Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	249,179	447,616	289,277	287,194	270,762	256,767	259,159
0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004	54,717	0	0	0	0	0	0
0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006	171,942	0	0	0	0	0	0
0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008	16,000	0	0	0	0	0	0
AX01 Ballistic Missile Defense C2BMC Block 1.0	0	101,592	0	0	0	0	0
BX01 Ballistic Missile Defense C2BMC Block 2.0	0	111,091	88,893	27,605	0	0	0
CX01 Ballistic Missile Defense C2BMC Block 3.0	0	85,192	147,551	203,115	215,508	166,794	98,765
DX01 Ballistic Missile Defense C2BMC Block 4.0	0	66,033	0	0	0	0	0
EX01 Ballistic Missile Defense C2BMC Block 5.0	0	30,321	0	0	0	33,854	103,012
XX01 Ballistic Missile Defense C2BMC Sustainment	0	45,620	44,495	46,455	47,507	48,656	49,652
0602 Program-Wide Support	6,520	0	0	0	0	0	0
ZX40 Program-Wide Support	0	7,767	8,338	10,019	7,747	7,463	7,730

Note: There is a substantial change in funding from FY08 to FY09 because PB09 does not continue the consolidation of C2BMC efforts in the C2BMC PE. MDA believes the C2BMC funds that are being used to develop component and element interfaces for the C2BMC system are more appropriately placed in their respective PEs.

A. Mission Description and Budget Item Justification

A.1 System Element Description

Intelligence sources predict an increasing ballistic missile threat with respect to numbers of missiles and launchers, more complex delivery boosters to include countermeasures, and more lethal warheads. Potential adversaries can employ a coordinated attack of short-, medium-, and intermediate-range ballistic missiles (SRBMs, MRBMs, and IRBMs) as well as intercontinental ballistic missiles (ICBMs) to confound our defenses, create a situation of confusion, and paralyze legacy command and control systems. To protect U.S. cities, population, and territory, as well as our deployed forces and other critical assets from this growing threat requires an integrated, layered defense. The ballistic missile defense Command and Control, Battle Management, and Communications (C2BMC) Program is the centerpiece of an integrated, layered missile defense. The C2BMC Program puts the “System” in the Ballistic Missile Defense System (BMDS). It is the force multiplier--the elements reach their full potential and the BMDS

becomes greater than the sum of its parts, with the capability to deliver an integrated, layered defense against any ballistic missile, at any range, from any direction. Without a central C2BMC system there is no BMDS or layered defense.

BMD C2BMC Program efforts enable coordinated, real-time, decision-making by warfighters and leaders across the globe, up to and including the Secretary of Defense and the President of the United States. Specifically, the mission of C2BMC is to provide a Combatant Command decision aid to integrate and globally synchronize missile defense systems and operations to provide optimized layered missile defense against all ranges of threat, in all phases of flight. The result is an extended network of defensive sensors, shooters, battle managers, and intelligence assets. The global C2BMC system spans the existing U.S. Combatant Command structure allowing the warfighter to orchestrate and optimize U.S. ballistic missile defense response on a worldwide level. Without the C2BMC Program, the Ballistic Missile Defense System would require many more sensors and interceptors to achieve equivalent protection from ballistic missile threats to our homeland, friends, and allies.

The C2BMC Program uses spiral development (i.e., incremental development, test, and fielding) to produce the hardware, software, network connectivity, and fielded support required to provide a system-wide, integrated ballistic missile defense capability. As C2BMC products mature they are engineered and integrated into fielded spirals. The average timeframe to develop and field a spiral is 18-24 months (depending on requirements and funding stability), with a new spiral fielded every year. Therefore multiple spirals are in staggered stages of development at any time.

Capabilities are integrated and evolve through four C2BMC product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Global Engagement Manager (GEM), and BMD Network. The C2BMC Program has integrated 6 of the 9 BMDS elements; is in 21 locations with 12 customers; has deployed over 450 pieces of equipment and 3 SATCOM links, has stood up over 70 crew positions; has trained over 1000 users, and supports over 48,000 miles of DISA communication lines. These numbers will continue to grow with each Block. Delivered spirals enable progressively increased abilities to plan ballistic missile defense, see the battle unfold on common situational awareness displays, control sensors worldwide, and optimally pair them with BMD weapons systems (such as Ground Based Missile Defense, Theater High Altitude Air Defense, Patriot, and Aegis BMD) across a global-grid communications network to defeat an adversary's attack.

