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Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors						
COST (\$ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	567,193	278,168	514,510	589,395	647,382	326,364	220,349
0811 Ballistic Missile Defense Radars Block 2006	271,464	234,703	222,511	84,993	102,545	0	0
0911 Ballistic Missile Defense Radars Block 2008	0	38,745	276,126	470,808	404,233	184,883	160,959
0011 Ballistic Missile Defense Radars Block 2010	2,250	180	7,061	18,530	123,779	129,318	47,992
0812 Space Tracking and Surveillance System (STSS) Block 2006	248,086	0	0	0	0	0	0
0012 Space Tracking and Surveillance System (STSS) Block 2010	42,616	0	0	0	0	0	0
0602 Program-Wide Support	2,777	4,540	8,812	15,064	16,825	12,163	11,398
Amount Included in PE 0904903D	0	0	0	-259,670	-337,825	-201,570	-148,283
Total PE Cost Reflected in R-1	567,193	278,168	514,510	329,725	309,557	124,794	72,066

Starting in FY06 funding for the Space Tracking and Surveillance System (STSS) effort is contained within the Space Tracking and Surveillance System (0603893C) Program Element.

A. Mission Description and Budget Item Justification

The Sensors PE's mission is to develop, acquire, field and operate BMDS sensors utilizing the Block approach to deliver increasing BMDS capabilities. The BMDS architectural objectives are to enhance sensor synergy, close sensor coverage gaps and expand the Engagement Sequence Group (ESG) possibilities for BMDS. Sensor data is used to detect, track, and discriminate ballistic missile threats; to control interceptors; and to support kill assessment and re-targeting. The Sensor elements in this PE have been developed in coordination with MDA Systems Engineering. Fielding of these sensors will occur in conjunction with BMDS blocks: Block 2006 (Project 0811), Block 2008 (Project 0911), and Block 2010 (Project 0011). 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 and Control, Battle Management, and Communication (C2BMC) system. Sensor networking and data fusion are coordinated efforts between MDA C2BMC and the Sensors PE. This strategy will minimize gaps in sensor coverage to improve track continuity and situational awareness.

A.1 System Element Description

The Sensors PE will add four Forward Based X-Band Radar - Transportability (FBX-Ts) to the BMDS sensor architecture. The FBX-T is a phased array radar capable of search, track, and discrimination of ballistic missiles and provides fire control quality data to the BMDS. The radar leverages the THAAD radar's hardware design and incorporates the Hercules Algorithms to accomplish it's new role as a forward-based radar.

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Detection and tracking during the boost phase significantly reduces the uncertainty in target discrimination and reaction time, increasing the BMDS's probability of a successful engagement. Adding Mechanical Steering Kits (MSKs) to these radars enables FBX-Ts to rotate the radar and increases BMDS sensor coverage. Deploying an Adjunct Sensor with the FBX-T will extend tracking/discrimination ranges and support target hand-off to midrange sensors (enables BMDS to close sensor gaps between some forward and mid range sensors to provide continuous tracking and discrimination). Evolving radar configurations will use additional algorithms and provide enhanced capabilities for Block 2008 and beyond. The Sensors PE will validate Hercules forward-based algorithms and other algorithms using the FBX-T Testbed Radar (i.e. TPS-X, a prototype to the FBX-T). The TPS-X allows for testing X-Band algorithms in a live environment before incorporating them in other BMDS X-Band radars. TPS-X significantly reduces the development risk to these radars and ensures the algorithms will enhance BMDS search, track and discrimination capabilities on ballistic missiles in all phases of flight (boost, midcourse and terminal).

The Thule Early Warning Radar (EWR) is a phased array UHF radar capable of search , track and target classification. The Sensors PE will provide upgrades to EWR located at Thule Air Base, Greenland. These upgrades will include hardware and software modifications to enhance processing capabilities and integrate the Thule UEWB into the BMDS Sensor architecture as a midcourse sensor.

The Sensors PE is leveraging the use of external sensors to assist in missile defense engagements. External sensors refers to sensors that are not part of the BMDS but can provide useful cueing, track and/or discrimination data to BMDS. The Sensors PE will use an external sensors laboratory to capture the data from external sensors, correlate and fuse the useful data, and then provide it to BMDS via an interface with C2BMC. This process will allow BMDS to demonstrate the ability to utilize External Sensors in Engagement Sequence Groups.

The Sensors PE was provided a Congressional Plus up in FY05 and FY06 for the Airborne Infrared Surveillance (AIRS) program and in FY05 for a rocket plume signatures study. AIRS is used to evaluate the feasibility of using EO/IR Sensor capabilities to enhance BMDS engagement sequence group options.

A.2 System Element Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS)

The BMDS spiral development approach allows sensor technologies and capabilities to be incorporated as they mature and evolve into a network of sensors at the BMDS level. 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 high probability of success.

Locating the FBX-T's near potential threats (e.g. far-east, middle-east) gives BMDS early track and discrimination capability on missiles in their boost phase and transition to midcourse. Having four FBX-T radars that are transportable gives the BMDS the ability to move the sensors to respond

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<p>to changes in geographical threats. Mechanical Steering Kits and Adjunct Sensors improve the FBX-T's ability to adapt to and operate in a variety of geographical locations. Deploying an Adjunct Sensor in conjunction with an FBX-T extends the tracking and discrimination range where needed to provide continuous sensor coverage between the forward-based radar and a midcourse sensor.</p> <p>The Thule upgraded EWR will be used to provide coverage from asymmetric threats and ICBMs in the midcourse phase of flight. Together with other BMDS sensors the upgrades will help enable continuous tracking and discrimination on ballistic missile threats and provide BMDS with additional Engagement Sequence Group (ESG) possibilities.</p> <p>External Sensors contribute to the BMDS layered approach to sensors that includes diversity in spectra, basing modes and technologies. The External Sensors and other BMDS track data provide new opportunities for data fusion to improve discrimination and situational awareness. The External Sensor data provides for new ESG's that have the potential to enhance the performance of the BMDS.</p> <p><u>A.3 Major System Element Goals</u></p> <p>MDA sensors activities are focused on: 1) develop, upgrade, integrate, field, and verify sensors within the BMDS sensor network; 2) provide BMDS sensors sustainment and Warfighter (Combatant Commanders) support; 3) enhance the performance of the BMDS by extending sensor coverage and accuracy provided by a network of layered sensors.</p> <p>Block 2006</p> <ul style="list-style-type: none">• Develop FBX-T #1 and deploy• Deliver FBX-T #2 <p>Block 2008</p> <ul style="list-style-type: none">• Deliver FBX-T#3 and #4• Develop Adjunct Sensor #1• Upgrade Thule radar to UEWR configuration <p>Block 2010</p> <ul style="list-style-type: none">• Deliver Adjunct Sensor #2• Integrate External Sensor Data into BMDS		

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A.4 Major Events Schedule and Description

Major Event	Project	Timeframe
Contract Activity		
Acquisition Milestones		
Award FBX-T CLS Contract	0811	2Q FY 2005
Thule Upgrade Contract Award	0911	3Q FY 2006
Award Adjunct Sensor Contract	0911	1Q FY 2007
Award Mechanical Steering Kit (MSK) Contract	0911	1Q FY 2007
Other		
Testing Milestones		
FBX-T #1 Integration with BMDS at VAFB	0811	3Q FY 2005 - 1Q FY 2006
FBX-T #2 Integration with BMDS at VAFB	0811	2Q FY 2007 - 4Q FY 2007
Thule Certification	0911	4Q FY 2009
Program Milestones		
FBX-T #1 Operational	0811	4Q FY 2006
FBX-T #2 Operational	0811	1Q FY 2008
FBX-T #3 Operational	0911	2Q FY 2009
FBX-T #4 Operational	0911	2Q FY 2010

B. Program Change Summary	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2006 PB)	577,297	529,829	995,711
Current President's Budget (FY 2007 PB)	567,193	278,168	514,510
Total Adjustments	-10,104	-251,661	-481,201
Congressional Specific Program Adjustments	0	-230,547	0
Congressional Undistributed Adjustments	0	-21,114	0
Reprogrammings	-833	0	0
SBIR/STTR Transfer	-9,271	0	0
Adjustments to Budget Years	0	0	-481,201

FY05 reduction of \$10.104 million includes the SBIR/STTR transfer and MDA reprogrammings.

FY06 reduction of \$251.661 million includes the Congressionally directed transfer of the Space Surveillance and Tracking System to a unique Program Element (PE #0603893C) and a portion of the MDA Congressional undistributed adjustment.

FY07 reduction of \$481.201 million follows through with the Space Surveillance and Tracking System transfer and includes overhead/infrastructure reductions.

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COST (\$ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0811 Ballistic Missile Defense Radars Block 2006	271,464	234,703	222,511	84,993	102,545	0	0
RDT&E Articles Qty	1	0	1	0	0	0	0

Note: RDT&E Articles: Two FBX-T radars will be delivered under Block 2006. Acquisition of one radar, FBX-T #1, was initiated in FY03 and delivered in FY05 with CR1, search and track functionality. Acquisition of FBX-T #2 radar was initiated in FY04 for delivery in FY07.

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense Radars Block 2006 (Project 0811) effort is mostly focused on the Forward Based X-Band Radar-Transportable (FBX-T). Additional Block 2006 efforts include operation of the TPS-X test bed asset, operations and sustainment activities, test and evaluation efforts, and AIRS. The Forward Based X-Band Radar-Transportable (FBX-T) will provide a capability to detect ballistic missiles early in their flight and provide precise tracking information for use by the BMDS. 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.

Block 2006 efforts include:

- Availability for overseas deployment to Japan of the first Forward Based X-Band Radar-Transportable (FBX-T #1);
- Production and deployment planning of the second Forward Based X-Band Radar-Transportable (FBX-T #2);
- Contractor Logistics Support (CLS) contract to operate and sustain the deployed FBX-T Radars; and
- Implement with the MDA Battle Management/Command and Control Directorate (BC) and other MDA Elements sensor netting.

Through FY07, Block 2006 funds primarily support development and production of two FBX-Ts. The out year funds will provide for CLS support to all FBX-Ts through FY09 with the increased funding in FY09 reflecting the acquisition of FBX-T depot spares.

The FBX-T is a high-resolution, X-band, phased array radar . It includes modified software algorithms for tracking and discrimination from a forward based perspective. The radar will have a direct interface with the BMDS C2BMC. The radar will perform surveillance autonomously or as cued by other sensors, and it will acquire, track and discriminate threat missiles and missile components.

Four FBX-T's will be developed and deployed to protect the United States from Intercontinental Ballistic Missiles (ICBMs) and medium range threats (3rd and 4th radars will be Block 2008 assets).

