Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	311,402	231,528	242,441	266,509	560,130	735,727	938,191
0812 Space Tracking and Surveillance System (STSS) Block 2006	265,428	0	0	0	0	0	0
0912 Space Tracking and Surveillance System (STSS) Block 2008	17,300	0	0	0	0	0	0
R312 Space Tracking and Surveillance System (STSS) Follow-On	14,700	0	0	0	0	0	0
WX12 Space Tracking and Surveillance System (STSS) Capability Development	0	219,293	235,453	253,723	546,966	714,341	910,207
0602 Program-Wide Support	13,974	0	0	0	0	0	0
ZX40 Program-Wide Support	0	12,235	6,988	12,786	13,164	21,386	27,984
Amount Included in PE 0904903D				-225,821	-453,824	-626,596	-627,266
Total PE Cost	311,402	231,528	242,441	40,688	106,306	109,131	310,925

Note: The Space Tracking and Surveillance System (STSS) will unify the three spiral acquisitions previously known as STSS Block 2006, STSS Block 2008 and STSS Follow-on under this Program Element into one Project WX12 in Program Element 0603893C.

In FY07, the Near Field Infrared Experiment (NFIRE) was funded in STSS Project 0812 as well as the in the Advanced Technology PE 0603175C, Project 0502.

The content previously planned in Projects 0812, 0912 and R112 for STSS in FY08-13 has been captured in Project WX12 in accordance with the MDA revised Block Structure. The content for NFIRE previously planned in Projects 0812 and 0516 for FY08-13 has been captured in Project WX16 in accordance with the MDA revised Block Structure.

MDA is pursuing an analysis of alternatives for space-based sensors capability to provide tracking of ballistic missiles.

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop and field an integrated, layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, and allies from ballistic missiles of all ranges in all phases of flight. In 2004, the United States fielded an initial defense capability to address known threats. This initial capability will be expanded by adding and networking forward-deployed sensors, interceptors at sea and on land, and layers of increasingly capable weapons and sensors. MDA is developing sensors which will enable new Engagement Sequences and provide coverage of a wider variety of threat trajectories than terrestrial radars can provide. Space sensors will provide

data to close the fire control loop with BMDS interceptors. Infrared sensors, when combined with radars, provide robustness against countermeasures.

MDA is developing the STSS Demonstration Satellites to demonstrate key functions of space sensors. Software upgrades are planned to optimize the usefulness of the Demonstration Satellites. Knowledge from the STSS Demonstration Satellites will contribute to future MDA space sensor development

A.1 System Element Description

The Space Tracking and Surveillance System (STSS) continues developing a satellite ground segment at the Missile Defense Space Experimentation Center (MDSEC) and preparing two R&D satellites for launch in 2008 (STSS Demonstration Satellites-- Project WX12). STSS will enhance the ground segment and data processing algorithms at the MDSEC to take advantage of on-orbit experience (STSS Software Upgrades -- Project WX12).

Lessons learned from the Demonstration Satellites and Software Upgrade efforts will feed the development of MDA space sensors.

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

- STSS extends sensor coverage to a global level. STSS enables global tracking of ballistic missiles, and will provide accurate tracking information to the BMDS battle manager, close the global fire control loop with BMDS interceptors, and extend the effective range of BMDS interceptors and other sensors.
- Space-based sensors are not limited by basing rights issues or deployment decisions, and will allow coverage of countries not accessible from ground based sensors. STSS's visible and Infrared (IR) sensors will complement radars and contribute to a sensor architecture more robust to countermeasures.

A.3 Major System Element Goals

Demonstration Satellites

Launch two low earth orbit satellites:

- Demonstrate capability to acquire, track, discriminate and report ballistic missile and intercept events from lift-off through midcourse to reentry
- Demonstrate capability to perform autonomous acquisition-to-track handover within a satellite
- Demonstrate capability to perform track handover to a satellite

- Demonstrate capability to uplink commands and downlink mission, health, and status data both directly and via cross link between two satellites at the MDSEC
- Explore approaches to close the global fire control loop at the MDSEC for BMDS weapons and methods to conduct integrated operations with other BMDS elements

Software Upgrades:

- Upgrade the Demonstration Satellites' Ground Segment, Spacecraft/Payload software and Ground Segment hardware at the MDSEC
- Improve the Demonstration Satellites experiment through enhancement or added capabilities necessary to implement lessons learned in design and development of the Demonstration Satellites' hardware and software development at the MDSEC
- Provide utility to the Follow-on constellation at the MDSEC through proof of concept for algorithms, system design and BMDS interfaces to be used in the operational constellation
- Improve Operational Capability through system upgrade that will enable use of the Demonstration Satellites/Software Upgraded system during contingency operations

MDA Space Sensors

Design, develop and launch initial satellites:

- Leverage advances in technology and add satellites to field initial constellation
- Provide accurate and timely global midcourse object tracking and reporting of long-range missile attacks against the United States, its allies and deployed forces
- Provide accurate launch-on/engage data for use by BMDS
- Support BMDS threat data acquisition efforts and other potential adjunct missions

Near Field Infrared Experiment (NFIRE):

- Goals are identified in PE 0603175C, Project 0516 and PE 0603895C, Project WX16

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A.4 Major Events Schedule and Description

