Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507
0013/R113 Ballistic Missile Defense Interceptor Block 2010/2012	100,652	267,411	218,749	420,160	604,631	961,096	1,189,257	1,453,512
R216 Space Test Bed	0	0	0	0	44,997	149,998	247,995	229,993
0602 Program-Wide Support	14,017	12,404	10,909	24,740	27,615	26,243	31,575	34,002
Amount Included in PE 0904903D	0	0	0	0	0	0	0	-189,088
Total PE Cost Reflected in R-1	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,528,419

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. The BMDS Interceptor program element funds our next generation mobile, multi-use (boost, ascent, and midcourse phase) kinetic intercept capabilities. Our development plan exploits the synergistic attributes of basing mobility, battle space engagement flexibility, and evolutionary payload integration with a common booster to cost-effectively add layers and defense robustness to the BMDS. We are designing a single containerized interceptor round that is highly compatible with mobile land and sea platforms. Our BMDS-focused design approach fully leverages and builds upon existing and planned BMDS sensor and command control, battle management, and communication capabilities developed in other program elements. The BMDS interceptor program addresses capability objectives that are corner stones of our integrated system acquisition strategy. The program develops a kinetic boost/ascent layer as a backup to our primary boost intercept capability, the Airborne Laser. The boost/ascent phase is the engagement regime where target intercepts and observations offer the greatest defensive payoff. We will decide in FY08 whether to continue the development of the kinetic boost/ascent layer based on the performance achievements of Airborne Laser (first intercept test in 08) and Kinetic Energy Interceptor (KEI) (first booster flight test in 08). For wide-area midcourse defense against stressing complex countermeasures and asymmetric threats, we plan to integrate the common booster with our multi-use kill vehicle and advanced discrimination payloads (e.g. MKV) to flexibly augment fixed site (GMD) and legacy mobile defenses (THAAD, Aegis BMD, and PAC-3).

The BMDS interceptor program element funds the BMDS Interceptor Block 12/14 Test Bed as well as the Space Test Bed. The BMDS Interceptor Block 12/14 Test Bed includes Kinetic Energy Interceptor Development and Test (element engineering, interceptor, command and control, battle management and communications, launcher, integration and test) and the Near Field Infrared Experiment (NFIRE). Our FY05-FY08 emphasis is on component capability risk reduction and objective element engineering. The MDA has established performance-based decision points for the BMDS interceptor projects. At these decision points the MDA Director will decide whether to continue the project as planned, terminate the effort, slow down the project, or increase out-year funding in pursuit of specific Test Bed or operational capability objectives. The Agency goal is to mitigate BMDS interceptor critical risk areas prior to making full budget commitments for Block 12/14 capabilities. In addition to BMDS interceptor project execution performance, other competing BMDS investment priorities and threat evolution will dictate budget adjustments.

The Kinetic Energy Interceptor is the first BMDS element designed after we withdrew from the Anti-Ballistic Missile treaty in 2002. Our innovative design maximizes multi-use (boost, ascent, and midcourse) intercept capabilities through the integration of mature technologies in a deployable all-up round configuration compatible with both mobile land and sea basing. We rely on the BMDS responsible engineering and test organizations, the BMDS command and control, battle management and communications development organization, and multiple MDA and external agency sensor offices to assist us in the definition and implementation of Kinetic Energy Interceptor engagement sequence groups. These engagement sequence groups describe how our interceptor, mobile launcher, and fire control capabilities interface with BMDS sensor and BMDS command and control, battle management and communications capabilities to detect, track, and intercept an enemy missile in the boost, ascent, and midcourse phases of flight. Our capability value to the BMDS is greatly enhanced by a network-centric fire control design that enables the interceptor to receive fused data from a diverse suite of ballistic missile defense sensors (land, sea, and space) integrated with the Kinetic Energy Interceptor weapon through the BMDS command and control, battle management and

communications. We believe this system vice element integration construct represents the most efficient acquisition approach. We are critically dependent on our agency partners for the BMDS-level design, development, integration, and testing of kinetic intercept capabilities.

In December 2003 we awarded the Kinetic Energy Interceptor Development and Test contract to Northrop Grumman. The Northrop Grumman-MDA Kinetic Interceptor team conducted a successful Initial Baseline Review in March 2004. The team refined the Kinetic Energy Interceptor concept design in FY04 to comply with new MDA requirements in areas such as nuclear hardening, anti-tamper, and insensitive munitions. The baseline seeker design evolved from a one-color to two-color seeker design to reduce plume-to-hardbody risk and increase engagement performance in the ascent and midcourse phases. The Kinetic Energy Interceptor team worked with BMDS capability development partners to ensure that our common booster design is compatible with other high value BMDS payloads such as the multiple kill vehicle and GMD exoatmospheric kill vehicle. The FY04 concept design update fully aligns the program with the Agency's vision for the development of a mobile, multi-use intercept capability built to the highest quality, safety and mission assurance standards.

In addition to the design update, the Northrop Grumman team developed and tested key subcomponent and assembly capabilities during FY04. Our Kinetic Energy Interceptor command and control, battle management and communications team developed and evaluated real-time fire control algorithm performance with Defense Support Program (DSP) sensor data. These early tests confirmed our initial simulation predictions of Kinetic Energy Interceptor engagement timeline functionality and predicted trajectory convergence. We also developed prototype Kinetic Energy Interceptor command and control screens and conducted demonstrations to solicit feedback from the User to update our Kinetic Energy Interceptor operations concept. The interceptor team executed a thrust vector control (trapped ball) characterization test, completed multiple high burn rate propellant characterization tests, burst tested the 2nd stage rocket motor case, and enhanced the plume-to-hardbody algorithm to increase robustness against liquid target shock wave phenomenology.

The Kinetic Energy Interceptor development and test program has been restructured to focus on objective element engineering and component risk reduction. We have significantly reduced the Kinetic Energy Interceptor development and test funding in this budget request. Future funding decisions on a Block 12/14 Kinetic Energy Interceptor operational capability are explicitly tied to the outcome of FY05-FY08 development and testing of the core capabilities (booster, kill vehicle, and command and control, battle management and communications). The planned design, development and test efforts provide the capability knowledge required for a high confidence Kinetic Energy Interceptor Block 12/14 product line decision. The risk reduction tests include ten rocket motor static fires, a full scale booster flight test, a series of two-color seeker hardware-in-the-loop ground tests, a field campaign of battle management/fire control verification tests with BMDS and overhead sensor data, and canister eject tests.

During FY05-FY08 we are focused on developing and testing common capabilities that are compatible with both land and sea-based operations. We are actively working with the Navy to determine the appropriate interim sea-based platform for Kinetic Energy Interceptor integration prior to executing our long term strategy of basing KEI on the CG(X). We prefer sea-basing for the critical boost/ascent mission to mitigate the geopolitical risk of having to establish land-based sites in countries adjacent to our future adversaries. The land-based capability will complement sea-based boost/ascent and serve as the work horse for mobile midcourse defense operations. MDA and the Navy will determine the Kinetic Energy Interceptor sea-basing roadmap well in advance of the FY08 decision point we have established for the program.

MDA continues to take a disciplined approach to collecting and analyzing data to better understand the physics and phenomenology of boost/ascent targets. We participate in the BMDS measurements test program that collects relevant ICBM and space launch vehicle target of opportunity data through the use of ground, aircraft-borne and spaced-based sensors. During FY04, a joint Kinetic Energy Interceptor -Airborne Infrared Sensor team successfully collected high resolution scene data on Atlas and Minuteman launch vehicles with multiple High Altitude Observatory aircraft. The Kinetic Energy Interceptor team also worked closely with the National Sensors Integration and Rapid Prototyping project to continue the collection of overhead non-imaging infrared sensor data in support of Kinetic Energy Interceptor battle management and fire control risk mitigation. These high fidelity data products enable us to improve tracking/guidance algorithms, scene generators, and modeling and simulation tools that define Kinetic Energy Interceptor performance against the complete set of adversary capabilities. During FY 2005 and beyond we intend to conduct additional target of opportunity tests with the Responsible Test Organization.

While ground, airborne, and overhead non-imaging infrared observations have greatly increased our confidence in the interceptor's ability to acquire and track a boosting target, there remains a critical data gap. The data sets we currently have do not contain the very high resolution, near head on aspect angle phenomenology data that the terrestrial Kinetic Energy Interceptor or future space-based

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interceptor kill vehicle will encounter during endgame homing. The Near Field Infrared Experiment is built to address this specific data need. The Near Field Infrared Experiment low earth orbiting satellite provides the opportunity for multiple high resolution collections in multiple wavebands over a range of engagement geometries. The one year long experiment will collect high resolution visible and infrared imagery, integrate a space-based asset into the BMDS Test Bed, and validate the use of hyper-temporal short wave infrared sensors for early launch detection and track. Our primary objective is to collect near field visible, long, medium, and short wave infrared measurements of the rocket plume and body in the boost phase of flight to anchor our understanding of the plume phenomenology and plume to rocket body discrimination. MDA will also use this data to validate the models and simulations that are fundamental to developing the navigation, guidance and control and endgame homing algorithms for both terrestrial and space-based interceptors. MDA plans to launch the Near Field Infrared Experiment satellite in 2Q FY 2006.