The C2BMC Program delivers spiral hardware, software capabilities, network connectivity, training, and logistics support to Combatant Commands and national command authorities. Hardware capabilities consist of Enterprise Work Stations (warfighter display monitors and access to BMDS planner, situation awareness, and battle manager capabilities), servers, processors, communications racks and equipment, situational awareness web browsers, stand-alone laptop BMDS planners, and video distribution equipment. Logistics support includes C2BMC initial operational training, 24/7 on-site sustainment and operational support to the Combatant Commands, hardware and software maintenance and sustainment of deployed AN/TPY-2 radar communications, and C2BMC interface capabilities.

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

The C2BMC program contributes to the Ballistic Missile Defense System (BMDS) by delivering:

- BMD Defense design planning and analysis capability among all Combatant Commands and their service components so that warfighters have the capability to explore the effectiveness of potential BMD courses of action.
- Clear, accurate, and consistent display of the ballistic missile defense battlespace (situational awareness) to warfighters at the tactical, operational, and strategic levels of command, permitting key decision-makers the ability to render command and control decisions of global importance, in real-time.
- A network tying together sensors (both BMDS radars and space sensors) and weapons systems via the Combatant Command Command and Control (COCOM C2) and Global Engagement Manager (GEM) to enable system-wide detection, tracking, and decision tools for optimal engagement of ballistic missile threats across all flight regimes.

C2BMC enables integrated system performance of all BMDS elements by providing missile detection, tracking, discrimination, and network distribution of threat information. It provides the warfighter the ability to rapidly identify and concurrently track multiple ballistic missile threats; dynamically adjust BMD system resources to engage multiple ballistic missile threats in the kill zone through all phases of flight; and globally direct engagement against multiple ballistic missile threats in any area of responsibility, at any time. The C2BMC program further enables an integrated, layered Ballistic Missile Defense by synergistically planning and operating existing and new theater and strategic ballistic missile defense weapon systems across the world for the highest probability of defeating threats of any type and range. These systems include PATRIOT, Theater High Altitude Area Defense (THAAD), Ground-based Midcourse Defense (GMD), Aegis BMD; and sensors such as the AN/TPY-2 radar, Sea-Based X-Band Radar (SBX), and Space-Based Infrared System (SBIRS).

The C2BMC Program facilitates BMDS Concurrent Test Training and Operations (CTTO) activities that will safely separate test, evaluation, and training venues from real-world activities; and allow injection of high-fidelity simulations to run realistic scenarios on operational equipment and networks. CTTO will enable end-to-end testing of the BMDS and enable BMDS training that allows operators to exercise any or all BMDS elements, as needed.

A.3 Major System Element Goals

Block 1.0 (Defend U.S. from Limited North Korean Long-Range Threats)

- Basic Deliberative/Crisis Action Planning
- Common situational awareness capability/displays at the Combatant Commands (COCOMS) and National Military Command Center (NMCC)
- Initial Sensor Resource Management of the AN/TPY-2 radar

- Redundant communication/data paths and connections to Ground Based Missile Defense (GMD), Aegis BMD, AN/TPY-2 radar
- Engagement Sequence Groups (ESG) involving Ground Based Interceptor (GBI), Standard Missile 3 (SM-3), SPY-1 Sensor, and AN/TPY-2.

Block 2.0 (Defend Allies & Deployed Forces from Short- to Medium-Range Threats in One Region/Theater) ·

- Enhanced crisis action/deliberative planning
- Enhanced situational awareness and command and control at Combatant Commands (COCOM) Headquarters
- Initial fielding of the Global Engagement Manager (GEM) capability at the Kenney Air Operations Center in Hawaii
- Improved system reliability and availability to support test and operations

Block 3.0 (Expand Defense of U.S. to Include Limited Iranian Long-Range Threats)

- Fully integrated BMDS Planner and situation awareness displays with integrated intelligence information and defended asset priority schemes
- Initial interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture
- NORTHCOM, EUCOM, and CENTCOM expansion of Global Engagement Manager (GEM) coordination and optimization of increased "Launch-on and Engage-on" networked capability
- Initial Joint Integrated Air and Missile Defense (JIAMD) Planner capability

Block 4.0 (Defend Allies & Deployed Forces in Europe from Limited Iranian Long-Range Threats, Expand Protection of U.S.)

