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Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	605,718	594,190	586,150	620,104	654,352	672,952	687,478	696,651
0804 Test & Evaluation Block 2006	91,207	128,178	0	0	0	0	0	0
0904 Test & Evaluation Block 2008	0	44,987	113,646	120,085	0	0	0	0
0004 Test & Evaluation Block 2010	0	0	29,856	42,221	124,710	117,414	8,950	0
R104 Test & Evaluation Block 2012	0	0	0	0	55,573	78,449	81,684	3,961
R204 Test & Evaluation Block 2014	0	0	0	0	0	3,574	113,591	198,077
0917 Concurrent Test, Training & Ops (CTTO) Block 2008	0	0	41,647	37,789	0	0	0	0
0017 Concurrent Test, Training & Ops (CTTO) Block 2010	0	0	0	0	35,978	33,216	0	0
R117 Concurrent Test, Training & Ops (CTTO) Block 2012	0	0	0	0	0	0	9,013	9,115
0304 Test & Evaluation	214,907	212,144	209,273	210,239	207,883	212,970	232,624	236,202
0305 Targets & Countermeasures Core	20,654	20,062	21,135	21,582	21,383	21,673	21,673	21,673
0805 Targets & Countermeasures Block 2006	265,949	159,066	0	0	0	0	0	0
0905 Targets & Countermeasures Block 2008	3,250	19,231	160,794	139,676	0	0	0	0
0005 Targets & Countermeasures Block 2010	500	2,989	1,663	39,035	189,422	156,980	0	0
R105 Targets & Countermeasures Block 2012	0	0	0	0	5,937	38,635	209,784	217,444
0602 Program-Wide Support	9,251	7,533	8,136	9,477	13,466	10,041	10,159	10,179

Note: Starting in FY08, Concurrent Test, Training and Operations (CTTO) efforts previously included in Ballistic Missile Defense Products PE 0603889C in Projects 0803, 0903 and 0003 within the BMDS Training area are now addressed in BMD Ballistic Missile Defense Test and Targets PE 0603888C Projects 0917 (Block 2008), 0017 (Block 2010) and R117 (Block 2012). Distributed Multi-Echelon Training System (DMETS) is an activity in the CTTO task.

A. Mission Description and Budget Item Justification

A.1 System Element Description

As part of the total Ballistic Missile Defense System (BMDS), the Test and Targets Program Element (PE) provides the resources, including targets and countermeasures development, for an integrated system-level test approach, bringing together the capabilities of the BMDS elements. This PE consists of fifteen projects: Test & Evaluation (T&E); T&E Block 2006; T&E Block 2008; T&E Block 2010; T&E Block 2012; T&E Block 2014; Targets & Countermeasures Core; Targets & Countermeasures Block 2006; Targets & Countermeasures Block 2008; Targets & Countermeasures Block 2010; Targets & Countermeasures Block 2012; Concurrent Test, Training, and Operations (CTTO) Block 2008; CTTO Block 2010; CTTO Block 2012, and Program Wide Support.

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<p>BMDS testing is conducted at essentially three levels, Element component level testing, Element level verification testing, and BMD System level integration testing. Element component level testing consist primarily of Element subsystem developmental testing and Component-level debug and improvement testing. This level of testing is funded as part of an Elements developmental program and reflected in their respective Program Element (PE) submission. Element level verification testing primarily consists of Element level developmental and verification testing, Element improvements, Component-level integration, verification and validation of hardware and software readiness for incorporation into BMDS, and System integration testing. This level of testing is funded primarily as part of an Elements developmental program and reflected in their respective Program Element (PE); however, portions of this testing are occasionally funded by the Test and Targets PE if the Element test has BMD System level interest. BMD System Integration Testing primarily supports Engagement Sequence Group (ESG) demonstration, Launch threat characterization, Operational Test Agency (OTA) involvement, System-level integration and improvements, International participation, and Warfighter involvement. This level of testing is funded as a combination of funding from this PE and the primary Elements PE. This approach includes a combined Developmental/Operational Test (DT/OT) Program at both the element and system level. System Level test infrastructure is also funded as part of this PE.</p> <p>Test and Evaluation and Targets and Countermeasures Core (Projects 0304 and 0305, respectively) provide for the implementation of test and target functions that span multiple Blocks. These projects also assist in expanding the capabilities of the BMDS in future Blocks, and developing capabilities not yet foreseen as part of a current or future Block. Block functions (e.g., Project 0804 - T&E Block 2006 and Project 0805 - Targets and Countermeasures Block 2006) include all efforts (e.g., detailed planning, hardware procurement, test execution, analysis, and reporting) necessary to test and assess a specific BMDS Block. Element participation in system-level testing, including test article procurement and test conduct, is captured in the respective element PE.</p> <p>The T&E projects provide consolidated MDA-wide capabilities and resources to support the management and execution of BMDS System and Element-level testing. With the evolution of the BMDS, testing needs have expanded beyond those of the individual elements to include testing of BMDS engagement sequences that rely on multiple BMDS elements. The structure of MDA's T&E Directorate, hereafter referred to as the MDA Responsible Test Organization (RTO), centralizes authority, control, and responsibility for all BMDS testing. The RTO is responsible for executing BMDS system tests and conducting post-test analysis to characterize BMDS system performance to support system verification. BMDS system test objectives are determined by BMD Responsible Engineering Organization (REO) and include threat capability in the selection of targets and test parameters. The MDA test program provides data and information to anchor the models and simulations used to verify BMDS capabilities and to support BMDS characterization and assessments. RTO activities are grouped into six functional areas: Test Policy and Strategy; BMDS Combined Test Force; Test Assurance; Test Resources; Facilities, Siting, and Environmental management; Concurrent Test, Training, and Operations (CTTO).</p>		

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<p>The Test Policy and Strategy program supports the development and implementation of strategic planning, test policy, standards, and procedures for creating a unified BMD test process. This program also includes funding for the BMDS Capability Assessment (BCA) team and funding for all of the Service Operational Test Agencies (OTAs) to conduct a BMDS Operational Assessment (OA). The Test Assurance program is responsible for improving the quality, design, execution and efficiency of the BMDS test, integration and fielding programs. The Test Assurance program is responsible for assuring test readiness, ensuring test realism, assessing test adequacy, and tracking test risk. The RTO also includes the BMDS Combined Test Force (CTF) which plans, executes, analyzes, and reports all BMD system test events. The BMDS CTF consolidates the personnel, processes, and resources across MDA, including the BMDS elements, into a unified, cohesive team to execute the BMDS test program. The BMDS CTF provides for core support that spans multiple Blocks as well as the individual efforts required for the test and assessment of specific Blocks. The Test Resources program supports the development, operation, maintenance, and modernization of the T&E infrastructure supporting both BMDS System and Element-level testing. The MDA test program provides data and information to anchor the models and simulations used to verify BMDS capabilities and to support BMDS characterization and assessment. The Facilities, Siting and Environmental program provides guidance, environmental analysis and documentation, real property facility siting, acquisition, and facility operational support for BMD systems.</p> <p>The BMDS RTO uses a top-down approach to develop BMDS test plans based on engagement sequence groups, system test objectives, and the overall system design provided by the BMDS Responsible Engineering Organization (REO). The BMDS CTF uses these inputs to create an integrated system-level test and analysis approach, bringing together the contributions of the various BMDS elements into combined system test events. These system test events are comprised of two or more elements interacting to verify the capability of the system in one or more of the engagement sequences; these events are documented in the Integrated Master Test Plan (IMTP). The IMTP is the foundation for developing the element Developmental Master Test Plans (DMTP) that details the element contributions to the overall test program. Elements design their component test programs via the DMTP to support the IMTP and participate in the overall BMD system level test program. The development and acquisition of new test facilities and instrumentation are integrated into a Test Resources Master Plan (TRMP) that supports the overall test approach.</p> <p>The Targets and Countermeasures Directorate provides targets (hardware and launch services) to the MDA Elements to test the integrated BMDS. The Targets and Countermeasures Directorate oversees the associated funding for the testing. The funding for these targets reside in the Elements respective Program Elements.</p> <p>The Ballistic Missile Defense System (BMDS) Concurrent Test, Training and Operations (CTTO) capability is critical to the defense of homeland and friendly forces in the face of emerging BMDS threats from unfriendly forces. CTTO provides comprehensive, in-place, geographically dispersed upgrades, testing, training, and sustainment while maintaining operational readiness across the complete Ballistic Missile Defense System (BMDS)</p>		

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<p>Enterprise. This CTTO capability will enable simultaneous cross-element-on training events in the field during BMDS incremental and spiral development testing and sustained operational readiness conditions without degrading protection capability.</p> <p>In the October 2006 Joint Functional Component Command for Integrated Missile Defense (JFCC-IMD) Warfighter Prioritized Capability List (PCL), the BMDS is required to provide “The capability to sustain operations while simultaneously supporting concurrent research, development, test, and evaluation (RDT&E); maintenance; training; and system upgrade activities without degrading protection capability.” The BMDS CTTO capability is required in the JFCC-IMD Modifications Requirement List (MRL). The currently fielded (Block 06) BMDS system has only limited abilities to conduct concurrent test and operational readiness activities, and there is no capacity for Warfighters to obtain initial or recurrency training or participate in exercises using BMDS assets to build and maintain their operational proficiency without degrading incremental and spiral developmental tests and operational readiness.</p> <p>Test and Evaluation Description:</p> <ul style="list-style-type: none">• MDA's Responsible Test Organization (RTO) structure centralizes authority, control, and responsibility for all BMDS testing.• Plans tests according to BMDS and Element objectives.• Provides test ranges, instrumentation and infrastructure.• Develops MDA test policy.• Directs the Combined Test Force (CTF).• Plans, executes, and conducts analysis of BMDS ground and flight tests.• Demonstrates integrated BMDS capability.• Addresses critical measurements for growth and capability.• Collects data for BMDS analysis and manages MDA data centers.• Provides documentation of BMDS and Element performance results for use by MDA, the OTAs, STRATCOM, and senior decision makers.• Provides civil engineering / facility acquisition expertise, oversees all construction funding, and ensures environmental compliance of all MDA activities. <p>Targets and Countermeasures Description:</p> <p>The Targets and Countermeasures Program is a supporting BMDS program that provides targets to test the integrated, layered BMDS, including targets, countermeasures, and instrumentation to support testing prior to initial defensive operational capability.</p>		

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<p>Concurrent Test, Training and Operations (CTTO) Description: Concurrent Test, Training, and Operations (CTTO) effort organizes and provides the resources, including systems development and acquisition, for an integrated system-level developmental and acquisition approach, bringing together the capabilities of the BMDS Elements. This effort provides for implementation of test and evaluation, training, and operations functions that span multiple Blocks, as well as identifies capability gaps as part of current and future Blocks.</p> <p><u>A.2 System Element Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS)</u></p> <p>Test and Evaluation Contribution to the BMDS:</p> <ul style="list-style-type: none">• Plan and conduct testing of the BMDS Engagement Sequence Groups (ESGs) developed by the REO.• Collect and provide test data in order to support the effectiveness, suitability, survivability, and interoperability assessments of the BMDS.• Provide infrastructure and environmental compliance necessary to support increasingly complex tests.• Provide risk reduction for the BMDS through measurements flight testing to include technology demonstration, algorithm and model validation, and threat and countermeasure characterization.• Develop MDA BMDS testing policy with common, repeatable processes. <p>Targets and Countermeasures Contribution to the BMDS: The Targets and Countermeasures Program develops new targets and countermeasures, risk reduction flights (tests of target prototypes), subsystem characterization, and the acquisition and maintenance of long lead target material items. Specifically, the Targets and Countermeasures program provides capability-based ballistic missile target systems to include missile subsystems and common target components, such as boosters, re-entry vehicles (RVs), countermeasures, guidance and control components, data and instrumentation packages, and launch support systems. Additionally, the Targets and Countermeasure program supports aging surveillance, refurbishment, and reuse of existing government furnished equipment such as Minuteman II and Lance missile hardware. Utilizing existing government inventories and the development of common target components, a BMDS target system is integrated and tested, thus reducing the cost and cycle time of developing and acquiring new target system hardware. To assist the government in this endeavor, a ten year prime contract was awarded in FY04 to design, develop, and test all BMDS targets.</p> <p>Concurrent Test, Training, and Operations (CTTO) Contribution to the BMDS:</p> <ul style="list-style-type: none">• Enables BMDS sustained operational capability and continued BMDS incremental and spiral development while providing Warfighters the ability to maintain an operational capability, participate in exercises, train, and mission rehearse.• Provides comprehensive, in-place, geographically dispersed test, evaluation and training of the complete BMDS		

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<ul style="list-style-type: none">• Eliminates current need to co-locate forces at a central training facility, thus providing both cost savings for the exercise conduct and the added advantage of training operators in an operational state• Ensures horizontal and vertical test and evaluation scalability from Element through Global BMDS• Safely injects consistent high fidelity threat and scenario data on operational equipment to exercise all phases of the kill chain using all sensor/shooter combinations• Strategic end-state: BMDS available on-demand for test and evaluation, training, and operations that is transparent to real world operations <p><u>A.3 Major System Element Goals</u></p> <p>Major Test and Evaluation Goals:</p> <ul style="list-style-type: none">• Form one BMDS test team under the RTO that is accountable to the MDA Director and Element program directors.• Provide leadership and guidance under the CTF for the planning, execution, analysis, and reporting of BMD system test events to support system verification.• Establish single BMD system test processes that reflect the best practices of existing Element processes.• Benchmark and merge existing Elements and executing processes into BMDS processes.• Develop Element Lessons Learned and Best Practices to support single BMDS test design processes.• Provide required infrastructure and environmental compliance for robust BMD system testing. <p>Major Targets and Countermeasures Goals:</p> <p>The Targets and Countermeasures Program is developing a Flexible Target Family (FTF). This approach emphasizes commonality and modularity. The FTF will minimize the set of different booster stages, provide common FTS and Instrumentation components, provide common vehicle support equipment, provide common launch support equipment, and provide common interfaces. Targets and Countermeasure Program has incorporated a Product Line strategy to better manage the Program. Product Lines consist of Systems Engineering, Launch Vehicle, Data and Instrumentation, Countermeasures, Re-entry Vehicles, Logistics, Integration, and Mission Management. Product Lines will develop common target components for BMDS testing which will reduce both cycle time and cost while maximizing flexibility. Product Lines will prove the flexibility to allow common target components to be developed, integrated, and tested.</p> <p>Major Concurrent Test, Training and Operations (CTTO) Goals:</p> <ul style="list-style-type: none">• Integrate existing BMDS teams to support BMDS CTTO and report progress to Missile Defense Agency Director.• Provide leadership and guidance for the planning, execution, analysis, and reporting of BMDS CTTO events to support system verification.		

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- Benchmark and merge existing Element and executing processes into BMDS CTTO processes.
- Develop Lessons Learned and Best Practices to support single BMDS CTTO design process.
- Increase Warfighter confidence in the BMDS.
- Enable BMDS testing and training in the field without degrading protection capability.
- Sustain BMDS operations while simultaneously supporting concurrent BMDS systems development and acquisition without degrading protection capability.
- Ensure horizontal and vertical CTTO scalability from MDA Element through global BMDS.
- Safely inject consistent high fidelity threat and scenario data on operational equipment to exercise all phases of the kill chain using all sensor/shooter combinations.
- Support the development and evaluation of Warfighter Tactics, Techniques, and Procedures at the BMDS level.

A.4 Major Events Schedule and Description

Major Event	Project	Timeframe	Description
Flight Test			
System Flight Tests			
FTM-11	0304	1Q FY 2007	<ul style="list-style-type: none"> • An incorrect system setting aboard the ship resulted in no launch of the interceptors. • BMDS Primary: <ul style="list-style-type: none"> • Exercise functionality used in SM-3 Engage On (EO) AN/SPY-1 Engagement Sequence Group (ESG) with priority on AN/SPY-1 sensor for Launch and Engagement (L&E) support for SM-3 weapon to engage target. • BMDS/Aegis BMD Secondary: <ul style="list-style-type: none"> • Determine Aegis BMD 3.6 capability with lethal intercept of exo-atmosphere Short Range Ballistic Missile (SRBM) & Anti-Ship Cruise Missile (ASCM) • ESG tested: SM-3 EO AN/SPY-1 • Participants include: Aegis BMD 3.0E/3.6, AN/TPY-2 (TM) 4.1
FTT-05	0304	2Q FY 2007	<ul style="list-style-type: none"> • THAAD Primary: <ul style="list-style-type: none"> • Demo booster / kill vehicle separation in high dynamic pressure fly-out environment • THAAD Secondary: <ul style="list-style-type: none"> • Evaluate aero heating effects on seeker window • ESGs tested: Element Development Test • Participants include: THAAD