The Space Test Bed project will begin in FY08. Our objective in adding a space-based interceptor layer to the BMDS is to transition our mobile terrestrial intercept capabilities to space in order to overcome the basing and geographic access limitations of our land, sea, and airborne defenses. We will build upon our terrestrial multi-use interceptor, BMDS sensor and BMDS C2BMC capabilities to achieve a cost-effective space-based layer. A limited constellation of space-based interceptors (50-100 satellites) offers thin boost/ascent defense against intercontinental ballistic missiles. The same size constellation provides multi-shot mid course defense against medium to intercontinental range ballistic missiles. Beginning in FY08, we will initiate a Space Test Bed competitive concept design phase of approximately one year. The development and test phase will start in FY09 with key milestones including multiple space-based intercept tests in Block 12/14 and a constellation production decision in Block 14. The acquisition strategy for this new project is in the early stages of development.

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

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B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	117,719	511,262	1,118,599	1,717,480
Current President's Budget (FY 2006 PB)	114,669	279,815	229,658	444,900
Total Adjustments	-3,050	-231,447	-888,941	-1,272,580
Congressional Specific Program Adjustments	0	-163,000	0	0
Congressional Undistributed Adjustments	0	-68,447	0	0
Reprogrammings	4,307	0	0	0
SBIR/STTR Transfer	-7,357	0	0	0
Adjustments to Budget Years	0	0	-888,941	-1,272,580

The BMDS Interceptor program element funding and schedule profile has changed significantly from last year's request. We have significantly reduced the FY06 budget request and out-year plans to align with FY05 congressional and Agency adjustments and in response to the MDA Director's guidance for restructuring the Kinetic Energy Interceptor Development & Test program. The restructured program defers major investments in operational Kinetic Energy Interceptor Block 12/14 capabilities until after the successful completion of development verification tests and the initial Block 12/14 design review in FY07. We are maintaining our acquisition strategy emphasis on mission assurance, systems engineering, and extensive ground and flight testing in support of knowledge-based design reviews. The funding request changes delay our delivery of the kinetic multi-use intercept capabilities to the war fighter from Block 10 to Block 12/14. The acquisition of the next generation mobile intercept capabilities (boost, ascent, midcourse) for the BMDS is an integral part of our strategy to defend the United States, allies, friends, and deployed forces. Failure to develop, test, and implement these capabilities will leave us vulnerable to the increasingly sophisticated countermeasures and tactics of future adversaries.

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COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0013/R113 Ballistic Missile Defense Interceptor Block 2010/2012	100,652	267,411	218,749	420,160	604,631	961,096	1,189,257	1,453,512
RDT&E Articles Qty	0	0	3	1	1	3	3	9

A. Mission Description and Budget Item Justification

The BMDS Interceptor Block 12/14 Test Bed project develops and tests our next generation mobile, multi-use (boost, ascent, and midcourse phase) kinetic intercept capabilities. Our development plan exploits the synergistic attributes of basing mobility, battle space engagement flexibility, and evolutionary payload integration with a common booster to cost-effectively add layers and defense robustness to the BMDS. We are designing a single containerized interceptor round that is highly compatible with mobile land and sea platforms. Our BMDS-focused design approach fully leverages and builds upon existing and planned BMDS sensor and command control, battle management, and communication capabilities developed in other program elements. The Kinetic Energy Interceptor program addresses capability objectives that are corner stones of our integrated system acquisition strategy. The program develops a kinetic boost/ascent layer as a backup to our primary boost intercept capability, the Airborne Laser. The boost/ascent phase is the engagement regime where target intercepts and observations offer the greatest defensive payoff. We will decide in FY08 whether to continue the development of the kinetic boost/ascent layer based on the performance achievements of the Airborne Laser (first intercept test in FY08) and Kinetic Energy Interceptor (first booster flight test in FY08). For wide-area midcourse defense against stressing complex countermeasures and asymmetric threats, we plan to integrate the common booster with our multi-use kill vehicle and advanced discrimination payloads (e.g. MKV) to flexibly augment legacy fixed site (GMD) and mobile defenses (THAAD, Aegis BMD, and PAC-3).

The BMDS Interceptor Block 12/14 Test Bed includes the Kinetic Energy Interceptor Development and Test program and the Near Field Infrared Experiment. We have recently implemented a performance-based decision process to incrementally determine Kinetic Energy Interceptor project investment levels. During Phase I (FY05-FY08) of this process the Kinetic Energy Interceptor program will demonstrate medium to high risk capabilities in full scale component tests. Our planned testing includes ten rocket motor static fires, an integrated tactical booster flight test, a series of kill vehicle hardware-in-the-loop tests, and a campaign of real-time battle management and fire control tests with fully integrated BMDS sensors, and BMDS command, control, battle management, and communications. We are relying on the BMDS responsible engineering and test organizations to lead the definition and BMDS Test Bed implementation of Kinetic Energy Interceptor engagement sequence groups. Based on our design, build, system integration, and test execution performance, the Director will decide on an annual basis to continue as planned, slow down, terminate, or accelerate the Kinetic Energy Interceptor program. By the end of FY08, we will have the required capability knowledge to make Block12/14 product line decisions.

The Kinetic Energy Interceptor development and test effort is comprised of element engineering, interceptor, command and control, battle management and communication, launcher, and integration and test work packages. In early FY05, the Kinetic Energy Interceptor element engineering team will complete a concept design update that incorporates MDA core standard requirements, anti-tamper technology protection features, a 2-color seeker, and expanded processing capacity for enhanced boost/ascent/midcourse defense. Our plan is to hold a Block 12/14 objective design update review in CY06 with a follow-up System Design Review in CY07. The element engineering team defines the objectives and requirements for our component development verification test to ensure maximum traceability between the risk reduction tests and the objective capability design. The element engineering team will evaluate and assess development verification test results against the objective capability specifications to develop the clear evidence that our critical risks have been mitigated. We will also use development verification test data to anchor our high fidelity component and element simulations that provide the basis for capability verification and validation across the complete performance battle space. We will incrementally deliver updated versions of the high fidelity Kinetic Energy Interceptor simulation in support of BMDS layered defense systems engineering, integrations and testing.

Our FY05-FY08 interceptor capability development and test effort includes risk reduction testing and objective design. We are reducing interceptor component risks through a series of ground and flight development verification tests. Key subcomponent demonstration areas include the kill vehicle and booster. In the kill vehicle area we will focus on seeker and propulsion development. For the seeker, we will develop and test a 2-color all-reflective prototype seeker (comprised of a 2-color focal plane array, new signal processor, and all reflective optics) to demonstrate the ability of the interceptor to acquire and track, transition from plume to hardbody, discriminate the lethal object, and select a hardbody aimpoint on boost, ascent and midcourse targets. We will manufacture a single lot of 2-color focal plane arrays demonstrating our ability to produce these devices to the quality level required to execute our mission. The prototype seeker demonstrations will use both simulated

data and data acquired from targets of opportunity and the Near Field Infrared Experiment in both open and closed loop simulation environments to demonstrate critical seeker functionality. In the area of kill vehicle propulsion, we will demonstrate the ability of the kill vehicle divert and attitude control system to support the high acceleration levels and large divert velocities required by means of divert thruster hot-fire demonstrations in FY07-08. Our team will also execute risk reduction testing of critical elements of our high performance common booster. We will conduct a comprehensive series of first and second stage static motor firings in FY05-07 to characterize the motor and thrust vector control performance in preparation for an integrated booster flight test in FY08. This flight test will validate critical aspects of the Kinetic Energy Interceptors booster design: velocity at burn out, hot staging event between the first and second stage, operation of the boost vehicle in a high dynamic pressure environment, and a flight test characterization of the first and second stage thrust vector control systems.

We will directly leverage the kill vehicle and booster risk reduction test results to engineer a robust Block 12/14 multi-use interceptor capability that is producible with high mission assurance. During FY05-08, we will perform a comprehensive set of objective interceptor trades to produce detailed component requirements and designs. Following this interceptor component engineering activity and the MDA investment decisions, we will test the interceptor in an increasingly more complex series of tests leading to element-level intercept flight testing. The robust series of ground tests includes multiple static fire tests of all three rocket motor stages and integrated kill vehicle hover testing as well as a an additional booster flight test, a partial full scale flight test and a control test vehicle flight test. The Kinetic Energy Interceptor program will culminate with a series of seven intercept flight tests from land and sea-based platforms against threat representative targets.

The Kinetic Energy Interceptor is designed as a common land/sea all-up round. The interceptor dimensions and safety features such as a gas eject launch make it compatible with both surface combatants (cruisers and destroyers) and submarines. To support a seamless sea basing transition we will begin concept design and risk reduction of a solid, throttleable divert and attitude control system for the kill vehicle starting in FY05. In FY05-08 we will focus efforts on identifying, producing and demonstrating high risk items associated with the throttleable divert and attitude control system concept. Following the FY08 decisions, we will initiate full-scale development and test of the throttleable divert and attitude control system. This will include design verification and interceptor integration testing to allow easy insertion into a sea basing capability.

Our primary Kinetic Energy Interceptor command control, battle management, and communication objective for the next four years is to design, develop, build and demonstrate a fielded prototype capability in a near operational configuration. This operational prototype will serve as a host for a series of battle management and fire control demonstrations during FY 05-08. We will begin incremental field testing of Kinetic Energy Interceptor engagement sequence groups starting in the fourth quarter of FY05. Our focus is on testing mission critical software and interfaces to include the following: message transfer mechanisms to and from the BMDS common network interface processor interface to include connectivity to a forward-based radar; ability to process a real-time direct downlink of defense support program (DSP) satellite data with objective system hardware and software; ability to process real-time data fusion of forward-based radar data with overhead non-imaging infrared data; and the ability to process real-time data fusion of multiple sources of overhead non-imaging infrared data. The command and control, battle management and communication team will conduct a FY05-FY08 campaign of target of opportunity tests against threat-representative targets and space vehicle launches to verify and validate the Kinetic Energy Interceptor engagement timeline, engagement planning, target typing, and predicted interceptor point capabilities. Additionally, we will build and test our in-flight communication transmit and receive phased-array antenna panel. In parallel with command, control, battle management, and communication component testing, we will engineer and design the Block 12/14 objective capability and conduct a series of design reviews.