- European Interceptor Site (EIS) communications procurement
- European Midcourse Radar (EMR) communications procurement
- Southern radar site (AN/TPY-2 #6) communications procurement and sensor resource management

Block 5.0 (Expand Defense of Allies & Deployed Forces in Two Regions/Theaters)

- Incorporate new sensors and weapons systems into a global, integrated C2BMC network
- Command and Control decision aids to re-direct coordinated engagements
- BMDS system level discrimination for boost/early ascent and expanded engagement coordination to include intelligence projections
- Continued BMDS global expansion with addition of C2BMC deployed locations (e.g., CENTCOM)

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Sustainment

- Provide on-site support, C2BMC Control Center Activities, off-site and vendor support, training, and hardware and software maintenance to ensure 24 X 7 continuity of C2BMC operations.

A.4 Major Events Schedule and Description

Major Event	Project	Timeframe	Description
Contract Activity			
C2BMC Element			
Block 04 System Level Tests	0701	1Q FY 2007 - 4Q FY 2007	• C2BMC participation in BMDS-level ground and flight tests
Spiral 6.0 Cycle 5 Testing	0801	1Q FY 2007	• Field installation and check out
Block 06 System Level Tests	0801	1Q FY 2007 - 4Q FY 2007	• C2BMC participation in BMDS-level ground and flight tests
GEM Increment 2	0801	1Q FY 2007 - 4Q FY 2007	• end of software development cycle and ready for integration test
Spiral 6.2 Cycle 2 Testing	0801	2Q FY 2007 - 3Q FY 2007	• C2BMC element functional verification test at the Missile Defense Integration & Operations Center (MDIOC)
Spiral 6.2 Cycle 5 Testing	0801	3Q FY 2007 - 4Q FY 2007	• Field installation and checkout
Fielding			
Install Spiral 6.4 NORTHCOM HW	BX01	2Q FY 2008	• Installation of C2BMC hardware
Install Spiral 6.4 STRATCOM HW	BX01	3Q FY 2008	• Installation of C2BMC hardware
Install Spiral 6.4 FGA HW	BX01	3Q FY 2008 - 4Q FY 2008	• Installation of C2BMC hardware
Install Spiral 6.4 FGA SW	BX01	2Q FY 2009	• Installation of C2BMC software and network connectivity
Install Spiral 6.4 PACOM/AOC SW	BX01	2Q FY 2009	• Installation of C2BMC software and network connectivity
Install Spiral 6.4 NORTHCOM SW	BX01	2Q FY 2009 - 3Q FY 2009	• Installation of C2BMC software and network connectivity
Install Spiral 6.4 STRATCOM SW	BX01	2Q FY 2009 - 3Q FY 2009	• Installation of C2BMC software and network connectivity
Install Spiral 8.4 STRATCOM SW	CX01	3Q FY 2011 - 4Q FY 2011	• Installation of C2BMC software
Install Spiral 10.2 FGA HW	EX01	3Q FY 2013	• Installation of C2BMC hardware
Install Spiral 10.2 FGA SW	EX01	4Q FY 2013	• Installation of C2BMC software and network connectivity
Development			
Spiral 6.4 Cycle 2 Testing	BX01	4Q FY 2008 - 1Q FY 2009	• C2BMC element functional verification test at the Missile Defense Integration & Operations Center (MDIOC)
Spiral 6.4 Cycle 5 Testing	BX01	1Q FY 2009 - 2Q FY 2009	• Field installation and checkout
Spiral 8.2 Content Agreement	CX01	1Q FY 2009	• Definition of capabilities within the spiral
Spiral 8.2 Cycle 2 Testing	CX01	4Q FY 2009 - 3Q FY 2010	• C2BMC element functional verification test at the Missile Defense Integration & Operations Center (MDIOC)
Spiral 8.4 Content Agreement	CX01	1Q FY 2010	• Definition of capabilities within the spiral
Spiral 8.2 Cycle 5 Testing	CX01	3Q FY 2010 - 4Q FY 2010	• Field installation and checkout