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Advanced capabilities will be added through upgrades and improvement programs via a series of spiral software enhancements. FBX-T forward-based discrimination enhancements will be added in Block 2006 as part of the BMDS Test Bed.

A Contractor Logistics Support (CLS) contract will be used to deploy, operate, and sustain the radars.

Block 2006 efforts include investigation of Electro-Optical/Infrared (EO/IR) sensors. The program's primary objective is to evaluate the AIRS ability to operate as the primary sensor in an Engagement Sequence Group. This is a congressionally directed program with funding in FY05.

B. Accomplishments/Planned Program

	FY 2005	FY 2006	FY 2007
FBX-T Basic Program (includes FBX-T #1)	133,954	80,577	62,538
RDT&E Articles (Quantity)	1	0	0

The basic FBX-T program includes development of the first FBX-T with software Capability Release 1 (CR1) for search and track in a forward-based role. Capability Release 2 (CR2) software development incorporates forward-based discrimination algorithms from project Hercules. This effort also provides the FBX-T program infrastructure, modeling and simulation capability, hardware-in-the-loop facilities, software maintenance, and systems engineering/management support for all radars. The 1st FBX-T provides the BMD System with a forward-based capability and extends the sensor coverage.

FY05 Accomplishments:

RDT&E Test Article: Acquisition of one FBX-T #1 radar was initiated in FY03 and delivered in FY05 with CR1, search and track functionality

- Completed FBX-T #1 hardware production
- Delivered CR1 software for testing
- Began integration and test of C2BMC interface for FBX-T
- Completed Preliminary Design Review for FBX-T software Capability Release 2 (CR2)
- Continued sensor analysis to support definition of BMDS
- Completed final integration and test of FBX-T #1 hardware

FY06 Planned Program:

- Complete FBX-T CR1 software verification
- Develop tool for generation of operational mission plans and search profiles

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- Implement Anti-Tamper program and complete security documentation
- Complete integration and test of C2BMC interface for FBX-T
- Continue FBX-T software development of Capability Release 2 (CR2)
- Complete Critical Design Review for CR2
- Develop models and simulations for input into MDWAR for wargaming participation
- Upgrade hardware in the loop facility with radar digital signal injection system for discrimination testing
- Begin life cycle support

FY07 Planned Program:

RDT&E Test Article: Develop and test FBX-T Capability Release 2 software with forward-based discrimination algorithms from Project Hercules

- Complete FBX-T CR2 software development
- Complete BMDS integration testing with FBX-T CR2 software
- Begin FBX-T software development for CR3
- Maintain hardware in the loop facility to support test and modification activities
- Continue life cycle support of software maintenance

	FY 2005	FY 2006	FY 2007
FBX-T #2 Manufacture	62,582	66,499	40,467
RDT&E Articles (Quantity)	0	0	1

This effort includes the material, labor, engineering and management support for manufacture and acceptance testing of the 2nd FBX-T radar. Software development and system integration are covered under the basic FBX-T program. FBX-T #2 is scheduled for delivery in FY07. The 2nd FBX-T provides the BMD System with a forward based capability and extends the sensor coverage.

FY05 Accomplishments:

- Continued FBX-T #2 hardware production
- Completed manufacture of Monolithic Microwave Integrated Circuits (MMICs) for FBX-T #2
- Completed manufacture of Transmit/Receive Modules (TRMs) for FBX-T #2
- Began production of FBX-T #2 initial spares

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FY06 Planned Program:

- Continue FBX-T #2 hardware production & integration
- Complete assembly of Transmit/Receive Integrated Microwave Modules (TRIMMs) for FBX-T #2
- Complete Near Field Range (NFR) Testing

FY07 Planned Program:

RDT&E Test Article: Acquisition of FBX-T #2 radar was initiated in FY04 for delivery in FY07

- Complete FBX-T #2 acceptance testing
- Deliver FBX-T #2 for system testing with Capability Release 2 (CR2)
- Complete production of FBX-T #2 initial spares

	FY 2005	FY 2006	FY 2007
FBX-T #3 Manufacture	13,224	0	0
RDT&E Articles (Quantity)	0	0	0

This effort includes the material, labor, engineering and management support for manufacture and acceptance testing of the 3rd FBX-T radar. Software development and system integration efforts are covered under the basic. The remainder of the radar production effort and delivery of FBX-T #3 is included in Block 2008 (Project 0911).

FY05 Accomplishments:

- Began FBX-T #3 production of long lead material
- Completed manufacture of Monolithic Microwave Integrated Circuits (MMICs) for FBX-T #3

	FY 2005	FY 2006	FY 2007
Deployment/Site Prep/Activation	17,545	20,514	38,635
RDT&E Articles (Quantity)	0	0	0

The FBX-T radars will be deployed to sites located near expected missile threats. The Block 2006 effort includes deployment of FBX-T #1 and FBX-T #2. FBX-T #1 is scheduled to be deployed to Japan to meet immediate missile threat. The Deployment/ Site Preparation / Activation efforts include planning and coordination with host nation and Combatant Commanders (COCOMs), radar site design, site construction, transport of the radar to the

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<p>overseas site, and radar setup, calibration and activation. This effort also includes deployment preparations, site activation, and radar operations at Vandenberg AFB during final integration & test.</p> <p>FY05 Accomplishments:</p> <ul style="list-style-type: none">• Planned and conducted search and tracking testing with Targets of Opportunity (TOO) SERV 1, 2, GT-187 and GT-189 from test site at Vandenberg AFB• Planned and conducted integration testing with C2BMC for message transfer• Prepared scenarios for ground testing with BMDS including GT 04-1A, GT 04-2A(Phase1)• Began initial site planning and develop facility requirements for FBX-T #1• Conducted site surveys for FBX-T #1 overseas site• Developed and generated operational mission plans and search profiles for FBX-T #1 deployed site• Sustained operations at Vandenberg AFB to include: training CLS team, development of SOP's, and preparation for deployment <p>FY06 Planned Program:</p> <ul style="list-style-type: none">• Complete FBX-T #1 deployment site design• Complete FBX-T #1 deployment construction• Transport and install FBX-T #1 radar• Complete installation and checkout of FBX-T #1• Identify facility requirements for FBX-T #2 <p>FY07 Planned Program:</p> <ul style="list-style-type: none">• Complete host nation agreements for FBX-T #2• Conduct site survey for FBX-T #2 overseas site• Begin initial site planning for FBX-T #2• Ensure readiness for operational use for FBX-T #2		

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APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603884C Ballistic Missile Defense Sensors	
	FY 2005	FY 2006	FY 2007
Test & Evaluation	276	4,003	17,703
RDT&E Articles (Quantity)	0	0	0
<p>This effort includes funds for test infrastructure and test operations (TITO). Conduct flight, ground tests including wargames to demonstrate the capabilities of the forward-based radar to search, track, and discriminate. The testing will demonstrate ability to receive battle management direction from the C2BMC and send the C2BMC messages with tracks and threat data. Effort includes planning, resourcing test sites, creating test files, test execution, analysis and reporting of test event data. This test program will provide an understanding of the capability of the FBX-T, completion of the radar qualification, characterization of an upgraded FBX-T Radar on overall BMDS.</p> <p>FY05 Accomplishments:</p> <ul style="list-style-type: none"> • Provided government oversight and support services to testing • Provided site services to Vandenberg AFB <p>FY06 Planned Program:</p> <ul style="list-style-type: none"> • Plan CR 2 verification site testing • Plan and conduct TOO flight tests - SERV 3, GT-190, and GT-191 • Provide test site support at Vandenberg AFB • Plan and prepare scenarios • Participate in BMDS Missile Defense Integration Exercises • Participate in BMDS ground testing <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • Conduct CR 2 verification testing at Vandenberg AFB, including integration with C2BMC • Plan and conduct TOO flight tests - GT-194, GT-195, and GT-196, including test site support at Vandenberg AFB • Plan, prepare scenarios, and participate in Missile Defense Integration Exercises • Complete environmental testing for FBX-T • Provide test site support at Vandenberg AFB 			

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APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603884C Ballistic Missile Defense Sensors	
	FY 2005	FY 2006	FY 2007
Operations and Support (Sustainment)	14,625	45,644	63,168
RDT&E Articles (Quantity)	0	0	0
<p>MDA will use Contractor Logistics Support (CLS) to operate and sustain the FBX-T radars. The Block 2006 effort includes overseas operation and sustainment of FBX-T #1 and #2; and depot level logistics support for the radars. The O&S efforts include radar operators/maintainers, site security personnel, site maintenance costs, fuel costs, utility costs, and communications support. The operations and sustainment effort will provide support for the FBX-T, which will ensure a critical tracking capability for the BMDS. The GBR-P radar has been placed in a care-taker status while upgrade options are being considered for its future role in the BMDS.</p> <p>FY05 Accomplishments:</p> <ul style="list-style-type: none"> • Established depot and repair infrastructure • Awarded Contractor Logistics Support (CLS) contract for FBX-T Operation and Sustainment • Acquired initial spares to support FBX-T #1 • Operated and sustained FBX-T #1 at Vandenberg AFB <p>FY06 Planned Program:</p> <ul style="list-style-type: none"> • Maintain depot and repair infrastructure • Operate and sustain FBX-T #1 • Acquire spares to support FBX-T #2 overseas deployment • Develop and update mission profiles and security plans • Maintain GBR-P in an operational configuration to support BMDS <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • Operate and sustain FBX-T #1 and #2 • Develop mission plans for FBX-T radars • Conduct depot, return, and repair program 			

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	FY 2005	FY 2006	FY 2007
FBX-T Risk Reduction Test-Bed (TPS-X)	14,866	11,402	0
RDT&E Articles (Quantity)	0	0	0
<p>The primary function of the TPS-X is a test asset radar, where the Project Hercules algorithms and the FBX-T C2BMC interface can be tested while the FBX-T radars are in production. TPS-X provides risk reduction for the FBX-T program by validating the forward-based algorithms that will be used in the CR-2 software release for FBX-T.</p> <p>FY05 Accomplishments:</p> <ul style="list-style-type: none"> • Tested full Project Hercules algorithm suite with decision logic during CMCM-1A and CMCM-1B flight test • Supported FBX-T - C2BMC integration and testing using a prototype C2BMC Network Interface Processor (CNIP) • Demonstrated cued acquisition from FBX-T Radar to TPS-X Radar during SERV-1 mission • Supported FBX-T cue Aegis BMD hardware in the loop demonstration <p>FY06 Planned Program</p> <ul style="list-style-type: none"> • Complete testing and validation of forward-based algorithms with TPS-X • Demonstrate the ability to accept and execute a cue/focus search plan from an overhead sensor • Administration resource management using radar tasking commands • Develop a strategic plan on operating and sustaining the TPS-X 			
	FY 2005	FY 2006	FY 2007
EO/IR Sensors	10,149	6,064	0
RDT&E Articles (Quantity)	0	0	0
<p>The Airborne Infrared Surveillance (AIRS) program is a proof of concept program to demonstrate and evaluate the potential benefits of airborne infrared sensor systems to the Ballistic Missile Defense System (BMDS). The program's scope of work is to evaluate the AIRS ability to operate as the primary sensor in an Engagement Sequence Group (i.e. use AIRS data to engage ballistic missile threats).</p>			

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FY05 Accomplishments:

- Enhanced HALO II sensor tracking performance and calibrated sensor gyros
- Demonstrated AIRS ability to show airborne IR launch and engagement functionality on IFT-13C, IFT-14, SERV-2, MRTF, GT-189, and Cobra Dane/LRALT target launches
- Demonstrated the AIRS search surveillance fence scan on several flight missions
- Communicated 3D state vectors with AIRS encrypted Iridium link from HALO II to a ground station at PMRF

FY06 Planned Accomplishments:

- Demonstrate AIRS ability to provide airborne IR launch and engagement functionality on SERV-3, GT-191, SERV-4, and other MDA flight test opportunities throughout FY06.
- Continue to demonstrate the AIRS search surveillance fence scan during flight test opportunities.
- Communicate 3D state vectors with AIRS encrypted communications link from HALO II to a ground station with C2BMC interface.
- Integrate and test discrimination algorithms on AIRS processing equipment post-processed and also real-time onboard HALO II.