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FTT-06	0304	2Q FY 2007	<ul style="list-style-type: none"> • THAAD Primary: <ul style="list-style-type: none"> • Demo high endo aim point selection & medium aspect intercept against a non-separating liquid fuel target • THAAD Secondary: <ul style="list-style-type: none"> • Demo Element Integration at Pacific Missile Range Facility (PMRF) • ESG s tested: THAAD EO AN/TPY-2 (TM) • Participants include: THAAD TFC/C Bld. 4.A AN/TPY-2 (TM) Bld. 4.1
FTX-02	0304	2Q FY 2007	<ul style="list-style-type: none"> • BMDS/GMD Primary: <ul style="list-style-type: none"> • Demo GBI EO SBX through a simulated interceptor launch and post-mission, through hit assessment; and collect XBR data to support assessment of radar functions (including advanced algorithm) against a dynamic target with associated objects • BMDS Secondary: <ul style="list-style-type: none"> • Collect SM-3 Launch on Remote (LOR) data • Collect SBX data to support assessment of radar functions as a risk reduction path for GBI EO SBX & to anchor SBX Modeling and Simulation (M&S) • ESG tested: GBI Engage On Launch On (EO/LO) SBX (Simulated) GBI LO AN/SPY-1 (Simulated); GBI LO AN/TPY-2 (FB) (Simulated), SM-3 LOR (AN/SPY-1) (Simulated) • Participants include: Aegis BMD 3.6; C2BMC 6.0; GMD GFC/C Bld. 6A; SBX Bld. 1.6; Beale UEWR Bld. 6.3.2; AN/TPY-2 (FB) Bld. CR-1; SBIRS 07-1
ATM-48	0304	3Q FY 2007	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Exercise BMDS functionality for PAC-3/GEM/GEM+ & EO AN/MPQ-53/65 ESG • BMDS/PAC Secondary: <ul style="list-style-type: none"> • First live test of PATRIOT PDB-6 & C2BMC Spiral 6.2 • Demonstrate and Assess (D&A) BMDS Block 06 functionality & intercept with: <ul style="list-style-type: none"> • PATRIOT, THAAD, C2BMC, DSP/SBIRS (if available) • ESG tested: PAC-3 GEM/GEM+ EO AN/MPQ-53/65 • Participants include: C2BMC 6.2; PATRIOT 6.0; THAAD HWIL BLD. 4; SBIRS 07-1
FTG-03	0304	3Q FY 2007	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Demo BMDS functionality of GBI LO/EO Beale Upgraded Early Warning Radar (UEWR) for Ground Based Interceptor (GBI) launched from Vandenberg Air Force Base (VAFB) to perform all functions thru acquisition, discrimination, transition to terminal, & hitting lethal object • BMDS/ GMD Secondary: <ul style="list-style-type: none"> • SBX collect data in shadow mode for post msn playback of GBI LO/EO SBX • ESG s tested: GBI LO/EO CD/UEWR Mod 1/2 (SBIRS); GBI LO/EO SBX (Possible) • Participants include: GMD GFC/C 6A; DSP-SBIRS 07-1; C2BMC 6.0; SBX 1.6; Beale UEWR 6.3.2; Aegis BMD 3.6

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Major Event	Project	Timeframe	Description
FTM 11b	0304	3Q FY 2007	<ul style="list-style-type: none"> • BMDS Primary (repeat of FTM-11): <ul style="list-style-type: none"> • Exercise functionality used in SM-3 EO AN/SPY-1 ESG with priority on AN/SPY-1 sensor for L&E support for SM-3 weapon to engage target. • BMDS/Aegis BMD Secondary: <ul style="list-style-type: none"> • Determine Aegis BMD 3.6 capability with lethal intercept of exo-atmosphere SRBM & Anti-Ship Cruise Missile (ASCM) • ESG tested: SM-3 EO AN/SPY-1 • Participants include: Aegis BMD 3.0E/3.6, AN/TPY-2 (TM) 4.1
FTM-12	0304	3Q FY 2007	<ul style="list-style-type: none"> • Aegis BMD Primary: <ul style="list-style-type: none"> • Determine Aegis BMD 3.6 capability with cued engagement & lethal intercept of exo-atmosphere Medium Range Ballistic Missile (MRBM) • Aegis BMD Secondary: <ul style="list-style-type: none"> • Assess multiple simultaneous engagement performance • ESG tested: SM-3 EO AN/SPY-1 • Participants include: Aegis BMD 3.6 • Potential: C2BMC 6.2; AN/TPY-2 (TM) 4.2
FTT-07	0304	3Q FY 2007	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Exercise BMDS functionality for THAAD EO AN/TPY-2 (TM) ESG where AN/TPY-2 (TM) is surveillance, initial track & launch sensor & THAAD interceptor is engaging weapon against a non-separating low aspect mid endo liquid fuel target • BMDS/THAAD Secondary: <ul style="list-style-type: none"> • Demonstrate and Assess (D&A) ability of THAAD to provide beyond-line-of-sight Link 16 track data to Aegis BMD and C2BMC • ESG tested: THAAD EO AN/TPY-2 (TM) • Participants include: C2BMC 6.0; THAAD TFCC Bld. 4; AN/TPY-2 (TM) Bld. 4.2; Aegis BMD 3.6; PATRIOT 6.0 HWIL
FTG-04	0304	4Q FY 2007	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Demo BMDS functionality of GBI EO SBX Mod 1 (SBIRS) for GBI launched from VAFB to perform all functions thru acquisition, discrimination, transition to terminal, & intercepting lethal object • ESGs tested: GBI EO SBX • Participants include: GMD GFC/C 6A; SBX 1.6; C2BMC 6.2; Aegis BMD 3.6; Beale UEWR Bld. 6.3.2
FTM-11a	0304	4Q FY 2007	<ul style="list-style-type: none"> • AEGIS BMD Primary: <ul style="list-style-type: none"> • Demo Engagement under operational conditions with minimal a-priori data provided • Aegis BMD Secondary: <ul style="list-style-type: none"> • Evaluate Aegis BMD 3.6 cruiser performance against engineering specifications • ESG tested: SM-3 EO AN/SPY-1 • Participants include: Aegis BMD 3.6; C2BMC 6.2

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Major Event	Project	Timeframe	Description
FTT-08	0304	4Q FY 2007	<ul style="list-style-type: none"> • THAAD Primary: <ul style="list-style-type: none"> • Demo Exo Aim point selection & intercept against a high aspect non-separating exo-atmospheric liquid fuel target • THAAD Secondary: <ul style="list-style-type: none"> • Evaluate missile endgame against high aspect angle intercept • ESG tested: THAAD EO AN/TPY-2 (TM) • Participants include: THAAD TFCC Bld. 4; AN/TPY-2 (TM) Bld. 4.2
FTX-03	0304	4Q FY 2007	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Track a live, ballistic target with AN/TPY-2 (FB) radar & pass real-time data to C2BMC • BMDS/AN/TPY-2 (FB) Secondary: <ul style="list-style-type: none"> • D&A AN/TPY-2 ability to exchange track data with Aegis BMD via C2BMC • ESG tested: Operational Test of AN/TPY-2 (FB) SM-3 LO AN/TPY-2 (FB) ; Simulation • Participants include: Aegis BMD 3.6; C2BMC 6.2; AN/TPY-2 (FB) Bld. CR-1; SBIRS 07-1
FTG-05	0304	1Q FY 2008	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Demo BMDS functionality of GBI EO SBX for GBI Launched from VAFB to perform all functions thru acquisition, discrimination, transition to terminal, & intercepting a long range/low elevation lethal object • BMDS/ GMD Secondary: <ul style="list-style-type: none"> • Demo Long Range/Low Elevation Operations, Aegis BMD ability to provide S&IT to GFC/SBX/C2BMC, and demo SBX engagement support sensor for GBI LO AN/SPY-1 Mod 1 (SBX) • ESG tested: GBI EO SBX; GBI LO AN/SPY-1 Mod 1 (SBX) • Participants include: C2BMC 6.0/6.2; GMD GFC/C Bld. 6A; SBX Bld. 1.6.;Beale UEWR Bld. 6.3
FTM-13	0304	1Q FY 2008	<ul style="list-style-type: none"> • Aegis BMD Primary: <ul style="list-style-type: none"> • Lethal intercept of a unitary exo-atmosphere ballistic missile targets • Aegis BMD Secondary: <ul style="list-style-type: none"> • Verify MSE performance (SM-3) • ESG tested: SM-3 EO AN/SPY-1; SM-3 LOR AN/SPY-1 • Participants include: Aegis BMD 3.6 • Potential: TFCC B5
JFTM-01	0304	1Q FY 2008	<ul style="list-style-type: none"> • Aegis BMD Primary: <ul style="list-style-type: none"> • Lethal intercept of a unitary exo-atmosphere ballistic missile targets • Verify JBMD System performance against a Group "B" MRBM target • ESG tested: SM-3 EO AN/SPY-1; (Demonstrate performance of the Japan BMD (JABMD) configuration and the SM-3 Block IA installed in the Japan Maritime Self Defense Force (JMSDF) Destroyer JDS KONGO • Participants include: Aegis BMD 3.6

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Major Event	Project	Timeframe	Description
FTT-09	0304	2Q FY 2008	<ul style="list-style-type: none"> • THAAD Primary: <ul style="list-style-type: none"> • Demo exo aim point selection & intercept of a spin stabilized non-reorienting separating target • THAAD Secondary: <ul style="list-style-type: none"> • Demo Long Range Radar Discrimination with radar SW update • ESG tested: THAAD EO AN/TPY-2 (TM) • Participants include: THAAD TFC/C Bld. 5; AN/TPY-2 (TM) Bld. 4.2
FTG-06	0304	3Q FY 2008	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Demo BMDS functionality of a GBI EO AN/TPY-2 (FB) Mod 1 ESG for a GBI launched from VAFB to perform all functions through acquisition, discrimination, transition to terminal, & intercepting a medium/high closing velocity lethal object • BMDS/GMD Secondary: <ul style="list-style-type: none"> • Demo ability of AN/TPY-2 (FB) to forward data via C2BMC to GMC • Assess capability against a Medium to High Vc/LO target • ESG tested: GBI LO/EO AN/TPY-2 (FB) Mod 1 (Herc 1, SBIRS); GBI EO SBX Mod 1 (SBIRS) • Participants include: GFC/C 6B; SBX 2.2; UEWR 6.3; AN/TPY-2 (FB) CR 2.3; C2BMC 6.4; SBIRS 08-1
FTM-14	0304	3Q FY 2008	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Demo Aegis BMD LOR using another Aegis BMD ship against Intermediate Range Ballistic Missile (IRBM) • BMDS/Aegis BMD Secondary: <ul style="list-style-type: none"> • Verify Near-Term Sea-Based Terminal with lethal engagement of a Group • ESG Tested: SM-3 LOR (AN/SPY-1) • Participants include: C2BMC 6.2; Aegis BMD 3.6; TFCC B5
FTS-01	0304	3Q FY 2008	<ul style="list-style-type: none"> • STSS Primary: <ul style="list-style-type: none"> • Demo detection & acquisition of a boosting missile with acquisition sensor • Demo handover of boosting missile track from Acquisition sensor to track sensor on same SV • BMDS/STSS Secondary: <ul style="list-style-type: none"> • Collect signature of targets for discrimination analysis • ESG tested: GBI LO/EO SBIRS Mod 1 (SBIRS) (Simulation) • Participants include: STSS (TBD); GMD GFC/C Bld. 6B; SBX Bld. 2.2; SBIRS 07-2, C2BMC X-Lab 6.2
FTS-02	0304	3Q FY 2008	<ul style="list-style-type: none"> • STSS Primary: <ul style="list-style-type: none"> • Demo capability to detect, acquire & track a boosting TBM with Acquisition sensor • Demo capability to handover boosting TBM track from Acq sensor to track sensor on same satellite • STSS Secondary: <ul style="list-style-type: none"> • Demonstrate simulated GBI LO/EO STSS with SBX engagement support • Evaluate measured signature of targets against truth models • ESG tested: Element Development Test • Participants include: STSS (TBD); C2BMC X-Lab 6.2

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets	
Major Event	Project	Timeframe	Description
FTK-01	0304	4Q FY 2008	<ul style="list-style-type: none"> KEI Primary: <ul style="list-style-type: none"> Demo Proof of Concept, high burn rate Stage 1 rocket motor with a Flex Seal TVC system Assess Objective System Representative Trajectory Traceability to action times, Staging dynamic pressures, and etc. KEI Secondary: <ul style="list-style-type: none"> Measure payload environments & obtain data on BF flight environment ESG Tested: N/A KEI (Demonstrate Proof of Concept, high burn rate Stage 1 rocket motor with a Flex Seal TVC system) Participants include: KEI
FTS-03	0304	4Q FY 2008	<ul style="list-style-type: none"> STSS Primary: <ul style="list-style-type: none"> Demo capability to detect, acquire & track a boosting TBM with Acquisition sensor Demo capability to handover boosting TBM track from Acquisition sensor to track sensor on same satellite STSS Secondary: <ul style="list-style-type: none"> Evaluate measured signature of targets against truth models ESG tested: Element Development Test Participants include: STSS (TBD); SIBRS 08-1; C2BMC (X-Lab) 6.2
FTT-10	0304	4Q FY 2008	<ul style="list-style-type: none"> BMDS Primary: <ul style="list-style-type: none"> Exercise BMDS functionality for THAAD EO AN/TPY-2 (TM) ESG BMDS/THAAD Secondary: <ul style="list-style-type: none"> Demo salvo launch & high endo intercept against a spin stabilized non-reorienting separating target with low aspect angle ESG tested: THAAD EO AN/TPY-2 (TM) Participants include: C2BMC 6.2; THAAD TFC/C Bld. 5; AN/TPY-2 (TM) Bld. 4.2; Aegis BMD 3.6; PATRIOT 6.5 HWIL
FTX-04	0304	4Q FY 2008	<ul style="list-style-type: none"> THAAD Primary: <ul style="list-style-type: none"> Radar data collection to support radar software development ESG tested: N/A (Radar data collection to support radar software development) Participants include: THAAD TFCC Bld. 5; AN/TPY-2 (TM) Bld. 4.2
FTG-07	0304	1Q FY 2009	<ul style="list-style-type: none"> BMDS Primary: <ul style="list-style-type: none"> Demonstrate BMDS functionality of a GBI LO/EO UEWB Mod 1/2 ESG for a GBI launched from VAFB to perform all functions through acquisition, discrimination, transition to terminal, & intercepting medium closing velocity lethal object BMDS/ GMD Secondary: <ul style="list-style-type: none"> Demo SBX ESS for GBI LO/EO UEWB ESG tested: GBI LO CD/UEWB Mod 1 (SBIRS); GBI EO CD/UEWB Mod 2 (SBIRS) ; GBI EO/LO SBX Mod 1 (SBIRS) Participants include: C2BMC 6.4; GMD GFC/C Bld. 6B; SBX Bld. 2.2; SBIRS 07-2; Beale UEWB Bld. 6.3

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APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603888C Ballistic Missile Defense Test and Targets	
Major Event	Project	Timeframe	Description
FTS-04	0304	1Q FY 2009	<ul style="list-style-type: none"> • STSS Primary: <ul style="list-style-type: none"> • Demo detection & acquisition of a boosting missile with acquisition sensor • Demo handover of boosting missile track from Acquisition sensor to track sensor on same SV • STSS Secondary: <ul style="list-style-type: none"> • Collect measure signature of targets for evaluation against truth & models • ESG tested: N/A (Demonstrate detection & acquisition of a boosting missile with acquisition sensor) • Participants include: STSS (TBD); SBIRS 08-1; C2BMC (X-Lab) 6.4
FTT-11	0304	1Q FY 2009	<ul style="list-style-type: none"> • THAAD Primary: <ul style="list-style-type: none"> • Demo mid endo intercept against a spin stabilized non-reorienting separating target with high aspect angle. • THAAD Secondary: <ul style="list-style-type: none"> • Demo functionality of TFC/C B5 Software in a Flight Test Environment • ESG tested: THAAD EO AN/TPY-2 (TM) • Participants include: THAAD TFCC Bld. 5; AN/TPY-2 (TM) Bld. 4.2; PATRIOT 6.5 (possible)
JFTM-02	0304	1Q FY 2009	<ul style="list-style-type: none"> • Aegis BMD Primary: <ul style="list-style-type: none"> • Lethal intercept of a unitary exo-atmosphere ballistic missile targets • Verify JBMD System performance against a Group "B" MRBM target • ESG tested: SM-3 EO AN/SPY-1; (Demonstrate performance of the Japan BMD (JABMD) configuration and the SM-3 Block IA installed in the Japan Maritime Self Defense Force (JMSDF) Destroyer • Participants include: Aegis BMD 3.6
FTT-12	0304	2Q FY 2009	<ul style="list-style-type: none"> • THAAD Primary: <ul style="list-style-type: none"> • Demo exo intercept against a lofted spin stabilized reoriented separating target with low IR signature & RCS • THAAD Secondary: <ul style="list-style-type: none"> • Characterize performance of a hot Stockpile to Target Sequence (STS) conditioned, hot launched interceptor • ESG tested: THAAD EO AN/TPY-2 (TM) • Participants include: TFCC Bld 5, AN/TPY-2 (TM) Bld 4.2
FTL-01	0304	4Q FY 2009	<ul style="list-style-type: none"> • ABL Primary: <ul style="list-style-type: none"> • Demo ABL capability to negate a threat-representative BM during boost phase • ABL Secondary: <ul style="list-style-type: none"> • Characterize ABL engagement capabilities from target detection through negation. • Assess ABL interfaces and interoperability with BMDS • ESG tested: ABL EO ABL Sensor (Blk 14+) • Participants include: ABL BMC4I Spiral 24; ABL BC/FC 3C4m; ABL HEL Modules Build 8; C2BMC 6.4

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Major Event	Project	Timeframe	Description
FTT-13	0304	4Q FY 2009	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Exercise BMDS functionality for THAAD EO AN/TPY-2 (TM) ESG • BMDS / THAAD Secondary: <ul style="list-style-type: none"> • Demo high endo intercept against a lofted spin stabilized target with high aspect angle. • ESG tested: THAAD EO AN/TPY-2 (TM) ; SM-3 EO AN/SPY-1 Mod 1 (AN/SPY-1 Mod, SBIRS, AN/TPY-2 (FB), AN/TPY-2 (TM)) Simulated • Participants include: C2BMC 6.4; THAAD TFC/C Bld 5; AN/TPY-2 (TM) Bld. 4.2; Aegis BMD 3.6; PATRIOT 6.5 HWIL
Ground Test			
System Ground Tests			
GTD-01	0304	1Q FY 2007	<ul style="list-style-type: none"> • COMPLETED • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to simultaneously execute multiple Block 04 ESGs using multiple raid sizes and Block 04 functionality & interoperability • D&A Element SA data is sent to C2BMC • Demo AN/TPY-2 (FB) functionality & interoperability with BMDS by assessing: <ul style="list-style-type: none"> • C2BMC sensor management & tasking to AN/TPY-2 (FB) • AN/TPY-2 (FB) track data is sent to C2BMC & forwarded to GMD • D&A BMDS Block 04 software upgrades do not affect LDC functionality
GTG 04-3	0304	2Q FY 2007	<ul style="list-style-type: none"> • GMD Primary: <ul style="list-style-type: none"> • Demo readiness of GMD Block 06 initial capability upgrades including SBX & Fylingdales, for field integration & BMDS ground tests • GMD Secondary: <ul style="list-style-type: none"> • Demo GMD capability to perform EO SBX and Flyingdales • Demo CE-2 architecture additions (Second IDT) with current ESGs • Demo GMD system performance, with component upgrades, is consistent with previously demonstrated Block 04 ESG behavior • Demo communication between GMD components, GMD readiness functionality, GMD activation (alert transition) functionality, GMD planning operations, and GMD engagement operations • Collect test data to support GMD characterization & M&S anchoring

