile Defense Agency's executing agents (Army Space and Missile Defense Command, Army PEO-AMD, Air Force, and Navy) including government salaries & benefits, SETA support, and various management/overhead costs.

### Fiscal Requirements:

This effort funds various requirements at the Missile Defense Agency, to include accounting services, special termination costs foreign currency fluctuations, and charges from cancelled appropriations.

Project: 5090 Program-Wide Support

MDA Exhibit R-2A (PE 0603884C)

		Date
MDA Exhibit R-2A RDT&E Project Justification		February 2004
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603884C Ballistic Missil	e Defense Sensors

IM/IT Operations:

This effort pays for Information Management/Information Technology requirements within the Missile Defense Agency. These requirements are moved to the Management Headquarters Program Element in Fiscal Years 2004-2009.

C. Other Program Funding Summary

C. Other Program Funding Summary									
								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603175C Ballistic Missile Defense									
Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts,									
Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense									
System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense									
Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense	2.056.025	2.744.066	4 40 4 225	2.0.7.000	2 005 1 15	1 001 200	1 000 055		a
Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost	705 (42	617.070	402 614	555 667	611.726	472 602	455.061		G
Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing
PE 0603886C Ballistic Missile Defense	0	117.710	511 262	1 110 500	1 717 490	2 106 521	2 440 222	Cantinoin a	Cantinaina
System Interceptors	0	117,719	511,262	1,118,599	1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test	0	635,782	716,427	673,476	656,152	654,015	688,119	Continuing	Continuing
and Targets	U	055,762	/10,42/	0/3,4/0	030,132	034,013	000,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,049	445,971	456,339	469.621	Continuing	Continuing
	U	303,307	410,000	441,047	443,7/1	430,339	409,021	Continuing	Continuing
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
-	· ·	773,330	477,704	472,700	321,371	337,210	300,303	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile	007,010	U	U	U		0	0	Continuing	Continuing
Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
Berense Acquisition - EMB	130,722	O	O	O	o l	U	U	Continuing	Continuing

Project: 5090 Program-Wide Support

MDA	Exhibit R-2A I	RDT&E Proje	ct Justification			Date <b>Febr</b> i	ıary 2004		
APPROPRIATION/BUDGET ACTIVITY  RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)  R-1 NOMENCLATURE 0603884C Ballistic Missile I							nse Sensors		
								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0		0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,95	3 12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,09	9 145,112	151,727	154,583	Continuing	Continuing

Project: 5090 Program-Wide Support

MDA Exhibit R-2A (PE 0603884C)

MDA Exhibit R-2A RDT&E Project Justification		Date <b>February 2</b>	004						
APPROPRIATION/BUDGET ACTIVITY	R-	NOMENCLA	TURE						
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&	RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) 0603884C Ballistic Missile Defense Sensors								
COST (\$ in Thousands)	FY 200	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009		
0602 Program-Wide Support		0 7,424	14,085	16,703	20,871	22,892	26,379		
RDT&E Articles Qty		0 0	0	0	0	0	0		

Note: Fiscal Year 2003 is reflected in project 5090 and Fiscal Years 2004 and out are in project 0602.

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

This project covers personnel and related support costs, statutory and fiscal requirements.

Personnel covers government civilians performing program-wide oversight functions such as contracting, program integration, safety, quality and mission assurance at Missile Defense Agency (MDA), Executing Agents within the US Army Space & Missile Defense Command, US Army PEO Air and Missile Defense, US Navy PEO for Theater Surface Combatants, Office of Naval Research, and US Air Force.

Assistance required to support Missile Defense Agency program-wide management functions is also contained in this project. Typical efforts include cost estimating; audit; technology integration across MDA projects; and assessment of schedule, cost and performance, with attendant documentation of the many related programmatic issues. The requirements for this area are based on most economical and efficient utilization of contractors versus government personnel.

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

#### B. Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Civilian Salaries and Support	0	7,424	14,085
RDT&E Articles (Quantity)			

#### Personnel:

Provides funding for government salaries and benefits at the Missile Defense Agency that are associated with program-wide support.

#### Management Support:

Funds the contract SETA support costs directly associated with Missile Defense Agency program-wide support organizations. This effort provides the funding for the Missile Defense Agency's executing agents (Army Space and Missile Defense Command, Army PEO-AMD, Air Force, and Navy) including government salaries & benefits, SETA support, and various management/overhead costs.

#### Fiscal Requirements:

This effort funds various requirements at the Missile Defense Agency, to include accounting services, special termination costs foreign currency fluctuations, and charges from cancelled appropriations.

Project: 0602 Program-Wide Support

MDA Exhibit R-2A (PE 0603884C)

		Date
MDA Exhibit R-2A RDT&E Project Justification		February 2004
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	
RDT&E. DW/04 Advanced Component Development and Prototynes (ACD&P)	0603884C Ballistic Missile	e Defense Sensors

IM/IT Operations:

This effort pays for Information Management/Information Technology requirements within the Missile Defense Agency. These requirements are moved to the Management Headquarters Program Element in Fiscal Years 2004-2009.

C. Other Program Funding Summary

C. Other Frogram Funding Summary								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603890C Ballistic Missile Defense System Core	0	445,356	479,764	492,988	527,541	539,210	568,365	Continuing	Continuing
PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD	887,616	0	0	0	0	0	0	Continuing	Continuing
PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD	138,922	0	0	0	0	0	0	Continuing	Continuing
PE 0605502C Small Business Innovative Research - MDA	138,791	0	0	0	0	0	0	Continuing	Continuing
PE 0901585C Pentagon Reservation	7,432	14,327	13,884	12,958	12,850	13,158	13,476	Continuing	Continuing
PE 0901598C Management Headquarters - MDA	35,331	92,449	141,923	146,099	145,112	151,727	154,583	Continuing	Continuing
PE 0603175C Ballistic Missile Defense Technology	151,217	225,268	204,320	199,468	246,291	286,286	305,365	Continuing	Continuing
PE 0603869C Meads Concepts - Dem/Val	101,754	0	0	0	0	0	0	Continuing	Continuing
PE 0603879C Advanced Concepts, Evaluations and Systems	0	149,993	256,159	229,512	232,463	231,583	224,626	Continuing	Continuing
PE 0603880C Ballistic Missile Defense System Segment	1,028,016	0	0	0	0	0	0	Continuing	Continuing
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	134,093	874,527	937,748	993,048	1,117,657	570,000	410,324	Continuing	Continuing
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,056,035	3,744,066	4,404,335	3,067,800	3,087,147	1,881,298	1,802,257	Continuing	Continuing
PE 0603883C Ballistic Missile Defense Boost Defense Segment	705,643	617,270	492,614	555,667	611,736	473,602	455,961	Continuing	Continuing

Project: 0602 Program-Wide Support

MDA Exhibit R-2A RDT&E Project Justification					Date February 2004				
APPROPRIATION/BUDGET ACTIVITY  RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors				
								То	Total
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Complete	Cost
PE 0603886C Ballistic Missile Defense System Interceptors	0	117,719	511,262	1,118,59	99 1,717,480	2,196,531	2,449,322	Continuing	Continuing
PE 0603888C Ballistic Missile Defense Test and Targets	0	635,782	716,427	673,4	76 656,152	654,015	688,119	Continuing	Continuing
PE 0603889C Ballistic Missile Defense Products	0	305,309	418,608	421,04	445,971	456,339	469,621	Continuing	Continuing

Project: 0602 Program-Wide Support