	FY 2005	FY 2006	FY 2007
FBX-T #4 Manufacture	4,243	0	0
RDT&E Articles (Quantity)	0	0	0

This effort includes the material, labor, engineering and management support for manufacture and acceptance testing of the 4th FBX-T radar. Software development and system integration efforts are covered under the basic. The remainder of the radar production effort and delivery of FBX-T #4 is included in Block 2008. The 4th FBX-T provides the BMD System with a forward-based capability and extends the sensor coverage.

FY05 Accomplishments:

- Began FBX-T #4 production of long lead items
- Began manufacture of Monolithic Microwave Integrated Circuits (MMICs) for FBX-T #4

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C. Other Program Funding Summary								
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	224,016	162,297	197,707	192,034	203,946	212,106	218,002	1,410,108
PE 0603879C Advanced Concepts, Evaluations and Systems	166,996	0	0	0	0	0	0	166,996
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	914,063	1,198,860	1,037,203	878,540	615,005	731,692	482,362	5,857,725
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	4,487,253	2,489,257	2,605,567	2,444,109	2,065,344	1,979,612	1,617,059	17,688,201
PE 0603883C Ballistic Missile Defense Boost Defense Segment	472,543	490,863	632,028	567,493	493,842	615,859	988,731	4,261,359
PE 0603886C Ballistic Missile Defense System Interceptors	272,064	215,952	438,287	634,709	1,138,597	1,391,301	1,499,204	5,590,114
PE 0603888C Ballistic Missile Defense Test and Targets	700,570	632,107	692,209	614,174	649,766	668,624	678,105	4,635,555
PE 0603889C Ballistic Missile Defense Products	384,935	394,652	521,640	517,507	534,429	530,893	531,219	3,415,275
PE 0603890C Ballistic Missile Defense System Core	398,852	420,151	558,231	557,880	561,003	548,354	554,731	3,599,202
PE 0603891C Special Programs - MDA	0	324,522	421,303	836,168	1,110,695	1,027,677	1,260,497	4,980,862
PE 0603892C Ballistic Missile Defense Aegis	0	939,066	990,565	857,832	900,265	933,815	816,206	5,437,749
PE 0603893C Space Tracking & Surveillance System	0	239,998	361,515	429,679	640,367	787,008	818,606	3,277,173
PE 0603894C Multiple Kill Vehicle	0	83,000	220,370	273,805	307,566	309,284	115,119	1,309,144
PE 0603895C BMD System Space Program	0	0	0	45,000	150,000	166,000	206,100	567,100
PE 0605502C Small Business Innovative Research - MDA	138,907	0	0	0	0	0	0	138,907
PE 0901585C Pentagon Reservation	11,001	17,386	15,586	6,058	6,376	4,490	4,725	65,622
PE 0901598C Management Headquarters - MDA	110,662	99,327	89,314	86,821	86,244	70,600	70,714	613,682
PE Air Force Military Personnel	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
PE Air Force Operations and Maintenance	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
PE Air Force Other Procurement	0	2,400	1,453	11,279	386	17,710	25,709	58,937
PE Army Operations and Maintenance	49,597	66,974	68,246	69,809	71,472	73,325	75,230	474,653
PE Army Natl Guard Military Personnel	21,000	17,648	24,432	24,952	25,591	25,591	25,591	164,805
PE Army Natl Guard Operations and Maintenance	0	155	151	150	154	164	167	941
PE Navy Operations and Maintenance	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PE PAC-3/MEADS Missile Procurement	574,972	581,924	578,579	660,584	616,020	509,032	738,679	4,259,790
PE PAC-3/MEADS RDT&E	344,978	304,973	336,959	465,395	521,791	522,418	502,961	2,999,475

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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D. Acquisition Strategy

The Forward X-Band Radar-Transportable (FBX-T) 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. This development strategy includes utilizing the TPS-X radar as a risk reduction asset for the BMDS Sensors through FY06. The BMDS radar (FBX-T) project used an existing radar design to minimize development costs and schedule. Design enhancements focus on software changes for the forward-based algorithms and C2BMC connectivity. The contract is a cost plus award fee.

A Contractor Logistics Support (CLS) contract was awarded in FY05 to operate and maintain the FBX-T radars. The CLS contract provides the operations and support activities required for site surveys, planning, and relocation; depot maintenance; system operations; and repair and replacement. The contract is an IDIQ task order contract.

The AIRS program is executed under an existing MDA contract.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis						Date February 2006		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
I. Product Development Cost (\$ in Thousands)								
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
FBX-T Basic Program (includes FBX-T #1)								
FBX-T Radar Basic Program (includes FBX-T #1)	SS/CPAF	Raytheon/ MA	232,295	62,121	1Q	50,349	1Q	344,765
Assessment	MIPR	OGA	0	3,021	N/A	3,352	N/A	6,373
FBX-T Radar		TBD	0	8,717	3Q	2,927	3Q	11,644
FBX-T #2 Manufacture								
FBX-T #2 Manufacture	SS/CPAF	Raytheon/ MA	66,320	58,387	1Q	34,474	1Q	159,181
GFE	MIPR		0	75	2/3Q	0	N/A	75
Assessment	MIPR	OGA	0	2,494	3Q	2,169	N/A	4,663
FBX-T #3 Manufacture								
FBX-T #3 Manufacture	SS/CPAF	Raytheon/ MA	12,535	0	N/A	0	N/A	12,535
Deployment/Site Prep/Activation								
Deployment/Site Prep/Activation	SS/CPAF	Raytheon/ MA	16,247	12,984	1/2Q	20,141	1Q	49,372
Deployment Support/Transportation	MIPR	VAFB, Travis AFB, & TRANSCOM/ CA	383	5,050	2Q	12,772	3Q	18,205
Assessment	MIPR	OGA	0	774	N/A	2,071	N/A	2,845
Operations and Support (Sustainment)								
Deployed Site Operations/Depot Support/ Spares	SS/CPAF	Raytheon/ MA	13,863	35,772	1Q	49,325	1Q	98,960
Base Support Services/Security	MIPR	TBD	0	4,355	2Q	4,487	3Q	8,842
Assessment	MIPR	OGA	0	1,711	2/3Q	3,386	N/A	5,097

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis						Date February 2006		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
FBX-T Risk Reduction Test-Bed (TPS-X)								
TPS-X Operations and Support	SS/CPAF	Raytheon/ MA	4,841	4,311	1Q	0	N/A	9,152
TPS-X Testing & Evaluation Support	FFRDC	MIT/LL/ MA	8,550	4,386	1Q	0	N/A	12,936
Range Support	MIPR	PMRF/ HI	700	275	1Q	0	N/A	975
Assessment	MIPR	OGA	0	1,479	2/3Q	0	N/A	1,479
EO/IR Sensors								
AIRS Prime	SS/CPFF	L3/Aeromet/ OK	4,328	2,386	3Q	0	N/A	6,714
AIRS Requirements	FFRDC	JHU/APL/ MD	2,308	1,220	3Q	0	N/A	3,528
Tactical Component Network Concept	SS/CPAF	Raytheon/ MA	1,000	578	3Q	0	N/A	1,578
Plume Study		Montana State University/ MT	900	0	3Q	0	N/A	900
Technical Engineering and Testing Support	MIPR	MIT/LL; and Peterson AFB/ MA, & CO	1,085	1,146	3Q	0	N/A	2,231
Assessment	MIPR	OGA	0	227	3Q	0	N/A	227
FBX-T #4 Manufacture								
FBX-T#4 Manufacture	SS/CPAF	Raytheon/ MA	4,022	0	N/A	0	N/A	4,022
Subtotal Product Development			369,377	211,469		185,453		766,299
Remarks								

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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III. Test and Evaluation Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test & Evaluation								
Govt Testing Oversight	MIPR	NSWC PHD/ CA	262	500	1/4Q	1,000	1/4Q	1,762
Radar Testing	SS/CPAF	Raytheon/ MA	0	2,719	1Q	4,500	1Q	7,219
Testing Site Support	MIPR	VAFB, MDA directed support & FBX-T testing	0	300	1/4Q	1,800	1/4Q	2,100
Environmental Qualification Testing for FBX-T	MIPR	NAWC Pax River/ MD	0	0	N/A	7,781	2Q	7,781
Assessment	MIPR	OGA	0	150	3Q	949	N/A	1,099
Subtotal Test and Evaluation			262	3,669		16,030		19961

Remarks

IV. Management Services Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services								

Remarks

Project Total Cost			393,483	234,703		222,511		850,697
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Remarks

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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Fiscal Year	2005				2006				2007				2008				2009				2010				2011				
	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																													
Award FBX-T CLS Contract		▲																											
Award FBX-T #1 Site Construction Contract						▲																							
Award FBX-T #2 Site Construction Contract											▲																		
Award Cooperative Agreement for Plume Study				▲																									
Studies & Analyses																													
Evaluate Forward-Based Algorithms (TPS-X)	▲	—	—	▲	▲	—	—	▲																					
Perform Sensor Architecture Analysis	▲	—	—	▲	▲	—	—	—	—	—	—	▲																	
Development Milestones																													
FBX-T #1 Factory Integration & Test Complete	▲																												
Testing Milestones																													
FBX-T #1 Integration with BMDS at VAFB			▲	—	▲																								
Targets Of Opportunity (TOO) Flight Testing			▲	—	▲	▲	—	▲					▲	—	▲														
FBX-T #2 Integration with BMDS at VAFB													▲	—	▲														
Legend																													
▲	Significant Event (complete)	▲	Significant Event (planned)																										
★	Milestone Decision (complete)	☆	Milestone Decision (planned)																										
◆	Element Test (complete)	◇	Element Test (planned)																										
▼	System Level Test (complete)	▽	System Level Test (planned)																										
▲—▲	Complete Activity	▲—▲	Planned Activity																										