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APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603888C Ballistic Missile Defense Test and Targets	
Major Event	Project	Timeframe	Description
GTG 04-4.a	0304	2Q FY 2007	<ul style="list-style-type: none"> • GMD Primary: <ul style="list-style-type: none"> • Verify the GMD system, dormant node with upgrades • Verify the dual node GMD system • Demo GMD system is consistent with previously demonstrated behavior for Block 04 ESGs, GMD capability to perform Block 06 ESGs, communications between GMD components, GMD readiness functionality • Demo GMD activation, GMD planning operations, GMD sensor operations and tasking, GMD engagement operations • Demo GFC to XBR, ET to XBR, GFC to UEWR FYL, & ET to UWR FYL interface connectivity • Demo GMD upgrades & enhancements for IP-5 have not affected safety • Collect EME data to support GCD requirements validation
GTX-02a	0304	2Q FY 2007	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to simultaneously execute multiple Block 06 ESGs using theater assets with Block 06 scenarios with priority on THAAD EO AN/TPY-2 (TM) • Assess BMDS initial Block 06 functionality & interoperability with: THAAD, PATRIOT, C2BMC, AEGIS BMD, SBIRS/Azusa • BMDS Secondary: <ul style="list-style-type: none"> • D&A THAAD - PATRIOT exchange track information (man/voice not P2P engagement coordination) • D&A capability for THAAD & C2BMC to exchange data • Assess assigned SEBOs (THAAD, PATRIOT, C2BMC) • Collect data to identify & support later investigation of any new system issues
GTI-02	0304	4Q FY 2007	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to simultaneously execute multiple Block 06 ESGs using theater & strategic assets with Block 06 scenarios • Assess BMDS initial Block 06 functionality & interoperability with • THAAD, AN/TPY-2 (FB), C2BMC, GMD (SBX, Fylingdales, Beale, Cobra Dane), Aegis BMD, SBIRS/MCS, PATRIOT) • Exercise functionality used in applicable Block 06 ESGs with priority on: <ul style="list-style-type: none"> • THAAD EO AN/TPY-2 (TM) • ESGs with AN/TPY-2 (FB) as Surveillance/Initial Track Sensor • BMDS Secondary: <ul style="list-style-type: none"> • D&A C2BMC's • Capability to control & manage BMDS communication networks • SA capability with BMDS • Initial Protection Capability (PROCAP) capability with BMDS • Capability to exchange data with THAAD

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets	
Major Event	Project	Timeframe	Description
GTD-02	0304	1Q FY 2008	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to simultaneously execute multiple Blk 06 ESGs using theater & strategic assets with Blk 06 scenarios and operational comm. • BMDS Secondary: <ul style="list-style-type: none"> • Exercise functionality used in app. Blk 06 ESGs, priority on THAAD EO AN/TPY-2 (TM) • Assess BMDS initial Blk 06 functionality & interoperability with THAAD, AN/TPY-2 (FB), C2BMC, GMD, (SBX, Fylingdales, Beale, Cobra Dane), Aegis BMD, SBIRS/MCS, PATRIOT • D&A capability for THAAD & C2BMC to exchange data, THAAD-PATRIOT peer-to-peer coord. THAAD Hit Assessment capability, Aegis BMD-THAAD-PATRIOT exchange of track info, Aegis BMD peer-to-peer coord. with THAAD & PATRIOT (voice only) • D&A C2BMCs Capability to control & manage BMDS comm networks, Sensor management capability with AN/TPY-2 (FB) & interfaces with BMDS-SBIRS; GMD-Aegis BMD; Aegis BMD-SBIRS
GTX-03a	0304	2Q FY 2008	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to execute multiple Block 06 ESGs while integrating AN/TPY-2 (FB)'s track data forwarding capability using Block 06 scenarios & Block 06 threats • BMDS Secondary: <ul style="list-style-type: none"> • Exercise interface functionality used in applicable ESGs with priority on AN/TPY-2 (FB) as launch or engagement support sensor • D&A BMDS Block 06 functionality & interoperability with: AN/TPY-2 (FB), C2BMC, GFC/C, DSP/SBIRS • D&A AN/TPY-2 (FB) enhanced discrimination (Hercules 1) results generated & sent to C2BMC • Collect data to identify & support later investigation of any new system issues • D&A C2BMC interfaces: (C2BMC to AN/TPY-2 (FB) and GFC/C receipt of AN/TPY-2 (FB) data via C2BMC)
GTX-03b	0304	2Q FY 2008	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to execute Block 06 ESGs using theater assets with Block 06 scenarios & Block 06 threats while integrating AN/TPY-2 (FB) track forwarding capability & Aegis BMD BSP upgrade • BMDS Secondary: <ul style="list-style-type: none"> • Exercise functionality used in applicable ESGs with priority on AN/TPY-2 (FB) as launch or engagement support sensor • D&A BMDS Block 06 functionality & interoperability with: AN/TPY-2 (FB), C2BMC, Aegis BMD, DSP/SBIRS • D&A capability of C2BMC to forward AN/TPY-2 (FB) object classification data to Aegis BMD and capability of Aegis BMD to receive & utilize AN/TPY-2 (FB) object classification data from C2BMC • D&A AN/TPY-2 (FB) enhanced discrimination (Hercules 1) results are generated and sent to C2BMC • D&A BC interfaces (C2BMC to AN/TPY-2 (FB) and Aegis BMD receipt of AN/TPY-2 (FB) data via C2BMC)

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Major Event	Project	Timeframe	Description
GTI-03	0304	3Q FY 2008	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to simultaneously execute multiple Block 06 ESGs using theater & strategic assets with Block 06 scenarios & Block 06 threats • BMDS Secondary: <ul style="list-style-type: none"> • Exercise functionality of applicable Block 06 ESGs with priority on PATRIOT, THAAD, & AN/TPY-2 (FB) as launch or engagements support sensor • D&A Aegis BMD capability to exercise SM-3 LO AN/TPY-2 (FB), AN/TPY-2 (FB) enhanced discrim results are generated & sent to C2BMC, THAAD & PATRIOT peer-to-peer engagement coordination, THAAD hit assessment to C2BMC, AN/TPY-2 (TM) coherent integration & improved discrimination, & PATRIOT upper tier debris mitigation • Collect data to identify & support later investigation of any new system issues
GTD-03	0304	4Q FY 2008	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to simultaneously execute multiple Block 06 ESGs using theater & strategic assets with Block 06 scenarios & Block 06 threats while using operational communications • BMDS Secondary: <ul style="list-style-type: none"> • Exercise functionality of applicable Block 06 ESGs with priority on PATRIOT, THAAD, & AN/TPY-2 (FB) as launch or engagements support sensor • D&A C2BMC's • D&A AN/TPY-2 (FB) enhanced discrim results are generated & sent to C2BMC, Aegis BMD capability to receive & utilize AN/TPY-2 (FB) object classification data from C2BMC, THAAD & PATRIOT peer-to-peer engagement coordination, THAAD hit assessment to C2BMC, AN/TPY-2 (TM) coherent integration & improved discrimination, and PATRIOT upper tier debris mitigation
GTX-04a	0304	2Q FY 2009	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to simultaneously execute multiple Block 06 ESGs while integrating new GFC software builds • BMDS Secondary: <ul style="list-style-type: none"> • D&A improved GMD shot quality capability & functionality • Demo ability of AN/TPY-2 (FB) to forward feature data via C2BMC to GFC • D&A common X-Band type interface (AN/TPY-2 (FB), SBX) • Collect data to identify & support later investigation of any new system issues
GTX-04b	0304	2Q FY 2009	<ul style="list-style-type: none"> • BMDS Primary: <ul style="list-style-type: none"> • Assess BMDS ability to simultaneously execute multiple Block 06 ESGs while integrating new Aegis BMD software builds • BMDS Secondary: <ul style="list-style-type: none"> • D&A initial Aegis BMD AN/SPY-1 BSP mod functionality & interoperability with BMDS • D&A common X-Band type interface (AN/TPY-2 (FB), SBX) • Collect data to identify & support later investigation of any new system issues

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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B. Program Change Summary	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007 PB)	608,663	591,911	587,064	620,222
Current President's Budget (FY 2008 PB)	605,718	594,190	586,150	620,104
Total Adjustments	-2,945	2,279	-914	-118
Congressional Specific Program Adjustments	0	4,800	0	0
Congressional Undistributed Adjustments	0	-2,521	0	0
Reprogrammings	8,223	0	0	0
SBIR/STTR Transfer	-11,168	0	0	0
Adjustments to Budget Years	0	0	-914	-118

FY06 decrease of \$2.954 million includes SBIR/STTR transfers and MDA reprogrammings.

FY07 increase of \$2.279 million includes congressional earmarks and a portion of the MDA undistributed reduction.

FY08 decrease of \$0.914 million and FY09 decrease of \$0.118 million reflect MDA programmatic changes.

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APPROPRIATION/BUDGET ACTIVITY				R-1 NOMENCLATURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				0603888C Ballistic Missile Defense Test and Targets				

COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0804 Test & Evaluation Block 2006	91,207	128,178	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Test & Evaluation Block Testing: The MDA T&E program has six primary purposes: 1) to collect system verification and assessment data that demonstrates BMDS effectiveness, 2) to verify Block design capability, 3) to identify areas where technology can increase overall system performance, 4) to identify system vulnerabilities, 5) to provide anchoring and validation data for modeling and simulation (M&S) tools, and 6) to support early capability readiness decisions.

MDA structures the BMDS T&E program around two-year Block increments with upgrades and fielding opportunities for new capabilities occurring throughout the Block. The Test and Evaluation (T&E) activities to be performed in each Block are determined by progress made toward developing BMDS capabilities in previous Blocks, with each Block offering more complex and more realistic scenarios for system-level tests. As a result of progress delays (e.g., reprogramming, new priorities) Block testing from a previous Block may be completed in the next successive Block. The BMDS developmental and operational test program encompasses all T&E activities associated with technology developments, demonstrations, experiments, research, deployment, and maintenance activities. The T&E program describes test methods and approaches that the CTF uses to test Element capabilities to meet the system-necessary capabilities delineated in the System Specification Documents (SSD) and Interface Design Documents (IDD). The MDA T&E program provides test data to support assessments used to document and determine BMDS effectiveness. The BMDS testing approach addresses the system wide test objective development process, Engagement Sequence Group (ESG) test environments, testing methodologies (i.e., M&S, ground testing, flight testing), and identifies the test resources (e.g., Test Bed, M&S tools, targets, ranges) required to provide test data that when combined with analysis of data from multiple sources, will contribute to verification of the BMDS capability.

Test & Evaluation Block Funding:

Funding levels identified support all BMD system Flight Tests (to include Critical Measurements and Countermeasure (CMCM) Tests, Lethality and Ground Tests). Funding provides manpower, range and logistics support to perform system flight and ground test planning, integration, execution, data collection, and analysis and range and auxiliary sensor support. Funding supports overlaying system-level objectives onto Element flight tests and Risk Reduction/Target of Opportunity flight tests.

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Test Operations:

Test Operations consists of the flight and ground test execution teams which perform detailed test planning, pre-test field integration and execution of all BMDS test program events, the staffing, management and execution of BMDS Task Forces, ensuring the fulfillment of all Executive Test Review requirements, and the interface with collocated OTA representatives. Under the BMDS Task Force construct Test Operations currently consists of five distinct Task Forces (TFs): TF A (GBI ESG Flight Testing), TF B (SM-3 & THAAD ESG Flight Testing), TF C (Special Flight Testing), TF D (BMDS Ground Testing) and TF E (Emerging Technologies). Test Operation products include detailed test planning and execution documentation, Operations Requirements (ORs), Test Directives, Executive Test Reviews, and Pre/Post-Test Notifications.

System Flight Tests:

- System FTs examine the capability of the BMDS to detect, track, and engage targets. More advanced tests are planned that will provide data to support verification of more complex Engagement Sequence Groups (ESGs). These projects will also provide analysis of each system test event through the Joint Analysis Team (JAT). BMDS flight test events also include:
- Target of Opportunity (TOO) are events (e.g., Minuteman flight tests, Air Force Space Command operations, or approved foreign launches) that afford the opportunity to exercise some portion of BMDS, to conduct on-board and off-board experiments, and to gather phenomenology data on representative objects and events. These events can be categorized as domestic, foreign cooperative, or non-cooperative tests. TOOs support developmental risk reduction for BMDS FTs through early identification of test integration issues. Specifically, TOOs provide a cost-effective means of exercising and collecting data on component interfaces in a real-time environment; communication links and connectivity, real-time Element loading, timing, cueing, tracking capabilities, algorithm development, and test checklists for the Integrated Test Team.
- Critical Measurements and Counter Measures (CMCM) Flight Tests (FTs) provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology (understanding the physics of what was observed during a test event and its effects on BMDS sensors), countermeasures and counter-countermeasures requirements, providing critical measurements to support development and validation of algorithms, M&S, discrimination, and new technology demonstrations. CMCM FTs augment various MDA and Elements test programs and ensure a coherent, complete, cost effective, and disciplined approach to collecting data/measurements to support characterization of the BMDS mission space (i.e., provide an understanding of how the BMDS visible, infrared and radar sensors perform when observing ballistic missile targets and countermeasures during flight). Requirements are allocated to specific tests. The budget associated with Critical Measurements and Counter Measures (CMCM) flight tests are captured in projects 0804, 0904, 0004 R104, and R204 which are managed as part of the CTF Flight Test program.
- The CTF Lethality Program seeks to characterize the effectiveness of BMDS engagements (i.e., determining the fate of threat targets post-engagement) and assure 10 USC 2366 requirements for BMDS lethality Live Fire Test and Evaluation (LFT&E) are achieved, and to investigate how successful a given BMDS engagement will be in destroying the incoming warhead. Laboratory, ground and flight tests are defined and

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<p>executed in response to the MDA System Engineer's requirement for data on the resultant space, atmosphere and ground effects of engaging high explosive and weapon of mass destruction (WMD) payloads. Flight test data requirements are achieved by leveraging planned BMDS intercept or Measurements Program test events with alternative targets, supplemental payloads and ancillary sensor coverage. The CTF integrates lethality testing across MDA and coordinates with related programs (e.g. PAC-3) to establish an efficient, requirements-driven approach to BMDS lethality characterization. Requirements are allocated to specific test events. The budget associated with Lethality is captured in projects 0804, 0904, 0004, R104, and R204 which are managed as part of the CTF Flight Test program.</p> <p>System Ground Tests: A vigorous System GT program brings together a variety of controllable and flexible testing venues to include high fidelity hardware in the loop tests and nondestructive tests performed in a controlled repeatable environment. BMDS ground testing consists of the following:</p> <ul style="list-style-type: none"> • BMDS Integrated Ground Tests (GTI) are test event integration exercises that use a test environment to determine the impact of specific threats on a wide variety of proposed engagement scenarios and to provide data for multiple ESGs and multiple threats across a range of environmental conditions. The data generated from a GTI is used to collect data to anchor M&S and to improve their ability to verify and assess end-to-end system level performance and to provide risk reduction for FT. Within the performance and threat space envelope, GTIs provide a wider range of data than can be obtained from flight testing for integration, characterization, verification, and assessment. • BMDS Distributed Ground Tests (GTD) are test events that typically follow a GTI where they combine the fielded hardware (HW) and software (SW) of most of the BMDS Elements to exercise the BMDS communications networks and communication links. During GTDs, actual Element sensors are stimulated where possible to obtain data to evaluate both the Element and system test objectives. Since GTDs can closely represent the actual BMDS, it is possible that following a GTD and corresponding quick look report some Engagement Sequence Groups (ESGs) will become candidates for early delivery to the warfighter. • BMDS Focused Ground Tests Other (GTX) are short duration integration exercises that focus on specific ESGs or functionality. A GTX can test a subset of the BMDS configuration, focusing on specific ESGs with only the required Elements participating in the test. Typically, one or more GTXs will precede a GTI as risk reductions test for the GTI. Additionally, a GTX can be used to test a new capability that was not available during the previous GTI. Since GTXs are intended to be smaller, less complex events, they will be more responsive to scheduling adjustments and unplanned test requirement needs. 		

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B. Accomplishments/Planned Program				
	FY 2006	FY 2007	FY 2008	FY 2009
Test Operations BMDS Flight Tests (Block 2006)	26,551	68,138	0	0
RDT&E Articles (Quantity)	0	0	0	0

Flight Testing (FT) examines the capability of the BMDS to detect, track, and engage targets. More advanced tests are planned that will provide data to support verification of more complex Engagement Sequence Groups (ESGs). These projects also provide analysis of each system test event through the Joint Analysis Team (JAT). BMDS flight tests also include Target of Opportunity (TOO) test events, Critical Measurements and Counter Measures (CMCM) Flight Tests, and the CTF Lethality Program.

Flight Testing (FT) is planned and executed to provide anchoring data for M&S tools, to collect test data to further characterize the BMDS, and to demonstrate BMDS operational capability in whole or in part. Even though FTs are conducted in realistic operational environments and are critical to achieving system verification requirements, they only examine a single scenario/vignette and parts of Engagement Sequence Groups (ESGs) and do have environmental and safety constraints.

FY06 Accomplishments:

- Planned and executed the following FY06 BMDS System Flight Tests: FTT-04-5, FT-04-1, FTG-02, FTM-10, GT-191, ATM-46, and FTT-04 (no test).
- Planned and executed critical measurements countermeasures test FTC-02a/b (CMCM 2).
- Conducted planning for FY07 major BMDS system tests to include but not limited too FTM-11, FTX-02, FTX-03, FTG-03/04, FTM-11a, FTM-12, ATM-48, FTT-07, GT-193, RDC-01c/d, and FTT-08.
- Support BMDS Elements in planning and execution of their FY07 program-specific Flight Tests.
- Coordinated integration of multiple elements and components.
- Refined scenario designs for BMDS Flight Tests to support ESGs identified in the BMDS IMTP.
- Provide system-level range support, mission assurance, logistics support, test specific support personnel, test specific communication, support equipment, and permission analysis and studies.