Major Event	Project	Timeframe	Description
Contract Activity			
STSS Demonstration Satellites (Block 2006)			
Satellite Integration and Test	WX12	1Q FY 2007 - 2Q FY 2008	• Extension of activities for Satellite Integration and Test due to Demo Satellites launch slip from 1QFY2008 to 3QFY2008. Activities included the Space Vehicles 1 and 2 Thermal Vacuum testing completed in May 2007 and December 2007 respectively.
Launch Integration and Test	WX12	3Q FY 2008 - 4Q FY 2008	• Extension of activities for Launch Integration and Test due to Demo Satellites launch slip from 1QFY2008 to 3QFY2008. Includes efforts to mate the stacked Space Vehicles to the Launch Vehicle and perform final checkout/pre-launch activities.
Launch (2 Satellites)	WX12	4Q FY 2008	• Demo Satellites launch slipped from 1QFY2008 to 3QFY2008
STSS On-Orbit Operations	WX12	4Q FY 2008 - 4Q FY 2013	• Start of STSS On-Orbit Operations delayed due to Demo Satellites launch slip from 1QFY2008 to 3QFY2008
FTS-01	WX12	2Q FY 2009	• Delay of Verification Test #1 due to Demo Satellites launch slip from 1QFY2008 to 3QFY2008
FTS-02	WX12	3Q FY 2009	• Delay of Verification Test #2 due to Demo Satellites launch slip from 1QFY2008 to 3QFY2008
Near Field Infrared Experiment			
LCT Delivery	0812	1Q FY 2007	• Delivery of Laser Communication Terminal (LCT) payload
Launch	0812	3Q FY 2007	• Launch Complete 24 Apr 2007
On Orbit Operations	0812	3Q FY 2007 - 4Q FY 2007	• On-Orbit Operations continuing until FY09. For FY08 and FY09 operations refer to PE 0603895C
STSS Software Upgrades (Block 2008)			
Contract Modification	0912	1Q FY 2007	• The STSS Software Upgrades effort is contracted through the STSS Demonstration Satellites prime contractor, Northrop Grumman Space Technology (NGST). Contract modification took place in FY07 to add the STSS Software Upgrades effort.
Drop 1 Payload Upgrades	WX12	1Q FY 2007 - 4Q FY 2008	• Upgrade of on-board software to improve tracking performance. Incorporates lessons learned in design and development.
Drop 1 Ground Station Upgrades	WX12	1Q FY 2007 - 2Q FY 2010	• First of two software drops for the ground software aimed at improving the Ground Mission Data Processing and Mission management software to include reduction of latency and automation of planning and tracking
Drop 2 Ground Station Upgrades	WX12	1Q FY 2009 - 1Q FY 2011	• Additional software upgrades to Ground Mission Data Processing to improve track features
Installation and Checkout	WX12	4Q FY 2009 - 2Q FY 2011	• Delay of Software Upgrades due to Demo Satellites launch slip from 1QFY2008 to 3QFY2008
On-Orbit Ops and Data Analysis	WX12	2Q FY 2010 - 4Q FY 2013	• Delay of On-Orbit Ops and Data Analysis due to Demo Satellites launch slip from 1QFY2008 to 3QFY2008
STSS Follow-On			

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Major Event	Project	Timeframe	Description
Architecture Studies and Technology Development	R312	1Q FY 2007 - 4Q FY 2007	• Includes analyzing trade space and reducing risks for the STSS Follow-On Program, developing system specifications, and conducting a payload concept study.
Space Sensors			
Analysis of Alternatives	WX12	2Q FY 2008 - 4Q FY 2008	• Study to assess alternatives for satellite-based capability for infrared and visible sensors to provide global tracking
Design	WX12	1Q FY 2009 - 4Q FY 2012	• Phase of the development effort to produce design specifications prior to proceeding into the satellite build

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008 PB)	322,220	331,525	347,811
Current President's Budget (FY 2009 PB)	311,402	231,528	242,441
Total Adjustments	-10,818	-99,997	-105,370
Congressional Specific Program Adjustments	0	-98,400	0
Congressional Undistributed Adjustments	0	-1,597	0
Reprogrammings	-5,927	0	0
SBIR/STTR Transfer	-4,891	0	0
Adjustments to Budget Years	0	0	-105,370

FY07 decrease of $10.818 million includes SBIR/STTR transfer and MDA reprogrammings.

FY08 decrease of $99.997 million includes a Congressionally specific program decrease of $98.4 million and a portion of the MDA Congressional undistributed reduction.

FY09 decrease of $105.370 million reflects MDA programmatic changes to support program requirements.

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COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0812 Space Tracking and Surveillance System (STSS) Block 2006	265,428	0	0	0	0	0	0
RDT&E Articles Qty	1	0	0	0	0	0	0

Note: RDT&E Articles: FY07 - One NFIRE Satellite; FY08 - two STSS Demonstration Satellites

STSS content previously planned in FY07 Project 0812 for FY08-13 is captured in FY08-13 Project WX12, in accordance with the MDA revised Block Structure.

In FY07, NFIRE content is located in BMD Technology PE 0603175C, Project 0502 and STSS PE 0603893C, Project 0812. In FY 2008, content for NFIRE in FY08-13, including On-Orbit Operations, is captured in the BMDS Space Program PE 0603895C, Project WX16 in accordance with the MDA revised Block Structure.

Activities to stand-up the Missile Defense Space Experimentation Center (MDSEC) were identified in FY07 under the auspices of the STSS Ground Segment task in PE 0603893C, Project 0812. Continuation of the MDSEC effort is captured in PE 0603895C, Project WX33.

A. Mission Description and Budget Item Justification

Space Tracking and Surveillance System (STSS):
The STSS Demonstration Satellites provide a space-based demonstration of key ballistic missile tracking capabilities, adding two space based sensors controlled and operated from the MDSEC and associated ground station processing capability to the BMDS Test Bed.

The STSS Demonstration Satellites will furnish key knowledge on which to base the design of a future constellation. The STSS Demonstration Satellites effort delivers a ground segment to the MDSEC in FY07 and launches two satellites with visible and infrared sensors into low earth orbit in FY08 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 global BMDS interceptor fire control loop with data from the STSS Demonstration Satellites.

To provide STSS with appropriate test opportunities, MDA is procuring dedicated ballistic missile targets for on-orbit testing. The STSS-centric tests conducted with these targets will also include opportunities for secondary participation from other BMDS Elements. STSS is contracting with National Aeronautics and Space Administration (NASA) for launch services for the two demonstration satellites using a single Delta II launch vehicle.

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The STSS Demonstration Satellites program will develop and demonstrate most of the functions and interfaces required for data delivery allowing BMDS interceptors to launch and/or engage on STSS sensor data.

Near Field Infrared Experiment (NFIRE):
The Near Field Infrared Experiment (NFIRE) technology effort will collect high and low resolution images of a boosting rocket to improve our understanding of exhaust plume phenomenology and plume-to-rocket body discrimination. We will use this data to validate the models and simulations that are fundamental to developing the guidance and endgame homing algorithms for boost phase interceptors. A secondary objective of the experiment is to collect hyper-temporal short wave infrared and visible data for assessing early launch detection and tracking capability. The experiment will include three plume signature mission types: targets of opportunity, dedicated fly-bys, and ground observations. Targets of opportunity may include aircraft flights, space launches and missile tests at a viewing distance of 100 to 1000 kilometers. Dedicated fly-bys are high resolution observations of a dedicated target vehicle at a range of less than 10 kilometers. Ground observations may include bright burning events such as forest fires, volcanoes, and static tests of rocket engines. In addition to the plume data collections, NFIRE will carry a Laser Communication Terminal, to conduct communication experiments with the German Terra SAR-X satellite. These experiments will test low earth orbit satellite-to-ground and satellite-to-satellite capabilities of the terminal for potential incorporation into the Ballistic Missile Defense System. The laser communication experiments will be conducted on a non-interference basis with the other MDA missions. The NFIRE satellite will be operated from the MDSEC by the MDA Space Applications Product Center. Data products will be utilized by multiple programs to improve missile engagement performance.