For the launcher component, we are planning in FY05-FY08 to design, build and test a demonstration model canister. The demonstration model canister is common to both land and sea based launchers. In FY07, we will static fire the gas generator used to safely eject the kinetic energy interceptor from the canister at land or sea. In FY08 we will mate the gas generator with the interceptor, integrate an interceptor test unit into the demonstration model canister and conduct a full scale canister ejection test. This eject test provides us key interceptor launch loads and environmental data for Block 12/14 interceptor and canister design refinements. We will generate objective Block 12/14 designs for both land and sea-based launchers. The sea-based design will begin after an interim sea-based platform is selected by MDA and the Navy.

Our Kinetic Energy Interceptor element integration and test team plans are to 1) support the Kinetic Energy Interceptors FY05-FY08 component development verification test program execution, 2) conduct supporting long-lead activities to execute a robust intercept flight test program beginning in FY10, and 3) continue activities to facilitate a seamless transition of the Kinetic Energy Interceptors capability from land to sea. In FY04 we established (in coordination with the Responsible Test Organization) early interfaces with the test ranges and initiated test planning and range safety coordination. Our team is proactively working the BMDS Responsible Test Organization and test ranges to establish kinetic boost/ascent test concept of operations where all unique debris and

safety issues are evaluated and mitigated well in advance of our FY10 intercept testing dates. In the area of User interfaces, we worked with the MDA Force Integration and Deployment team to solicit early user inputs on the Kinetic Energy Interceptors design and concepts of operation. This included a series of interface meetings with the Army, Strategic Command (STRATCOM), and the Navy. In FY04 we completed phase one of a concept of operations study commissioned by MDA and conducted by the Navy to determine the feasibility of utilizing an Aegis cruiser or submarine for the Kinetic Energy Interceptor boost/ascent mission.

In FY05-FY08 the element integration and test team will develop (with the BMDS Responsible Engineering and Test Organizations) Kinetic Energy Interceptor test, verification, validation, and accreditation plans. Our test, validation, verification and accreditation plans will encompass all simulation, ground, and flight tests. We have already put in place contract provisions to deliver our high fidelity element simulation to both the Responsible Engineering Organization and Responsible Test Organization in support of BMDS integration and testing. We will deliver a Kinetic Energy Interceptors development master test plan to the Responsible Test Organization at each of our major design reviews. Our element integration and test team will coordinate and iterate Kinetic Energy Interceptors test strategies with the Responsible Test Organization to maximize the value of each test event based on BMDS objectives. The test team will conduct and coordinate all environmental analysis activities for the Kinetic Energy Interceptors program. We will continue to participate in war game exercises such as Nimble Titan that are essential to demonstrating the Kinetic Energy Interceptors mission capability in a layered BMDS within the context of offensive-defensive operations. War games provide us valuable feedback for both technical design and operations concept development. In FY05, we will choose a site for the Kinetic Energy Interceptors system integration facility, the element integration facility and the system integration lab. Our plan is for the Kinetic Energy Interceptors system integration lab to be operational in FY08. We will continue our active coordination with OSD DOT&E and the Responsible Test Organization in refining and implementing the Kinetic Energy Interceptor live fire test and evaluation strategy. Our safety experts will engage the Navy through the Weapon Systems Explosive Safety Review Board to define an executable roadmap for sea-based integration of the Kinetic Energy Interceptors capability.

MDA is executing the Near Field Infrared Experiment to mitigate endgame homing and guidance risk for both terrestrial (Kinetic Energy Interceptor) and future space-based boost phase interceptors. While several previous experiments have increased our confidence in the interceptor's ability to acquire and track a boosting target, the purpose of this experiment is to enhance the quantity and quality of high resolution phenomenology data. The Near Field Infrared Experiment is a low earth orbiting satellite that will provide the opportunity for multiple data collections in multiple wavebands over a range of engagement geometries. The primary objective of this effort is to collect near field visible and long, medium and short wave infrared measurements of the rocket plume and body in the boost phase of flight to anchor our understanding of the plume phenomenology and plume to rocket body discrimination. MDA will use this data to validate the models and simulations that are fundamental to developing the navigation, guidance and control and endgame homing algorithms for terrestrial and space-based interceptors. The complete set of objectives for the experiment include the collection of visible and infrared imagery, early integration of a space-based asset into the BMDS Test Bed, and hyper-temporal short wave infrared and visible data collection for early launch detect and track capability validation. The MDA held a Near Field Infrared Experiment continuation review in summer 2004 that accepted the recommendation of an Independent Review Team to remove the kill vehicle payload. The Independent Review Team determined that the removal of the kill vehicle payload would significantly reduce the program cost and schedule risk while still meeting the primary experiment objectives.

Over the one-year lifetime of the Near Field Infrared satellite, we will execute three mission types. During Mission 1 - Target of Opportunities - the satellite views non- dedicated targets, allowing collection opportunities of varying target types at distances of 100-1000 kilometers. These might include aircraft flights, space launches and operational missile tests. During Mission 2 - dedicated target fly-bys - the Near Field Infrared Experiment satellite views dedicated boosting targets from ranges of less than ten kilometers. To ensure successful collection of the sub-meter resolution near field infrared (IR) data, the Near Field Infrared Experiment will conduct two of these dedicated target missions. During Mission 4 - ground observations - the satellite tracks ground targets such as forest fires, volcanoes, and static tests of rocket engines. This mission will verify the pointing accuracy of the gimbaled system and calibrate the tracking sensors.

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B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Element Engineering	27,694	55,977	48,603	87,985
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Conducted contract Integrated Baseline Review
- Updated KEI concept design to incorporate new core standards, anti-tamper, and insensitive munition requirements
- Delivered KEI Simulation version 1.0
- Completed Draft KEI-BMDS Interface Control Document
- Conducted series of Land-Based KEI Concept of Operation reviews with Army
- Conducted NFIRE independent and continuation reviews
- Initiated Restructure of KEI Program to support MDA Decision Points

FY 2005 Planned Accomplishments:

- Modify KEI contract to account for program restructure and new requirements
- Conduct KEI Block 12/14 concept baseline design review
- Generate component development verification test (DVT) objectives and requirements
- Release updated element capability specification (ECS)
- Complete Ascent/Midcourse Phase performance Assessment #1
- Assess engineering manufacturing and software readiness levels across the KEI Element
- Update KEI Element risk assessment and mitigation plans
- Demonstrate through simulation KEI multi-use capability augmentation of BMDS
- Deliver KEI Simulation version 1.1 (concept design update)
- Conduct User Concept of Operation Table Top exercises
- Generate KEI concept description document in collaboration with Responsible Engineering Organization
- Define KEI Engagement Sequence Groups with Responsible Engineering Organization
- Generate KEI inputs to BMDS Master Integration Plan
- Deliver KEI basing report to Congress

FY 2006 Planned Program:

- Conduct KEI Block 12/14 baseline update review
- Continue assessment of engineering manufacturing and software readiness levels

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- Update KEI Element risk assessment and mitigation plans
- Complete Ascent/Midcourse Phase Performance Assessment #2
- Demonstrate through simulation KEI multi-use capability augmentation of BMDS
- Deliver KEI Simulation version 2.0
- Conduct User Concept of Operation Table Top exercises
- Update KEI Engagement Sequence Group definitions
- Update KEI inputs to BMDS Master Integration Plan

FY 2007 Planned Program:

- Conduct KEI Block 12/14 System Design Review (SDR)
- Generate KEI Test Bed Description Document with Responsible Engineering Organization
- Continue assessment of engineering manufacturing and software readiness levels
- Update KEI element risk assessment and mitigation progress
- Demonstrate through simulation KEI multi-use capability augmentation of BMDS
- Deliver KEI Simulation version 3.0
- Release updated Block 12/14 Element Capability Spec
- Develop KEI capability verification and assessment report with Responsible Engineering Organization /Responsible Testing Organization

	FY 2004	FY 2005	FY 2006	FY 2007
Interceptor	18,496	113,557	120,643	244,520
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Burst-tested a demonstration second stage rocket motor case
- Executed 2nd stage rocket motor thrust vector control nozzle (trapped ball) characterization test
- Matured the Interceptor mass properties baseline
- Refined and matured the booster Attitude Control System requirements and margin assessments
- Released and evaluated the 2nd and 3rd stage attitude control system proposals (Liquid and Solid)
- Enhanced Plume-To-Hard Body Algorithm vs. Liquid Target Shock Wave Phenomenology
- Performed initial Modeling and Analysis on 1st and 2nd Stage separation dynamics
- Executed high burn rate propellant characterization tests
- Developed plans for increasing Focal Plane Array production yield
- Matured requirements for staging concept development
- Optimized stage designs and splits (physical size, burn duration, and thrust profiles)

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APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