FY07 Planned Program:

- Conclude planning for and execute FY07 major BMDS system tests to include but not limited too FTM-11, FTX-02, FTX-03, FTG-03/04, FTM-11a, FTM-11b, FTM-12, ATM-48, FTT-07, GT-193, GT-195, RDC-01c/d, and FTT-08.
- Conducted planning for FY08 major BMDS system tests to include but not limited too FTM-13, FTG-05/06, FTM-14, FTS-01, and GT-198.

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- Began initial planning for critical measurements countermeasures test FTC-04.
- Support BMDS Elements in the planning of FY08 program-specific Flight Tests, and in execution of their FY07 program-specific Flight Tests.
- Continue coordination and integration of multiple elements and components.
- Refine scenario designs for BMDS Flight Tests to support ESGs identified in the BMDS IMTP.
- Continue to populate the BMDS Test Database with the most current test data to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs, and provide validation data for M&S.
- Provide system-level range support, mission assurance, logistics support, test specific support personnel, test specific communication, support equipment, and permission analysis and studies.

	FY 2006	FY 2007	FY 2008	FY 2009
Test Operations BMDS Ground Tests (Block 2006)	44,766	48,327	0	0
RDT&E Articles (Quantity)	0	0	0	0

Ground Testing (GT), using M&S that have been validated using anchoring data from flight tests, is the primary method for verifying and validating functional Block capability. Ground testing is used to collect data for BMDS characterization and assessment, component and element integration, and exploration of scenarios where flight testing is either impractical or impossible. GT allows examination of mature designs and identification and efficient correction of performance anomalies based on the capability to test all Engagement Sequence Groups (ESGs) using digital representations of realistic threat types, trajectories, geometries, and raid sizes that would be cost prohibitive to do in flight testing. A vigorous Ground Test (GT) program brings together a variety of controllable and flexible testing venues to include high fidelity hardware in the loop tests and nondestructive tests performed in a controlled repeatable environment. BMDS ground testing consists of BMDS Integrated Ground Tests (GTI), BMDS Distributed Ground Tests (GTD), and BMDS Ground Tests Other (GTX).

FY06 Accomplishments:

- Planned and executed the following FY 06 System Ground Tests: GTI-01, GTX-01a, GTX-01b, PATRIOT Limited User Test (LUT).
- Planned GTD-1, the first fully integrated BMDS Ground Test using operational assets (GMD, AN/TPY-2, 2 Aegis Ships, SBIRS and 3 C2BMC nodes).
- Developed and integrated C2BMC Representation (BITC) and the test support team for system ground testing into GTI-01.
- Supported Warfighter requirements during GTI-01 (including 94th AAMDC) with a Cheyenne Mountain Operations Center representation.
- Conducted interoperability portion (LUT) of PATRIOT acceptance and fielding of PDB 6.
- Planned and conducted two ground tests focusing on the integration of the AN/TPY-2 Hardware-in-the-Loop (HWIL) representation into the BMDS.

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<ul style="list-style-type: none"> • Conducted first fully integrated Ground Test (GTD-01) with all MDA Elements represented via HWIL • Planned and prepared for Terminal Fury and Vigilant Shield wargames. • Participated in Amalgam Phantom wargame. <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • Plan and coordinate element participation and execute the following System Ground Tests: GTD-01, GTX-02a, GTI-02, GTX-02b, and GTD-02. • Conduct ground tests focusing on the integration THAAD via HWIL representation into the BMDS. • Refine scenario designs for BMDS Ground Tests to support Engagement Sequence Groups identified in the BMDS Integrated Master Test Plan. • Continue to populated the BMDS Test Database with most current test data to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs, and provide validation data for M&S. • Execute and perform post-test analysis of GTD-01. • Test planning for second BMDS Ground Test (GTD-02) using operational assets. • Develop and integrate permanent Cheyenne Mountain Operations Center representation for use by warfighter during BMDS Ground Tests. • Develop test plan for third ground test campaign. 				
	FY 2006	FY 2007	FY 2008	FY 2009
Test Analysis and Reporting (Block 2006)	17,639	6,653	0	0
RDT&E Articles (Quantity)	0	0	0	0
<p>The CTF Test Analysis and Reporting (TA&R) division develops, integrates, and delivers all Ballistic Missile Defense System (BMDS) post test analysis and reporting products for Integrated Master Test Plan (IMTP) specified system flight and ground tests, and other targets of opportunity. Maintain and execute all critical path TA&R functions, tools, processes, and infrastructures supporting development and delivery of TA&R products within a single, integrated, standardized reporting process.</p> <p>Functional Products and Processes:</p> <ul style="list-style-type: none"> • Joint Analysis Teams (JATs) - Establish, plan, schedule, and conduct JATs for system tests to coordinate and integrate all component and system post test analysis and reporting activities. Develop and brief all post test analysis and reporting products Mission Logistics Plan, Flash Report, Quick Look Report, Quick Look Briefing (QLB), Executive Quick Look Briefing (EQLB), Mission Data Review (MDR), Executive Mission Data Review (EMDR), and Report to Congress. 				

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<ul style="list-style-type: none"> • Data Management - Develop and publish Integrated Data Management Plans (IDMP), coordinating and documenting all component and system data products and requests. Develop Data Handling Plans (DHP) and provide event specific data distribution reports, synchronized with Missile Defense Data Center (MDDC), to ensure timely and complete data distribution in accordance with (IAW) IDMP. Provide inputs to the National Test Ranges Universal Documentation System (UDS) to ensure availability of critical data supporting test analysis and reporting conduct. • Data Collection - Construct, install and maintain Joint Analysis Data Engine (JADE) systems, and associated accreditation documentation, at BMDS Communications Network (COMNET) nodes to provide independent, time-stamped, raw message traffic required for truth and system analysis. Maintain JADE test support plans and ensure readiness for test analysis and reporting operations. Register and deliver all JADE data products IAW IDMP. • Data Processing - Process all raw data files and test configurations to integrated test analysis and reporting databases to support post test truth and system analysis and reporting activities. Deliver databases [Integrated System Configuration Database (ISCD), Truth Data Package (TDP), and Integrated Analysis Data Package (IADP)] to Operational Test Agency (OTA), BMDS Capability Assessment (BCA), C2BMC, and Element Primes IAW IDMP. • Truth - Develop Truth Data Requirements Document (TDRD) to ensure that auxiliary sensor data collection to support truth data analysis and Truth Data Package (TDP) creation are captured in the IDMP, Operational Requirements (OR), and MDA/DTR documentation. The TDRD defines and documents mission specific auxiliary sensor data collection requirements and provide truth requirements for MDA/DTR mission architecture development. Develop pre-mission prediction packages (metric, optical, and radar) and deliver to truth sensors in support of their pre-mission test support planning. Develop and deliver post-mission TDP to data requestors as captured in the IDMP as an integrated truth source to anchor post-mission analysis activities. Plan, schedule, and execute post mission truth summits to coordinate auxiliary sensor inputs to post-mission executive briefs and data reviews. Conduct post-mission truth sensor data quality assessments to determine the quality and quantity of data sources with respect to truth analysis requirements, and capture lessons learned for future truth data collection and analysis activities. • Analysis - Develop analysis data requirements documents to ensure IDMP contains all products required to support post test analysis of system test objectives [e.g., Systems Engineering Behavioral Objectives (SEBO), Engagement Sequence Groups (ESG), Characterization Points, and Military Standards (MIL-STD) Compliance]. Develop Analysis Execution Plans (AEP) to document post test analysis process, timelines, and areas of responsibility. Develop test event logs to capture test sequences, analysis observations, and Tactics, Techniques, and Procedure (TTP) execution for use in post test analysis process. Develop and deliver all post test analysis reports (Final Test Report, BMDS System Characterization Brief/Report). Develop and deliver analysis content in support of the QLB, EQLB, MDR, and EMDR. Develop and submit system level Test Incident Reports (TIR) found during test analysis and reporting process. 		

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Distributed Analysis Tools and Infrastructures

Develop, integrate, test, train, deploy, and operate spiral releases of software tools to automate and enhance the test analysis and reporting process of the evolving BMDS test program and associated data products. Tools include: DMS for data management, JADE for data collection, CONDOR for test analysis observations, RAPTOR for truth analysis, RAVEN for system analysis, and PHOENIX for common tool framework.

Develop, coordinate (with MDA/DO), implement, and maintain requirements and capabilities for distributed and virtual data architectures, to include the Joint Data Analysis Center (JDAC), supporting timely data distribution, processing, and analysis across a distributed test analysis and reporting community. Develop and maintain System Security Authorization Agreements (SSAA) for all test analysis and reporting tools and nodes to ensure risk mitigation IAW latest BMDS information assurance (IA) guidance from MDA/DO and continued authority to operate (ATO) in support on ongoing test analysis and reporting operations. Maintain hardware and software configuration management of all test analysis and reporting tools and systems.

FY06 Accomplishments:

- Provided TA&R product development and delivery for: FT-04-1, FT-04 -1A/B (CMCM), SERV-3, FTG-2 (FT-2), THAAD FTT-4 (FT-4), FTG-3 (FT-3), FTM-10GT-191, GTI-01 and GTD-01.

FY07 Planned Program:

- Provide TA&R product development and delivery to include but not limited to the following major tests: FTG-03, FTG-04 (FT-4), FTX-02, FTG-05, FTM-11, FTM-11a (Stellar Demon), FTT-07, PAC-2 (ATM-48), FTT-06, FTM-12 & Tracker, GT-195, FTX-03, GTD-01, GTG 04-4a, GTX-02a, GTI-02, GTG 04-46, GTD-02, VS07, GTG 04-3, GT-193.
- Plan, schedule, and execute all system JATs, and facilitate integration of BMDS analysis activities within joint venues.
- Standardization of TA&R tools and processes.
- Develop requirements for and coordinate development of facilities and infrastructures which enable virtual TA&R.

	FY 2006	FY 2007	FY 2008	FY 2009
Test Planning and Design (Block 2006)	2,251	5,060	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: Funding for Test Planning and Design for FY06 was contained in budget projects 0304 and 0804. For FY07, funding was consolidated in budget projects 0804 and 0904.

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Test Planning and Design includes campaign-level planning and design functions for the BMDS Test Program to include the collection and adjudication of test objectives from MDA System Engineering, the OTAs and the Warfighters, validation of test venues and test scenarios, definition of test resource requirements, the establishment of a baseline test campaign timeline, and the interface with collocated OTA and Advanced Systems representatives. These efforts culminate in the development and publication the Integrated Master Test Plan (IMTP). The IMTP is the overarching document that describes the BMDS test environment, supporting test organizations, developmental and operational test programs, and management of MDA test resources.

FY06 Accomplishments:

- Published Block 06 IMTP update
- Established the Test Requirements Working Group (TRWG)
- Performed test planning and design for FTT-07, FTX-02, FTM-11a, and PAC-2 GEM ATM-48 BMDS Overlay
- Initiated implementation of common threat in GT-02 Campaign

FY07 Planned Program:

- Perform preliminary planning for Block 08 Tests and documented in the IMTP
- Establish Ground Test Design Capabilities
- Develop a Ground Test Template for future Campaign Planning

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402

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	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

D. Acquisition Strategy

The Responsible Test Organization (RTO) acquisition strategy is consistent with the Missile Defense Agency's (MDA) capabilities based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge based funding thought the use of two year blocks. The RTO directs a team of various internal staff (Government and System Engineering and Technical Assistance (SETA)), executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, Federally Funded Research and Development Centers (FFRDC), and other MDA programs to execute the various diverse efforts within the BMDS test program. When a specific effort/activity being conducted, acquired, or maintained, requires the use of an executing agent the acquisition strategy that conform to their respective headquarters regulations are utilized. This combination of organizations forms an integrated team to accomplish the necessary testing for BMDS.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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I. Product Development Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Product Development										

Remarks

II. Support Costs Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Test Operations BMDS Flight Tests (Block 2006)										
BMDS FT	Various	USASMDC, WSMR, MITLL, JNIC & VAFB/ AL, NM, MA, HI & CA	56,505	41,641	1Q	0	N/A	0	N/A	98,146
BMDS Risk/ECPS	Various	Various	2,218	1,606	1Q	0	N/A	0	N/A	3,824
Targets			0	24,891	1Q	0	N/A	0	N/A	24,891

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	FY 2008 Cost	FY 2008 Award/Oblg Date	FY 2009 Cost	FY 2009 Award/Oblg Date	Total Cost
Test Operations BMDS Ground Tests (Block 2006)										
BMDS GT/MDIE	Various	JNIC/Colorado Springs, CO	91,136	40,542	1Q	0	N/A	0	N/A	131,678
Exercise Overlays	Various	JNIC/Colorado Springs, CO	9,744	7,785	1Q	0	N/A	0	N/A	17,529
Test Analysis and Reporting (Block 2006)										
FTC-02/FTX-05	Various	USASMDC / Huntsville, AL	11,414	4,305	1Q	0	N/A	0	N/A	15,719
Test Analysis and Reporting		CTF TA&R, Huntsville, AL	17,639	2,348	1Q	0	N/A	0	N/A	19,987
Test Planning and Design (Block 2006)										
Test Planning and Design	Various	Boeing/ Huntsville, AL	2,251	5,060	1Q	0	N/A	0	N/A	7,311
Subtotal Test and Evaluation			190,907	128,178		0		0		319,085
Remarks										
IV. Management Services Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	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			190,907	128,178		0		0		319,085
Remarks										

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Fiscal Year	2006				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	1	2	3	4
System Ground Tests																																
PACOM Tier 1 CPX					▽																											
Vigilant Shield 07					▽																											
GTG 04-3						◇																										
GTG 04-4.a						◇																										
GTX-02a						▽																										
BMDS Overlay 07 - Juniper Cobra 07											△																					
GTG 04-4.b											◇																					
GTI-02											▽																					
System Flight Tests																																
(PAC) 2-3	◇																															
AST-10	◇																															
ATM-46	▽																															
FT 04-5	▽																															

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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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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Fiscal Year	2006				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	1	2	3	4				
System Flight Tests																																				
PAC PDB-6 LUT				◆																																
RDC-01a/b				▼																																
FTM-11					▼																															
P6L-1					◆																															
P6L-2					◆																															
P6L-3					◆																															
AST-11									◇																											
AST-12									◇																											
FTT-05									◇																											
FTT-06									◇																											
FTX-02									▽																											
RDC-01c									◇																											
ATM-48																																				

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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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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Fiscal Year	2006				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	1	2	3	4
System Flight Tests																																
FTG-03							▽																									
FTM 11b							▽																									
FTM-12							▽																									
FTT-07							▽																									
PAC3 7-1							◇																									
RDC-01d							◇																									
FTG-04								▽																								
FTM-11a								◇																								
FTT-08								◇																								
FTX-03								▽																								
N FIRE-2A								◇																								
Measurement Tests																																

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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Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
System Ground Tests								
GT 04-1a	1Q							
GT 04-2a.1	1Q							
WG 04-5	1Q							
GTX-01a	2Q							
Amalgam Phantom 06	3Q							
GT 04-2a.2	3Q							
GT 04-2a.3	3Q							
GTX 06-2	3Q							
GTX-01b	3Q							
GT 04-2a.4	4Q							
GTI-01	4Q							
BMDS Overlay 07 - Terminal Fury 07		1Q						
BMDS Overlay 07 - Vigilant Shield 07		1Q						
GTD-01		1Q						
PACOM Tier 1 CPX		1Q						
Vigilant Shield 07		1Q						
GTG 04-3		2Q						
GTG 04-4.a		2Q						
GTX-02a		2Q						
BMDS Overlay 07 - Juniper Cobra 07		4Q						
GTG 04-4.b		4Q						
GTI-02		4Q						
System Flight Tests								
(PAC) 2-3	1Q							
AST-10	1Q							
ATM-46	1Q							
FT 04-5	1Q							
FT-1	1Q							
FTM 04-2	1Q							
FTT-01	1Q							

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Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
FTX-01	2Q							
JCTV-1	2Q							
FTM-10	3Q							
FTT-02	3Q							
P6-2	3Q							
Pacific Phoenix	3Q							
FTG-02	4Q							
FTT-03	4Q							
FTT-04	4Q							
P6-4	4Q							
PAC PDB-6 LUT	4Q							
RDC-01a/b	4Q							
FTM-11		1Q						
P6L-1		1Q						
P6L-2		1Q						
P6L-3		1Q						
AST-11		2Q						
AST-12		2Q						
FTT-05		2Q						
FTT-06		2Q						
FTX-02		2Q						
RDC-01c		2Q						
ATM-48		3Q						
FTG-03		3Q						
FTM 11b		3Q						
FTM-12		3Q						
FTT-07		3Q						
PAC3 7-1		3Q						
RDC-01d		3Q						
FT 06-4 (CMCM-4)		4Q						
FTG-04		4Q						

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APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE							
RDTE&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603888C Ballistic Missile Defense Test and Targets							
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
FTM-11a		4Q						
FTT-08		4Q						
FTX-03		4Q						
N FIRE-2A		4Q						
Measurement Tests								
FTC-02a/b	3Q							
FT 06-4 (CMCM-4)		4Q						
Glory Trips (USAF Operational)/Potential BMDS Tests								
GT-189	1Q							
SERV-3	2Q							
GT-190	3Q							
GT-191	3Q							
GT-192	4Q							
GT-193		2Q						
GT-194		3Q						
GT-195		4Q						

Element participation in system test events is funded within the respective element budget.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0904 Test & Evaluation Block 2008	0	44,987	113,646	120,085	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note: FY09 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce one test article for critical measurements and countermeasures test FTC 04 (to be expended in FY10).

A. Mission Description and Budget Item Justification

Test & Evaluation Block Testing: The MDA T&E program has six primary purposes: 1) to collect system verification and assessment data the demonstrates BMDS effectiveness, 2) to verify Block design capability, 3) to identify areas where technology can increase overall system performance, 4) to identify system vulnerabilities, 5) to provide anchoring and validation data for M&S tools, and 6) to support early capability readiness decisions.