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Major Event	Project	Timeframe	Description
Spiral 8.4 Cycle 2 Testing	CX01	3Q FY 2011 - 4Q FY 2011	• C2BMC element functional verification test at JNIC
Spiral 8.4 Cycle 5 Testing	CX01	3Q FY 2011 - 1Q FY 2012	• Field installation and check out
Site Activation			
S6.0 at STRATCOM, NORTHCOM, and PACOM	0801	1Q FY 2007	• Hardware and software installation and check out
S6.2 at STRATCOM, NORTHCOM, and PACOM	0801	3Q FY 2007	• Hardware and software installation and check out
C2BMC upgrades (PSN) at STRATCOM, PACOM, NORTHCOM	0801	4Q FY 2007	• Hardware installation and check out, and network connectivity
Fielding			
Install Spiral 8.2 NORTCOM HW	CX01	1Q FY 2010	• Installation of C2BMC hardware
Install Spiral 8.4 NORTHCOM HW	CX01	1Q FY 2010	• Installation of C2BMC hardware
Install Spiral 8.2 STRATCOM HW	CX01	2Q FY 2010	• Installation of C2BMC hardware
Install Spiral 8.2 PACOM/AOC HW	CX01	2Q FY 2010 - 3Q FY 2010	• Hardware and software installation and check out
Install Spiral 8.2 FGA HW	CX01	3Q FY 2010	• Installation of C2BMC hardware
Install Spiral 8.2 NORTHCOM SW	CX01	3Q FY 2010 - 4Q FY 2010	• Installation of C2BMC software and network connectivity
Install Spiral 8.2 PACOM/AOC SW	CX01	3Q FY 2010 - 4Q FY 2010	• Installation of C2BMC software and network connectivity
Install Spiral 8.2 STRATCOM SW	CX01	3Q FY 2010 - 4Q FY 2010	• Installation of C2BMC software and network connectivity
Install Spiral 8.4 PACOM/AOC HW	CX01	2Q FY 2011 - 3Q FY 2011	• Hardware and software installation and check out
Install Spiral 8.4 FGA HW	CX01	3Q FY 2011	• Installation of C2BMC hardware
Install Spiral 8.4 NORTHCOM SW	CX01	3Q FY 2011 - 4Q FY 2011	• Installation of C2BMC software and network connectivity
Install Spiral 8.4 PACOM/AOC SW	CX01	3Q FY 2011 - 4Q FY 2011	• Installation of C2BMC software and network connectivity
Install Spiral 8.4 FGA SW	CX01	4Q FY 2011	• Installation of C2BMC software and network connectivity
Install Spiral 8.4 STRATCOM HW	CX01	4Q FY 2011	• Installation of C2BMC hardware
Install Spiral 10.0 PACOM/AOC HW	EX01	2Q FY 2012 - 3Q FY 2012	• Hardware and software installation and check out
Install Spiral 10.0 NORTHCOM SW	EX01	3Q FY 2012 - 4Q FY 2012	• Installation of C2BMC software and network connectivity
Install Spiral 10.0 PACOM/AOC SW	EX01	3Q FY 2012 - 4Q FY 2012	• Installation of C2BMC software and network connectivity
Install Spiral 10.2 PACOM/AOC HW	EX01	2Q FY 2013 - 3Q FY 2013	• Hardware and software installation and check out
Install Spiral 10.0 STRATCOM SW	EX01	3Q FY 2013 - 4Q FY 2013	• Installation of C2BMC software and network connectivity
Install Spiral 10.2 NORTHCOM SW	EX01	3Q FY 2013 - 4Q FY 2013	• Installation of C2BMC software and network connectivity
Install Spiral 10.2 PACOM/AOC SW	EX01	3Q FY 2013 - 4Q FY 2013	• Installation of C2BMC software and network connectivity
Sustainment			
Sustainment	XX01	1Q FY 2008 - 4Q FY 2013	

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B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008 PB)	246,852	258,913	294,627
Current President's Budget (FY 2009 PB)	249,179	447,616	289,277
Total Adjustments	2,327	188,703	-5,350
Congressional Specific Program Adjustments	0	191,790	0
Congressional Undistributed Adjustments	0	-3,087	0
Reprogrammings	6,065	0	0
SBIR/STTR Transfer	-3,738	0	0
Adjustments to Budget Years	0	0	-5,350

FY07 increase of $2.327 million includes SBIR/STTR transfer and MDA reprogrammings.