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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Fiscal Year	2005				2006				2007				2008				2009				2010				2011			
	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
Deployment/Site Prep/ Activation																												
Conduct Overseas Site Surveys for FBX-T #1			▲	▲																								
Complete FBX-T #1 Checkout								▲																				
Conduct Overseas Site Surveys for FBX-T #2								▲	▲																			
Complete FBX-T #2 Checkout														▲														
Program Milestones																												
FBX-T #1 Operational								▲																				
FBX-T #2 Operational														▲														
Demonstrate AIRS Target Search Capability			▲																									
Studies & Analysis																												
Evaluate Forward-Based Algorithms (TPS-X)	▲	▲	▲	▲	▲	▲	▲	▲																				

Legend	
▲	Significant Event (complete)
★	Milestone Decision (complete)
◆	Element Test (complete)
▼	System Level Test (complete)
▲	Complete Activity
▲	Significant Event (planned)
☆	Milestone Decision (planned)
◇	Element Test (planned)
▼	System Level Test (planned)
▲	Planned Activity

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2006	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Acquisition Milestones							
Award FBX-T CLS Contract	2Q						
Award FBX-T #1 Site Construction Contract		2Q					
Award FBX-T #2 Site Construction Contract			2Q				
Award Cooperative Agreement for Plume Study	4Q						
Studies & Analyses							
Evaluate Forward-Based Algorithms (TPS-X)	1Q-4Q	1Q-4Q					
Perform Sensor Architecture Analysis	1Q-4Q	1Q-4Q	1Q-4Q				
Development Milestones							
FBX-T #1 Factory Integration & Test Complete	1Q						
Develop Op Mission Plan & Search Profile Tool		1Q-4Q					
Manufacture FBX-T #2 Hardware	1Q-4Q	1Q-4Q	1Q				
Manufacture FBX-T #3 Long-lead Items	1Q-4Q						
Manufacture FBX-T #4 Long-lead Items	1Q-4Q						
Testing Milestones							
FBX-T #1 Integration with BMDS at VAFB	3Q-4Q	1Q					
Targets Of Opportunity (TOO) Flight Testing	3Q-4Q	1Q-3Q	2Q-4Q				
SERV 1 FBX-T#1	4Q						
SERV 2 FBX-T #1	4Q						
GT-187 FBX-T #1	4Q						
GT-189 FBX-T #1	4Q						
SERV 3 FBX-T #1 (If Available)		2Q					
GT-190 FBX-T #1 (If Available)		3Q					
GT-191 FBX-T #1 (If Available)		3Q					
Integrated and Distributed Ground Testing		1Q-3Q	3Q-4Q				
GT 04-1a FBX-T #1		1Q					
GT 04-2a (Phase 1) FBX-T #1		1Q					
GT 04-1b FBX-T #1 (If Available)		3Q					
GT 04-2a (Phase 2) FBX-T #1 (If Available)		2Q					
GT 04-2b FBX-T #1 (If Available)		3Q					
FBX-T #2 Integration with BMDS at VAFB			2Q-4Q				

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2006	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
GT-194 FBX-T #2			3Q				
GT-195 FBX-T #2			4Q				
GT-196 FBX-T #2			3Q				
DGT 06-2 FBX-T #2			4Q				
Missile Defense Integrated Exercises (MDIE)			4Q				
AIRS Targets Of Opportunity (TOO) Flight Testing	1Q-4Q						
IFT - 13C AIRS	1Q						
SERV 2 AIRS	4Q						
IFT - 14 AIRS	2Q						
GT - 189 AIRS	4Q						
MRT AIRS	3Q						
Cobra Dane/LRALT AIRS	4Q						
Deployment/Site Prep/ Activation							
Conduct Overseas Site Surveys for FBX-T #1	3Q-4Q	1Q					
Complete FBX-T #1 Site design		1Q					
FBX-T #1 Site Construction		1Q-3Q					
Complete FBX-T #1 Checkout		4Q					
Conduct Overseas Site Surveys for FBX-T #2		3Q-4Q	1Q-2Q				
Complete FBX-T #2 Site Design			2Q				
FBX-T #2 Site Construction			2Q-4Q				
Complete FBX-T #2 Checkout				1Q			
Operation & Sustainment							
FBX-T #1 O & S	4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
FBX-T #2 O & S			4Q	1Q-4Q	1Q-4Q		
FBX-T #3 O & S				4Q	1Q-4Q		
FBX-T #4 O & S					3Q-4Q		
Program Milestones							
FBX-T #1 Operational		4Q					
FBX-T #2 Operational				1Q			
Enhanced HALO II Sensor Track Performance	1Q-2Q						
Demonstrate AIRS Target Search Capability	4Q						

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2006	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Provide 3D State Vectors to PMRF	1Q-4Q						
Studies & Analysis							
Evaluate Forward-Based Algorithms (TPS-X)	1Q-4Q	1Q-4Q					

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification					Date February 2006		
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
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COST (\$ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0911 Ballistic Missile Defense Radars Block 2008	0	38,745	276,126	470,808	404,233	184,883	160,959
RDT&E Articles Qty	0	0	0	1	1	0	0

Note: RDT&E Articles: Two FBX-T radars will be delivered under Block 2008. Acquisition of both FBX-T #3 and FBX-T #4 were initiated in FY05 with delivery of FBX-T #3 in FY08 and FBX-T #4 in FY09. Acquisition of an Adjunct Sensor will be initiated in FY07 with delivery in FY09.

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense Radar Block 2008 (Project 0911) will continue the spiral development to enhance and expand on the sensor capabilities provided to the BMDS under Block 2006. This increased sensor coverage will give the BMDS more opportunities to engage ballistic missile threats which improves the probability of successfully destroying the target. The deployment and networking of additional sensors supports the MDA goals of using a layered sensor architecture to provide a more robust BMDS. Expanding the layered sensor architecture will improve BMDS ability to detect, track and engage ballistic missiles in all phases of their flight.

Block 2008 efforts include delivery of Forward Based X-Band Radar-Transportable (FBX-T) #3 and #4 which will expand the BMDS coverage with the two additional radars. Development of the Adjunct Sensor to use with FBX-T will extend the tracking and discrimination range to close BMDS sensor gaps. The Thule upgrade provides extended range sensor. Improved tracking and discrimination is provided by implementing sensor netting through sensor coordination and data collection.

The existing Contractor Logistics Support (CLS) contract will be used to deploy, operate and sustain all the FBX-T radars. The contract provides for radar site survey, site preparations, personnel training, and radar system maintenance. CLS effort for Block 2008 will begin in FY09. Included in the FY10 and FY11 are the O&S costs required to maintain the FBX-T's and other sensors.

The Block 2008 funding in FY08 reflects the continuing efforts on FBX-T #3 and #4 as well as the contractor efforts on Adjunct Sensors and Thule upgrade.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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B. Accomplishments/Planned Program

	FY 2005	FY 2006	FY 2007
FBX-T Basic Program (Block 2008 Enhancements)	0	2,000	10,652
RDT&E Articles (Quantity)	0	0	0

The FBX-T Basic program includes software upgrades to support Block 2008 ESGs and common software (FY07-FY09) that will support both the FBX-T and the THAAD radar missions. This effort also includes FY08 thru FY09 funding for the FBX-T program infrastructure, modeling and simulation capability, hardware-in-the-loop facilities, software maintenance, and systems engineering/management support for all radars.

FY06 Planned Program:

- Initiate develop of a common radar specification

FY07 Planned Program:

- Complete common radar specification
- Begin implementing common radar specification

	FY 2005	FY 2006	FY 2007
FBX-T #3 Manufacture	0	28,420	88,673
RDT&E Articles (Quantity)	0	0	0

This effort includes the material, labor, engineering and management support for production of the 3rd FBX-T radar. The 3rd FBX-T provides the BMD System with a forward-based capability and extends the sensor coverage.

FY06 Planned Program:

- Continue FBX-T #3 hardware production begun in Block 2006 (Project 0811)
- Complete manufacture of Transmit/Receive Modules (TRMs) for FBX-T #3

FY07 Planned Program:

- Complete production and assembly of Transmit/Receive Integrated Microwave Modules (TRIMMs) for FBX-T #3
- Continue FBX-T #3 hardware production & integration
- Begin Near Field Range (NFR) testing of FBX-T #3

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2006	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors	
	FY 2005	FY 2006	FY 2007
Adjunct Sensor #1	0	0	10,652
RDT&E Articles (Quantity)	0	0	0
<p>The Adjunct Sensor is a radar that is currently being designed to perform the forward-based mission cooperatively with the FBX-T providing extended range tracking and discrimination to reduce sensor coverage gaps for more threat missiles. The FBX-T will handover targets to the Adjunct Sensor which will track and discriminate targets and provide engagement quality data to the BMDS C2BMC.</p> <p>The primary mission of the Adjunct Sensor is to provide discrimination and track of ballistic missile threats. The Adjunct Sensor is planned to be transportable and will be co-located with the FBX-T. The Adjunct Sensor will have a limited search capability to support cued acquisition of targets from FBX-T. These sensors will reduce discrimination gaps for most missile trajectories from specific rogue nations, thereby improving BMDS effectiveness. Procurement of the Adjunct Sensors will begin in FY07 with delivery of Adjunct Sensor #1 in Block 2008 and Adjunct Sensor #2 in Block 2010. Contractor Logistics Support will be provided to operate and sustain the radars. Support will include radar site survey, site preparations, personnel training and radar system maintenance.</p> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • Award Contract for two Adjunct Sensors (Block 2008 and Block 2010) • Begin manufacture of Adjunct Sensors #1 • Begin integration and development efforts of Adjunct Sensors and FBX-T 			
	FY 2005	FY 2006	FY 2007
Test & Evaluation	0	0	1,598
RDT&E Articles (Quantity)	0	0	0
<p>Block 2008 includes integration of the Adjunct Sensor with FBX-T. Test & Evaluation includes participating in flight and ground tests including wargames to demonstrate the capabilities of the sensors to search, track, and discriminate against strategic and tactical threats. Completion of this test planning is needed to ensure adequate and timely resources to conduct a Block 2008 testing of Adjunct Sensor, and define and start long lead test site preparations to be ready to receive and test an Adjunct Sensor.</p> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • Plan the test program for Adjunct Sensor and FBX-T integration • Define test site modifications for the Adjunct Sensor testing at Vandenberg AFB 			