MDA structures the BMDS T&E program around two-year Block increments, with upgrades and fielding opportunities for new capabilities occurring throughout the Block. The Test and Evaluation (T&E) activities to be performed in each Block are determined by progress made toward developing BMDS capabilities in previous Blocks, with each Block offering more complex and more realistic scenarios for system-level tests. As a result of progress delays (e.g., reprogramming, new priorities) Block testing from a previous Block may be completed in the next successive Block. The BMDS developmental and operational test program encompasses all T&E activities associated with technology developments, demonstrations, experiments, research, deployment, and maintenance activities. The T&E program describes test methods and approaches that the CTF uses to test Element capabilities to meet the system-necessary capabilities delineated in the System Specification Documents (SSD) and Interface Design Documents (IDD). The MDA T&E program provides test data to support assessments used to document and determine BMDS effectiveness. The BMDS testing approach addresses the system wide test objective development process, Engagement Sequence Group (ESG) test environments, testing methodologies (i.e., M&S, ground testing, flight testing), and identifies the test resources (e.g., Test Bed, M&S tools, targets, ranges) required to provide test data that when combined with analysis of data from multiple sources, will contribute to verification of the BMDS capability.

Test & Evaluation Blocks Funding:

Funding levels identified support all BMD system Flight Tests (to include Critical Measurements and Countermeasure (CMCM) Tests, Lethality and Ground Tests. Funding provides manpower, range and logistics support (i.e., Aegis fuel) to perform system flight and ground test planning, integration, execution, data collection, and analysis and range and auxiliary sensor support. Funding supports overlaying system-level objectives onto Element flight tests and Risk Reduction/Target of Opportunity flight tests.

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Test Operations:

Test Operations consists of the flight and ground test execution teams which perform detailed test planning, pre-test field integration and execution of all BMDS test program events, the staffing, management and execution of BMDS Task Forces, ensuring the fulfillment of all Executive Test Review requirements, and the interface with collocated OTA representatives. Under the BMDS Task Force construct Test Operations currently consists of five distinct Task Forces (TFs): TF A (GBI ESG Flight Testing), TF B (SM-3 & THAAD ESG Flight Testing), TF C (Special Flight Testing), TF D (BMDS Ground Testing) and TF E (Emerging Technologies). Test Operation products include detailed test planning and execution documentation, Operations Requirements (ORs), Test Directives, Executive Test Reviews, and Pre/Post-Test Notifications.

System Flight Tests:

System FTs examine the capability of the BMDS to detect, track, and engage targets. More advanced tests are planned that will provide data to support verification of more complex Engagement Sequence Groups (ESGs). These projects will also provide analysis of each system test event through the Joint Analysis Team (JAT). BMDS flight tests also include:

- Targets of Opportunity (TOO) are events (e.g., Minuteman flight tests, Air Force Space Command operations, or approved foreign launches) that afford the opportunity to exercise some portion of BMDS, to conduct on-board and off-board experiments, and to gather phenomenology data on representative objects and events. These events can be categorized as domestic, foreign cooperative, or non-cooperative tests. TOOs support developmental risk reduction for BMDS FTs through early identification of test integration issues. Specifically, TOOs provide a cost-effective means of exercising and collecting data on component interfaces in a real-time environment; communication links and connectivity; real-time Element loading; timing; cueing; tracking capabilities; algorithm development; and test checklists for the Integrated Test Team.
- Critical Measurements and Counter Measures (CMCM) Flight Tests (FTs) provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology (understanding the physics of what was observed during a test event and its effects on BMDS sensors), countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, M&S, discrimination, and new technology demonstrations. CMCM FTs augment various MDA and Elements test programs and ensure a coherent, complete, cost effective, and disciplined approach to collecting data/measurements to support characterization of the BMDS mission space (i.e., provide an understanding of how the BMDS visible, infrared and radar sensors perform when observing ballistic missile targets and countermeasures during flight). Requirements are allocated to specific tests. The budget associated with Critical Measurements and Counter Measures (CMCM) flight tests are captured in projects 0804, 0904, 0004, R104 and R204 which are managed as part of the CTF Flight Test program.
- The CTF Lethality Program seeks to characterize the effectiveness of BMDS engagements (i.e., determining the fate of threat targets post-engagement) and assure 10 USC 2366 requirements for BMDS lethality Live Fire Test and Evaluation (LFT&E) are achieved, and to investigate how successful a given BMDS engagement will be in destroying the incoming warhead. Laboratory, ground and flight tests are defined and

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<p>executed in response to the MDA System Engineer's requirement for data on the resultant space, atmosphere and ground effects of engaging high explosive and weapon of mass destruction (WMD) payloads. Flight test data requirements are achieved by leveraging planned BMDS intercept or Measurements Program test events with alternative targets, supplemental payloads and ancillary sensor coverage. The CTF integrates lethality testing across MDA and coordinates with related programs (e.g. PAC-3) to establish an efficient, requirements-driven approach to BMDS lethality characterization. Requirements are allocated to specific tests. Funding associated with Lethality is captured in projects 0804, 0904, 0004, R104 and 0204 which are managed as part of the CTF Flight Test events.</p> <p>System Ground Tests: A vigorous System GT program brings together a variety of controllable and flexible testing venues to include high fidelity hardware in the loop tests and nondestructive tests performed in a controlled repeatable environment. BMDS ground testing consists of the following:</p> <ul style="list-style-type: none">• BMDS Integrated Ground Tests (GTI) are test event integration exercises that use a test environment to determine the impact of specific threats on a wide variety of proposed engagement scenarios and to provide data for multiple ESGS and multiple threats across a range of environmental conditions. The data generated from a GTI is used to collect data to anchor M&S and to improve their ability to verify and assess end-to-end system level performance and to provide risk reduction for FT. Within the performance and threat space envelope, GTIs provide a wider range of data than can be obtained from flight testing for integration, characterization, verification, and assessment.• BMDS Distributed Ground Tests (GTD) are test events that typically follow a GTI where they combine the fielded HW and SW of most of the BMDS Elements to exercise the BMDS communications networks and communication links. During GTDs, actual Element sensors are stimulated where possible to obtain data to evaluate both the Element and system test objectives. Since GTDs can closely represent the actual BMDS, it is possible that following a GTD and corresponding quick look report some Engagement Sequence Groups (ESGs) will become candidates for early delivery to the warfighter.• BMDS Focused Ground Tests Other (GTX) are short duration integration exercises that focus on specific ESGs or functionality. A GTX can test a subset of the BMDS configuration, focusing on specific ESGs with only the required Elements participating in the test. Typically, one or more GTXs will precede a GTI as risk reductions test for the GTI. Additionally, a GTX can be used to test a new capability that was not available during the previous GTI. Since GTXs are intended to be smaller, less complex events, they will be more responsive to scheduling adjustments and unplanned test requirement needs.		

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<u>B. Accomplishments/Planned Program</u>				
	FY 2006	FY 2007	FY 2008	FY 2009
Test Operations BMDS Ground Tests (Block 2008)	0	4,300	45,994	48,432
RDT&E Articles (Quantity)	0	0	0	0

Ground Testing (GT), using M&S that have been validated using anchoring data from flight tests, is the primary method for verifying and validating functional Block capability. Ground testing is used to collect data for BMDS characterization and assessment, component and element integration, and exploration of scenarios where flight testing is either impractical or impossible. GT allows examination of mature designs and identification and efficient correction of performance anomalies based on the capability to test all Engagement Sequence Groups (ESGs) using digital representations of realistic threat types, trajectories, geometries, and raid sizes that would be cost prohibitive to do in flight testing. A vigorous Ground Test (GT) program brings together a variety of controllable and flexible testing venues to include high fidelity hardware in the loop tests and nondestructive tests performed in a controlled repeatable environment. BMDS ground testing consists of BMDS Integrated Ground Tests (GTI), BMDS Distributed Ground Tests (GTD), and BMDS Ground Tests Other (GTX).

FY07 Planned Program:

- Plan and coordinate element participation in the following System Ground Tests: GT4 series (GTX, GTI, GTD).
- Support Elements in planning for FY 08 System Ground Tests.
- Initiate coordination of KEI integration and other elements into the BMDS ground test architecture.
- Refine scenario designs for BMDS Ground Tests to support ESGs identified in the BMDS IMTP.
- Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOMS, and OTAs, and provide validation data for M&S.

FY08 Planned Program:

- Plan and coordinate element participation and execute the following FY 08 System Ground Tests: GT4 Series (GTX, GTI, GTD). Execute GTX-04a.
- Support Elements in planning for FY 08 System Ground Tests.
- Continue Development of Block 08 scenario designs for BMDS Ground Tests to support Block 08 ESGs identified in the Block 08 TBDD.
- Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs; plus provide validation data for M&S.
- Plan for systems test; including system execution and reporting.
- Plan FY 09 System Ground Tests.

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<p>FY09 Planned Program:</p> <ul style="list-style-type: none"> Plan and coordinate element participation and execute the following FY 09 System Ground Tests: GTX-04a, GTX-04b, GTI-04, GTX-04c, GTD-04. Support Elements in planning for FY 09 System Ground Tests. Continue Development of Block 08 scenario designs for BMDS Ground Tests to support Block 08 ESGs identified in the Block 08 TBDD. Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs; and provide validation data for M&S. Plan for FY10 System Ground Tests. 				
	FY 2006	FY 2007	FY 2008	FY 2009
Test Operations BMDS Flight Tests (Block 2008)	0	36,287	38,139	41,234
RDT&E Articles (Quantity)	0	0	0	0
<p>Flight Testing (FT) examines the capability of the BMDS to detect, track, and engage targets. More advanced tests are planned that will provide data to support verification of more complex Engagement Sequence Groups (ESGs). These projects also provide analysis of each system test event through the Joint Analysis Team (JAT). BMDS flight tests also include Target of Opportunity (TOO), Critical Measurements and Counter Measures (CMCM) Flight Tests, and the CTF Lethality Program.</p> <p>Flight Testing (FT) is planned and executed to provide anchoring data for M&S tools, to collect test data to further characterize the BMDS, and to demonstrate BMDS operational capability in whole or in part. Even though FTs are conducted in realistic operational environments and are critical to achieving system verification requirements, they only examine a single scenario/vignette and parts of Engagement Sequence Groups (ESGs) and do have environmental and safety constraints.</p>				
<p>FY07 Planned Program:</p> <ul style="list-style-type: none"> Conclude planning for and execute FY07 major BMDS system tests to include but not limited too FTM-11, FTX-02, FTX-03, FTG-03/04, ATM-48, FTT-07, and GT-193. Conducted planning for FY08 major BMDS system tests to include but not limited too FTM-13, JFTM-01, FTT-10, FTG-05, FTG-06, FTM-14, FTS-01, and GT-198. Conduct planning for critical measurements countermeasures test FTC-04. Support BMDS Elements in the planning of FY08 program-specific Flight Tests, and in execution of their FY07 program-specific Flight Tests. Plan for system level test execution and reporting for FY08. 				

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<ul style="list-style-type: none"> • Continue coordination and integration activities of multiple elements and components. • Refine scenario designs for BMDS Flight Tests to support ESGs identified in the BMDS IMTP. • Continue to populate the BMDS Test Database with the most current test data to support capability assessments by Systems Engineering JTAMDO/STRATCOM, and OTAs, and provide validation data for M&S. • Provide system-level range support mission assurance, logistic support, test specific support personnel, test specific communication, support equipment and permission analysis and studies. <p>FY08 Planned Program:</p> <ul style="list-style-type: none"> • Conclude planning for and execute FY08 major BMDS system tests to include but not limited too: FTM-13, JFTM-01, FTG-05, FTG-06, FTG-05, FTM-14, FTS-01, FTT-10, and GT-198. • Conducted planning for FY09 major BMDS system tests to include but not limited too: FTM-15/16, FTG-07/08, FTX-05/06, FTL-01, and FTT-12/13. • Planning for critical measurements countermeasures test FTC-04. • Support BMDS Elements in the planning of FY09 program-specific Flight Tests, and in execution of their FY08 program-specific Flight Tests and system flight tests. • Support BMDS Elements in planning and execution of their FY08 program-specific Flight Tests to support Block 10 development and objectives. • Support and coordinate Block 08 target development including target system requirements, integration, and component testing requirements. • Continue Development of Block 08 scenario designs for BMDS Flight Tests to support Block 08 ESGs identified in the Block 08 TBDD. • Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs, and provide validation data for M&S. • Plan for system level test execution and reporting for FY09. • Plan for an FY09 GBI Readiness Test. • Provide system-level range support mission assurance, logistic support, test specific support personnel, test specific communication, support equipment and permission analysis and studies. <p>FY09 Planned Program:</p> <ul style="list-style-type: none"> • Conclude planning for and execute FY09 major BMDS system tests to include but not limited too: FTM-15/16, FTG-07/08, FTX-05/06, FTL-01, and FTT-12/13. 		

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- Conducted planning for FY10 major BMDS system tests to include but not limited too: FTG-09/10, FTM-17/18, FTL-02/03, FTS-05, FTT-14/15, and FTX-07.
- Conclude planning for critical measurements countermeasures test FTC-04.
- Begin initial planning for critical measurements countermeasures test FTC-05.
- Support BMDS Elements in the planning of FY10 program-specific Flight Tests, and in execution of their FY09 program-specific Flight Tests.
- Support Elements in planning for FY09 System Flight Tests.
- Support and coordinate Block 08 target development including target systems requirements, integration, and component testing requirements.
- Continue Development of Block 08 scenario designs for BMDS Flight Tests to support Block 08 ESGs identified in the Block 08 TBDD.
- Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs; and provide validation data for M&S.
- Plan for system level test execution and reporting for FY10.
- Execute a GBI Readiness Test.
- Provide system-level range support mission assurance, logistic support, test specific support personnel, test specific communication, support equipment and permission analysis and studies.

	FY 2006	FY 2007	FY 2008	FY 2009
Test Analysis and Reporting (Block 2008)	0	2,347	18,390	19,768
RDT&E Articles (Quantity)	0	0	0	0

The CTF Test Analysis and Reporting (TA&R) division develops, integrates, and delivers all Ballistic Missile Defense System (BMDS) post test analysis and reporting products for Integrated Master Test Plan (IMTP) specified system flight and ground tests, and other targets of opportunity. Maintain and execute all critical path TA&R functions, tools, processes, and infrastructures supporting development and delivery of TA&R products within a single, integrated, standardized reporting process.

Functional Products and Processes:

- Joint Analysis Teams (JATs) - Establish, plan, schedule, and conduct JATs for system tests to coordinate and integrate all component and system post test analysis and reporting activities. Develop and brief all post test analysis and reporting products Mission Logistics Plan, Flash Report, Quick Look Report, Quick Look Briefing (QLB), Executive Quick Look Briefing (EQLB), Mission Data Review (MDR), Executive Mission Data Review (EMDR), and Report to Congress.

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<ul style="list-style-type: none">• Data Management - Develop and publish Integrated Data Management Plans (IDMP), coordinating and documenting all component and system data products and requests. Develop Data Handling Plans (DHP) and provide event specific data distribution reports, synchronized with Missile Defense Data Center (MDDC), to ensure timely and complete data distribution in accordance with (IAW) IDMP. Provide inputs to the National Test Ranges Universal Documentation System (UDS) to ensure availability of critical data supporting test analysis and reporting conduct.• Data Collection - Construct, install and maintain Joint Analysis Data Engine (JADE) systems, and associated accreditation documentation, at BMDS Communications Network (COMNET) nodes to provide independent, time-stamped, raw message traffic required for truth and system analysis. Maintain JADE test support plans and ensure readiness for test analysis and reporting operations. Register and deliver all JADE data products IAW IDMP.• Data Processing - Process all raw data files and test configurations to integrated test analysis and reporting databases to support post test truth and system analysis and reporting activities. Deliver databases [Integrated System Configuration Database (ISCD), Truth Data Package (TDP), and Integrated Analysis Data Package (IADP)] to Operational Test Agency (OTA), BMDS Capability Assessment (BCA), C2BMC, and Element Primes IAW IDMP.• Truth - Develop Truth Data Requirements Document (TDRD) to ensure that auxiliary sensor data collection to support truth data analysis and Truth Data Package (TDP) creation are captured in the IDMP, Operational Requirements (OR), and MDA/DTR documentation. The TDRD defines and documents mission specific auxiliary sensor data collection requirements and provide truth requirements for MDA/DTR mission architecture development. Develop pre-mission prediction packages (metric, optical, and radar) and deliver to truth sensors in support of their pre-mission test support planning. Develop and deliver post-mission TDP to data requestors as captured in the IDMP as an integrated truth source to anchor post-mission analysis activities. Plan, schedule, and execute post mission truth summits to coordinate auxiliary sensor inputs to post-mission executive briefs and data reviews. Conduct post-mission truth sensor data quality assessments to determine the quality and quantity of data sources with respect to truth analysis requirements, and capture lessons learned for future truth data collection and analysis activities.• Analysis - Develop analysis data requirements documents to ensure IDMP contains all products required to support post test analysis of system test objectives [e.g., Systems Engineering Based Objectives (SEBO), Engagement Sequence Groups (ESG), Characterization Points, and Military Standards (MIL-STD) Compliance]. Develop Analysis Execution Plans (AEP) to document post test analysis process, timelines, and areas of responsibility. Develop test event logs to capture test sequences, analysis observations, and Tactics, Techniques, and Procedure (TTP) execution for use in post test analysis process. Develop and deliver all post test analysis reports (Final Test Report, BMDS System Characterization Brief/Report). Develop and deliver analysis content in support of the QLB, EQLB, MDR, and EMDR. Develop and submit system level Test Incident Reports (TIR) found during test analysis and reporting process.		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets	
<p>Distributed Analysis Tools and Infrastructures: Develop, integrate, test, train, deploy, and operate spiral releases of software tools to automate and enhance the test analysis and reporting process of the evolving BMDS test program and associated data products. Tools include: DMS for data management, JADE for data collection, CONDOR for test analysis observations, RAPTOR for truth analysis, RAVEN for system analysis, and PHOENIX for common tool framework.</p> <p>Develop, coordinate (with MDA/DO), implement, and maintain requirements and capabilities for distributed and virtual data architectures, to include the Joint Data Analysis Center (JDAC), supporting timely data distribution, processing, and analysis across a distributed test analysis and reporting community. Develop and maintain System Security Authorization Agreements (SSAA) for all test analysis and reporting tools and nodes to ensure risk mitigation IAW latest BMDS information assurance (IA) guidance from MDA/DO and continued authority to operate (ATO) in support on ongoing test analysis and reporting operations. Maintain hardware and software configuration management of all test analysis and reporting tools and systems.</p> <p>FY07 Planned Program:</p> <ul style="list-style-type: none">• Provide TA&R product development and delivery to include but not limited to the following major FY 07 Tests: Vigilant Shield, FTG-04 (FT-4), FTX-02, FTM-11a (Stellar Demon), FTT-07, PAC-2 (ATM-48), GT-195, FTX-03, GTX-02a, GTI-02, GTG 04-4b, GTD-02, VS- 07, GTG 04-3, and GT-193.• Plan, schedule, and execute all system JATs, and facilitate integration of BMDS analysis activities within joint venues.• Standardization of TA&R tools and processes.• Develop requirements for and coordinate development of facilities and infrastructures which enable virtual TA&R. <p>FY08 Planned Program:</p> <ul style="list-style-type: none">• Provide TA&R product development and delivery for the following FY 08 Tests: FTG-05, FTG-06, PATRIOT-PAC-XXX, FTS-01 (SMDD-1), FTT-10, FTS-03 (TMDD-2), FTM-14 & Tracker, GT-198 (Glory Trip), GTX-03a/b, GTI-03, GTD-03, Vigilant Shield-08. <p>FY09 Planned Program:</p> <ul style="list-style-type: none">• Provide TA&R product development and delivery for the following FY 09 Tests: FTG-07, FTG-08, FTM-15, FTM-16, FTT-12, FTT-13, FTS-04, JFTM-02, FTX-06, PATRIOT PAC-XXX, GBI Readiness Test, GT-YY (AF Glory Trip) and ground tests specified in the IMTP.		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification			Date February 2007	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE		
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603888C Ballistic Missile Defense Test and Targets		
	FY 2006	FY 2007	FY 2008	FY 2009
Test Planning and Design (Block 2008)	0	2,053	11,123	10,651
RDT&E Articles (Quantity)	0	0	0	0
<p>Note: Funding for Test Planning and Design for FY06 was contained in budget projects 0304 and 0804. For FY07, funding was consolidated in budget projects 0804 and 0904.</p> <p>Test Planning and Design includes campaign-level planning and design functions for the BMDS Test Program to include the collection and adjudication of test objectives from MDA System Engineering, the OTAs and the Warfighters, validation of test venues and test scenarios, definition of test resource requirements, the establishment of a baseline test campaign timeline, and the interface with collocated OTA and Advanced Systems representatives. These efforts culminate in the development and publication the Integrated Master Test Plan (IMTP). The IMTP is the overarching document that describes the BMDS test environment, supporting test organizations, developmental and operational test programs, and management of MDA test resources.</p> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • Performed preliminary planning for Block 08 Tests and document in IMTP updates. • Established a Ground Test Design Capability, and • Developed a Ground Test Template for future Campaign planning. <p>FY08 Planned Program:</p> <ul style="list-style-type: none"> • Continue refinement of Block 08 plans and document in updates to the IMTP. • Begin initial planning for Block 10 test events. <p>FY09 Planned Program:</p> <ul style="list-style-type: none"> • Complete planning for Block 08 test events and document in updates to the IMTP. • Publish preliminary plans for Block 10 testing in the IMTP. 				