- Conducted Sea-Based Commonality/Compatibility evaluation of Land-Based Boost/Ascent Concept
- Executed interceptor configuration trade studies to incorporate additional requirements and capability
- Conducted an Interceptor Integrated Baseline Review
- Conducted Interceptor Supplier Workshops Completed initial versions of key Interceptor specifications and plans
- Conducted an Executive System Engineering Interceptor Peer Review

FY 2005 Planned Accomplishment:

- Develop objectives and requirements for booster flight
- Conduct boost flight requirements review
- Execute initial booster flight wind tunnel tests and conduct computational fluid dynamics analyses
- Conduct static firing of stage 2 rocket motor
- Perform first and second stage propellant characterization tests
- Develop requirements specification for 2-color seeker focal plane array
- Develop initial booster requirements and interface specifications

FY 2006 Planned Program:

- Execute final booster flight wind tunnel tests
- Conduct bench testing of thrust vector control actuators
- Continue static firings of rocket stages
- Complete 2-color sensor requirements
- Develop kill vehicle signal processor hardware
- Develop the Interceptor Component level simulation requirements and architecture
- Develop Software architecture, requirements analysis, and establish development tools

FY 2007 Planned Program:

- Conduct booster flight Preliminary Design Review
- Conduct booster flight Critical Design Review
- Conduct plume-to-hardbody and tracking algorithm evaluation tests with live fire and simulated data
- Perform ground testing of the boost flight avionics
- Update models incorporating Development Verification and Testing early results into KEI Simulation to update Element performance
- Conduct hot firing of kill vehicle divert thruster
- Execute hot fire testing of the second stage attitude control system
- Conduct Interceptor System Design Review
- Prototype key algorithms and develop software specifications
- Support mission planning, mission profile, and mission analysis

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

- Complete initial safety, reliability, maintainability, security, and testability analyses
- Establish Interceptor 6 Degrees of Freedom simulation capability
- Develop Integration Validation & Verification plans

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC	10,591	23,440	24,690	49,947
RDT&E Articles (Quantity)	0	0	0	1

FY 2004 Accomplishments:

- Developed interface requirements between KEI element and BMDS Command and Control, Battle Management and Communications
- Conducted Algorithm/Timeline Demonstration
- Conducted Human Machine Interface (HMI) Demonstration to obtain user feedback
- Evaluated Contribution of other Overhead Non-imaging Infrared Sensors to KEI boost/ascent element
- Conducted Anti-Jamming and nuclear hardening study for KEI Command and Control, Battle Management and Communications
- Established KEI Command and Control, Battle Management and Communications software development environments

FY 2005 Planned Accomplishment:

- Conduct Direct Downlink Experiment (Lab)
- Conduct KEI Command and Control, Battle Management and Communications Demo Requirements Review for Pathfinder Shelter
- Update interface requirements between KEI and BMDS Command and Control, Battle Management and Communications
- Build Pathfinder Shelter with Direct Downlink Capability
- Demonstrate BMDS Command and Control, Battle Management and Communications Network Integration Processor (CNIP) connectivity to KEI Command and Control, Battle Management and Communications Lab using a message generator
- Demonstrate Continental US (CONUS) KEI data fusion processing
- Complete Design of radar interface to Pathfinder Shelter

FY 2006 Planned Program:

- Demonstrate Forward-Based Radar Interface and fusion of radar/IR data in Pathfinder Shelter
- Demonstrate Continental US (CONUS) KEI data fusion processing through BMDC CNIP to Pathfinder Shelter
- Complete communications waveform study
- Demonstrate KEI In-flight Communications (KICS) Antenna Panels in Lab Environment
- Complete design of KEI In-flight Communications (KICS) Antenna Panels for Pathfinder Shelter
- Update interface requirements between KEI and BMDS Command and Control, Battle Management and Communications components

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

FY 2007 Planned Program:

RDT&E Article: 1 C2BMC Operational Prototype

- Establish KEI Command and Control, Battle Management and Communications integration lab
- Integrate and demonstrate KEI In-flight Communications (KICS) Antenna Panels and Controller in KEI Pathfinder Shelter
- Complete design and demonstrate key KEI In-flight Communications (KICS) components in Lab Environment Test waveforms in lab environment
- Initiate Hardware/Software procurement for System Integration Lab and System Integration Facility integration
- Update interface requirements between KEI multi-use element and BMDS Command and Control, Battle Management and Communications
- Conduct KEI Command and Control, Battle Management and Communication System Design Review
- Deliver C2BMC Operational Prototype

	FY 2004	FY 2005	FY 2006	FY 2007
Launcher	3,039	3,510	6,309	19,023
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Generated launcher development plans and schedules
- Conducted launcher trade studies
- Developed initial launcher development verification test plans
- Define Launcher functional and physical interface requirements

FY 2005 Planned Accomplishments:

- Develop Development Model Canister Specification
- Define Development Model Canister functional and physical interfaces - Support Canister Initial Design Review (IDR)
- Conduct engineering and design activities in support of DMC baseline design
- Conduct Development Model Canister Intermediate Design Reviews

FY 2006 Planned Program:

- Conduct Development Model Canister Final Design Reviews
- Manufacture Development Model Canister to support Canister Development Verification Test
- Manufacture test support equipment to support Canister Development Verification Test
- Conduct Ejection Gas Generator Static Firing Test

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

- Define Development Model Launcher functional and physical interfaces
- Develop Launcher simulation models (Trans/Mobility Model, Launch Dynamics Model)

FY 2007 Planned Program:

- Conduct Launcher System Design review (land and sea)
- Conduct requirement, interface, and baseline development analysis and trade studies
- Conduct engineering and design activities in support of Development Model Launcher baseline (DML) design
- Develop Model Launcher Specification
- Conduct engineering and design activities in support of DML detailed design
- Conduct Canister Ejection Development Verification Test

	FY 2004	FY 2005	FY 2006	FY 2007
Integration and Test	3,200	2,927	4,798	7,911
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Initiated range and range safety planning and coordination with Pt. Mugu and Vandenberg Air Force Base
- Provided program introduction document to ranges 90 days after contract award
- Developed commercial support agreements with ranges
- Conducted user working group meetings
- Developed draft KEI Concept of Operations
- Developed initial facility requirements
- Began analyzing sites for System Integration Facility (SIF) and Element Integration Facility (EIF) development
- Developed draft Target System Requirements Document (TSRD)
- Participated in Nimble Titan Wargame
- Completed Navy Boost/Ascent Concept of Operations Study
- Initiated coordination with the Navy on design, integration and safety issues

FY 2005 Planned Accomplishments:

- Publish Developmental Master Test Plan (DMTP)
- Continue range and range safety planning and coordination
- Continue User Working Group Meetings
- Select site for facility modifications for System Integration Facility (SIF) and Element Integration Facility (EIF)

- Participate in Nimble Titan Wargame
- Publish Validation Verification & Analysis Plan
- Conduct Navy/KEI Midcourse Concept of Operations Study

FY 2006 Planned Program:

- Update Developmental Master Test Plan (DMTP)
- Participate in War Game Exercises Continue range and range safety planning and coordination
- Initiate Environmental Analysis documentation
- Publish Target System Requirements Letter
- Update Validation Verification & Analysis Plan
- Continue User Working Group Meetings
- Initiate requirements analysis on System Integration Lab (SIL)
- Initiate requirements analysis on System Integration Facility (SIF)
- Initiate requirements analysis on Element Integration Facility (EIF)
- Continue coordination with the Navy on design, integration and safety issues

FY 2007 Planned Program:

- Update Developmental Master Test Plan (DMTP)
- Participate in War Game Exercises
- Continue range and range safety planning and coordination
- Update Environmental Analysis documentation
- Update Target System Requirements Letter
- Update Developmental Master Test Plan
- Continue User Working Group Meetings
- Complete SIL, SIF, EIF Requirements and Design
- Update Validation & Verification Plan
- Update Target System Requirements Document
- Continue coordination with the Navy on design, integration and safety issues

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

	FY 2004	FY 2005	FY 2006	FY 2007
NFIRE	37,632	68,000	13,706	10,774
RDT&E Articles (Quantity)	0	0	3	0

FY 2004 Accomplishments:

- Initiated assembly, Integration and ground testing of Multi Spectral Tracking Sensor Payload
- Ground Tested Hover Kill Vehicle
- Initiated Flight Kill Vehicle assemble and integration
- Initiated assembly, integration and ground testing Spacecraft bus
- Began development of Ground Segment Mission Operations Center
- Initiated procurement for two (2) Multi Stage Boost Targets
- Initiated integration and Test of the Multi-Spectral Tracking Sensor Payload

FY 2005 Planned Accomplishments:

- Complete Calibration of the Multi-Spectral Tracking Sensor Payload
- Complete and Deliver the Multi-Spectral Tracking Sensor Payload
- Complete Space Vehicle Environmental Test
- Complete Space Vehicle Integration and Acceptance Test
- Certify Ground Segment Launch Site Readiness
- Complete ground test of flight software
- Complete Ground Segment Mission Operations Center
- Conduct Near Field Infrared Experiment Mission Training
- Conduct Near Field Infrared Experiment Mission Rehearsals
- Complete procurement of Near Field Infrared Experiment targets

FY 2006 Planned Program:

RDT&E Articles: 1 NFIRE Experiment Satellite; 2 Multi-Stage Boost Target

- Complete delivery and acceptance of Launch Vehicle
- Launch Near Field Infrared Experiment Satellite
- Conduct Initial On-Orbit Operations
- Conduct On-Orbit Calibration
- Conduct Near Field Infrared Experiment Mission 1 - Target of Opportunity

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

- Accept delivery of Two Multi-Stage Boost Target
- Conduct first of two Near Field Infrared Experiment Mission 2 , Near Field Boosting Target Fly By

FY 2007 Planned Program:

- Conduct Near Field Infrared Experiment Mission 4, Ground based Hyper Temporal Experiment
- Conduct Near Field Infrared Experiment Mission 1 – Target of Opportunity

	FY 2004	FY 2005	FY 2006	FY 2007
Program Management & Engineering	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: Project 0013 Ballistic Missile Defense Interceptor Block 2010 has been combined with Project R113 Ballistic Missile Defense Interceptor Block 2012. All Program Management and Engineering FY04 accomplishments are described within the components of Project R113 (Government SE/PM and Contractor SE/PM).