NFIRE Goals:
- Launch the Near Field Infrared Experiment satellite
- Conduct multiple data collection missions against ground, air, space and ballistic missile targets from the MDSEC
- Conduct low earth orbit satellite-to-satellite and satellite-to-ground laser communication experiments from the MDSEC
- Provide data to validate the models and simulations that are fundamental to developing the navigation, guidance and control, and endgame homing algorithms, as well as laser communication proof of concept

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B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
Space	161,698	0	0
RDT&E Articles (Quantity)	0	0	0

Designs, develops, builds and tests two R&D satellites for launch in 2008 in support of the MDA mission.

FY07 Accomplishments

- Delivered Payload 2 to space vehicle integration
- Conducted Satellite bus integration and testing for Satellites 1 and 2
- Integrated Payload 2 to the Satellite bus and conduct systems integration for Satellite 2
- Conducted Satellite 1 thermal vacuum testing
- Began Satellite 2 thermal vacuum testing

	FY 2007	FY 2008	FY 2009
Ground	20,388	0	0
RDT&E Articles (Quantity)	0	0	0

Designs, develops, builds and maintains a robust ground system for the STSS Demonstration satellites at the Missile Defense Space Experimentation Center (MDSEC).

FY07 Accomplishments:

- Completed software qualification testing of version 2.5 which includes increased capability to the same five software items from Build 1
- Conducted Ground Acceptance Test 2 at the MDSEC to demonstrate the full capability of the ground segment using the qualified Build 2 software to command and control two simulated STSS satellites
- Completed the second iteration of operations procedures along with the on-line training system which supported test rehearsals throughout the year for ground crew operations at the MDSEC. The second iteration of procedures captured the additional capability that was developed with the second software build.
- Completed the second of two Operational Readiness Demonstrations at the MDSEC which demonstrated the full capability of the developed ground system. This demonstration was executed on the final Build 2 qualified baseline.
- Archived relevant ground segment documentation and artifacts, and revised as required, to ensure their effective retrieval for subsequent use

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	FY 2007	FY 2008	FY 2009
Government	19,198	0	0
RDT&E Articles (Quantity)	0	0	0

Provides all necessary and continuous personnel, technology, and administrative support for the Space Tracking and Surveillance System Program Office

FY07 Accomplishments:

- Continued program management FFRDC support to manage execution of the STSS and NFIRE programs
- Provided Program Office Support for travel, SETA support (i.e., cost estimating, financial management support and administrative management services), hardware and software purchases and maintenance, computer network support, supplies, reimbursement to the Space and Missile Center (SMC) at Los Angeles Air Force Base for salaries of matrixed USAF civilians assigned to support MDA activities as well as funding for MDA civilian positions. Also provided funding for infrastructure support including IRRT, SMC Above Standard Costs and SMC Operations and Maintenance costs comparable to services received. Agreement for payment of these costs were outlined in the official MOA between SMC and MDA dated March 2007.

	FY 2007	FY 2008	FY 2009
Systems Engineering	38,455	0	0
RDT&E Articles (Quantity)	0	0	0

Oversee system level requirement and specification development, configuration development, integration, test, and verification for two satellites for launch in FY08. Interfaces with other MDA elements to ensure proper integration into the Ballistic Missile Defense System (BMDS).

FY07 Accomplishments

- Continued Launch and On-orbit Flight Test Preparations at the MDSEC
- Continued to staff and train crews to operate the STSS system
- Continued Advanced Tracking and Discrimination Algorithm Development
- Continued System Requirements Verification

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	FY 2007	FY 2008	FY 2009
IR Engagement Sequence	2,000	0	0
RDT&E Articles (Quantity)	0	0	0

The Infrared (IR) Engagement Sequence effort provides the means for the STSS Program to collect, process and disseminate IR data from surrogate sensors for the purpose of testing, evaluating, and maturing discrimination and tracking algorithms

FY07 Planned Program:

- Continue to utilize the STSS Surrogate Testbed (SSTB) Fusion Workstation (FW) located at the MDSEC to collect, process and distribute live and archived IR surrogate for distribution throughout the BMDS community for testing, verification, validation and accreditation of STSS and BMDS advanced algorithms
- Continue to demonstrate the utility of STSS advanced tracking and discrimination algorithms to the BMDS community utilizing surrogate IR sensor data in preparation of the STSS Block 2006 satellite launch

	FY 2007	FY 2008	FY 2009
Near Field Infrared Experiment (NFIRE)	23,689	0	0
RDT&E Articles (Quantity)	1	0	0

The Near Field Infrared Experiment (NFIRE) technology effort will collect high and low resolution images of a boosting rocket to improve our understanding of exhaust plume phenomenology and plume-to-rocket body discrimination. Data will be used to validate the models and simulations that are fundamental to developing the guidance and endgame homing algorithms for boost phase interceptors. A secondary objective of the experiment is to collect hyper-temporal short wave infrared and visible data for assessing early launch detection and tracking capability.

FY07 Accomplishments:

- Received Laser Communications Terminal (LCT) payload for payload integration
- Completed and certified Ground Segment Mission Operations Center at the MDSEC to ensure the system is ready to support mission operations
- Conducted Mission Training to ensure the mission operators are prepared to execute
- Conducted Mission Rehearsals at the MDSEC to test the interactions between the ground system, space system, and personnel prior to a mission
- Completed delivery and acceptance of Launch Vehicle to support launch of the spacecraft
- Launched the NFIRE Satellite to insert the spacecraft into orbit

- Conducted Initial On-Orbit Operations from the MDSEC to ensure the functionality and performance of the Tracking Sensor Payload (TSP) prior to executing a mission
- Accepted delivery of Multi-stage Boost Target
- Conducted Target of Opportunity Missions at the MDSEC to collect low resolution plume data and validate the tracking performance of the TSP
- Conducted Near Field Boosting Target Fly-by mission to collect high resolution plume data
- Conducted Hyper-Temporal Experiment to assess early launch detect and tracking capability

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603896C BMD C2BMC	249,179	447,616	289,277	287,194	270,762	256,767	259,159	2,059,954
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870

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	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