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification							Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
C. Other Program Funding Summary									
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets	
<p><u>D. Acquisition Strategy</u></p> <p>The Responsible Test Organization (RTO) acquisition strategy is consistent with the Missile Defense Agency's (MDA) capabilities based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge based funding thought the use of two year blocks. The RTO directs a team of various internal staff (Government and System Engineering and Technical Assistance (SETA)), executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, Federally Funded Research and Development Centers (FFRDC), and other MDA programs to execute the various diverse efforts within the BMDS test program. When a specific effort/activity being conducted, acquired, or maintained, requires the use of an executing agent the acquisition strategy that conform to their respective headquarters regulations are utilized. This combination of organizations forms an integrated team to accomplish the necessary testing for BMDS.</p>		

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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I. Product Development Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Product Development										

Remarks

II. Support Costs Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Test Operations BMDS Ground Tests (Block 2008)										
BMDS GT/MDIE		JNIC/Colorado Springs, CO	0	3,630	1Q	38,232	N/A	41,036	N/A	82,898
Exercise Overlays		JNIC/Colorado Springs, CO	0	670	1Q	7,762	N/A	7,396	N/A	15,828
Test Operations BMDS Flight Tests (Block 2008)										
BMDS FT		CTF, Huntsville, AL & various MDA Elements	0	16,185	1Q	28,314	N/A	31,372	N/A	75,871

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	FY 2008 Cost	FY 2008 Award/Oblg Date	FY 2009 Cost	FY 2009 Award/Oblg Date	Total Cost
Targets		MDA/ Washington, D.C.	0	19,790	1Q	9,825	1Q	9,862	1Q	39,477
BMDs Risk/ECPs	Various	Various	0	312	1Q	0	N/A	0	N/A	312
Test Analysis and Reporting (Block 2008)										
Test Analysis and Reporting	Various	CTF TA&R, Huntsville, AL/ Huntsville, AL	0	2,347	1Q	18,390	1Q	19,768	1Q	40,505
Test Planning and Design (Block 2008)										
Test Planning and Design		CTF TP&D, Huntsville, AL	0	2,053	1Q	11,123	1Q	10,651	1Q	23,827
Subtotal Test and Evaluation			0	44,987		113,646		120,085		278,718
Remarks										
IV. Management Services Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	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			0	44,987		113,646		120,085		278,718
Remarks										

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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Fiscal Year	2006				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	1	2	3	4	
System Ground Tests																																	
CENTCOM US/UK 08 Exercise Set									▲	—	▲																						
GTD-02									▽																								
GTG 06-3									▽																								
BMDS Overlay 08 - System Engineering Simulation										▲																							
BMDS Overlay 08 - Joint Project Optic Windmill										▲																							
GTG 06-4										▽																							
GTX-03a										▽																							
GTX-03b										▽																							
BMDA Overlay 08 - Blue Flag Exercise											▲	—	▲																				
BMDS Overlay 08 - Eagle Resolve 2008											▲	—	▲																				
BMDS Overlay 08 - PACOM Exercise Set											▲	—	▲																				
GTI-03											▽																						
BMDS Overlay 08 - BMDS Exercise												▲																					

Legend

<ul style="list-style-type: none"> ▲ Significant Event (complete) ★ Milestone Decision (complete) ◆ Element Test (complete) ▼ System Level Test (complete) ▲— Complete Activity 	<ul style="list-style-type: none"> ▲ 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-4 Schedule Profile	Date February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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Fiscal Year	2006				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	1	2	3	4
System Ground Tests																																
GTD-03													▽																			
GTX-03c													▽																			
CENTCOM US/UK 09 Exercise Set																	△	—	△													
BMDS Overlay 09 - Juniper Cobra																	△															
BMDS Overlay 09 - System Engineering Simulation																	△															
GTX-04a																	▽															
GTX-04b																	▽															
BMDS Overlay 09 - Blue Flag Exercise																					△	—	△									
BMDS Overlay 09 - Eagle Resolve 2009																					△	—	△									
GTI-04																					▽											
PACOM Exercise Set 2009																					△	—	△									
BMDS Overlay 09 - BMDS Exercise																									△							
GTD-04																													▽			

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 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
System Ground Tests								
CENTCOM US/UK 08 Exercise Set			1Q-4Q					
GTD-02			1Q					
GTG 06-3			1Q					
BMDS Overlay 08 - System Engineering Simulation			2Q					
BMDS Overlay 08 - Joint Project Optic Windmill			2Q					
GTG 06-4			2Q					
GTX-03a			2Q					
GTX-03b			2Q					
BMDA Overlay 08 - Blue Flag Exercise			3Q-4Q					
BMDS Overlay 08 - Eagle Resolve 2008			3Q-4Q					
BMDS Overlay 08 - PACOM Exercise Set			3Q-4Q					
GTI-03			3Q					
BMDS Overlay 08 - BMDS Exercise			4Q					
GTD-03			4Q					
GTX-03c			4Q					
CENTCOM US/UK 09 Exercise Set				1Q-4Q				
BMDS Overlay 09 - Juniper Cobra				2Q				
BMDS Overlay 09 - System Engineering Simulation				2Q				
GTX-04a				2Q				
GTX-04b				2Q				
BMDS Overlay 09 - Blue Flag Exercise				3Q-4Q				
BMDS Overlay 09 - Eagle Resolve 2009				3Q-4Q				
GTI-04				3Q				
PACOM Exercise Set 2009				3Q-4Q				
BMDS Overlay 09 - BMDS Exercise				4Q				
GTD-04				4Q				
GTX-04c				4Q				
GTX-05c				4Q				
System Flight Tests								
FTG-05			1Q					

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
FTM-13			1Q					
JFTM-01			1Q					
N-FIRE 2b			1Q					
P6X-2			1Q					
(PAC) 7-2			2Q					
FTT-09			2Q					
AST-13			3Q					
FTG-06			3Q					
FTM-14			3Q					
FTS-01			3Q					
FTS-02			3Q					
PAC3 7-3			3Q					
AST-14			4Q					
FTK-01			4Q					
FTS-03			4Q					
FTT-10			4Q					
FTX-04			4Q					
FTG-07				1Q				
FTS-04				1Q				
FTT-11				1Q				
JFTM-02				1Q				
FTT-12				2Q				
FTX-05				2Q				
FTG-08				3Q				
FTM-15				3Q				
PAC-09				3Q				
FTL-01				4Q				
FTM-16				4Q				
FTS-05				4Q				
FTT-13				4Q				
FTX-06				4Q				

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDTE&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
GBI Readiness Test 09				4Q				
GT-XX				4Q				
Measurement Tests								
FTC-04a/b					2Q			
FTC-05						2Q		
Glory Trips (USAF Operational)/Potential BMDS Tests								
GT-196			2Q					
GT-197			2Q					
GT-199			3Q					
GT-198			4Q					
<p>Element participation in system test events is funded within the respective element budget.</p>								

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0004 Test & Evaluation Block 2010	0	0	29,856	42,221	124,710	117,414	8,950	0
RDT&E Articles Qty	0	0	0	0	1	0	0	0

Note: FY10 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce one test article for critical measurements and countermeasures test FTC 05 (to be expended in FY11).

FY11 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce one test article for critical measurements and countermeasures test FTC 06 (to be expended in FY12).

A. Mission Description and Budget Item Justification

Test & Evaluation Block Testing: The MDA T&E program has six primary purposes: 1) to collect system verification and assessment data the demonstrates BMDS effectiveness, 2) to verify Block design capability, 3) to identify areas where technology can increase overall system performance, 4) to identify system vulnerabilities, 5) to provide anchoring and validation data for modeling and simulation (M&S) tools, and 6) to support early capability readiness decisions.

MDA structures the BMDS T&E program around two-year Block increments, with upgrades and fielding opportunities for new capabilities occurring throughout the Block. The Test and Evaluation (T&E) activities to be performed in each Block are determined by progress made toward developing BMDS capabilities in previous Blocks, with each Block offering more complex and more realistic scenarios for system-level tests. As a result of progress delays (e.g., reprogramming, new priorities) Block testing from a previous Block may be completed in the next successive Block. The BMDS developmental and operational test program encompasses all T&E activities associated with technology developments, demonstrations, experiments, research, deployment, and maintenance activities. The T&E program describes test methods and approaches that the CTF uses to test Element capabilities to meet the system-necessary capabilities delineated in the System Specification (SSD) and Interface Design Documents (IDD). The MDA T&E program provides test data to support assessments used to document and determine BMDS effectiveness. The BMDS testing approach addresses the system wide test objective development process, Engagement Sequence Group (ESG) test environments, testing methodologies (i.e., M&S, ground testing, flight testing), and identifies the test resources (e.g., Test Bed, M&S tools, targets, ranges) required to provide test data that when combined with analysis of data from multiple sources, will contribute to verification of the BMDS capability.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets	
<p>Test & Evaluation Blocks Funding: Funding levels identified support all BMD system Flight Tests (to include Critical Measurements and Countermeasure (CMCM) Tests, Lethality and Ground Tests. Funding provides manpower, range and logistics support to perform system flight and ground test planning, integration, execution, data collection, and analysis and range and auxiliary sensor support. Funding supports overlaying system-level objectives onto Element flight tests and Risk Reduction/Targets of Opportunity flight tests.</p> <p>MDA will evaluate the addition of a 3rd site to increase the effectiveness of the BMDS. The addition of this site will require additional test and operational, communications, planning and integration activities, on-site test personnel, identification of testing methodologies (i.e., M&S, ground testing, flight testing), and identification of test resources (e.g., Test Bed, M&S tools, targets, ranges) required to provide test data that when combined with analysis of data from multiple sources, will contribute to verification of the BMDS capability for this site. Testing of this increased capability will be through BMD system Flight Tests (to include Critical Measurements and Countermeasure (CMCM) Tests, and System Ground Tests. Funding provides manpower, range and logistics support to perform system flight and ground test planning, integration, execution, data collection, and analysis and range and auxiliary sensor support.</p> <p>System Flight Tests: System FTs examine the capability of the BMDS to detect, track, and engage targets. More advanced tests are planned that will provide data to support verification of more complex Engagement Sequence Groups (ESGs). These projects will also provide analysis of each system test event through the Joint Analysis Team (JAT). BMDS flight tests also include:</p> <ul style="list-style-type: none">• Targets of Opportunity (TOO) are events (e.g., Minuteman flight tests, Air Force Space Command operations, or approved foreign launches) that afford the opportunity to exercise some portion of BMDS, to conduct on-board and off-board experiments, and to gather phenomenology data on representative objects and events. These events can be categorized as domestic, foreign cooperative, or non-cooperative tests. TOOs support developmental risk reduction for BMDS FTs through early identification of test integration issues. Specifically, TOOs provide a cost-effective means of exercising and collecting data on component interfaces in a real-time environment; communication links and connectivity; real-time Element loading; timing; cueing; tracking capabilities; algorithm development; and test checklists for the Integrated Test Team.• Critical Measurements and Counter Measures (CMCM) Flight Tests (FTs) provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology (understanding the physics of what was observed during a test event and its effects on BMDS sensors), countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, M&S, discrimination, and new technology demonstrations. CMCM FTs augment various MDA and Elements test programs and ensure a coherent, complete, cost effective, and disciplined approach to collecting data/measurements to support characterization of the BMDS mission space (i.e., provide an understanding of how the BMDS visible, infrared and radar sensors perform when observing ballistic missile		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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targets and countermeasures during flight). Requirements are allocated to specific tests. Funding associated with Critical Measurements and Counter Measures (CMCM) flight tests are captured in projects 0804, 0904, 0004 and R104; and is managed as part of the CTF Flight Test program.

- The CTF Lethality Program seeks to characterize the effectiveness of BMDS engagements (i.e., determining the fate of threat targets post-engagement) and assure 10 USC 2366 requirements for BMDS lethality Live Fire Test and Evaluation (LFT&E) are achieved, and to investigate how successful a given BMDS engagement will be in destroying the incoming warhead. Laboratory, ground and flight tests are defined and executed in response to the MDA System Engineer's requirement for data on the resultant space, atmosphere and ground effects of engaging high explosive and weapon of mass destruction (WMD) payloads. Flight test data requirements are achieved by leveraging planned BMDS intercept or Measurements Program test events with alternative targets, supplemental payloads and ancillary sensor coverage. The CTF integrates lethality testing across MDA and coordinates with related programs (e.g. PAC-3) to establish an efficient, requirements-driven approach to BMDS lethality characterization. Requirements are allocated to specific tests. Funding associated with Lethality is captured in projects 0804, 0904, 0004, R104 and 0204; and is managed as part of the CTF Flight Test program.

System Ground Tests:

A vigorous System GT program brings together a variety of controllable and flexible testing venues to include high fidelity hardware in the loop tests and nondestructive tests performed in a controlled repeatable environment. BMDS ground testing consists of:

- BMDS Integrated Ground Tests (GTI) are test event integration exercises that use a test environment to determine the impact of specific threats on a wide variety of proposed engagement scenarios and to provide data for multiple ESGS and multiple threats across a range of environmental conditions. The data generated from a GTI is used to collect data to anchor M&S and to improve their ability to verify and assess end-to-end system level performance and to provide risk reduction for FT. Within the performance and threat space envelope, GTIs provide a wider range of data than can be obtained from flight testing for integration, characterization, verification, and assessment.
- BMDS Distributed Ground Tests (GTD) are test events that typically follow a GTI where they combine the fielded HW and SW of most of the BMDS Elements to exercise the BMDS communications networks and communication links. During GTDs, actual Element sensors are stimulated where possible to obtain data to evaluate both the Element and system test objectives. Since GTDs can closely represent the actual BMDS, it is possible that following a GTD and corresponding quick look report some Engagement Sequence Groups (ESGs) will become candidates for early delivery to the war-fighter.
- BMDS Focused Ground Tests Other (GTX) are short duration integration exercises that focus on specific ESGs or functionality. A GTX can test a subset of the BMDS configuration, focusing on specific ESGs with only the required Elements participating in the test. Typically, one or more GTXs will precede a GTI as risk reductions test for the GTI. Additionally, a GTX can be used to test a new capability that was not available

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during the previous GTI. Since GTXs are intended to be smaller, less complex events, they will be more responsive to scheduling adjustments and unplanned test requirement needs.

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Test Operations BMDS Ground Tests (Block 2010)	0	0	6,952	8,344
RDT&E Articles (Quantity)	0	0	0	0

Ground Testing (GT), using M&S that have been validated using anchoring data from flight tests, is the primary method for verifying and validating functional Block capability. Ground testing is used to collect data for BMDS characterization and assessment, component and element integration, and exploration of scenarios where flight testing is either impractical or impossible. GT allows examination of mature designs and identification and efficient correction of performance anomalies based on the capability to test all Engagement Sequence Groups (ESGs) using digital representations of realistic threat types, trajectories, geometries, and raid sizes that would be cost prohibitive to do in flight testing. A vigorous Ground Test (GT) program brings together a variety of controllable and flexible testing venues to include high fidelity hardware in the loop tests and nondestructive tests performed in a controlled repeatable environment. BMDS ground testing consists of BMDS Integrated Ground Tests (GTI), BMDS Distributed Ground Tests (GTD), and BMDS Ground Tests Other (GTX).