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2006	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603884C Ballistic Missile Defense Sensors	
	FY 2005	FY 2006	FY 2007
Mechanical Steering Kit (MSK)	0	0	32,252
RDT&E Articles (Quantity)	0	0	0
<p>The Mechanical Steering Kit (MSK) is designed to support and elevate the FBX-T Antenna Equipment and Electronic Equipment Units. The MSK provides the FBX-T with real-time rotation in both azimuth and elevation, and significantly increases the radar's real-time performance capabilities. This task consists of the MSK design, fabrication, assembly, and test; software development and test; and MSK integration and deployment with the FBX-T.</p> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • Award Mechanical Steering Kit (MSK) contract • Conduct hardware and software design reviews • Begin hardware fabrication 			
	FY 2005	FY 2006	FY 2007
FBX-T #4 Manufacture	0	8,325	54,537
RDT&E Articles (Quantity)	0	0	0
<p>This effort includes the material, labor, engineering and management support for production of the 4th FBX-T radar. The 4th FBX-T provides the BMD System with a forward based capability and extends the sensor coverage.</p> <p>FY06 Planned Program:</p> <ul style="list-style-type: none"> • Continue FBX-T #4 hardware production begun in Bock 2006 (Project 0811) • Complete manufacture of Monolithic Microwave Integrated Circuits (MMICs) for FBX-T #4 begun in Bock 2006 • Begin manufacture of Transmit/Receive Integrated Microwave Modules (TRIMMs) for FBX-T #4 <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • Continue FBX-T #4 hardware production • Complete manufacture of Transmit/Receive Integrated Microwave Modules (TRIMMs) for FBX-T #4 • Begin hardware integration for FBX-T #4 			

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2006	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603884C Ballistic Missile Defense Sensors	
	FY 2005	FY 2006	FY 2007
Thule Early Warning Radar	0	0	77,762
RDT&E Articles (Quantity)	0	0	0
<p>In FY06 MDA will initiate a program to upgrade the Early Warning Radar located at Thule Air Base, Greenland for incorporation into the Ballistic Missile Defense System (BMDS). The addition of the Thule Upgraded Early Warning Radar (UEWR) into the BMDS sensor architecture will improve BMDS sensor coverage, and will support Engagement Sequence Groups.</p> <p>The scope of the Thule UEWR program is similar to the ongoing upgrades to the Early Warning Radars at Beale Air Force Base, CA and RAF Fylingdales, United Kingdom, and will use the same baseline hardware and software configuration. It will entail site supporting activities, procuring hardware and software upgrade, modifying the Thule EWR facility, installation of the upgraded hardware and software kits, and integration of the Thule UEWR into the BMDS.</p> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • Complete support facility modifications. • Continue development of hardware and software upgrade • Begin modifications to Early Warning Radar facility 			

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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C. Other Program Funding Summary								
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	224,016	162,297	197,707	192,034	203,946	212,106	218,002	1,410,108
PE 0603879C Advanced Concepts, Evaluations and Systems	166,996	0	0	0	0	0	0	166,996
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	914,063	1,198,860	1,037,203	878,540	615,005	731,692	482,362	5,857,725
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	4,487,253	2,489,257	2,605,567	2,444,109	2,065,344	1,979,612	1,617,059	17,688,201
PE 0603883C Ballistic Missile Defense Boost Defense Segment	472,543	490,863	632,028	567,493	493,842	615,859	988,731	4,261,359
PE 0603886C Ballistic Missile Defense System Interceptors	272,064	215,952	438,287	634,709	1,138,597	1,391,301	1,499,204	5,590,114
PE 0603888C Ballistic Missile Defense Test and Targets	700,570	632,107	692,209	614,174	649,766	668,624	678,105	4,635,555
PE 0603889C Ballistic Missile Defense Products	384,935	394,652	521,640	517,507	534,429	530,893	531,219	3,415,275
PE 0603890C Ballistic Missile Defense System Core	398,852	420,151	558,231	557,880	561,003	548,354	554,731	3,599,202
PE 0603891C Special Programs - MDA	0	324,522	421,303	836,168	1,110,695	1,027,677	1,260,497	4,980,862
PE 0603892C Ballistic Missile Defense Aegis	0	939,066	990,565	857,832	900,265	933,815	816,206	5,437,749
PE 0603893C Space Tracking & Surveillance System	0	239,998	361,515	429,679	640,367	787,008	818,606	3,277,173
PE 0603894C Multiple Kill Vehicle	0	83,000	220,370	273,805	307,566	309,284	115,119	1,309,144
PE 0603895C BMD System Space Program	0	0	0	45,000	150,000	166,000	206,100	567,100
PE 0605502C Small Business Innovative Research - MDA	138,907	0	0	0	0	0	0	138,907
PE 0901585C Pentagon Reservation	11,001	17,386	15,586	6,058	6,376	4,490	4,725	65,622
PE 0901598C Management Headquarters - MDA	110,662	99,327	89,314	86,821	86,244	70,600	70,714	613,682
PE Air Force Military Personnel	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
PE Air Force Operations and Maintenance	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
PE Air Force Other Procurement	0	2,400	1,453	11,279	386	17,710	25,709	58,937
PE Army Operations and Maintenance	49,597	66,974	68,246	69,809	71,472	73,325	75,230	474,653
PE Army Natl Guard Military Personnel	21,000	17,648	24,432	24,952	25,591	25,591	25,591	164,805
PE Army Natl Guard Operations and Maintenance	0	155	151	150	154	164	167	941
PE Navy Operations and Maintenance	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PE PAC-3/MEADS Missile Procurement	574,972	581,924	578,579	660,584	616,020	509,032	738,679	4,259,790
PE PAC-3/MEADS RDT&E	344,978	304,973	336,959	465,395	521,791	522,418	502,961	2,999,475

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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D. Acquisition Strategy

The Forward X-Band Radar-Transportable (FBX-T) 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 BMDS radar (FBX-T) project used an existing radar design to minimize development costs and schedule. Design enhancements focus on software changes for the forward based algorithms and C2BMC connectivity. The contract was awarded in FY03 and is a cost plus award fee.

A Contractor Logistics Support (CLS) contract was awarded in FY05 to operate and maintain the FBX-T radars. The CLS contract provides the operations and support activities required for site surveys, planning, and relocation; depot maintenance; failure reporting, analysis, and corrective action system; system operations; and repair and replacement. The contract is an Indefinite Delivery Indefinite Quantity (IDIQ) task order contract.

An RFP will be issued in FY06 and the contract will be awarded in FY07 to build two Adjunct Sensors. The first one will be a Block 2008 capability and the other will be delivered in Block 2010. An acquisition strategy will be developed in FY07 to operate and sustain the Adjunct Sensors.

An acquisition strategy will be developed for the Mechanical Steering Kit in FY06.

The Acquisition Strategy is to award a sole source contract for procurement and installation of the Thule Early Warning Radar hardware and software upgrade kits.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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I. Product Development Cost (\$ in Thousands)								
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
FBX-T Basic Program (Block 2008 Enhancements)								
Software Enhancements	SS/CPAF	Raytheon/ MA	0	2,000	2Q	10,000	2Q	12,000
Assessment	MIPR	OGA	0	0	N/A	652	3Q	652
FBX-T #3 Manufacture								
FBX-T #3 Manufacture	SS/CPAF	Raytheon/ MA	0	28,420	1/4Q	83,243	3Q	111,663
Assessment	MIPR	OGA	0	0	N/A	5,430	3Q	5,430
Adjunct Sensor #1								
Adjunct Sensor #1 Procurement		TBD	0	0	N/A	10,000	2Q	10,000
Assessment	MIPR	OGA	0	0	N/A	652	3Q	652
Mechanical Steering Kit (MSK)								
MSK #1 Development & MSK #2 Manufacture	SS/CPAF	Raytheon/ MA	0	0	N/A	30,277	2Q	30,277
Assessment	MIPR	OGA	0	0	N/A	1,975	3Q	1,975
FBX-T #4 Manufacture								
FBX-T #4 Manufacture	SS/CPAF	Raytheon/ MA	0	8,325	1Q	51,197	1Q	59,522
Assessment	MIPR	OGA	0	0	N/A	3,340	3Q	3,340
Thule Early Warning Radar								
Upgrade Thule EWR	SS/CPAF	Raytheon/ MA	0	0	N/A	73,000	2Q	73,000
Assessment	MIPR	OGA	0	0	N/A	4,762	3Q	4,762
Subtotal Product Development			0	38,745		274,528		313273

Remarks

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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II. Support Costs Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs								

Remarks

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

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test & Evaluation								
Adjunct Sensor Test Planning and Preparation	CPAF	TBD	0	0	N/A	1,598	3Q	1,598
Subtotal Test and Evaluation			0	0		1,598		1598

Remarks

IV. Management Services Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services								

Remarks

Project Total Cost			0	38,745		276,126		314,871
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Remarks

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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Fiscal Year	2005				2006				2007				2008				2009				2010				2011							
	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																																
Award Adjunct Sensor Contract											△																					
Award Mechanical Steering Kit (MSK) Contract											△																					
Award FBX-T #3 Site Construction Contract															△																	
Award FBX-T #4 Site Construction Contract																							△									
Award Adjunct Sensor #1 Site Construction Contract																							△									
Thule Upgrade Contract Award																																
Studies & Analysis																																
Evaluate Advanced Algorithms																																
Development Milestones																																
Manufacture FBX-T #3 Hardware																																
Complete FBX-T #3 Acceptance Testing																																
Manufacture FBX-T #4 Hardware																																
Complete FBX-T #4 Acceptance Testing																																
Develop Adjunct Sensor #1																																
Develop MSK #1																																
Manufacture MSK #2																																
Legend																																
	Significant Event (complete)		Significant Event (planned)																													
	Milestone Decision (complete)		Milestone Decision (planned)																													
	Element Test (complete)		Element Test (planned)																													
	System Level Test (complete)		System Level Test (planned)																													
	Complete Activity		Planned Activity																													