D. Acquisition Strategy

STSS follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition as an acquisition within the Capability Development category of the new MDA Block Structure. The STSS Demonstration Satellites effort is being pursued through a single prime contractor, Northrop Grumman Space Technology (NGST), with the subcontractor Raytheon providing the sensor payload. The program develops a ground station at the MDSEC and series of R&D satellites aligned to the BMDS. A contract for the first R&D spiral, the STSS Demonstration Satellites effort, was awarded in third quarter of FY02. 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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I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Space								
Capability Based R&D Contract	SS/CPAF	NGST/CA	426,065	0	N/A	0	N/A	426,065
Launch Vehicle Integration	C/MIPR	NASA/FL	78,100	0	N/A	0	N/A	78,100
Target Acquisition	Various	MDA/Various	47,955	0	N/A	0	N/A	47,955
System Test Studies	SS/CPAF	NGST/CA	0	0	N/A	0	N/A	
			0	0	N/A	0	N/A	
Ground								
Capability Based R&D Contract	SS/CPAF	NGST/CA	92,691	0	N/A	0	N/A	92,691
Gov`t Furnished Equip - MDSEC	MIPR	MDIOC/Schriever AFB CO	6,350	0	N/A	0	N/A	6,350
Systems Engineering								
Capability Based R&D Contract	SS/CPAF	NGST/CA	199,536	0	N/A	0	N/A	199,536
Advanced Algorithm Development	C/MIPR	MIT/LL, Lockheed Martin,Xontech,Sparta,CSC Nichols/ Hanscom AFB MA,LAAFB CA	11,315	0	N/A	0	N/A	11,315
Risk Reduction Analysis	C/MIPR	AFRL/NM	5,310	0	N/A	0	N/A	5,310
System Test & Operations	SS/CPAF	NGST/CA	950	0	N/A	0	N/A	950
Residual STO	SS/CPAF	NGST/CA	0	0	N/A	0	N/A	
IR Engagement Sequence								
Data Collection and Analysis	MIPR	MIT/LL, AFRL / Hanscom AFB MA, Kirtland AFB NM	13,402	0	N/A	0	N/A	13,402
Near Field Infrared Experiment (NFIRE)								

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APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
NFIRE	C/CPAF	General Dynamics, AFRL, JNIC/ AZ, NM,CO	23,689	0	N/A	0	N/A	23,689
Subtotal Product Development			905,363	0		0		905363

Remarks

- Advanced Algorithm Development is accomplished by a team of multiple contractors or government organizations to include, but not limited to, the Massachusetts Institute of Technology/Lincoln Laboratory (MIT/LL), Defense Microelectronics Activity, Northrop Grumman Space Technology, Lockheed Martin, Photon Research Association, SPARTA and Computer Science Corporation/Nichols Research Corporation (CSC/Nichols). Determination of funding requirements will be made upon completion of prior fiscal year activities
- Data Collection and Analysis demonstrates STSS performance characteristics and testing of STSS advanced algorithms. Funding is forwarded to several government organizations to include, but not limited to, MIT/LL and Air Force Research Laboratory. Determination of funding requirements will be made upon completion of prior fiscal year activities, and testing schedules of partnering activities.
- NFIRE funding will be forwarded to several Contractors and government organizations to include, but not limited to General Dynamics, AFRL and the Missile Defense Integration and Operation Center (MDIOC) formerly known as the JNIC. For FY08, the Agency will transfer the NFIRE program funding to the new program element BMDS Space Program (PE 0603895C).
- For FY07 Risk Reduction Efforts are found in Project R112 and content for FY08-13 is found in Project WX112.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Government								
Program Mission Support	Various	SMC/CA	38,130	0	N/A	0	N/A	38,130
OGA Civilian	Various	SMC/CA	7,160	0	N/A	0	N/A	7,160
Subtotal Support Costs			45,290	0		0		45290

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

- Program Mission Support costs include All Program Mission Support costs as well as OGA/MDA Civilian costs have been allocated to funding for the STSS Demonstration Satellites effort.

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Government								
FFRDC	FFRDC	AEROSPACE/CA	48,062	0	N/A	0	N/A	48,062
SETA	FFRDC	MITRE/Wash DC	1,248	0	N/A	0	N/A	1,248
UARC	FFRDC	SDL/UT	500	0	N/A	0	N/A	500
Subtotal Management Services			49,810	0		0		49810

Remarks

Project Total Cost			1,000,463	0		0		1,000,463

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date: **February 2008**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**

R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	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
STSS Demonstration Satellites (Block 2006)																												
System Compatibility Tests	▲	—	—	▲																								
Ground Segment Integration & Test	▲	—	—	▲																								
Satellite Integration and Test	▲	—	—	▲																								
Operational and Test Readiness	▲	—	—	▲																								
Near Field Infrared Experiment																												
SV Integration and Test	▲	▲																										
Ground Segment Readiness Review #2	▲																											
LCT Delivery	▲																											
Launch			▲																									
On Orbit Operations			▲	▲																								

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
STSS Demonstration Satellites (Block 2006)							
System Compatibility Tests	1Q-4Q						
IR Engagement Sequence	1Q-4Q						
Ground Segment Integration & Test	1Q-4Q						
Satellite Integration and Test	1Q-4Q						
Operational and Test Readiness	1Q-4Q						
Near Field Infrared Experiment							
SV Integration and Test	1Q-2Q						
Ground Segment Readiness Review #2	1Q						
LCT Delivery	1Q						
Launch	3Q						
On Orbit Operations	3Q-4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0912 Space Tracking and Surveillance System (STSS) Block 2008	17,300	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: Content for the STSS Software Upgrades (formerly STSS Block 2008) effort previously planned in FY07 Project 0912 for FY08-13 has been captured in FY08-13 Project WX12 in accordance with the MDA revised Block Structure

A. Mission Description and Budget Item Justification

STSS is the space based sensor element of the BMDS.

The STSS Software Upgrades effort will provide improvements to the STSS Demonstration Satellites' ground station hardware and software at the MDSEC and Spacecraft/Payload software. It will incorporate lessons learned from design and development in the STSS Demonstration Satellites and experiences of other BMD elements to improve the performance of the STSS system and its utility to the BMDS. These improvements will provide additional knowledge points on which to base design and algorithms choices for the STSS Follow-on Constellation.

- Improve tracking capability for STSS satellite payload and ground station by upgrading on-board and ground station software
- Provide further automation of the Ground Mission Data Processing and Mission Management software to reduce latency, eliminate person in loop, enable real time data process and, for contingency operations, automate planning and tracking
- Upgrade existing software and hardware at the MDSEC to enhance interface and utility to BMDS elements
- Develop algorithms and upgrade Ground Mission Data Processing Build 2 software to generate additional midcourse track features and improve systems ability to discriminate tracks

STSS will conduct integrated operations with other BMD Elements in concert with the MDA Responsible Test Organization (RTO). Testing will be conducted to verify BMD System level goals and performance.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
Ground and Software Upgrades	17,300	0	0
RDT&E Articles (Quantity)	0	0	0

FY07 Accomplishments:

- Modified the STSS Demonstration Satellites contract to upgrade or add to Ground Segment's Build 2 software completed in FY06, Ground Segment hardware and Spacecraft/Payload software. These upgrades include enhancements as well as new capabilities necessary to implement lessons learned in design and development of the STSS Demonstration Satellites hardware and software development, and those necessary to refine the Ground Segment at the MDSEC to increase the utility the STSS Demonstration Satellites to the BMDS. Specific examples are:
  - Allocated upgrades to first of two capability enhancements or ``Drops``. The first Drop includes all space vehicle and payload software upgrades that will be accomplished in the STSS Software Upgrades as well as ground software improvements vital to improve STSS Demonstration Satellites operations.
  - Began requirements and interface control document development for Drop 1
  - Began development of Drop 1 Payload, Spacecraft and Ground upgrade prototype software
  - Conducted evaluation of prototype algorithms.