	FY 2004	FY 2005	FY 2006	FY 2007
Experimentation & Test	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: Project 0013 Ballistic Missile Defense Interceptor Block 2010 has been combined with Project R113 Ballistic Missile Defense Interceptor Block 2012. All Experimentation and Test FY04 accomplishments are described within the components of Project R113 (Near Field Infrared Experiment).

	FY 2004	FY 2005	FY 2006	FY 2007
Land Based	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: Project 0013 Ballistic Missile Defense Interceptor Block 2010 has been combined with Project R113 Ballistic Missile Defense Interceptor Block 2012. All Land Based FY04 accomplishments are described within the components of Project R113 (Interceptor, Command and Control, Battle Management and Communications, Launcher and Integration and Test).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

D. Acquisition Strategy

KEI's development and test (D&T) acquisition strategy focuses on developing multi-use kinetic energy capabilities in support of multiple basing modes (land, sea, and space). A feature distinguishing this acquisition is our early emphasis on full scale risk mitigation testing and engineering, manufacturing, and software readiness as an integral part of the design process. Our contractor team will design, build and test operationally traceable interceptor, Command and Control, Battle Management and Communication, and launcher capabilities in realistic test environments prior to the initial Block 12/14 design review in FY07. The FY05-08 development verification test (DVT) results mitigate critical program risks, and provide the agency very detailed design, performance, and programmatic knowledge to support the Block 12/14 investment decisions. This strategy also implements early proofing of critical manufacturing processes as an integral part of the design process. The payoff for these upfront program investments in systems engineering, full scale risk reduction testing, and manufacturing process development is reduced redesign and retest, fewer test failures as well as lowered manufacturing cost. The strategy has event-based knowledge points using Engineering and Manufacturing Readiness Levels (EMRL) and Software Readiness Levels (SWRL) as maturity and risk indicators for proceeding forward with detailed design, building flight hardware and having a production off-ramp. The KEI Development & Test strategy response to recent budget reductions is to maintain our event-based knowledge points and allow the event completion dates to slip. This is the basis for the program restructure from Block 10 to Block 12/14.

To implement the KEI Development & Test strategy we competitively picked a single contractor team who offered the best balance of mission assurance confidence, technological maturity, mission capability (system performance), managerial and technical team performance and price. That contractor also offered us a competitive price commitment for the hardware we will buy as well as a firm fixed price, 10 year warranty covering virtually any reliability failure or performance shortfall relative to the performance specification. The early commitment to a production price and warranty conditions are integral to our strategy. These give the contractor a huge monetary incentive to promise only what he is certain he can deliver, to design in features that enhance reliability and lower production cost and to have a robust ground test program to uncover any systemic issues before flight test.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Interceptor										
Interceptor	C/CPAF	Northrop Grumman	0	112,357	1Q	118,491	1Q	242,368	1Q	473,216
SDACS	Various	Various	0	1,200	1Q	2,152	1Q	2,152	1Q	5,504
C2BMC										
C2BMC	C/CPAF	Northrop Grumman	0	21,424	1Q	23,076	1Q	48,333	1Q	92,833
GFE	C/CPAF	Northrop Grumman	0	2,016	1Q	1,614	1Q	1,614	1Q	5,244
Launcher										
Launcher	C/CPAF	Northrop Grumman	0	3,510	1Q	6,309	1Q	19,023	1Q	28,842
Integration and Test										
Integration & Test	C/CPAF	Northrop Grumman	0	2,627	1Q	2,829	1Q	5,926	1Q	11,382
Live Fire	MIPR	Sandia National Lab	0	300	1Q	1,076	1Q	1,076	1Q	2,452
Test Planning & Execution	MIPR	ABL	0	0	1Q	893	1Q	909	1Q	1,802
NFIRE										
Spacecraft	C/CPAF	Spectrum Astro	0	13,279	1/2Q	4,386	1/2Q	3,454	1/2Q	21,119
Tracking Payload	Various	AFRL	0	3,625	1/2Q	1,375	1/2Q	1,000	1/2Q	6,000
Launch Vehicle	Various	SMC Det 12	0	11,573	1/2Q	0	N/A	0	N/A	11,573
Targets	Various	SMC Det 12	0	27,667	1/2Q	0	N/A	0	N/A	27,667
Secure Communications	MIPR	Com Sec Gear	0	500	1/2Q	0	N/A	0	N/A	500
Science Team	MIPR	Aerospace & MIT/LL	0	946	1Q	917	1Q	1,000	1Q	2,863
Mission Operations	Various	JNIC	0	9,779	1/2Q	6,534	1/2Q	5,320	1/2Q	21,633
Program Introduction	MIPR	VAFB	0	0	N/A	145	N/A	0	N/A	145
Calibration & Analysis	MIPR	AEDC	0	631	1Q	0	N/A	0	N/A	631

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Military Ops	MIPR	National Guard Flight	0	0	N/A	299	1Q	0	N/A	299
Spacecraft Shipping	MIPR	National Guard Flight	0	0	N/A	50	1Q	0	N/A	50
Land Based										
Capability Development	C/FFP	Northrop Grumman	56,508	0	N/A	0	N/A	0	N/A	56,508
MDA Service Systems Engineering	Various	Various	2	0		0		0		2
Subtotal Product Development			56,510	211,434		170,146		332,175		770,265

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Element Engineering										
Engineering Technical Support	MIPR	NSWC/DD	0	600	1Q	0	N/A	0	N/A	600
Engineering Technical Support	MIPR	Various	0	6,590	N/A	1,038	1Q	1,347	1Q	8,975
Civilian Salaries	Various		0	1,201	1Q	1,201	1Q	1,201	1Q	3,603
SETA	C/FFP	MEI	0	6,210	1Q	0	N/A	0	N/A	6,210
SETA	C/FFP	SPARTA	0	275	1Q	0	N/A	0	N/A	275
SETA	C/FFP	Various	0	0	N/A	6,421	1Q	6,421	1Q	12,842
Government Travel	Various	Various	0	258	2Q	1,351	2Q	351	2Q	1,960
KEI BMDS Interfaces	Various	SMDC	0	2,500	1Q	0	N/A	0	N/A	2,500
KEI BMDS Interfaces	Various	Various	0	4,628	1Q	2,959	2Q	4,035	1Q	11,622
SETA	C/FFP	Paradigm	0	334	1Q	0	N/A	0	N/A	334

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Contractor Element Engineering	C/CPAF	Northrop Grumman	0	33,081	1Q	35,633	1Q	74,630	1Q	143,344
KEI BMDS Interfaces	MIPR	NSWC/DD	0	300	1Q	0	N/A	0	N/A	300
Program Management & Engineering										
SETA	C/FFP	MEI	3,929	0	N/A	0	N/A	0	N/A	3,929
SETA	C/FFP	PENTA	300	0	N/A	0	N/A	0	N/A	300
SETA	C/FFP	SPARTA, Inc/ Arlington, VA	250	0	N/A	0	N/A	0	N/A	250
Engineering & Technical Spt	MIPR	NSWC/DD/ Dahlgren, MD	665	0	N/A	0	N/A	0	N/A	665
Engineering & Technical Spt	MIPR	NSWC/PHD	250	0	N/A	0	N/A	0	N/A	250
Engineering & Technical Support	MIPR	Sandia National Lab	50	0	N/A	0	N/A	0	N/A	50
Engineering & Technical Support	MIPR	THAAD	1	0	N/A	0	N/A	0	N/A	1
Engineering & Technical Support	MIPR	USAADACENSB	1	0	N/A	0	N/A	0	N/A	1
IMP/IMS Replan	Various	MDA/MP	15	0	N/A	0	N/A	0	N/A	15
Subtotal Support Costs			5,461	55,977		48,603		87,985		198,026

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Experimentation & Test										
Experimentation & Test-NFIRE	C/CPAF	Spectrum Astro	12,607	0	N/A	0	N/A	0	N/A	12,607

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Experimentation & Test - NFIRE	Various	PMS422/Raytheon	10,764	0	N/A	0	N/A	0	N/A	10,764
Experimentation Test -NFIRE	Various	AFRL/SAIC	7,158	0	N/A	0	N/A	0	N/A	7,158
Experimentation Test -NFIRE	Various	SMC Det 12	4,347	0	N/A	0	N/A	0	N/A	4,347
Experimentation & Test - NFIRE	MIPR	ComSec Gear	496	0	N/A	0	N/A	0	N/A	496
Experimentation & Test - NFIRE	MIPR	Aerospace	200	0	N/A	0	N/A	0	N/A	200
Experimentation & Test - NFIRE	Various	JNIC Mission Operations	2,070	0	N/A	0	N/A	0	N/A	2,070
Experimentation & Test	MIPR	AEDC	179	0	N/A	0	N/A	0	N/A	179
Experimentation & Test	Various	JCTE	350	0	N/A	0	N/A	0	N/A	350
Experimentation & Test	Various	VAFB	10	0	N/A	0	N/A	0	N/A	10
Subtotal Test and Evaluation			38,181	0		0		0		38,181