FY08 Planned Program:

- Plan and coordinate element participation and execute the following FY 08 System Ground Tests: GT4 Series (GTX, GTI, GTD)
- Support Elements in planning for FY 09 System Ground Tests.
- Continue Development of Block 08 scenario designs for BMDS Ground Tests to support Block 08 ESGs identified in the Block 08 TBDD.
- Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs; plus provide validation data for M&S.
- Plan for systems test; including system execution and reporting.
- Plan FY10 System Ground Tests.

FY09 Planned Program:

- Plan and coordinate element participation and execute the following FY 09 System Ground Tests: GTX-04a, GTX-04b, GTI-04, GTD-04.
- Support Elements in planning for FY 09 System Ground Tests.
- Continue Development of Block 08 scenario designs for BMDS Ground Tests to support Block 08 ESGs identified in the Block 08 TBDD.

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- Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs; and provide validation data for M&S.
- Plan and coordinate element participation to include scenario designs for FY10/11 System Ground Tests for a 3rd site (GTX, GTI, GTD).
- Plan for FY10 System Ground Tests.

	FY 2006	FY 2007	FY 2008	FY 2009
Test Operations BMDS Flight Tests (Block 2010)	0	0	18,975	26,613
RDT&E Articles (Quantity)	0	0	0	0

Flight Testing (FT) examines the capability of the BMDS to detect, track, and engage targets. More advanced tests are planned that will provide data to support verification of more complex Engagement Sequence Groups (ESGs). These projects also provide analysis of each system test event through the Joint Analysis Team (JAT). BMDS flight tests also include Target of Opportunity (TOO), Critical Measurements and Counter Measures (CMCM) Flight Tests, and the CTF Lethality Program.

Flight Testing (FT) is planned and executed to provide anchoring data for M&S tools, to collect test data to further characterize the BMDS, and to demonstrate BMDS operational capability in whole or in part. Even though FTs are conducted in realistic operational environments and are critical to achieving system verification requirements, they only examine a single scenario/vignette and parts of Engagement Sequence Groups (ESGs) and do have environmental and safety constraints.

FY08 Planned Program:

- Conclude planning for and execute FY08 major BMDS system tests to include but not limited too: FTM-14, FTG-06, FTS-01, and GT-198.
- Conducted planning for FY09 major BMDS system tests to include but not limited too: FTM-15/16, FTG-07, FTG-08, FTS-05, FTX-05/06, FTT-14 (1Q FY10), and FTL-01..
- Continue planning for and critical measurements countermeasures test FTC-04.
- Support BMDS Elements in the planning of FY09 program-specific and system level Flight Tests, and in execution of their FY08 program-specific and system level Flight Tests to support Block 10 development and objectives.
- Support and coordinate Block 08 target development including target system requirements, integration, and component testing requirements.
- Continue Development of Block 08 scenario designs for BMDS Flight Tests to support Block 08 ESGs identified in the Block 08 TBDD.
- Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs, and provide validation data for M&S.
- Plan for system level test execution and reporting for FY09.

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- Plan for an FY09 GBI Readiness Test.
- Provide system-level range support, mission assurance, logistics support, test specific support personnel, test specific communication, support equipment, and permission analysis and studies.

FY09 Planned Program:

- Conclude planning for and execute FY09 major BMDS system tests to include but not limited too: FTM-15/16, FTG-07, FTG-08, FTS-05, FTL-01, FTX-05/06, and FTT-12/13.
- Conducted planning for FY10 major BMDS system tests to include but not limited too: FTG-09, FTG-10, FTM-17/18, FTS-06, FTT-16/17, and FTX-07.
- Conclude planning for critical measurements countermeasures test FTC-04.
- Conduct initial planning for critical measurements countermeasures test FTC-05.
- Conduct planning for a sensor characterization flight (FTX) for the 3rd site sensor..
- Support BMDS Elements in the planning of FY10 program-specific Flight Tests, and in execution of their FY09 program-specific system Flight Tests.
- Support and coordinate Block 08 target development including target systems requirements, integration, and component testing requirements.
- Continue Development of Block 08 scenario designs for BMDS Flight Tests to support Block 08 ESGs identified in the Block 08 TBDD.
- Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs; and provide validation data for M&S.
- Plan for system level test execution and reporting for FY10.
- Execute an FY09 GBI Readiness Test.
- Provide system-level range support, mission assurance, logistics support, test specific support personnel, test specific communication, support equipment, and permission analysis and studies.

	FY 2006	FY 2007	FY 2008	FY 2009
Test Analysis and Reporting (Block 2010)	0	0	3,929	4,309
RDT&E Articles (Quantity)	0	0	0	0

The CTF Test Analysis and Reporting (TA&R) division develops, integrates, and delivers all Ballistic Missile Defense System (BMDS) post test analysis and reporting products for Integrated Master Test Plan (IMTP) specified system flight and ground tests, and other targets of opportunity.

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<p>Maintain and execute all critical path TA&R functions, tools, processes, and infrastructures supporting development and delivery of TA&R products within a single, integrated, standardized reporting process.</p> <p>Functional Products and Processes:</p> <ul style="list-style-type: none">• Joint Analysis Teams (JATs) - Establish, plan, schedule, and conduct JATs for system tests to coordinate and integrate all component and system post test analysis and reporting activities. Develop and brief all post test analysis and reporting products, Mission Logistics Plan, Flash Report, Quick Look Report, Quick Look Briefing (QLB), Executive Quick Look Briefing (EQLB), Mission Data Review (MDR), Executive Mission Data Review (EMDR), and Report to Congress.• Data Management - Develop and publish Integrated Data Management Plans (IDMP), coordinating and documenting all component and system data products and requests. Develop Data Handling Plans (DHP) and provide event specific data distribution reports, synchronized with Missile Defense Data Center (MDDC), to ensure timely and complete data distribution in accordance with (IAW) IDMP. Provide inputs to the National Test Ranges Universal Documentation System (UDS) to ensure availability of critical data supporting test analysis and reporting conduct.• Data Collection - Construct, install and maintain Joint Analysis Data Engine (JADE) systems, and associated accreditation documentation, at BMDS Communications Network (COMNET) nodes to provide independent, time-stamped, raw message traffic required for truth and system analysis. Maintain JADE test support plans and ensure readiness for test analysis and reporting operations. Register and deliver all JADE data products IAW IDMP.• Data Processing - Process all raw data files and test configurations to integrated test analysis and reporting databases to support post test truth and system analysis and reporting activities. Deliver databases [Integrated System Configuration Database (ISCD), Truth Data Package (TDP), and Integrated Analysis Data Package (IADP)] to Operational Test Agency (OTA), BMDS Capability Assessment (BCA), C2BMC, and Element Primes IAW IDMP.• Truth - Develop Truth Data Requirements Document (TDRD) to ensure that auxiliary sensor data collection to support truth data analysis and Truth Data Package (TDP) creation are captured in the IDMP, Operational Requirements (OR), and MDA/DTR documentation. The TDRD defines and documents mission specific auxiliary sensor data collection requirements and provide truth requirements for MDA/DTR mission architecture development. Develop pre-mission prediction packages (metric, optical, and radar) and deliver to truth sensors in support of their pre-mission test support planning. Develop and deliver post-mission TDP to data requestors as captured in the IDMP as an integrated truth source to anchor post-mission analysis activities. Plan, schedule, and execute post mission truth summits to coordinate auxiliary sensor inputs to post-mission executive briefs and data reviews. Conduct post-mission truth sensor data quality assessments to determine the quality and quantity of data sources with respect to truth analysis requirements, and capture lessons learned for future truth data collection and analysis activities.• Analysis - Develop analysis data requirements documents to ensure IDMP contains all products required to support post test analysis of system test objectives [e.g., Systems Engineering Based Objectives (SEBO), Engagement Sequence Groups (ESG), Characterization Points, and Military		

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<p>Standards (MIL-STD) Compliance]. Develop Analysis Execution Plans (AEP) to document post test analysis process, timelines, and areas of responsibility. Develop test event logs to capture test sequences, analysis observations, and Tactics, Techniques, and Procedure (TTP) execution for use in post test analysis process. Develop and deliver all post test analysis reports (Final Test Report, BMDS System Characterization Brief/Report). Develop and deliver analysis content in support of the QLB, EQLB, MDR, and EMDR. Develop and submit system level Test Incident Reports (TIR) found during test analysis and reporting process.</p> <p>Distributed Analysis Tools and Infrastructures: Develop, integrate, test, train, deploy, and operate spiral releases of software tools to automate and enhance the test analysis and reporting process of the evolving BMDS test program and associated data products. Tools include: DMS for data management, JADE for data collection, CONDOR for test analysis observations, RAPTOR for truth analysis, RAVEN for system analysis, and PHOENIX for common tool framework.</p> <p>Develop, coordinate (with MDA/DO), implement, and maintain requirements and capabilities for distributed and virtual data architectures, to include the Joint Data Analysis Center (JDAC), supporting timely data distribution, processing, and analysis across a distributed test analysis and reporting community. Develop and maintain System Security Authorization Agreements (SSAA) for all test analysis and reporting tools and nodes to ensure risk mitigation IAW latest BMDS information assurance (IA) guidance from MDA/DO and continued authority to operate (ATO) in support on ongoing test analysis and reporting operations. Maintain hardware and software configuration management of all test analysis and reporting tools and systems.</p> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"> • Provide pre-mission planning and analysis, data management planning for collection and distribution of data products, coordinate test analysis and report to include but not limited to the following events FY 08 Tests: FTG-05, FTG-06, FTS-01 (SMDD-1), FTT-10, PATRIOT PAC-XXX, FTS-03 (TMDD-2), FTM-14 & Tracker, GT-198 (Glory Trip), GTX-03a/b/c, GTI-03, GTD-03, Vigilant Shield-08. • Provide pre-mission data collection, data management and analysis plans for FY09 flight and ground tests. <p>FY09 Planned Program:</p> <ul style="list-style-type: none"> • Provide pre-mission planning and analysis, data management planning for collection and distribution of data products, coordinate test analysis and report to include but not limited to the following events FY 09 Tests: FTG-07, FTG-08, FTM-15, FTM-16, FTT-12, FTT-13, FTS-05, FTX-05, PATRIOT PAC-XXX, GBI Readiness Test, GT-YY (Air Force Glory Trip) and ground tests specified in the IMTP. • Provide pre-mission data collection, data management and analysis plans for FY10 flight and ground tests. 		

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APPROPRIATION/BUDGET ACTIVITY			R-1 NOMENCLATURE	
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	FY 2006	FY 2007	FY 2008	FY 2009
Third Site Testing	0	0	0	2,955
RDT&E Articles (Quantity)	0	0	0	0

FY09 Planned Program:

- Initiation of Third Site testing.

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000

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	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

D. Acquisition Strategy

The Responsible Test Organization (RTO) acquisition strategy is consistent with the Missile Defense Agency's (MDA) capabilities based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge based funding thought the use of two year blocks. The RTO directs a team of various internal staff (Government and System Engineering and Technical Assistance (SETA)), executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, Federally Funded Research and Development Centers (FFRDC), and other MDA programs to execute the various diverse efforts within the BMDS test program. When a specific effort/activity being conducted, acquired, or maintained, requires the use of an executing agent the acquisition strategy that conform to their respective headquarters regulations are utilized. This combination of organizations forms an integrated team to accomplish the necessary testing for BMDS.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets					
I. Product Development Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Product Development										
Remarks										
II. Support Costs Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Funding in this Project is not programmed until FY08.										
Test Operations BMDS Ground Tests (Block 2010)										
BMDS GT/MDIE	Various	JNIC/Colorado Springs, CO	0	0	N/A	6,952	1Q	8,344	1Q	15,296
Test Operations BMDS Flight Tests (Block 2010)										
BMDS FT	Various	USASMDC, WSMR, MITLL, JNIC, AL, NM, MA, HI & CA	0	0	N/A	18,975	1Q	26,613	1Q	45,588

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	FY 2008 Cost	FY 2008 Award/Oblg Date	FY 2009 Cost	FY 2009 Award/Oblg Date	Total Cost
Test Analysis and Reporting (Block 2010)										
Test Analysis and Reporting		CTF TA&R, Huntsville, AL	0	0	N/A	3,929	1Q	4,309	1Q	8,238
Third Site Testing										
Third Site	Various	Various	0	0	N/A	0	N/A	2,955	1Q	2,955
Subtotal Test and Evaluation			0	0		29,856		42,221		72,077
Remarks										
IV. Management Services Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	FY 2008 Cost	FY 2008 Award/Oblg Date	FY 2009 Cost	FY 2009 Award/Oblg Date	Total Cost
Subtotal Management Services										
			0	0		0		0		0
Remarks										
Project Total Cost			0	0		29,856		42,221		72,077
Remarks										

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
System Flight Tests								
FTG-08					1Q			
FTG-09					1Q			
FTT-14					1Q			
FTM-17					2Q			
FTS-06					2Q			
FTG-10					3Q			
FTL-02					3Q			
PAC-10					3Q			
FTL-03					4Q			
FTM-18					4Q			
FTT-15					4Q			
FTX-07					4Q			
FTG-11						1Q		
FTL-04						1Q		
FTK-02						2Q		
FTM-19						2Q		
FTS-07						2Q		
FTT-16						2Q		
FTG-12						3Q		
FTL-05						3Q		
PAC-11						3Q		
FTM-20						4Q		
FTT-17						4Q		
FTX-08						4Q		
GBI Readiness Test 11						4Q		
System Ground Tests								
BMDS Overlay 10-1					2Q			
GTX-05a					2Q			
GTX-05b					2Q			
GTX-06a					2Q	2Q		

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
BMDS Overlay 10 - Eagle Resolve 2010					3Q-4Q			
BMDS Overlay 10-2					3Q-4Q			
GTI-05					3Q			
PACOM Exercise Set 2010					3Q-4Q			
BMDS Overlay 10 - BMDS Exercise					4Q			
GTD-05					4Q			
GTX-05c					4Q			
BMDS Overlay 11-1						2Q		
GTX-06b						2Q		
BMDS Overlay 11 - Eagle Resolve 2011						3Q-4Q		
BMDS Overlay 11-2						3Q-4Q		
GTI-06						3Q		
PACOM Exercise Set 2011						3Q-4Q		
BMDS Overlay 11 - BMDS Exercise						4Q		
GTD-06						4Q		
GTX-06c						4Q		
Measurement Tests								
FTC-06							2Q	
FTC-07								2Q

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
R104 Test & Evaluation Block 2012	0	0	0	0	55,573	78,449	81,684	3,961
RDT&E Articles Qty	0	0	0	0	0	0	0	0
<p><i>Note: FY12 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce one test article for critical measurements and countermeasures test FTC 07 (to be expended in FY13).</i></p> <p><i>FY13 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce one test article for critical measurements and countermeasures test FTC 08 (to be expended in FY14).</i></p> <p><u>A. Mission Description and Budget Item Justification</u></p> <p>Test & Evaluation Block Testing: The MDA T&E program has six primary purposes: 1) to collect system verification and assessment data the demonstrates BMDS effectiveness, 2) to verify Block design capability, 3) to identify areas where technology can increase overall system performance, 4) to identify system vulnerabilities, 5) to provide anchoring and validation data for modeling and simulation (M&S) tools, and 6) to support early capability readiness decisions.</p> <p>MDA structures the BMDS T&E program around two-year Block increments, with upgrades and fielding opportunities for new capabilities occurring throughout the Block. The Test and Evaluation (T&E) activities to be performed in each Block are determined by progress made toward developing BMDS capabilities in previous Blocks, with each Block offering more complex and more realistic scenarios for system-level tests. As a result of progress delays (e.g., reprogramming, new priorities) Block testing from a previous Block may be completed in the next successive Block. The BMDS developmental and operational test program encompasses all T&E activities associated with technology developments, demonstrations, experiments, research, deployment, and maintenance activities. The T&E program describes test methods and approaches that the CTF uses to test Element capabilities to meet the system-necessary capabilities delineated in the System Specification (SSD) and Interface Design Documents (IDD). The MDA T&E program provides test data to support assessments used to document and determine BMDS effectiveness. The BMDS testing approach addresses the system wide test objective development process, Engagement Sequence Group (ESG) test environments, testing methodologies (i.e., M&S, ground testing, flight testing), and identifies the test resources (e.g., Test Bed, M&S tools, targets, ranges) required to provide test data that when combined with analysis of data from multiple sources, will contribute to verification of the BMDS capability.</p> <p>Test & Evaluation Blocks Funding: Funding levels identified support all BMD system Flight Tests (to include Critical Measurements and Countermeasure (CMCM) Tests and Lethality) and Ground Tests. Funding provides manpower, range and logistics support to perform system flight</p>								

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets	
<p>and ground test planning, integration, execution, data collection, and analysis and range and auxiliary sensor support. Funding supports overlaying system-level objectives onto Element flight tests and Risk Reduction/Targets of Opportunity flight tests.</p> <p>a) System Flight Tests: System FTs examine the capability of the BMDS to detect, track, and engage targets. More advanced tests are planned that will provide data to support verification of more complex Engagement Sequence Groups (ESGs). These projects will also provide analysis of each system test event through the Joint Analysis Team (JAT). In addition common flight test constructs such as Arrow, GBI, High Energy Laser, Interceptor, Countermeasure, Kinetic Energy, STSS, and Standard Missile; BMDS flight tests also includes:</p> <p>1) Targets of Opportunity (TOO). TOOs are events (e.g., Minuteman flight tests, Air Force Space Command operations, or approved foreign launches) that afford the opportunity to exercise some portion of BMDS, to conduct on-board and off-board experiments, and to gather phenomenology data on representative objects and events. These events can be categorized as domestic, foreign cooperative, or non-cooperative tests. TOOs support developmental risk reduction for BMDS FTs through early identification of test integration issues. Specifically, TOOs provide a cost-effective means of exercising and collecting data on component interfaces in a real-time environment; communication links and connectivity; real-time Element loading; timing; cueing; tracking capabilities; algorithm development; and test checklists for the Integrated Test Team.</p> <p>2) Critical Measurements and Counter Measures (CMCM) Flight Tests. CMCM FTs provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology (understanding the physics of what was observed during a test event and its effects on BMDS sensors), countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, modeling and simulation, discrimination, and new technology demonstrations. CMCM FTs augment various MDA and Elements test programs and ensure a coherent, complete, cost effective, and disciplined approach to collecting data/measurements to support characterization of the BMDS mission space (i.e., provide an understanding of how the BMDS visible, infrared and radar sensors perform when observing ballistic missile targets and countermeasures during flight). Requirements are allocated to specific tests. Funding associated with Critical Measurements and Counter Measures (CMCM) flight tests are captured in projects 0804, 0904, 0004 and R104; and is managed as part of the CTF Flight Test program.</p> <p>3) The CTF Lethality Program seeks to characterize the effectiveness of BMDS engagements (i.e., determining the fate of threat targets post-engagement) and assure 10 USC 2366 requirements for BMDS lethality Live Fire Test and Evaluation (LFT&E) are achieved, and to investigate how successful a given BMDS engagement will be in destroying the incoming warhead. Laboratory, ground and flight tests are defined and executed in response to the MDA System Engineer's requirement for data on the resultant space, atmosphere and ground effects of engaging high explosive and weapon of mass destruction (WMD) payloads. Flight test data requirements are achieved by leveraging planned BMDS intercept or Measurements Program test events with alternative targets, supplemental payloads and ancillary sensor coverage. The CTF integrates lethality testing across MDA</p>		

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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and coordinates with related programs (e.g. PAC-3) to establish an efficient, requirements-driven approach to BMDS lethality characterization. Requirements are allocated to specific tests. Funding associated with Lethality is captured in projects 0804, 0904, 0004, R104 and 0204; and is managed as part of the CTF Flight Test program.

b) System Ground Tests: A vigorous System GT program brings together a variety of controllable and flexible testing venues to include high fidelity hardware in the loop tests and nondestructive tests performed in a controlled repeatable environment. BMDS ground testing consists of:

1) BMDS Integrated Ground Tests (GTI) - These test events are integration exercises that use a test environment to determine the impact of specific threats on a wide variety of proposed engagement scenarios and to provide data for multiple ESGS and multiple threats across a range of environmental conditions. The data generated from a GTI is used to collect data to anchor M&S and to improve their ability to verify and assess end-to-end system level performance and to provide risk reduction for FT. Within the performance and threat space envelope, GTIs provide a wider range of data than can be obtained from flight testing for integration, characterization, verification, and assessment.