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603896C BMD C2BMC	249,179	447,616	289,277	287,194	270,762	256,767	259,159	2,059,954
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

D. Acquisition Strategy

STSS will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development and evolutionary acquisition. The STSS Software Upgrades effort is through the STSS Demonstration Satellites prime contractor, Northrop Grumman Space Technology (NGST), with subcontractors playing key roles as needed. The contract for the STSS Demonstration Satellites activity was awarded in third quarter of FY02. Contract modification took place in FY07 to add the STSS Software Upgrades effort.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Ground and Software Upgrades								
Capability Based R&D Contract	SS/CPAF	NGST/CA	15,600	0	N/A	0	N/A	15,600
Advanced Algorithm Development	MIPR	Various/Various	1,700	0	N/A	0	N/A	1,700
Subtotal Product Development			17,300	0		0		17300

Remarks

The Ground and Software upgrade activity is a refinement of the STSS Demonstration Satellites ground segment.

Advanced Algorithm Development is accomplished by a team of multiple contractors or government organizations to include, but not limited to, the Massachusetts Institute of Technology/Lincoln Laboratory (MIT/LL), Defense Microelectronics Activity, Northrop Grumman Space Technology, Lockheed Martin, Photon Research Association, SPARTA and Computer Science Corporation/Nichols Research Corporation (CSC/Nichols). Determination of funding requirements will be made upon completion of prior fiscal year activities

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Support Costs								

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Management Services								

Remarks

Project Total Cost			17,300	0		0		17,300

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date: **February 2008**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**

R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	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
STSS Software Upgrades (Block 2008)																												
Contract Modification	▲																											
Drop 1 Ground Station Upgrades	▲	—	—	▲																								
Drop 1 Space Vehicle Upgrades	▲	—	—	▲																								
Drop 1 Payload Upgrades	▲	—	—	▲																								

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
STSS Software Upgrades (Block 2008)							
Contract Modification	1Q						
Drop 1 Ground Station Upgrades	1Q-4Q						
Drop 1 Space Vehicle Upgrades	1Q-4Q						
Drop 1 Payload Upgrades	1Q-4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
R312 Space Tracking and Surveillance System (STSS) Follow-On	14,700	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Studies and analysis for STSS Follow-on satellites for increased global coverage of ballistic missiles yielding improved BMDS system performance, extending the engagement envelope of all BMDS interceptors, regardless of basing mode.

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
Space System Engineering	13,950	0	0
RDT&E Articles (Quantity)	0	0	0

FY07 Accomplishments

- Conducted Acquisition Strategy Development
- Contracted for and conducted system trades
- Started development of STSS Follow-on System Level Performance Model
- Continued Key Risk Reduction efforts for
  - Cryocoolers Development
  - Focal Plane Array Development
  - Explore Rad Hard Electronics and Batteries

	FY 2007	FY 2008	FY 2009
Government	750	0	0
RDT&E Articles (Quantity)	0	0	0

Provides necessary and continuous personnel, technology and administrative support for the STSS Follow-on program

FY07 Planned Program

- Provide program management FFRDC support to manage execution of the STSS Follow on program
- Provide Program Office Support for administrative management services and reimbursement for AF and/or MDA Civilian personnel

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603896C BMD C2BMC	249,179	447,616	289,277	287,194	270,762	256,767	259,159	2,059,954
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

D. Acquisition Strategy

Studies conducted under the STSS Demonstration Satellite contract.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Space System Engineering								
System Development & Demonstration	SS/CPAF	NGST/CA	0	0	N/A	0	N/A	
Risk Reduction Efforts	Various	Various/Various	4,016	0	N/A	0	N/A	4,016
Target Acquisition	Various	MDA/Various	0	0	N/A	0	N/A	
System Studies	SS/CPFF	NGST/CA	10,333	0	N/A	0	N/A	10,333
Subtotal Product Development			14,349	0		0		14349

Remarks

During FY07, NGST has been contracted to evaluate and define trade studies.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Government								
Subtotal Support Costs			0	0		0		0

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation								

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Government								
FFRDC	C/FFRDC	Aerospace/CA	0	0	N/A	0	N/A	
UARC	C/FFRDC	SDL/UT	250	0	N/A	0	N/A	250
SETA	C/MIPR	Various/CA	500	0	N/A	0	N/A	500
Subtotal Management Services			750	0		0		750

Remarks

Project Total Cost			15,099	0		0		15,099

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2008

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603893C Space Tracking & Surveillance System

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	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
STSS Follow-On																												
Architecture Studies and Technology Development	▲	—	—	▲																								

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
STSS Follow-On							
Architecture Studies and Technology Development	1Q-4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
WX12 Space Tracking and Surveillance System (STSS) Capability Development	0	219,293	235,453	253,723	546,966	714,341	910,207
RDT&E Articles Qty	0	2	0	0	0	0	0

Note: Content from FY07 Projects 0812, 0912 and R112 are described in Project WX12 beginning in FY08, in accordance with the MDA revised Block Structure.

MDSEC content from FY07 Project 0812 is described in Project WX33 in PE 0603895C in FY08 and beyond in accordance with the MDA revised Block Structure.

NFIRE content from FY07 Project 0812 is described in Project WX16 in PE 0603895C in FY08 and beyond in accordance with the MDA revised Block Structure.

A. Mission Description and Budget Item Justification

Space Tracking and Surveillance System (STSS)

STSS Demonstration Satellites:
The STSS Demonstration Satellites effort is a space-based demonstration of key ballistic missile tracking capabilities. The two space-based sensors platforms and associated ground station processing capability will be operated from the MDSEC.

The STSS Demonstration Satellites activity provides key knowledge on which to base the design of a future constellation. The STSS Demonstration Satellites effort delivers a ground segment at the MDSEC in FY07 and launches two satellites with visible and infrared sensors into low earth orbit in FY08 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 global BMDS interceptor fire control loop with data from the STSS Demonstration Satellites.

To provide STSS with appropriate test opportunities, MDA is procuring dedicated ballistic missile targets for on-orbit testing. The STSS-centric tests conducted with these targets will also include opportunities for secondary participation from other BMDS Elements. STSS is contracting with National Aeronautics and Space Administration (NASA) for launch services for the two Demonstration Satellites using a single Delta II launch vehicle.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

The STSS Demonstration Satellites will be operated from the MDSEC. The program will demonstrate the functions and interfaces required for space data delivery to the BMDS, validating the data quality necessary for 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.