Remarks

IV. Management Services Cost ($ in Thousands)

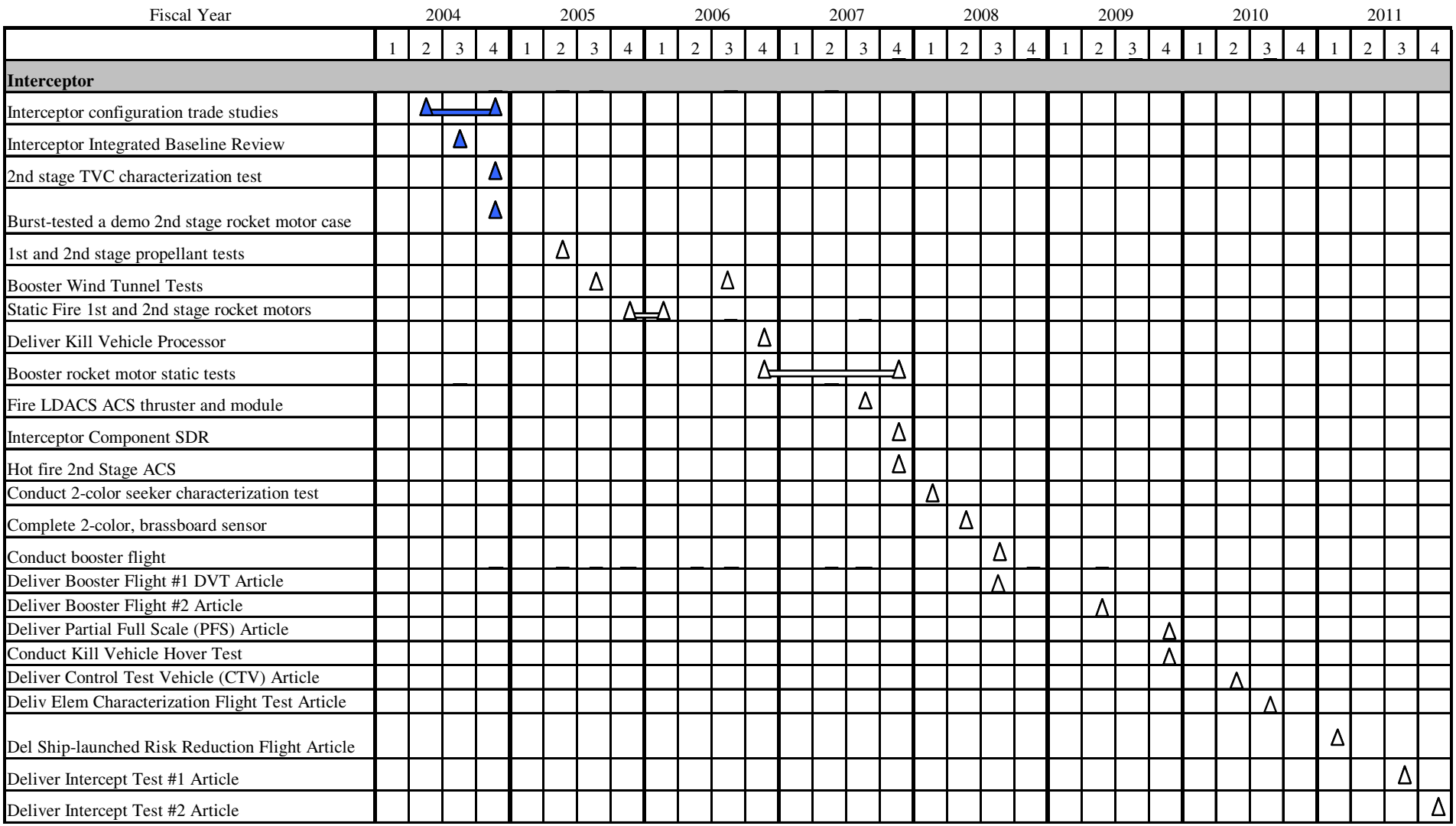
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Experimentation & Test										
FFRDC/National Laboratory	MIPR	MIT/LL	500	0	N/A	0	N/A	0	N/A	500
Subtotal Management Services			500	0		0		0		500