2) BMDS Distributed Ground Tests (GTD) - These test events typically follow a GTI where they combine the fielded HW and SW of most of the BMDS Elements to exercise the BMDS communications networks and communication links. During GTDs, actual Element sensors are stimulated where possible to obtain data to evaluate both the Element and system test objectives. Since GTDs can closely represent the actual BMDS, it is possible that following a GTD and corresponding quick look report some Engagement Sequence Groups (ESGs) will become candidates for early delivery to the war-fighter.

3) BMDS Focused Ground Tests Other (GTX) - These test events are short duration integration exercises that focus on specific ESGs or functionality. A GTX can test a subset of the BMDS configuration, focusing on specific ESGs with only the required Elements participating in the test. Typically, one or more GTXs will precede a GTI as risk reductions test for the GTI. Additionally, a GTX can be used to test a new capability that was not available during the previous GTI. Since GTXs are intended to be smaller, less complex events, they will be more responsive to scheduling adjustments and unplanned test requirement needs.

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Funding in this Project is not programmed until FY10.	0	0	0	
RDT&E Articles (Quantity)	0	0	0	

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification							Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
C. Other Program Funding Summary									
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets	
<p><u>D. Acquisition Strategy</u></p> <p>The Responsible Test Organization (RTO) acquisition strategy is consistent with the Missile Defense Agency's (MDA) capabilities based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge based funding thought the use of two year blocks. The RTO directs a team of various internal staff (Government and System Engineering and Technical Assistance (SETA)), executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, Federally Funded Research and Development Centers (FFRDC), and other MDA programs to execute the various diverse efforts within the BMDS test program. When a specific effort/activity being conducted, acquired, or maintained, requires the use of an executing agent the acquisition strategy that conform to their respective headquarters regulations are utilized. This combination of organizations forms an integrated team to accomplish the necessary testing for BMDS.</p>		

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
System Flight Tests								
FTG-12							1Q	
FTG-13							1Q	
FTK-03							1Q	
FTM-21							2Q	
FTS-08							2Q	
FTT-18							2Q	
FTG-14							3Q	
FTL-06							3Q	
FTL-08							3Q	
PAC-12							3Q	
FTL-07							4Q	
FTM-22							4Q	
FTT-19							4Q	
FTX-09							4Q	
FTG-15								1Q
FTK-04								1Q
FTM-23								2Q
FTS-09								2Q
FTT-20								2Q
FTG-16								3Q
FTL-09								3Q
PAC-13								3Q
FTM-24								4Q
FTT-21								4Q
FTX-10								4Q
GBI Readiness Test 13								4Q
System Ground Tests								
BMDS Overlay 12-1							2Q	
GTX-07a							2Q	
GTX-07b							2Q	

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
BMDS Overlay 12 - Eagle Resolve 2012							3Q-4Q	
BMDS Overlay 12-2							3Q-4Q	
GTI-07							3Q	
PACOM Exercise Set 2012							3Q-4Q	
BMDS Overlay 12 - BMDS Exercise							4Q	
GTD-07							4Q	
GTX-07c							4Q	
BMDS Overlay 13-1								2Q
GTX-08a								2Q
GTX-08b								2Q
BMDS Overlay 13 - Eagle Resolve 2013								3Q-4Q
BMDS Overlay 13-2								3Q-4Q
GTI-08								3Q
PACOM Exercise Set 2013								3Q-4Q
BMDS Overlay 13 - BMDS Exercise								4Q
GTD-08								4Q
GTX-08c								4Q

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
R204 Test & Evaluation Block 2014	0	0	0	0	0	3,574	113,591	198,077
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Test & Evaluation Block Testing: The MDA T&E program has six primary purposes: 1) to collect system verification and assessment data the demonstrates BMDS effectiveness, 2) to verify Block design capability, 3) to identify areas where technology can increase overall system performance, 4) to identify system vulnerabilities, 5) to provide anchoring and validation data for modeling and simulation (M&S) tools, and 6) to support early capability readiness decisions.

MDA structures the BMDS T&E program around two-year Block increments, with upgrades and fielding opportunities for new capabilities occurring throughout the Block. The Test and Evaluation (T&E) activities to be performed in each Block are determined by progress made toward developing BMDS capabilities in previous Blocks, with each Block offering more complex and more realistic scenarios for system-level tests. As a result of progress delays (e.g., reprogramming, new priorities) Block testing from a previous Block may be completed in the next successive Block. The BMDS developmental and operational test program encompasses all T&E activities associated with technology developments, demonstrations, experiments, research, deployment, and maintenance activities. The T&E program describes test methods and approaches that the CTF uses to test Element capabilities to meet the system-necessary capabilities delineated in the System Specification Document (SSD) and Interface Design Documents (IDD). The MDA T&E program provides test data to support assessments used to document and determine BMDS effectiveness. The BMDS testing approach addresses the system wide test objective development process, Engagement Sequence Group (ESG) test environments, testing methodologies (i.e., M&S, ground testing, flight testing), and identifies the test resources (e.g., Test Bed, M&S tools, targets, ranges) required to provide test data that when combined with analysis of data from multiple sources, will contribute to verification of the BMDS capability.

Test & Evaluation Blocks Funding:

Funding levels identified support all BMD system Flight Tests (to include Critical Measurements and Countermeasure (CMCM) Tests and Lethality) and Ground Tests. Funding provides manpower, range and logistics support to perform system flight and ground test planning, integration, execution, data collection, and analysis and range and auxiliary sensor support. Funding supports overlaying system-level objectives onto Element flight tests and Risk Reduction/Targets of Opportunity flight tests.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets	
<p>System Flight Tests (FT): System FTs examine the capability of the BMDS to detect, track, and engage targets. More advanced tests are planned that will provide data to support verification of more complex Engagement Sequence Groups (ESGs). These projects will also provide analysis of each system test event through the Joint Analysis Team (JAT). In addition common flight test constructs such as Arrow, GBI, High Energy Laser, Interceptor, Countermeasure, Kinetic Energy, STSS, and Standard Missile; BMDS flight tests also includes:</p> <ul style="list-style-type: none">• Targets of Opportunity (TOO) are events (e.g., Minuteman flight tests, Air Force Space Command operations, or approved foreign launches) that afford the opportunity to exercise some portion of BMDS, to conduct on-board and off-board experiments, and to gather phenomenology data on representative objects and events. These events can be categorized as domestic, foreign cooperative, or non-cooperative tests. TOOs support developmental risk reduction for BMDS FTs through early identification of test integration issues. Specifically, TOOs provide a cost-effective means of exercising and collecting data on component interfaces in a real-time environment; communication links and connectivity; real-time Element loading; timing; cueing; tracking capabilities; algorithm development; and test checklists for the Integrated Test Team.• Critical Measurements and Counter Measures (CMCM) Flight Tests (FTs) provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology (understanding the physics of what was observed during a test event and its effects on BMDS sensors), countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, modeling and simulation, discrimination, and new technology demonstrations. CMCM FTs augment various MDA and Elements test programs and ensure a coherent, complete, cost effective, and disciplined approach to collecting data/measurements to support characterization of the BMDS mission space (i.e., provide an understanding of how the BMDS visible, infrared and radar sensors perform when observing ballistic missile targets and countermeasures during flight). Requirements are allocated to specific tests. Funding associated with Critical Measurements and Counter Measures (CMCM) flight tests are captured in projects 0804, 0904, 0004 and R104; and is managed as part of the CTF Flight Test program.• The CTF Lethality Program seeks to characterize the effectiveness of BMDS engagements (i.e., determining the fate of threat targets post-engagement) and assure 10 USC 2366 requirements for BMDS lethality Live Fire Test and Evaluation (LFT&E) are achieved, and to investigate how successful a given BMDS engagement will be in destroying the incoming warhead. Laboratory, ground and flight tests are defined and executed in response to the MDA System Engineer's requirement for data on the resultant space, atmosphere and ground effects of engaging high explosive and weapon of mass destruction (WMD) payloads. Flight test data requirements are achieved by leveraging planned BMDS intercept or Measurements Program test events with alternative targets, supplemental payloads and ancillary sensor coverage. The CTF integrates lethality testing across MDA and coordinates with related programs (e.g. PAC-3) to establish an efficient, requirements-driven approach to BMDS lethality characterization. Requirements are allocated to specific tests. Funding associated with Lethality is captured in projects 0804, 0904, 0004, R104 and 0204; and is managed as part of the CTF Flight Test program.		

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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System Ground Tests (GT):

A vigorous System GT program brings together a variety of controllable and flexible testing venues to include high fidelity hardware in the loop tests and nondestructive tests performed in a controlled repeatable environment. BMDS ground testing consists of:

- BMDS Integrated Ground Tests (GTI) are test events that are integration exercises that use a test environment to determine the impact of specific threats on a wide variety of proposed engagement scenarios and to provide data for multiple ESGs and multiple threats across a range of environmental conditions. The data generated from a GTI is used to collect data to anchor M&S and to improve their ability to verify and assess end-to-end system level performance and to provide risk reduction for FT. Within the performance and threat space envelope, GTIs provide a wider range of data than can be obtained from flight testing for integration, characterization, verification, and assessment.
- BMDS Distributed Ground Tests (GTD) test events that typically follow a GTI where they combine the fielded HW and SW of most of the BMDS Elements to exercise the BMDS communications networks and communication links. During GTDs, actual Element sensors are stimulated where possible to obtain data to evaluate both the Element and system test objectives. Since GTDs can closely represent the actual BMDS, it is possible that following a GTD and corresponding quick look report some Engagement Sequence Groups (ESGs) will become candidates for early delivery to the war-fighter.
- BMDS Focused Ground Tests Other (GTX) are short duration integration exercises that focus on specific ESGs or functionality. A GTX can test a subset of the BMDS configuration, focusing on specific ESGs with only the required Elements participating in the test. Typically, one or more GTXs will precede a GTI as risk reductions test for the GTI. Additionally, a GTX can be used to test a new capability that was not available during the previous GTI. Since GTXs are intended to be smaller, less complex events, they will be more responsive to scheduling adjustments and unplanned test requirement needs.

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
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PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

D. Acquisition Strategy

The Responsible Test Organization (RTO) acquisition strategy is consistent with the Missile Defense Agency's (MDA) capabilities based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge based funding thought the use of two year blocks. The RTO directs a team of various internal staff (Government and System Engineering and Technical Assistance (SETA)), executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, Federally Funded Research and Development Centers (FFRDC), and other MDA programs to execute the various diverse efforts within the BMDS test program. When a specific effort/activity being conducted, acquired, or maintained, requires the use of an executing agent the acquisition strategy that conform to their respective headquarters regulations are utilized. This combination of organizations forms an integrated team to accomplish the necessary testing for BMDS.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603888C Ballistic Missile Defense Test and Targets
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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
R117 Concurrent Test, Training & Ops (CTTO) Block 2012	0	0	0	0	0	0	9,013	9,115
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note: Starting in FY08, Concurrent Test, Training and Operations (CTTO) efforts previously included in Ballistic Missile Defense Products PE 0603889C in Projects 0803, 0903 and 0003 within the BMDS Training area are now addressed in BMD Ballistic Missile Defense Test and Targets PE 0603888C Projects 0917 (Block 2008), 0017 (Block 2010) and R117 (Block 2012). Distributed Multi-Echelon Training System (DMETS) is an activity in the CTTO task.

A. Mission Description and Budget Item Justification

As part of the total Ballistic Missile Defense System (BMDS), the BMDS Concurrent Test, Training, and Operations (CTTO) effort organizes and provides the resources, including systems development and acquisition, for an integrated system-level developmental and acquisition approach, bringing together the capabilities of the BMDS Elements. This effort provides for implementation of test and evaluation, training, and operations functions that span multiple Blocks, as well as identifies capability gaps as part of current and future Blocks.

With the evolution of the BMDS, and each of the Unified Combatant Commanders high priority requirement for a capability to sustain BMDS operations while simultaneously supporting concurrent research, development, test, and evaluation; maintenance; training; and system upgrade activities without degrading the ability to defend the United States, its deployed forces, friends, and allies, it has become a priority to implement a CTTO capability. This effort enhances BMDS operational capabilities by enabling continued incremental and spiral development testing while providing the Unified Combatant Commanders the ability to maintain their operational capability, participate in exercises, train, and rehearse mission scenarios. To address this requirement, MDA is developing a CTTO approach to BMDS systems development and acquisition in which operational and developmental testing and training of the capabilities fielded to the Unified Combatant Commanders overlap to some extent while the system is in an operational state or “on alert.”

Addressing the Unified Combatant Commanders high priority requirement to conduct distributed, high fidelity, end-to-end training for missile defense operations and enabling the training portion of CTTO is the Distributed Multi-Echelon Training System (DMETS). DMETS consists of live, virtual and constructive training environments for proficiency training, operator certification, exercises, and Tactics, Techniques and Procedures (TTPs) development, mission rehearsal, review, testing and revision. DMETS will create an exercise like environment for units to gain training task coverage and achieve other learning objectives by presenting standardized, technically accurate threat scenarios and other problems, faults, and situations that elicit the performance of individual and collective tasks. The exercise environment supports training of the BMDS layered defense

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<p>with critical cross mission interaction. DMETS modernizes the approach to plan, conduct and evaluate training, thus enabling rapid response to the Unified Combatant Commanders training requirements. As MDA continues to develop the BMDS to defend the United States, deployed forces, friends and allies, the spiral development of DMETS will keep pace in meeting the continuing need to effectively train the crews, elements, staffs and commanders who execute the evolving BMDS mission.</p> <p>The functions of the CTTO are to:</p> <ul style="list-style-type: none">• Increase confidence in the BMDS through rigorous concurrent test, training, and operations• Enable BMDS testing and training in the field without degrading protection capability• Sustain Unified Combatant Commanders BMDS operations while simultaneously supporting concurrent BMDS systems development and acquisition while maintaining the ability to defend the United States, its deployed forces, friends, and allies• Ensure horizontal and vertical test and evaluation scalability from MDA Element through global BMDS. Safely inject consistent high fidelity test and evaluation threat data on operational equipment to exercise all phases of the kill chain using all sensor/shooter combinations• Support the development and evaluation of BMDS Tactics, Techniques, and Procedures• Validate and practice Unified Combatant Commanders BMDS Tactics, Techniques and Procedures• Provide a means for individuals, elements, and the Unified Combatant Commanders to train, maintain proficiency, collaborate, and exercise from operational environment• Aid in AEGIS Ballistic Missile Defense, Terminal High Altitude Air Defense, Ground-based Midcourse Defense, Sensors, and Fire Control standardization evaluation and certification for all BMDS personnel and ensures all crews are highly qualified to perform their mission-specific tasks by conducting exercises and wargames executed from actual equipment and networked configurations		

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C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

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<u>D. Acquisition Strategy</u> The Ballistic Missile Defense System Concurrent Test, Training, and Operations (BMDS CTTO) systems design and acquisition will follow the MDA's capability-based acquisition strategy that emphasizes assessment, phased-development, testing and evolutionary acquisition through the definition of distinct phases and two-year capability blocks. The design and development of the BMDS CTTO capability is a collaborative effort. The government is the task manager to integrate the technical effort and manage the contracting efforts. The government, using existing contract structures, will establish a BMDS CTTO Project Office, determine BMDS CTTO requirements and standardization, determine BMDS Core Protocol and Standards, upgrades, technology insertion points, and synchronize BMDS Element level activities, training exercises and events and capabilities. The long term contracting approach for BMDS CTTO will be full and open competition in the acquisition process. Led by a flag/general officer steering group, the BMDS CTTO Project Office task force will be comprised of government representative from the MDA Elements and Joint Functional Component Command for Integrated Missile Defense; defense industry partners; and Systems Engineering and Technical Assistance defense contractor(s). The intent is to develop a fully capable BMDS CTTO that provides comprehensive, in-place, geographically dispersed test, training and evaluation of the complete BMDS. The BMDS CTTO approach supports evolutionary development, continuously building upon demonstrated capabilities to advance the BMDS capabilities.		