STSS Software Upgrades:
The STSS Software Upgrades effort will provide improvements to the STSS Demonstration Satellites' ground station hardware and software at the MDSEC and Spacecraft/Payload software. It will incorporate lessons learned from design and development in the STSS Demonstration Satellites and experiences of other BMD elements to improve the performance of the STSS system and its utility to the BMDS. These improvements will provide additional knowledge points on which to base design and algorithms choices for future MDA space sensors.

- Improve tracking capability for STSS satellite payload and ground station by upgrading on-board and ground station software at the MDSEC
- Provide further automation of the Ground Mission Data Processing and Mission management software to reduce latency, eliminate person in loop, enable real time data process and, for contingency operations, automate planning and tracking
- Upgrade existing software and hardware at the MDSEC to enhance interface and utility to BMDS elements
- Develop algorithms and upgrade Ground Mission Data processing Build 2 software to generate additional midcourse track features and improve systems ability to discriminate tracks

STSS will conduct integrated operations with other BMD Elements in concert with the MDA Responsible Test Organization (RTO). Testing will be conducted to verify BMD System level goals and performance.

Results from trade studies, analysis of alternatives, and the STSS Demonstration Satellites will contribute to the future MDA space sensor capability. A space sensor constellation will improve the BMDS sensor coverage providing valuable data to extend the engagement envelope of all BMDS interceptors, regardless of basing mode. The ultimate size of the STSS constellation will be dictated by the needs of the BMDS.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
Demonstration Satellites	0	171,348	153,748
RDT&E Articles (Quantity)	0	2	0

Designs, develops, builds and tests two R&D satellites for launch in 2008 in support of the MDA mission to launch and sustain the Space Tracking and Surveillance System

FY08 Planned Program

- Complete Satellite 2 thermal vacuum testing
- Integrate the two satellites with the NASA booster and Orbital Insertion Stage (OIS)
- Set up STSS Demo Analysis Center
- Launch two STSS Demonstration Satellites into Low Earth Orbit (LEO)
- Conduct post launch analysis
- Conduct initial on-orbit check out from the MDSEC
- Complete hardware development in support of STSS flight tests
- Finalize range integration activities with Remote Test Site, Vandenburg Air Force Base (VAFB) and Pacific Missile Range Facility (PMRF) for STSS flight tests

FY09 Planned Program

- Conduct tests from the MDSEC with resident space objects, ground based and airborne targets
- Conduct System Flight Tests, FTS-01 and FTS-02
- Utilize STSS Demo Analysis Center to validate and analyze STSS satellite data prior to dissemination through the MDSEC Interchange System
- Conduct cooperative tests with other BMDS elements

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

	FY 2007	FY 2008	FY 2009
Software Upgrades	0	16,242	31,183
RDT&E Articles (Quantity)	0	0	0

FY08 Planned Program
- Complete Software Upgrades Rebaseline
- Continue Systems Engineering Configuration, Verification, Assessment and Prototype Algorithm Development Activities
- Complete Drop 1 Payload S/W Development
- Continue Drop 1 Space S/W Development
- Continue Drop 1 Ground Segment S/W Development
- Continue System Test/Operations Planning

FY09 Planned Program
- Continue Systems Engineering Configuration, Verification, Assessment and Prototype Algorithm Development Activities
- Complete Drop 1 Space S/W Development
- Continue Drop 1 Ground Segment S/W Development
- Begin Drop 2 Ground Segment S/W Development
- Continue System Test/Operations Planning
- Begin Drop 1 Flight Test Procedures Development and Ground Segment Integration and Check Out

	FY 2007	FY 2008	FY 2009
MDA Space Sensors	0	1,600	16,211
RDT&E Articles (Quantity)	0	0	0

FY08 Planned Program
- Conduct analysis of alternatives for space-based sensors (infrared and visible) to provide global tracking of ballistic missiles
- Examine applicability of system's ability to perform other space missions such as space situational awareness

FY09 Planned Program
- Conduct trades, risk reduction, and initial design activities to support development of future constellation

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

	FY 2007	FY 2008	FY 2009
Government	0	30,103	34,311
RDT&E Articles (Quantity)	0	0	0

FY08 Planned Program

- Continue program management FFRDC support to manage execution of the STSS program
- Provide Program Office Support for travel, cost estimating and financial management support, administrative management services, hardware and software purchases and maintenance, computer network support, supplies and reimbursement of AF and MDA civilian positions

FY09 Planned Program

- Continue program management FFRDC support to manage execution of the STSS program
- Provide Program Office Support for travel, cost estimating, administrative management services, hardware and software purchases and maintenance, computer network support, supplies and reimbursement of AF and MDA civilian manpower authorizations

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603896C BMD C2BMC	249,179	447,616	289,277	287,194	270,762	256,767	259,159	2,059,954
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

D. Acquisition Strategy

The STSS Program Office will build and deploy satellites of increasing performance and technical sophistication. STSS follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition as an acquisition within the Capability Development category of the new MDA Block Structure.

The STSS Demonstration Satellites effort is being pursued through a single prime contractor, Northrop Grumman Space Technology (NGST), with the subcontractor Raytheon providing the sensor payload. The program develops a ground station at the MDSEC. The contract for the STSS Demonstration Satellites effort was awarded in third quarter FY02. 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.

The STSS Software Upgrades effort is being pursued through the STSS Demonstration Satellites prime contractor, Northrop Grumman Space Technology (NGST), with subcontractors playing key roles as needed. The contract for the STSS Demonstration Satellites activity was awarded in third quarter FY02. Contract modification took place in FY07 to add the STSS Software Upgrades activity.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Demonstration Satellites								
Capability Based R&D	SS/CPAF	NGST/FFRDCs/ CA/mult.	0	131,651	1/4Q	112,198	1/4Q	243,849
Launch Vehicle Integration	C/MIPR	NASA/FL	0	12,806	1/2Q	300	1Q	13,106
Element Integration	Various	NGST/Aerospace/ CA	0	5,750	1/3Q	17,173	1/3Q	22,923
Advanced Algorithm Development	C/MIPR	MIT/LL, Lockheed Martin, Zntech, Sparta, CSC / Hanscom AFB MA, LAAFB CA	0	2,900	1/3Q	2,664	2Q	5,564
Risk Reduction Analysis	C/MIPR	AFRL/NM	0	3,329	1/2Q	1,779	1/2Q	5,108
IR Engagement Sequence	C/MIPR	MIT/LL, AFRL/ Hanscom AFB MA, Kirtland AFB NM	0	1,000	2/3Q	2,000	4Q	3,000
System Engineering	Various	Aerospace/Los Angeles AFB CA, Schriever AFB CO	0	13,912	1/4Q	17,634	1/4Q	31,546
Software Upgrades								
Capability Based R&D Contract	C/CPAF	NGST/CA	0	16,242	1/4Q	31,183	1/4Q	47,425
MDA Space Sensors								
System Engineering	Various	Various/Various	0	1,600	2/3Q	0	N/A	1,600
Capability Based R&D Contract	Various	TBD/TBD	0	0	N/A	16,211	1/3Q	16,211
Subtotal Product Development			0	189,190		201,142		390332