Remarks

Project Total Cost			100,652	267,411		218,749		420,160		1,006,972

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**



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

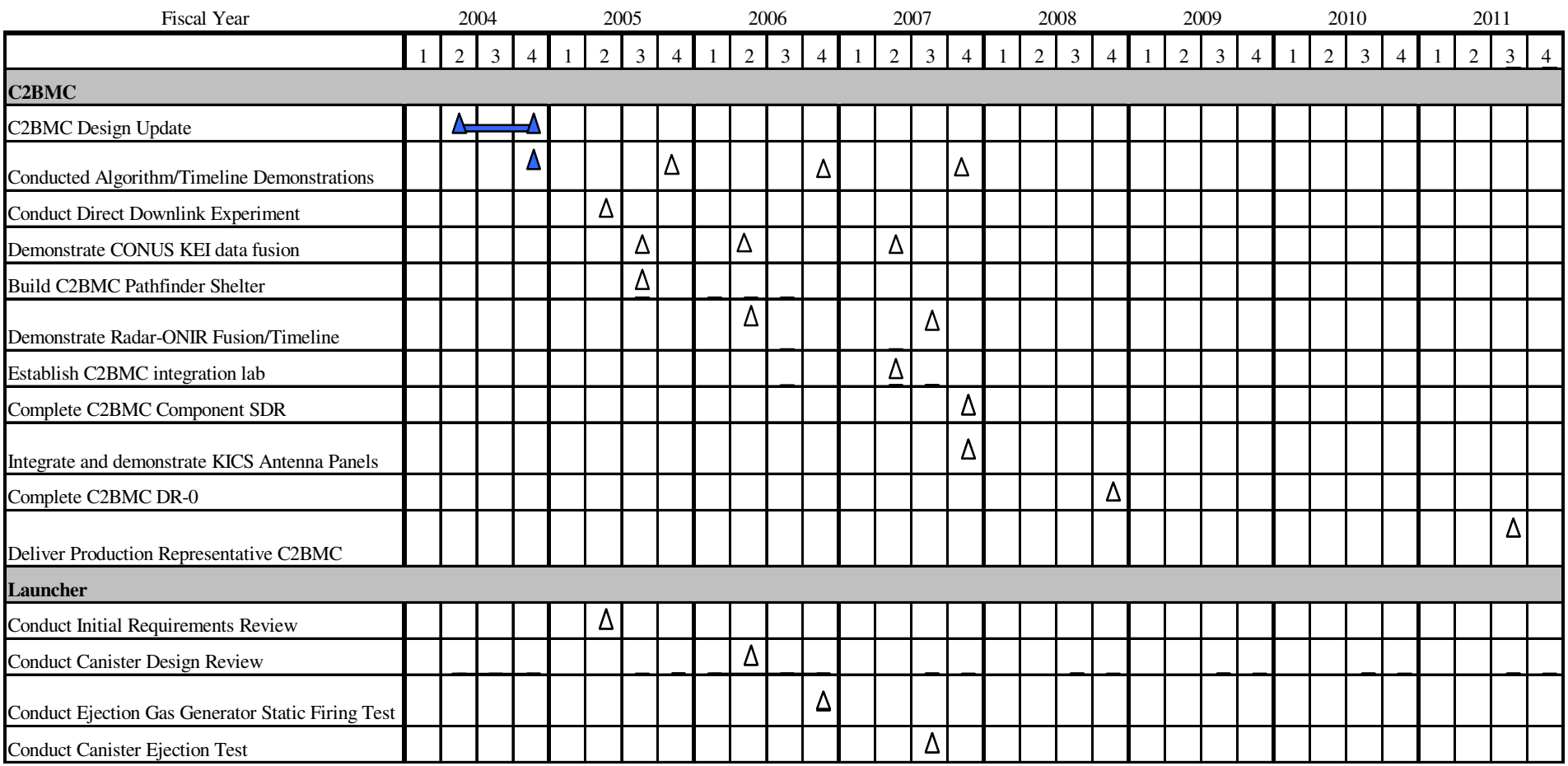
Date
February 2005

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

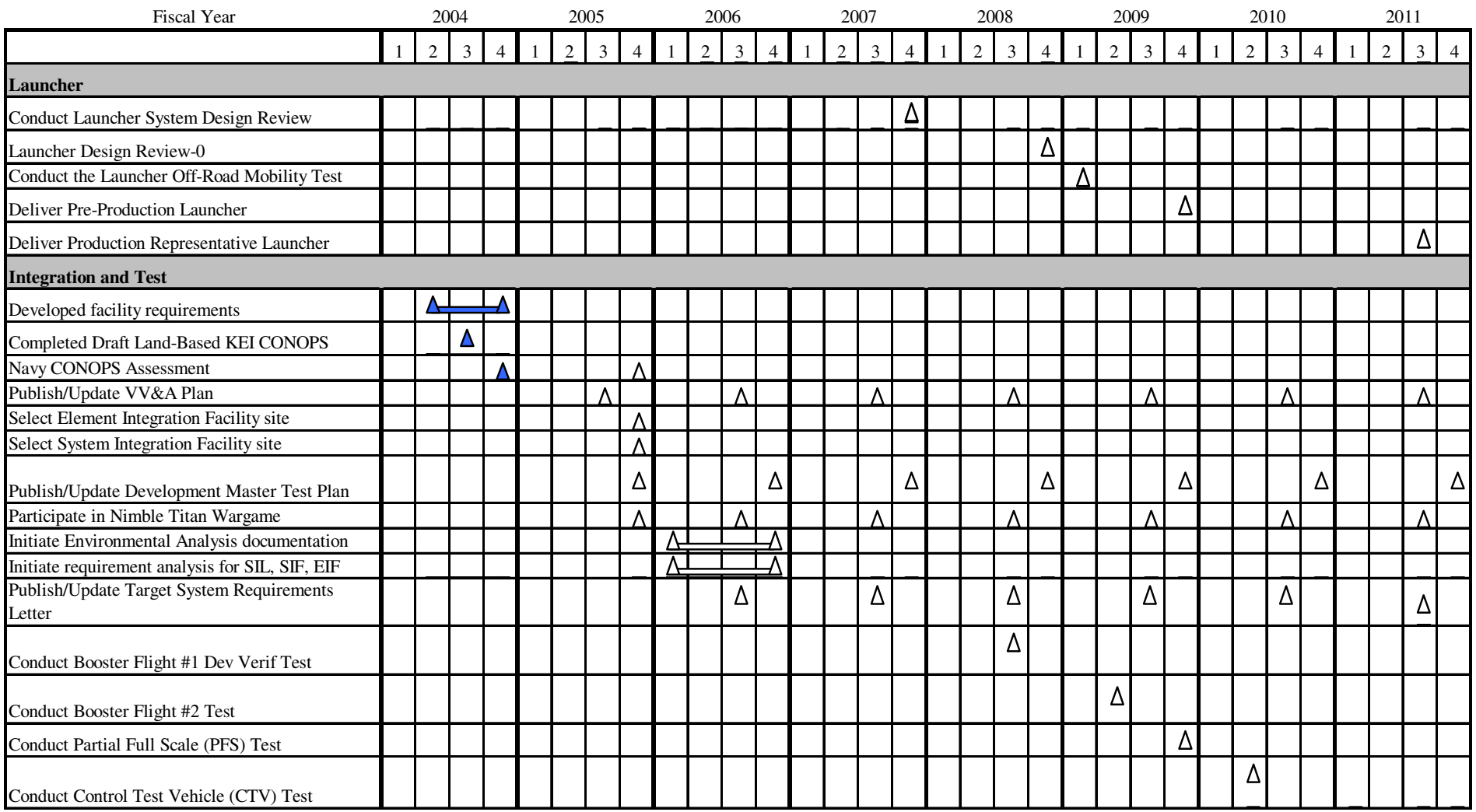
R-1 NOMENCLATURE
0603886C Ballistic Missile Defense System Interceptors

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Element Engineering																																
Award D&T contract to SE&I contractor	△																															
KEI IBR		△																														
Element Design Update		△	—	△																												
KEI Block 12 concept baseline update reviews						△					△																					
DVT objectives and requirements						△																										
Deliver Report to Congress on KEI Basing						△																										
Deliver KEISIM version 1.1							△																									
Define KEI Engagement Sequence Groups							△																									
Ascent Capability Performance Assessment - 1								△																								
Simulate KEI capability augmentation of BMDS								△				△				△																
KEI inputs to BMDS Master Integration Plan								△			△				△																	
Conduct User CONOPS Table Top exercises		—	—			—		△			—																					
Ascent Capability Performance Assessment - 2												△																				
Deliver KEISIM version 2.0												△																				
KEI Test Bed Description Document with REO				—		—	—	—			—	—		—	△	—				—			—				—					
Conduct KEI Block 12 System Design Review															△	—																
Deliver KEISIM version 3.0																△																
Complete DR-0 Data Package generation																				△												
Complete DR-1 Data Package Generation																							△									
Complete DR-2 Data Package Generation																											△					

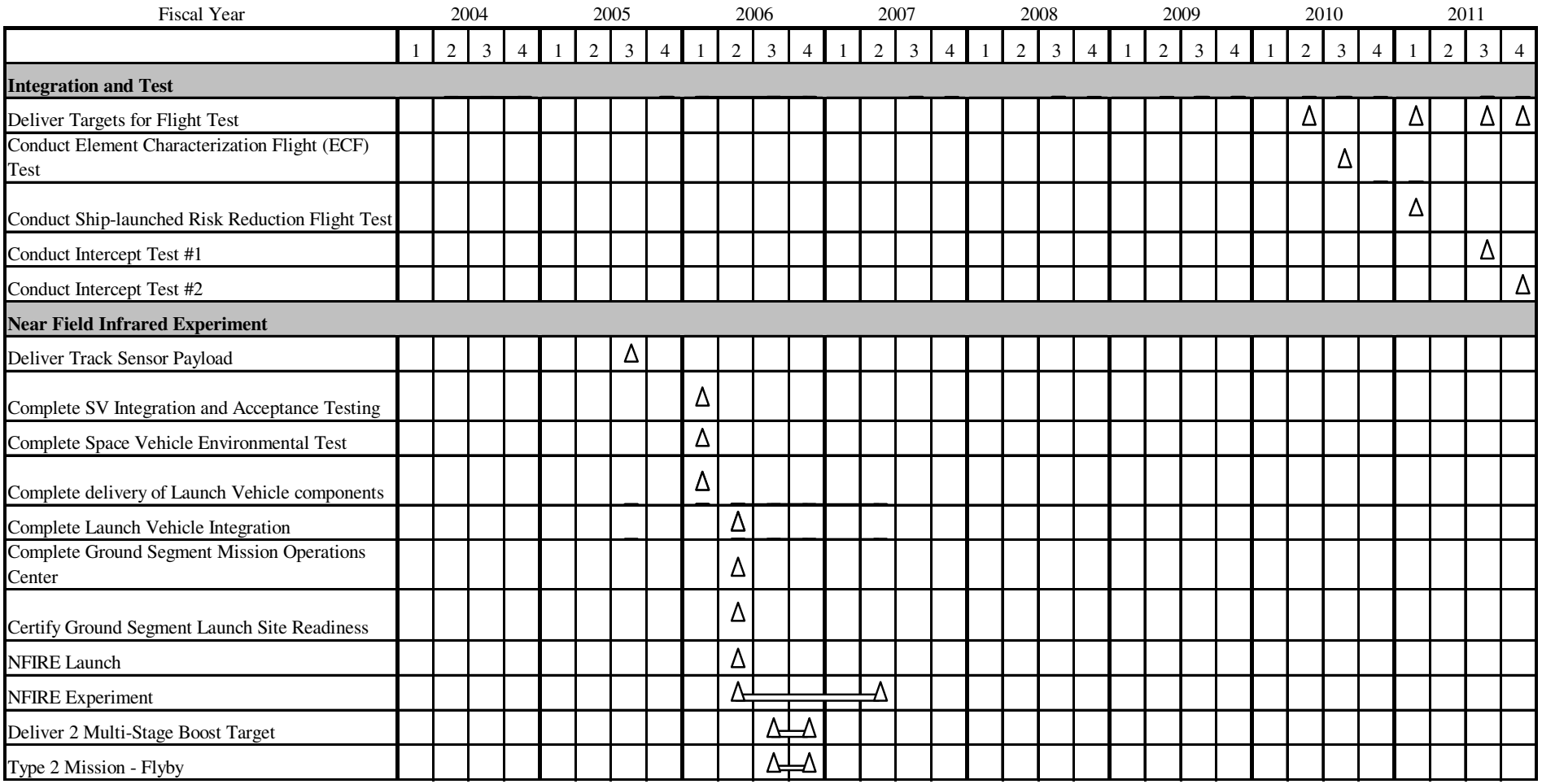
Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Element Engineering								
Award D&T contract to SE&I contractor	1Q							
KEI IBR	2Q							
Element Design Update	2Q-3Q							
DVT objectives and requirements		2Q						
Deliver Report to Congress on KEI Basing		2Q						
KEI Block 12 concept baseline update reviews		2Q	3Q					
Define KEI Engagement Sequence Groups		3Q						
Deliver KEISIM version 1.1		3Q						
KEI inputs to BMDS Master Integration Plan		4Q	3Q	3Q				
Conduct User CONOPS Table Top exercises		4Q						
Ascent Capability Performance Assessment - 1		4Q						
Simulate KEI capability augmentation of BMDS		4Q	4Q	4Q				
Deliver KEISIM version 2.0			4Q					
Ascent Capability Performance Assessment - 2			4Q					
Conduct KEI Block 12 System Design Review				3Q				
KEI Test Bed Description Document with REO				3Q				
Deliver KEISIM version 3.0				4Q				
Complete DR-0 Data Package generation					4Q			
Complete DR-1 Data Package Generation						3Q		
Complete DR-2 Data Package Generation							3Q	
Interceptor								
Interceptor configuration trade studies	2Q-4Q							
Interceptor Integrated Baseline Review	3Q							
Burst-tested a demo 2nd stage rocket motor case	4Q							
2nd stage TVC characterization test	4Q							
1st and 2nd stage propellant tests		2Q						
Booster Wind Tunnel Tests		3Q	3Q					
Static Fire 1st and 2nd stage rocket motors		4Q	1Q					
Booster rocket motor static tests			4Q	1Q-4Q				
Deliver Kill Vehicle Processor			4Q					