FY08 increase of $188.703 million includes a Congressionally specific program decrease of $191.790 million and a portion of the MDA Congressional undistributed reduction.

FY09 decrease of $5.350 million reflects MDA programmatic changes to support program requirements.

PB08 to PB09 schedule changes:

- Spiral 6.2 schedule extension due to BMDS system level test moves caused a delay in personnel rolling onto Spiral 6.4 development activities
- Spiral 6.2 challenges, particularly in developing a network server, have caused a delay in personnel rolling onto Spiral 6.4 development activities
- Spiral 6.4 original design incorporated track processing within the Global Engagement Manager (GEM). As the design matured, performance assessed, and the need for launch event association (previously provided by the radar) was identified, a separate track server was necessary. This design change has lengthened the Spiral 6.4 development time.
- Addition of Earth Rotation effects within the BMDS Planner has lengthened the Spiral 6.4 development cycle. This design change has been included in current work via an Engineering Change Proposal.
- Preparations for FTG-04 with radar operations in Alaska have drawn resources from our networks development team, hence lengthening Spiral 6.4 development time.

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COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004	54,717	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: The content previous planned in 0701 for FY08-13 has been captured in AX01, BX01,CX01, and XX01 in accordance with the MDA revised block structure

A. Mission Description and Budget Item Justification

In support of and in collaboration with the Missile Defense Agency's Ballistic Missile Defense System (BMDS) architectures and system specifications, the Command and Control, Battle Management, and Communications (C2BMC) program is the lynchpin of integrated missile defense providing the warfighter the capability of planning the Ballistic Missile Defense (BMD) fight while concurrently tracking potential ballistic missile threats; directing weapons to engage via a distributed network; and, pairing appropriate sensors with the appropriate weapon system to defeat ballistic missile threats of any range, in any phase of flight, in all theaters, and with coalition partners. The C2BMC Program delivers continually increasing capabilities via hardware, software, network connectivity, and operations and sustainment support.

The Block 2004 C2BMC Program delivered the rudimentary foundation for integrated, layered defense for initial defense against a rogue threat or accidental ballistic missile launch. Block goals were to deliver:

- Basic deliberative/crisis action planning capability
- Common situational awareness capability/displays at the Combatant Commands (COCOMS) and National Military Command Center (NMCC)
- Initial sensor management of the AN/TPY-2 Radar in Japan to support Ground Based Missile Defense (GMD)
- Redundant communication/data paths and connections to GMD and Aegis BMD
- Engagement Sequence Groups (ESG) involving Ground Based Interceptor (GBI), Standard Missile 3 (SM-3), Cobra Dane Upgraded Early Warning Radar, SPY-1 Sensor, and AN/TPY-2
- Sustainment of C2BMC operations

C2BMC ELEMENT

The Command and Control, Battle Management, and Communications (C2BMC) Program includes program management and the hardware/software engineering necessary to accomplish Block 2004 objectives by balancing development in four product lines: BMDS Planner, Situation Awareness, Battle Management, and BMD Network (For all other Blocks the four product lines are: BMDS Planner, Combatant Command Command and Control (COCOM C2), Global Engagement Manager (GEM), and BMD Network). This approach ensures that mature capabilities are integrated and

incrementally delivered to the warfighter. Multiple incremental deliveries, or spirals, are planned in Block 2004. Each spiral represents an improvement in capability and functionality over the previous spiral. The delivery of these spirals includes the software, hardware, network connectivity, training, and operations and sustainment support needed to operate an integrated Ballistic Missile Defense System (BMDS). The capability delivered in the spirals enables ballistic missile defense systems Engagement Sequence Groups (ESGs) by providing the proper interfaces, planning, and coordination to allow the BMDS elements and components to work together effectively. The C2BMC Program also includes development and post analysis support for BMDS-level wargames and tests of fielded spirals.