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDTE&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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Fiscal Year	2005				2006				2007				2008				2009				2010				2011				
	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	
Testing Milestones																													
FBX-T #3 Integration with BMDS at VAFB																													
FBX-T #4 Integration with BMDS																													
MSK #1 Integration into FBX-T & BMDS																													
Integrate Adjunct Sensor #1 with FBX-T & BMDS																													
Thule DT&E																													
Thule Certification																													
Deployment/Site Prep/ Activation																													
FBX-T #3 Available for Deployment																													
FBX-T #4 Available for Deployment																													
Program Milestones																													
FBX-T #3 Operational																													
FBX-T #4 Operational																													
Adjunct Sensor #1 Operational																													
MSK Available for Deployment																													
Legend																													
<table style="width:100%; border: none;"> <tr> <td style="width:50%; vertical-align: top;"> Significant Event (complete) Milestone Decision (complete) Element Test (complete) System Level Test (complete) Complete Activity </td> <td style="width:50%; vertical-align: top;"> Significant Event (planned) Milestone Decision (planned) Element Test (planned) System Level Test (planned) Planned Activity </td> </tr> </table>																												Significant Event (complete) Milestone Decision (complete) Element Test (complete) System Level Test (complete) Complete Activity	Significant Event (planned) Milestone Decision (planned) Element Test (planned) System Level Test (planned) Planned Activity
Significant Event (complete) Milestone Decision (complete) Element Test (complete) System Level Test (complete) Complete Activity	Significant Event (planned) Milestone Decision (planned) Element Test (planned) System Level Test (planned) Planned Activity																												

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2006	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Acquisition Milestones							
Award Adjunct Sensor Contract			1Q				
Award Mechanical Steering Kit (MSK) Contract			1Q				
Award FBX-T #3 Site Construction Contract				2Q			
Award FBX-T #4 Site Construction Contract					2Q		
Award Adjunct Sensor #1 Site Construction Contract					2Q		
Thule Upgrade Contract Award		3Q					
Studies & Analysis							
Evaluate Advanced Algorithms				1Q-4Q	1Q-4Q		
Integrate Adv Algorithms				1Q-4Q	1Q-4Q		
Perform Sensor Architecture Analysis		1Q-4Q	1Q-4Q				
Development Milestones							
Develop Models & Simulations for MDWAR				1Q-4Q			
Upgrade FBX-T HWIL Facility (Blk 2008 Capability)				1Q-4Q			
Manufacture FBX-T #3 Hardware		1Q	1Q-4Q	1Q			
FBX-T #3 Hardware Integration & Test Complete				1Q			
Deliver FBX-T Blk 2008 Software for System Test				1Q			
Complete FBX-T #3 Acceptance Testing				4Q			
Manufacture FBX-T #4 Hardware		1Q	1Q-4Q	1Q-4Q	1Q		
FBX-T #4 Hardware Integration & Test Complete					1Q		
Complete FBX-T #4 Acceptance Testing					4Q		
Develop Adjunct Sensor #1			1Q-4Q	1Q-4Q	1Q-4Q		
Develop MSK #1			1Q-4Q	1Q-4Q	1Q		
Manufacture MSK #2				1Q-4Q	1Q-4Q		
Thule Facility Design Complete			3Q				
Thule Hardware & Software Installation				2Q-4Q			
Testing Milestones							
FBX-T #3 Integration with BMDS at VAFB				1Q-4Q	1Q		
Targets Of Opportunity Flight Testing FBX-T #3				1Q-4Q	1Q		
Integ & Distributed Ground Test FBX-T #3				1Q-4Q	1Q		

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2006	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
FBX-T #4 Integration with BMDS					1Q-4Q	1Q	
Targets Of Opportunity Flight Testing FBX-T #4					1Q-4Q	1Q	
Integ & Distributed Ground Test FBX-T #4					1Q-4Q	1Q	
Missile Defense Integration Exercise					3Q-4Q		
MSK #1 Integration into FBX-T & BMDS				4Q	1Q		
Targets Of Opportunity Flight Testing MSK #1				4Q	1Q		
Integ & Distributed Ground Test MSK #1				4Q	1Q		
Integrate Adjunct Sensor #1 with FBX-T & BMDS					3Q-4Q		
Test Site Modification for Adjunct Sensor				1Q-4Q	1Q-2Q		
Targets Of Opportunity Flight Testing Adj Sensor					3Q-4Q		
Integ & Distributed Ground Test Adj Sensor					3Q-4Q		
Thule DT&E					1Q-3Q		
Thule Certification					4Q		
Deployment/Site Prep/ Activation							
FBX-T #3 Deployment Planning			1Q-4Q	1Q-2Q			
FBX-T #3 Site Design & Construction				1Q-4Q	1Q		
FBX-T #3 Available for Deployment				4Q	1Q-2Q		
FBX-T #4 Deployment Planning				1Q-4Q	1Q-2Q		
FBX-T #4 Site Design & Construction					1Q-4Q		
FBX-T #4 Available for Deployment					4Q	1Q-4Q	
Adjunct Sensor #1 Deployment Planning & Site Mods				2Q-4Q	1Q-4Q		
Operation & Sustainment							
FBX-T #1 O & S						1Q-4Q	1Q-4Q
FBX-T #2 O & S						1Q-4Q	1Q-4Q
FBX-T #3 O & S						1Q-4Q	1Q-4Q
FBX-T #4 O & S						1Q-4Q	1Q-4Q
Adjunct Sensor #1 O & S						1Q-4Q	1Q-4Q
Adjunct Sensor #2 O & S						1Q-4Q	1Q-4Q
Program Milestones							
FBX-T #3 Operational					2Q		

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2006	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
FBX-T #4 Operational						2Q	
Adjunct Sensor #1 Operational						2Q	
MSK Available for Deployment						1Q	

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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COST (\$ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0011 Ballistic Missile Defense Radars Block 2010	2,250	180	7,061	18,530	123,779	129,318	47,992
RDT&E Articles Qty	0	0	0	0	1	0	0

Note: The External Sensor program was formerly known as the National Sensor Integration Rapid Prototyping (NSIRP) and was funded under PE 0603890C Project 0102 through FY06. In FY05 data from an external sensor was identified that could be used to support BMDS testing. Funds to accomplish this work were provided using the Sensor PE, because they became the Program Manager. Starting in FY07 the External Sensor Program will be funded as a Block 2010 activity (Project 0011) under the Sensors Program Element (0603884C).

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense Radar Block 2010 (Project 0011) will continue the spiral development to enhance and expand on the sensor capabilities provided BMDS under Block 2008. This increased sensor coverage will give BMDS more opportunities to engage ballistic missile threats which improves the probability of successfully destroying the target. The deployment and networking of additional sensors supports the MDA goals of using a layered sensor architecture to provide a more robust BMDS. Expanding the layered sensor architecture will improve BMDS ability to detect, track and engage ballistic missiles in all phases of their flight. Enhancement of the existing sensor architecture will be based on continued sensor coverage gap analysis.

The Sensor PE in Block 2010 provides for the production and fielding of two additional Mechanical Steering Kits (MSKs) and a second Adjunct Sensor to enhance FBX-T performance. The MSK's will give the FBX-T radars the ability to rotate in the horizontal and vertical plane increasing BMDS leverage. This capability allows BMDS to rapidly adjust to changes in the threat axis. Adding the Adjunct Sensor to work in conjunction with an FBX-T radar permits the BMDS to extend the tracking and discrimination range where needed to help support cueing and handoff to midcourse sensors. The majority of this effort is funded in FY08 and out. This also includes funding in FY10-11 for FBX-T software enhancements needed to support new BMDS Block 10 Engagement Sequence Groups and maintain sensor network interoperability.

Starting in FY05 and out the Sensors PE will begin to leverage non-MDA sensors or External Sensors to enhance the BMDS sensor capabilities. Expanding the layered sensor architecture will improve BMDS ability to detect, track and engage ballistic missiles in all phases of their flight. In addition to expanding sensor coverage, the External Sensors enhance BMDS discrimination capabilities to address changing threats. The Sensor PE will use an External Sensors Laboratory to collect and fuse the external sensors data into useful track and discrimination data. The External Sensors Laboratory will be interfaced to the C2BMC to provide capability to the BMDS situational awareness and Engagement Sequence Strategies.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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B. Accomplishments/Planned Program

	FY 2005	FY 2006	FY 2007
External Sensors	2,250	180	7,061
RDT&E Articles (Quantity)	0	0	0

Upgrade the External Sensors Lab (ESL) to provide the capability to fuse data from external Overhead Non-imaging Infrared (ONIR) sensors to allow for the acquisition and tracking of targets from horizon to horizon. NSIRP was justified and funded in FY05 and FY06 in PE 0603890C (Project 0102). Subsequent to the transfer of the program in FY05, data from an external sensor was provided for use to the BMDS. This experience demonstrated utilization of the data to the BMDS thus solidifying the decision to transfer the program to the Sensor PE to operationalize the capability.

FY05 Accomplishments:

- Initiated development of ESL SBIRS High Auto Track Transfer Data to BMDS

FY06 Planned Program:

- External Sensor FY06 activities are presented in the Ballistic Missile Defense System Core Program Element 0603890C (Project 0102)

FY07 Planned Program:

- Investigate new sensor techniques and develop algorithms to utilize capability in BMDS
- Demonstrate operational capability using foreign and domestic targets of opportunity by providing cueing information to BMDS C2BMC
- Perform sensor cueing function in support of FBX-T
- Provide support and maintenance for the external sensor laboratory operations
- Hardware upgrades to SCI lab to improve reliability
- Develop new message set to allow ESL to communicate with elements of BMDS
- Algorithm development to improve performance in all phase of flight
- JNIC support and lab accreditation

C. Other Program Funding Summary	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	224,016	162,297	197,707	192,034	203,946	212,106	218,002	1,410,108
PE 0603879C Advanced Concepts, Evaluations and Systems	166,996	0	0	0	0	0	0	166,996

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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C. Other Program Funding Summary	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
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PE 0603891C Special Programs – MDA	0	324,522	421,303	836,168	1,110,695	1,027,677	1,260,497	4,980,862
PE 0603892C Ballistic Missile Defense Aegis	0	939,066	990,565	857,832	900,265	933,815	816,206	5,437,749
PE 0603893C Space Tracking & Surveillance System	0	239,998	361,515	429,679	640,367	787,008	818,606	3,277,173
PE 0603894C Multiple Kill Vehicle	0	83,000	220,370	273,805	307,566	309,284	115,119	1,309,144
PE 0603895C BMD System Space Program	0	0	0	45,000	150,000	166,000	206,100	567,100
PE 0605502C Small Business Innovative Research - MDA	138,907	0	0	0	0	0	0	138,907
PE 0901585C Pentagon Reservation	11,001	17,386	15,586	6,058	6,376	4,490	4,725	65,622
PE 0901598C Management Headquarters – MDA	110,662	99,327	89,314	86,821	86,244	70,600	70,714	613,682
PE Air Force Military Personnel	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
PE Air Force Operations and Maintenance	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
PE Air Force Other Procurement	0	2,400	1,453	11,279	386	17,710	25,709	58,937
PE Army Operations and Maintenance	49,597	66,974	68,246	69,809	71,472	73,325	75,230	474,653
PE Army Natl Guard Military Personnel	21,000	17,648	24,432	24,952	25,591	25,591	25,591	164,805
PE Army Natl Guard Operations and Maintenance	0	155	151	150	154	164	167	941
PE Navy Operations and Maintenance	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PE PAC-3/MEADS Missile Procurement	574,972	581,924	578,579	660,584	616,020	509,032	738,679	4,259,790
PE PAC-3/MEADS RDT&E	344,978	304,973	336,959	465,395	521,791	522,418	502,961	2,999,475