Remarks

Element Integration efforts are divided into several areas:

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

- Funding goes to the Navy at Pt Mugu, CA for the planning and calibration testing for the Demonstration Satellites. Aircraft are used to generate targets for the Acquisition sensor and Track sensor with Below The Horizon (BTH) backgrounds.
- The STSS Demonstration Satellites require assets for dedicated missile tests to be conducted jointly by the Air Force Satellite Control Network (AFSCN) and the Space and Missile Center (SMC) Test Wing by utilizing mobile Remote Test Site (RTS) assets that are critical in supporting STSS launches and the subsequent operations and testing of the Demo Satellites.
- Funding for the Data Control and Integration Laboratory enables the study, design, engineering, implementation, and testing of the capability to review STSS data prior to dissemination outside STSS control. Included are monies to be sent to other government programs such as the Space Based Surveillance System and the Aerospace Fusion Center to alter their processing to accept and process the data, provide a review service and disseminate to MDSEC Interchange System.

Advanced Algorithm Development is accomplished by a team of multiple contractors or government organizations to include, but not limited to, the Massachusetts Institute of Technology/Lincoln Laboratory (MIT/LL), Defense Microelectronics Activity, Northrop Grumman Space Technology, Lockheed Martin, Photon Research Association, SPARTA and Computer Science Corporation/Nichols Research Corporation (CSC/Nichols).
IR Engagement Sequence includes those activities related to data collection and analyses to demonstrate STSS performance characteristics and testing of STSS advanced algorithms. Funding is forwarded to several government organizations to include, but not limited to, MIT/LL and Air Force Research Laboratory.
Systems Engineering support is provided by Aerospace directly to the Demo Satellites effort.
$1.6M was specifically identified in the FY08 Appropriation to pursue analysis of alternatives for satellite-based capability for infrared and visible sensors to provide global tracking of ballistic missiles as well as examining the applicability to perform space situational awareness and other space missions.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Government								
Program Mission Support	Various	SMC/CA	0	2,998	1/4Q	3,995	1/4Q	6,993
OGA Civilian	Various	SMC/CA	0	3,255	1/4Q	3,613	1/4Q	6,868
MDA Civilian	Various	MDA/AL	0	1,009	1/4Q	1,120	1/4Q	2,129
OGA Contractor Support (SETA)	Various	SMC/CA	0	5,793	1/4Q	7,456	1/4Q	13,249

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Support Costs			0	13,055		16,184		29239

Remarks

Program Support Costs include but not limited to costs for reimbursement of AF and MDA Civilian personnel that directly support the STSS program, for Demo Satellites and STSS Software Upgrades. Additionally, the cost of personnel travel, training, hardware and software maintenance, IT network support, administrative, CCAR, logistics and cost estimating support are included in this section

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Government								
Aerospace	FFRDC	Aerospace/CA	0	15,812	1/4Q	18,127	1/4Q	33,939
MITRE	FFRDC	MITRE/ Washington DC	0	978	1/3Q	0	N/A	978
SDL	FFRDC	SDL/UT	0	258	1/3Q	0	N/A	258
Subtotal Management Services			0	17,048		18,127		35175

Remarks

Project Total Cost			0	219,293		235,453		454,746

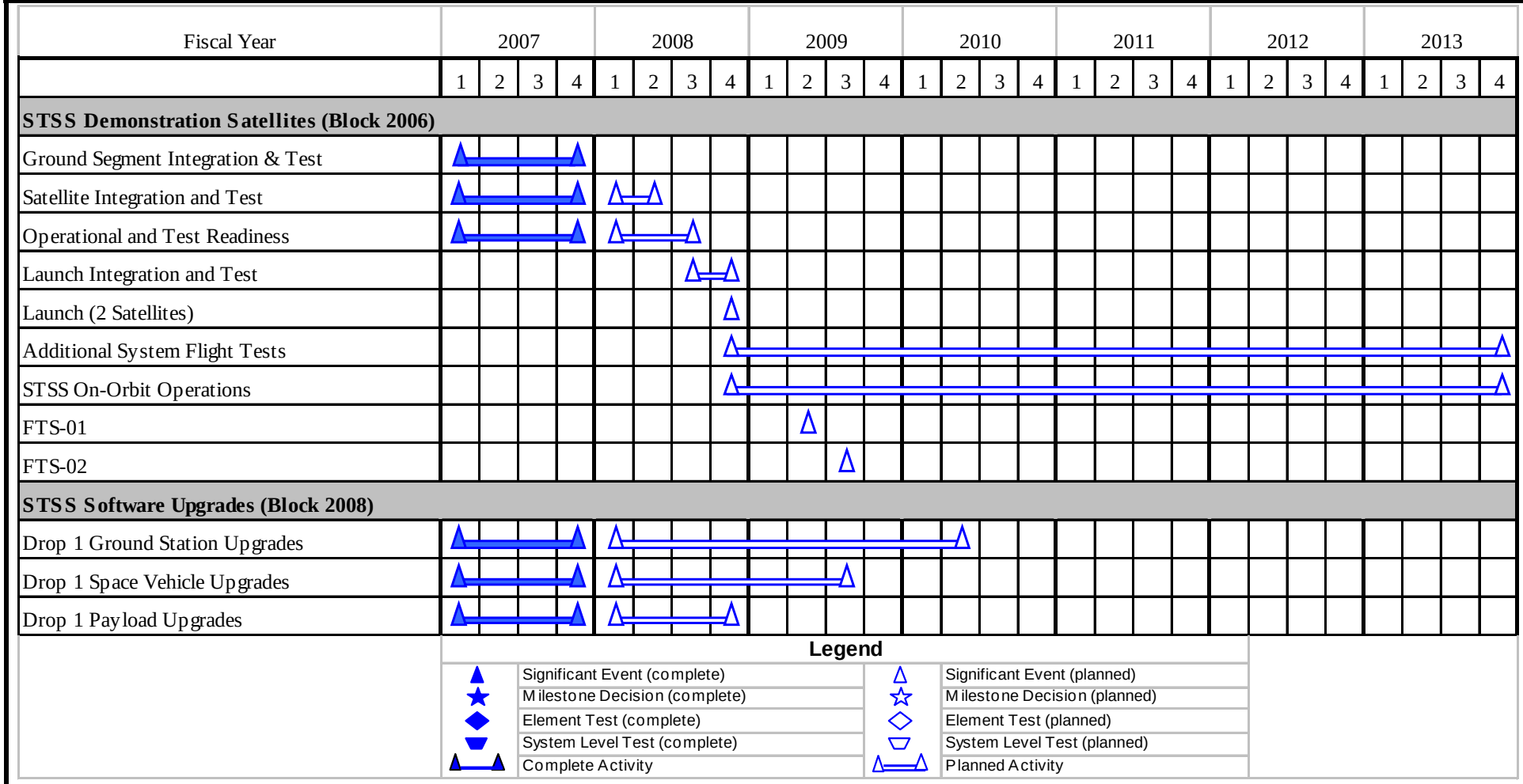
Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