The BMDS Planner and Situation Awareness architecture is based on several design features emphasizing scalability and interoperability. The architecture is designed to utilize an open system approach. This approach also provides a path for technology upgrades. The BMDS Planner emphasizes planning for both theater and global missile defense through all planning phases: deliberate, crisis, and dynamic. It provides the capability to coordinate with all weapon system elements in a collaborative fashion from the strategic to the operational level. This type of coherent planning results in ballistic missile defense for the full range and complexity of ballistic missile threats. To ensure the full C2BMC capability is realized by all weapon system elements, the architecture migrates in future Blocks to a network-centric (vice point-to-point) planner to ensure both vertical and horizontal collaboration. Additionally, in future Blocks, the BMDS Planner is being developed into a joint integrated air and missile defense planner.

Block 2004 development includes the following BMDS Planner and Situational Awareness capabilities:

- Basic force level ballistic missile defense planning capability
- Planning load robustness that protects against incomplete/inaccurate data
- Initial external Extensible Machine Language (XML) interface with the Army Air and Missile Defense Work Station (AMDWS) planner
- Sensor management display (AN/TPY-2 Radar), Integrated Ballistic Missile Picture (IBMP), BMDS Summary Screen (SS), and Executive Displays (displays all BMDS track and status data)

Situation Awareness capability was further enhanced with the introduction of initial Protection Capability (PROCAP) which allows the operator to visually see status and capabilities of BMD assets. Remote situation awareness is also provided to the United Kingdom.

Battle Management comprises the decisions and actions executed in direct response to the activities of enemy forces. In Block 2004, the battle management portion of C2BMC is focused at the Combatant Commands (COCOMs) Headquarters. Block 2004 battle management developed and delivered AN/TPY-2 radar management including Operational State Control, Sensor Tasking (cue), and Resource Management, all which increase

the effectiveness of the radar system within the Ballistic Missile Defense System (BMDS). In addition, track data management capability is improved to include forwarding of AN/TPY-2 radar tracks to Ground Based Missile Defense Fire Control (GFC) via fiber and satellite.

The Network Communications portion of C2BMC ensures connectivity between all components of the BMDS on the BMD network. The intent is to develop and deliver products that provide robust connectivity to quickly and unambiguously share information across the global BMD and with external users. Effective networking relies on an interconnection of a variety of platforms and capabilities. In Block 2004, network capability was delivered to enable Aegis BMD and GMD Engagement Sequence Groups (ESGs), Joint Range Extension to convert Satellite Communications (SATCOM) formatted messages from Aegis to land line messages to interface with the rest of the BMDS, initial network monitoring and management, Communications Node Equipment (CNE) auto-failover to prevent system outages, BMDS Global Integrated Missile Defense Network Operations Integration Center, the Joint Functional Component Commander for Integrated Missile Defense (JFCC IMD) in Colorado Springs, CO for remote monitoring of the network, and support of dual redundant suites. Additionally, engineering planning is provided for communications to support products installed and tested by the GMD and Sensor elements.

As the C2BMC products mature they are integrated into fielded spirals. The C2BMC Program uses spiral development (i.e., incremental development, test, and fielding) to produce the software required to provide a system-wide integrated BMD capability. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal C2MBC development and begins integration testing with other BMDS elements. Block 2004 matured products were integrated in Spirals 4.1 through 4.5 and delivered to the field for concurrent developmental testing and operational use in conjunction with the Responsible Test Organization (RTO) and Responsible Engineering Organization (REO) schedules and guidance. Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software. Spirals 4.1 and 4.2 provided infrastructure (including the development environment and initial message and track processing) and deliberate and dynamic planning (including planning tools and additional message processing and collaborative tools). Spiral 4.3 focused on developing the Initial Defensive Operations (IDO) capability, and was updated with Spiral 4.4 which incorporated high priority user fixes. Block 2004 was completed with the development and delivery of Spiral 4.5, which provides AN/TPY-2 radar management and aligns with the GMD Block 4B configuration.