D. Acquisition Strategy

An acquisition strategy will be developed in FY06 with the intent to award a sole source contract for an External Sensors Lab system integrator and software developer.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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I. Product Development Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
External Sensors								
Import SBIRS Data into BMDS	MIPR	AFC/ CO	2,250	0	N/A	0	4Q	2,250
Prime Contract	SS/CPAF	Northrop Grumman/ CA	0	0	N/A	5,949	3Q	5,949
External Sensors Program Support	MIPR	NASIC; NSWC DD; Aerospace Corp; & MIT/LL/ CO & MA	0	0	N/A	850	N/A	850
Assessment		OGA	0	180	N/A	262	N/A	442
Subtotal Product Development			2,250	180		7,061		9491

Remarks

II. Support Costs Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs								

Remarks

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

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation								

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile																	Date February 2006																
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)													R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors																				
Fiscal Year	2005				2006				2007				2008				2009				2010				2011								
	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																																	
Award ESL SBIRS High Auto Track Transfer Contract				▲																													
Award Adjunct Sensor #2 Site Construction Contract																								▲									
Development Milestones																																	
Complete FBX-T Block 10 Acceptance Testing																								▲									
Adjunct Sensor #2 Manufacture																	▲	—	—	—	▲												
MSK #3 Manufacture																	▲	—	—	—	▲												
MSK #4 Manufacture																					▲	—	—	—	▲								
Deliver SBIRS Hi Auto Track Transfer Capability																▲																	
Testing Milestones																																	
Adjunct Sensor #2 Integration with FBX-T																																	
Program Milestones																																	
Adjunct Sensor #2 Operational																																▲	

Legend			
▲	Significant Event (complete)	▲	Significant Event (planned)
★	Milestone Decision (complete)	★	Milestone Decision (planned)
◆	Element Test (complete)	◇	Element Test (planned)
▼	System Level Test (complete)	▽	System Level Test (planned)
▲—▲	Complete Activity	▲—▲	Planned Activity

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2006	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Acquisition Milestones							
Award ESL SBIRS High Auto Track Transfer Contract	4Q						
Award Adjunct Sensor #2 Site Construction Contract						2Q	
Development Milestones							
Develop Models & Simulations for MDWAR				1Q-4Q			
Upgrade FBX-T HWIL Facility (Block 10 Capability)						1Q-4Q	
Deliver FBX-T Blk 10 Software for System Test					1Q		
Complete FBX-T Block 10 Acceptance Testing					4Q		
Adjunct Sensor #2 Manufacture					1Q-4Q	1Q-4Q	
MSK #3 Manufacture					1Q-4Q	1Q-4Q	
MSK #4 Manufacture						1Q-4Q	1Q-4Q
External Sensor Lab Upgrade of Hardware			2Q				
Deliver SBIRS Hi Auto Track Transfer Capability				1Q			
Testing Milestones							
Adjunct Sensor #2 Integration with FBX-T						3Q-4Q	
Integ & Distributed Ground Test Adj Sensor						3Q-4Q	
Targets Of Opportunity Flight Testing Adj Sensor						3Q-4Q	
Deployment/Site Prep/ Activation							
Adjunct Sensor #2 Deployment Planning & Site Mods					2Q-4Q	1Q-4Q	
Operation & Sustainment							
FY 2010 and FY 2011 O&S Covered in Block 2008						1Q-4Q	1Q-4Q
Program Milestones							
Adjunct Sensor #2 Operational						4Q	

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification					Date February 2006		
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
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COST (\$ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0812 Space Tracking and Surveillance System (STSS) Block 2006	248,086	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: Per Congressional Direction to restructure allowing for greater visibility and oversight of the STSS program in a separate PE, FY06 and out funding has been transferred to PE 0603893C.

A. Mission Description and Budget Item Justification

STSS is the space based sensor element of the BMDS.

Block 2006 STSS is a low risk space based demonstration of key capabilities, adding two space based sensors and associated ground station processing capability to the Block 2006 BMDS Test Bed. The Block 2006 activity provides key knowledge on which to base the design of a future constellation. Block 2006 STSS delivers a ground segment in FY06 and launches two satellites with visible and infrared sensors into low earth orbit in FY07 for testing with other BMDS elements. These two satellites will provide valuable risk reduction for acquisition, tracking, and discrimination functionality including stereo data fusion, cueing radars over the horizon and over-the-horizon fire control. Key demonstrations will be performed showing the ability to close the BMDS interceptor fire control loop with data from the Block 2006 satellites.

To provide STSS with early, appropriate test opportunity, STSS is procuring four dedicated ballistic missile targets for on-orbit testing, two in FY07 and two in FY08. The STSS-centric tests with these targets will also include opportunities for secondary participation from other BMDS Elements. STSS is contracting through NASA for launch services for the two Block 2006 satellites using a single Delta II launch vehicle.

The Block 2006 program will develop and contribute to the testing of Engagement Sequence Groups (ESG) allowing BMDS interceptors to launch and/or engage on STSS sensor data. Testing will include configurations of the BMDS to include surrogate sensors such as the AF Maui Optical Station (AMOS) telescopes and High Altitude Observatory (HALO) II aircraft.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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B. Accomplishments/Planned Program

	FY 2005	FY 2006	FY 2007
Space	131,665	0	0
RDT&E Articles (Quantity)	0	0	0

FY05 Accomplishments:

- Furnished initial payment to NASA toward Launch Services for the 2 Block 2006 Satellites
- Completed Payload Software Build 3
- Conducted System Compatibility Tests (Payload and Satellite Bus)
- Conducted bus integration for Satellite 1
- Completed Thermal Vac testing/payload acceptance testing

	FY 2005	FY 2006	FY 2007
Ground	25,394	0	0
RDT&E Articles (Quantity)	0	0	0

FY05 Accomplishments:

- Completed Ground Hardware Integration to install and checkout the two processing strings of operational hardware at the Missile Defense Space Experimentation Center (MDSEC) and one duplicate string at the LSOC which is the contractor's alternate operations center
- Completed the Qualification of the first of two software builds. Version 1.4h is the qualified software that encompasses the five Software Items (SIs): Mission Management (MM), Ground Mission Data Processing (GMDP), System Control (SC), Services and Infrastructure (S&I), and Training and Simulation (T&S)
- Completed the first iteration of operations procedures that are used to conduct Initial Crew Training and are the foundation for how the system will be operated.
- Conducted Ground Acceptance Test 1 (1 GAT) to demonstrate the capability of the qualified Build 1 software integrated on the qualified hardware to command and control a simulated STSS satellite and the software's readiness to support training.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2006	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603884C Ballistic Missile Defense Sensors	
	FY 2005	FY 2006	FY 2007
Government	26,067	0	0
RDT&E Articles (Quantity)	0	0	0
<p>FY05 Accomplishments:</p> <ul style="list-style-type: none"> Continued program management FFRDC support to manage execution of the STSS program Provided Program Office Support to Travel, Cost Estimating Support, Administrative Management Services, Hardware and Software purchases and maintenance, Computer Network Support, Supplies and reimbursement for AF Civilian positions 			
	FY 2005	FY 2006	FY 2007
SE/PM	61,553	0	0
RDT&E Articles (Quantity)	0	0	0
<p>FY05 Accomplishments:</p> <ul style="list-style-type: none"> Conducted System Compatibility Tests (Payload, Satellite Bus and Ground System) Conducted BMDS system trades leveraging Block 2006 program office, MDA system engineers and Block 2006 contractor Initiated development of a capability based/spiral development acquisition strategy Conducted Advanced Algorithm Development studies 			
	FY 2005	FY 2006	FY 2007
IR Engagement Sequence	3,407	0	0
RDT&E Articles (Quantity)	0	0	0
<p>(Note: In FY05, AIRS was funded and managed in project 0811. STSS will continue to participate as a user of Airborne Infrared (IR) data, and to leverage lessons learned from IR sensor contributions to the BMDS.)</p> <p>FY05 Accomplishments:</p> <ul style="list-style-type: none"> Continue testing and evaluation of Infrared/Visible (IR/Vis) sensors' utility in BMDS Engagement sequences using surrogate sensor measurements Continue developing connectivity and algorithms toward providing near real time IR and IR-RADAR fused data to the BMDS 			

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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C. Other Program Funding Summary								
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	224,016	162,297	197,707	192,034	203,946	212,106	218,002	1,410,108
PE 0603879C Advanced Concepts, Evaluations and Systems	166,996	0	0	0	0	0	0	166,996
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	914,063	1,198,860	1,037,203	878,540	615,005	731,692	482,362	5,857,725
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	4,487,253	2,489,257	2,605,567	2,444,109	2,065,344	1,979,612	1,617,059	17,688,201
PE 0603883C Ballistic Missile Defense Boost Defense Segment	472,543	490,863	632,028	567,493	493,842	615,859	988,731	4,261,359
PE 0603886C Ballistic Missile Defense System Interceptors	272,064	215,952	438,287	634,709	1,138,597	1,391,301	1,499,204	5,590,114
PE 0603888C Ballistic Missile Defense Test and Targets	700,570	632,107	692,209	614,174	649,766	668,624	678,105	4,635,555
PE 0603889C Ballistic Missile Defense Products	384,935	394,652	521,640	517,507	534,429	530,893	531,219	3,415,275
PE 0603890C Ballistic Missile Defense System Core	398,852	420,151	558,231	557,880	561,003	548,354	554,731	3,599,202
PE 0603891C Special Programs - MDA	0	324,522	421,303	836,168	1,110,695	1,027,677	1,260,497	4,980,862
PE 0603892C Ballistic Missile Defense Aegis	0	939,066	990,565	857,832	900,265	933,815	816,206	5,437,749
PE 0603893C Space Tracking & Surveillance System	0	239,998	361,515	429,679	640,367	787,008	818,606	3,277,173
PE 0603894C Multiple Kill Vehicle	0	83,000	220,370	273,805	307,566	309,284	115,119	1,309,144
PE 0603895C BMD System Space Program	0	0	0	45,000	150,000	166,000	206,100	567,100
PE 0605502C Small Business Innovative Research - MDA	138,907	0	0	0	0	0	0	138,907
PE 0901585C Pentagon Reservation	11,001	17,386	15,586	6,058	6,376	4,490	4,725	65,622
PE 0901598C Management Headquarters - MDA	110,662	99,327	89,314	86,821	86,244	70,600	70,714	613,682
PE Air Force Military Personnel	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
PE Air Force Operations and Maintenance	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
PE Air Force Other Procurement	0	2,400	1,453	11,279	386	17,710	25,709	58,937
PE Army Operations and Maintenance	49,597	66,974	68,246	69,809	71,472	73,325	75,230	474,653
PE Army Natl Guard Military Personnel	21,000	17,648	24,432	24,952	25,591	25,591	25,591	164,805
PE Army Natl Guard Operations and Maintenance	0	155	151	150	154	164	167	941
PE Navy Operations and Maintenance	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PE PAC-3/MEADS Missile Procurement	574,972	581,924	578,579	660,584	616,020	509,032	738,679	4,259,790
PE PAC-3/MEADS RDT&E	344,978	304,973	336,959	465,395	521,791	522,418	502,961	2,999,475