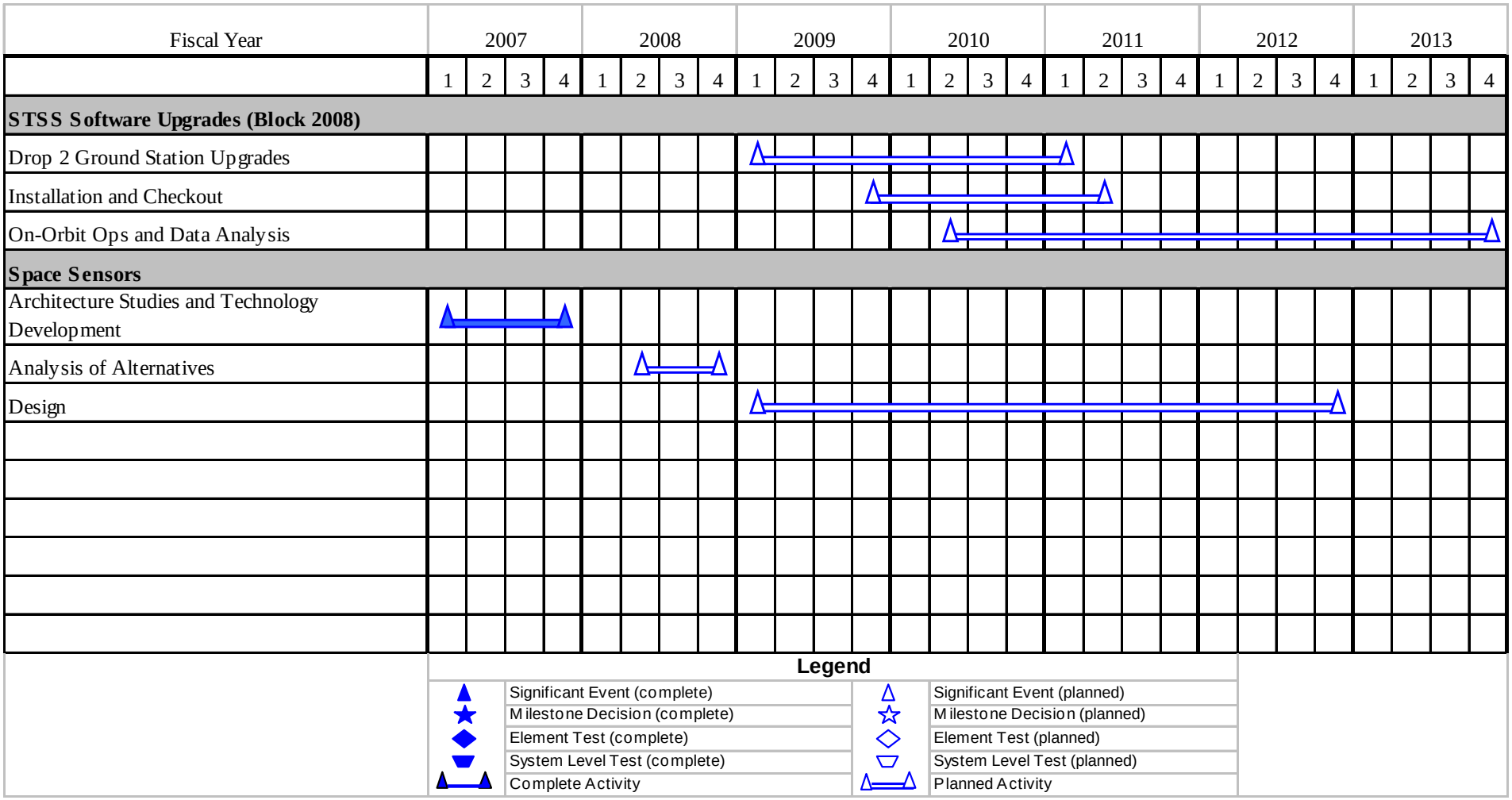
Date: **February 2008**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**

R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
STSS Demonstration Satellites (Block 2006)							
System Compatibility Tests	1Q-4Q						
IR Engagement Sequence	1Q-4Q	1Q-4Q					
Ground Segment Integration & Test	1Q-4Q						
Satellite Integration and Test	1Q-4Q	1Q-2Q					
Operational and Test Readiness	1Q-4Q	1Q-3Q					
Launch Integration and Test		3Q-4Q					
Launch (2 Satellites)		4Q					
Additional System Flight Tests		4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
STSS On-Orbit Operations		4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
FTS-01			2Q				
FTS-02			3Q				
STSS Software Upgrades (Block 2008)							
Drop 1 Ground Station Upgrades	1Q-4Q	1Q-4Q	1Q-4Q	1Q-2Q			
Drop 1 Space Vehicle Upgrades	1Q-4Q	1Q-4Q	1Q-3Q				
Drop 1 Payload Upgrades	1Q-4Q	1Q-4Q					
Drop 2 Ground Station Upgrades			1Q-4Q	1Q-4Q	1Q		
Installation and Checkout			4Q	1Q-4Q	1Q-2Q		
On-Orbit Ops and Data Analysis				2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Space Sensors							
Architecture Studies and Technology Development	1Q-4Q						
Analysis of Alternatives		2Q-4Q					
Design			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0602 Program-Wide Support	13,974	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: Efforts within this Project continue in FY 2008 under Project ZX40

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 2007	FY 2008	FY 2009
Civilian Salaries and Support	13,974	0	0
RDT&E Articles (Quantity)	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

C. Other Program Funding Summary

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PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603896C BMD C2BMC	249,179	447,616	289,277	287,194	270,762	256,767	259,159	2,059,954
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
ZX40 Program-Wide Support	0	12,235	6,988	12,786	13,164	21,386	27,984
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: In accordance with the Missile Defense Agency revised block structure, the content previously planned in Project 0602 for FY08-FY13 is now captured in Project ZX40.

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 2007	FY 2008	FY 2009
Civilian Salaries and Support	0	12,235	6,988
RDT&E Articles (Quantity)	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603896C BMD C2BMC	249,179	447,616	289,277	287,194	270,762	256,767	259,159	2,059,954
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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System

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