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Booster Preliminary Design Review				2Q				
Fire LDACS ACS thruster and module				3Q				
Booster Critical Design Review				4Q				
Hot fire 2nd Stage ACS				4Q				
Interceptor Component SDR				4Q				
Conduct 2-color seeker characterization test					1Q			
Complete 2-color, brassboard sensor					2Q			
Conduct booster flight					3Q			
Deliver Booster Flight #1 DVT Article					3Q			
Deliver Booster Flight #2 Article						2Q		
Conduct Kill Vehicle Hover Test						4Q		
Deliver Partial Full Scale (PFS) Article						4Q		
Deliver Control Test Vehicle (CTV) Article							2Q	
Deliv Elem Characterization Flight Test Article							3Q	
Del Ship-launched Risk Reduction Flight Article								1Q
Deliver Intercept Test #1 Article								3Q
Deliver Intercept Test #2 Article								4Q
C2BMC								
C2BMC Design Update	2Q-4Q							
Conducted Algorithm/Timeline Demonstrations	4Q	4Q	3Q	3Q				
Conduct Direct Downlink Experiment		2Q						
Build C2BMC Pathfinder Shelter		3Q						
Demonstrate CONUS KEI data fusion		3Q	2Q	2Q				
Demonstrate Radar-ONIR Fusion/Timeline			3Q	3Q				
Establish C2BMC integration lab				2Q				
Integrate and demonstrate KICS Antenna Panels				4Q				
Complete C2BMC Component SDR				4Q				
Complete C2BMC DR-0					4Q			
Deliver Production Representative C2BMC								3Q
Launcher								
Conduct Initial Requirements Review		2Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Conduct Canister Design Review			2Q					
Conduct Ejection Gas Generator Static Firing Test			4Q					
Conduct Canister Ejection Test				3Q				
Conduct Launcher System Design Review				4Q				
Launcher Design Review-0					4Q			
Conduct the Launcher Off-Road Mobility Test						1Q		
Deliver Pre-Production Launcher						4Q		
Deliver Production Representative Launcher								3Q
Integration and Test								
Developed facility requirements	2Q-4Q							
Completed Draft Land-Based KEI CONOPS	3Q							
Navy CONOPS Assessment	4Q	4Q						
Publish/Update VV&A Plan		3Q	3Q	3Q	3Q	3Q	3Q	3Q
Select System Integration Facility site		4Q						
Select Element Integration Facility site		4Q						
Publish/Update Development Master Test Plan		4Q	4Q	4Q	4Q	4Q	4Q	4Q
Participate in Nimble Titan Wargame		4Q	3Q	3Q	3Q	3Q	3Q	3Q
Initiate requirement analysis for SIL, SIF, EIF			1Q-4Q					
Initiate Environmental Analysis documentation			1Q-4Q					
Publish/Update Target System Requirements Letter			3Q	3Q	3Q	3Q	3Q	3Q
Conduct Booster Flight #1 Dev Verif Test					3Q			
Conduct Booster Flight #2 Test						2Q		
Conduct Partial Full Scale (PFS) Test						4Q		
Conduct Control Test Vehicle (CTV) Test							2Q	
Deliver Targets for Flight Test							2Q	1Q,3Q,4Q
Conduct Element Characterization Flight (ECF) Test							3Q	
Conduct Ship-launched Risk Reduction Flight Test								1Q
Conduct Intercept Test #1								3Q
Conduct Intercept Test #2								4Q
Near Field Infrared Experiment								
Deliver Track Sensor Payload		3Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Complete delivery of Launch Vehicle components			1Q					
Complete Space Vehicle Environmental Test			1Q					
Complete SV Integration and Acceptance Testing			1Q					
Complete Launch Vehicle Integration			2Q					
Complete Ground Segment Mission Operations Center			2Q					
Certify Ground Segment Launch Site Readiness			2Q					
NFIRE Launch			2Q					
NFIRE Experiment			2Q-4Q	1Q-2Q				
Type 2 Mission - Flyby			3Q-4Q					
Deliver 2 Multi-Stage Boost Target			3Q-4Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
R216 Space Test Bed	0	0	0	0	44,997	149,998	247,995	229,993
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Space Test Bed is an essential element of our BMDS acquisition plan. The forward-based intercept capabilities of the Airborne Laser (ABL) and Kinetic Energy Interceptor (KEI) are affected by geography and basing availability. A space-based intercept layer enables us to access to the highly valuable boost/ascent battle space independent of adversary country size or threat raid timing. A limited space-based interceptor layer also protects the United States and our Allies against asymmetric threats designed to exploit coverage and engagement gaps in our terrestrial defenses. We plan to add a space-based defensive layer to complement the evolutionary BMDS. The space-based interceptor depth of fire in the boost/ascent phase, however, is much less than that of the terrestrial boost/ascent elements. To achieve boost phase intercept raid defense from space requires very large number of satellites. We believe that a mix of terrestrial and space-basing offers the best defensive combination to defeat both rogue and near-peer adversaries.

The Kinetic Energy Interceptor program along with the Near Field Infrared Experiment (NFIRE) provides risk mitigation for the Space Test Bed project. These efforts along with other MDA development programs including the Multiple Kill Vehicle (MKV) will address fundamental spaced-based interceptor technical challenges and risk areas. Another key technology advancement is the evolution of the commercial electronics and computing industry. This industry has been able to offer electronics of increasingly lighter weight with more computing power, while increasing product quality and production rates. Our initial concept analysis indicates that there is a design opportunity starting in FY08 to integrate these evolving technologies into a lightweight, affordable, and high performance space-based interceptor that will add a flexible, multi-use intercept layer to the BMDS.

We plan to start a competitive concept design phase in FY08. Contractors selected in the concept design phase will produce a Space Test Bed concept detailing the functional architecture, capability design, mission performance, and development plan. In FY09, MDA will select a contractor team(s) to continue into the Space Test Bed Development and Test phase. During this phase the contractor will develop the spacecraft bus/interceptor housing, modify the KEI command, control, battle management and communications component, qualify a kill vehicle for space operations, and develop the axial stage interceptor motors. Much like the Kinetic Energy Interceptor contract, this development will produce high engineering and manufacturing readiness level components that will proof the production system during the development and test phase. The contractor will launch 5 space-based interceptors and perform space-based intercept testing against medium to intercontinental range ballistic missile targets. We anticipate the Development and Test phase to run through FY15 in order to enter a production phase for a small space layer in FY16.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2008.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

D. Acquisition Strategy

The Space Test Bed acquisition strategy is in the early stages of development. Our primary objective is to acquire a limited space-based intercept layer that builds upon existing and planned BMDS capabilities in order to address high priority system performance shortfalls where space-basing offers the best or only solution. We plan to define an integrated contractual approach across BMDS interceptor, sensor, and command control, battle management and communication product development centers that will enable us to efficiently transition our multi-use (boost, ascent, and midcourse) intercept capabilities from terrestrial to space-based interceptors. By fully leveraging terrestrial intercept capability development products such as kill vehicles, command and control, battle management, and sensors we will greatly shorten the development timeline and cost of realizing an initial space intercept capability. We plan on competitively acquiring the Space Test Bed. This acquisition process will begin with the release of a request for proposal in early FY08. We anticipate awarding 2-4, approximately one year concept design contracts to qualified industry teams in 2Q FY08. We will use team performance during the competitive concept design phase to select a Space Test Bed lead contractor for the development and test phase. It is likely that we will structure the acquisition so that the winning Space Test Bed contractor will be automatically teamed with our existing BMDS C2BMC and BMDS sensor contractors to facilitate terrestrial capability reuse and emphasize BMDS-level integration.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

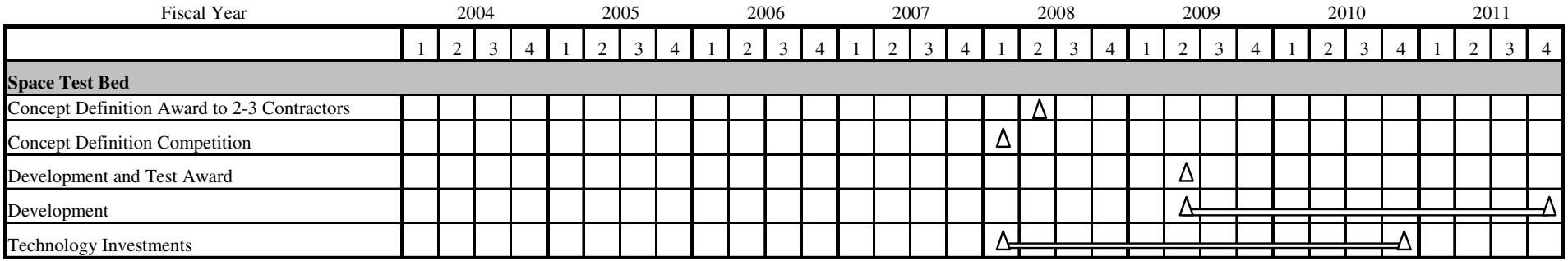
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost										

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Space Test Bed								
Concept Definition Award to 2-3 Contractors					2Q			
Concept Definition Competition					1Q			
Development						2Q-4Q	1Q-4Q	1Q-4Q
Development and Test Award						2Q		
Technology Investments					1Q-4Q	1Q-4Q	1Q-4Q	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	14,017	12,404	10,909	24,740	27,615	26,243	31,575	34,002
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	14,017	12,404	10,909	24,740
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2005
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

C. Other Program Funding Summary

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PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754