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2006
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile 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), with subcontractors playing key roles in systems engineering 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 first R&D spiral, the Block 2006, satellites was awarded in third quarter FY 2002. This contract 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.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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I. Product Development Cost (\$ in Thousands)								
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Space								
Capability Based R&D Contract	SS/CPAF	NGST/ CA	198,820	0	N/A	0	N/A	198,820
Launch Vehicle Integration	Various	NASA & AFRL/ FL & NM	42,341	0	N/A	0	N/A	42,341
Target Acquisition	Various	Various/ Various	200	0	N/A	0	N/A	200
Ground								
Capability Based R&D Contract	SS/CPAF	NGST/ CA	64,440	0	N/A	0	N/A	64,440
SE/PM								
Capability Based R&D Contract	SS/CPAF	NGST/ CA	128,574	0	N/A	0	N/A	128,574
Advanced Algorithm Development	Various	MIT/LL & Various/ Hanscomb AFB, MA & Various	9,413	0	N/A	0	N/A	9,413
IR Engagement Sequence								
Airborne Infrared Surveillance (AIRS)	Various	Various/ Various	7,002	0	N/A	0	N/A	7,002
Data Collection and Analysis	Various	MIT/LL & AFRL/ Hanscomb AFB, MA & Kirtland AFB, NM	9,981	0	N/A	0	N/A	9,981
Subtotal Product Development			460,771	0		0		460771

Remarks
 The Capability Based R&D contract was awarded in FY02. Prior year and FY03 costs were included in Project 5041.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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II. Support Costs Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government								
System Program Office Support	Various	Various/ CA	18,677	0	N/A	0	N/A	18,677
Subtotal Support Costs			18,677	0		0		18677

Remarks: All system program office support costs have been allocated to Block 2006, through the launch in FY07.

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

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation								

Remarks

IV. Management Services Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government								
FFRDC	FFRDC	AEROSPACE/ CA	25,547	0	N/A	0	N/A	25,547
Subtotal Management Services			25,547	0		0		25547

Remarks: All FFRDC costs have been allocated to Block 2006, through the launch in FY07.

Project Total Cost			504,995	0		0		504,995
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Remarks

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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Fiscal Year	2005				2006				2007				2008				2009				2010				2011			
	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																												
IR Engagement Sequence	▲————▲																											
System Test/Operational Planning	▲————▲																											
Spacecraft Integration and Test	▲————▲																											
Payload Fabrication and Integration & Test	▲————▲																											
Ground Software Development	▲————▲																											
Ground Hardware/Segment Integration & Test	▲————▲																											
Satellite Integration and Test			▲————▲																									
System Compatibility Tests			▲	▲																								

Legend	
▲	Significant Event (complete)
★	Milestone Decision (complete)
◆	Element Test (complete)
▼	System Level Test (complete)
▲————▲	Complete Activity
▲	Significant Event (planned)
★	Milestone Decision (planned)
◆	Element Test (planned)
▼	System Level Test (planned)
▲————▲	Planned Activity

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2006	
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors			
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Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
BLOCK 2006							
IR Engagement Sequence	1Q-4Q						
System Test/Operational Planning	1Q-4Q						
Spacecraft Integration and Test	1Q-4Q						
Payload Fabrication and Integration & Test	1Q-4Q						
Ground Software Development	1Q-4Q						
Ground Hardware/Segment Integration & Test	1Q-4Q						
Satellite Integration and Test	2Q-4Q						
System Compatibility Tests	3Q,4Q						

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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COST (\$ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0012 Space Tracking and Surveillance System (STSS) Block 2010	42,616	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: Activity for this funding is described elsewhere due to classification.

A. Mission Description and Budget Item Justification

Activity is described elsewhere due to classification. Location of documentation can be made available upon request but not in this document

B. Accomplishments/Planned Program

	FY 2005	FY 2006	FY 2007
Future Block Development	42,616	0	0
RDT&E Articles (Quantity)	0	0	0

Activity is described elsewhere due to classification. Location of documentation can be made available upon request but not in this document

C. Other Program Funding Summary

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	224,016	162,297	197,707	192,034	203,946	212,106	218,002	1,410,108
PE 0603879C Advanced Concepts, Evaluations and Systems	166,996	0	0	0	0	0	0	166,996
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	914,063	1,198,860	1,037,203	878,540	615,005	731,692	482,362	5,857,725
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	4,487,253	2,489,257	2,605,567	2,444,109	2,065,344	1,979,612	1,617,059	17,688,201
PE 0603883C Ballistic Missile Defense Boost Defense Segment	472,543	490,863	632,028	567,493	493,842	615,859	988,731	4,261,359
PE 0603886C Ballistic Missile Defense System Interceptors	272,064	215,952	438,287	634,709	1,138,597	1,391,301	1,499,204	5,590,114
PE 0603888C Ballistic Missile Defense Test and Targets	700,570	632,107	692,209	614,174	649,766	668,624	678,105	4,635,555
PE 0603889C Ballistic Missile Defense Products	384,935	394,652	521,640	517,507	534,429	530,893	531,219	3,415,275
PE 0603890C Ballistic Missile Defense System Core	398,852	420,151	558,231	557,880	561,003	548,354	554,731	3,599,202
PE 0603891C Special Programs - MDA	0	324,522	421,303	836,168	1,110,695	1,027,677	1,260,497	4,980,862
PE 0603892C Ballistic Missile Defense Aegis	0	939,066	990,565	857,832	900,265	933,815	816,206	5,437,749
PE 0603893C Space Tracking & Surveillance System	0	239,998	361,515	429,679	640,367	787,008	818,606	3,277,173

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603894C Multiple Kill Vehicle	0	83,000	220,370	273,805	307,566	309,284	115,119	1,309,144
PE 0603895C BMD System Space Program	0	0	0	45,000	150,000	166,000	206,100	567,100
PE 0605502C Small Business Innovative Research - MDA	138,907	0	0	0	0	0	0	138,907
PE 0901585C Pentagon Reservation	11,001	17,386	15,586	6,058	6,376	4,490	4,725	65,622
PE 0901598C Management Headquarters - MDA	110,662	99,327	89,314	86,821	86,244	70,600	70,714	613,682
PE Air Force Military Personnel	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
PE Air Force Operations and Maintenance	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
PE Air Force Other Procurement	0	2,400	1,453	11,279	386	17,710	25,709	58,937
PE Army Operations and Maintenance	49,597	66,974	68,246	69,809	71,472	73,325	75,230	474,653
PE Army Natl Guard Military Personnel	21,000	17,648	24,432	24,952	25,591	25,591	25,591	164,805
PE Army Natl Guard Operations and Maintenance	0	155	151	150	154	164	167	941
PE Navy Operations and Maintenance	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PE PAC-3/MEADS Missile Procurement	574,972	581,924	578,579	660,584	616,020	509,032	738,679	4,259,790
PE PAC-3/MEADS RDT&E	344,978	304,973	336,959	465,395	521,791	522,418	502,961	2,999,475

D. Acquisition Strategy

Activity is described elsewhere due to classification. Location of documentation can be made available upon request but not in this document

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors						
COST (\$ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	2,777	4,540	8,812	15,064	16,825	12,163	11,398
RDT&E Articles Qty	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, cost estimating, contracting, and financial management, to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions, as well as outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	2,777	4,540	8,812
RDT&E Articles (Quantity)	0	0	0

See Section A: Mission Description and Budget Item Justification

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2006
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603884C Ballistic Missile Defense Sensors
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C. Other Program Funding Summary								
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	224,016	162,297	197,707	192,034	203,946	212,106	218,002	1,410,108
PE 0603879C Advanced Concepts, Evaluations and Systems	166,996	0	0	0	0	0	0	166,996
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	914,063	1,198,860	1,037,203	878,540	615,005	731,692	482,362	5,857,725
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	4,487,253	2,489,257	2,605,567	2,444,109	2,065,344	1,979,612	1,617,059	17,688,201
PE 0603883C Ballistic Missile Defense Boost Defense Segment	472,543	490,863	632,028	567,493	493,842	615,859	988,731	4,261,359
PE 0603886C Ballistic Missile Defense System Interceptors	272,064	215,952	438,287	634,709	1,138,597	1,391,301	1,499,204	5,590,114
PE 0603888C Ballistic Missile Defense Test and Targets	700,570	632,107	692,209	614,174	649,766	668,624	678,105	4,635,555
PE 0603889C Ballistic Missile Defense Products	384,935	394,652	521,640	517,507	534,429	530,893	531,219	3,415,275
PE 0603890C Ballistic Missile Defense System Core	398,852	420,151	558,231	557,880	561,003	548,354	554,731	3,599,202
PE 0603891C Special Programs - MDA	0	324,522	421,303	836,168	1,110,695	1,027,677	1,260,497	4,980,862
PE 0603892C Ballistic Missile Defense Aegis	0	939,066	990,565	857,832	900,265	933,815	816,206	5,437,749
PE 0603893C Space Tracking & Surveillance System	0	239,998	361,515	429,679	640,367	787,008	818,606	3,277,173
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PE 0605502C Small Business Innovative Research - MDA	138,907	0	0	0	0	0	0	138,907
PE 0901585C Pentagon Reservation	11,001	17,386	15,586	6,058	6,376	4,490	4,725	65,622
PE 0901598C Management Headquarters - MDA	110,662	99,327	89,314	86,821	86,244	70,600	70,714	613,682
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PE Air Force Other Procurement	0	2,400	1,453	11,279	386	17,710	25,709	58,937
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PE PAC-3/MEADS Missile Procurement	574,972	581,924	578,579	660,584	616,020	509,032	738,679	4,259,790
PE PAC-3/MEADS RDT&E	344,978	304,973	336,959	465,395	521,791	522,418	502,961	2,999,475