OPERATIONS AND SUPPORT C2BMC

Program Operations and Support consists of 24/7 On-Site Support, C2BMC Control Center activities, and hardware/software maintenance. On-site support provides:

- Assistance to the System Administrator assigned by the site (e.g., Combatant Commands), with the general operational support of the C2BMC system

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- Integration of the C2BMC support processes into the site's support regimen
- Daily network operations and security support for the C2BMC system as part of a transition plan
- Prime contractor `over-the-shoulder` support to users when requested, or alternatively, via the C2BMC Control Center. The C2BMC Control Center is located in Colorado Springs, CO and provides:
  - Technical support to on-site personnel and to the C2BMC end-user
  - Review of hardware/software problems and coordination of Commercial Off-the-Shelf (COTS) developer/vendor service calls
  - Trouble ticket work-off
  - Tracking and implementing documented escalation procedures
  - Collecting of metrics
  - Maintenance of the C2BMC Control Center web site

Maintenance of the C2BMC system includes both software and hardware maintenance and sustaining engineering. Sustaining engineering consists of network and development engineering in support of identifies deficiencies, resolving system anomalies and improving fielded system reliability and maintainability. Operations and Support also includes the procurement of communications services from the Defense Information Service Agency (DISA), as well as fielding and maintaining, Communications Nodal Equipment (CNE), to include the Joint Range Extension (JRE) equipment, which enables a global network grid. Operations and Support includes on-site maintenance of communications equipment and C2BMC AN/TPY-2 radar interface equipment at the first AN/TPY-2 radar site in Japan.

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
C2BMC Element	2,432	0	0
RDT&E Articles (Quantity)	0	0	0

The C2BMC Element accomplishes Block 2004 objectives by balancing the development of four principle product lines: BMDS Planner, Situation Awareness, Battle Management, and BMD Network, enabling capabilities to be integrated and incrementally delivered to the warfighter via spirals. Block 2004 includes infrastructure development, testing activity, and development support of fielded hardware and software.

FY07 Accomplishments:
Designed, developed, and tested upgrades to resolve System Modification Requests (SMRs)

- Supported BMDS-level tests in accordance with the BMDS Integrated Master Test Plan (IMTP) and post analyses involving Spiral 4.5

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	FY 2007	FY 2008	FY 2009
Operations and Support	52,285	0	0
RDT&E Articles (Quantity)	0	0	0

Operations and Support staff and procedures are in place to maintain 24 X 7 C2BMC system capability. Maintenance agreements were established and spare parts procured and delivered to each site. System level Integrated Logistics Support plan has been developed and implemented. Training program has been developed and implemented.

FY07 Accomplishments:

- Provided on-site 24/7 C2BMC support of fielded sites for hardware and software
- Maintained C2BMC Control Center at the Missile Defense Integration and Operating Center (MDIOC) for fielded capabilities
- Provided C2BMC operator training for fielded capabilities

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603893C Space Tracking & Surveillance System	311,402	231,528	242,441	266,509	560,130	735,727	938,191	3,285,928

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

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

D. Acquisition Strategy

The Command and Control Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) is charged to support fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Element								
C2BMC HW/SW Development, I&T	SS/CPAF	Lockheed Martin Team/ Col. Springs, CO	903	0	N/A	0	N/A	903
C2BMC HW/SW Development, I&T	SS/CPAF	Lockheed Martin Team/ Huntsville, AL	137	0	N/A	0	N/A	137
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin Team/ Arlington, VA	1,695	0	N/A	0	N/A	1,695
EW/CEW; GCCS; JDP; JRE; ISC2; SBIRS-DSP; PATRIOT-JTAGS		Services, DISA, Agencies	0	0	N/A	0	N/A	
Federally Funded Research Development Center	SS/CPAF	MITRE, IDA, ORNL, MIT/LL/ Washington, DC	0	0	N/A	0	N/A	
Scientific Engineering and Technical Assistance	SS/CPAF	SPARTA/CSC/MDA HQ, / Arlington, VA	0	0	N/A	0	N/A	
Operations and Support								
Unit Personnel, Cont System Improv, Sustaining Suppt	SS/CPAF	Lockheed Martin Team	43,497	0	N/A	0	N/A	43,497
Indirect Support	MIPR	DISA Defense Enterprise Computing Center (DECC)	3,715	0	N/A	0	N/A	3,715
Unit Operations - Circuit Costs	MIPR	DISA	5,021	0	N/A	0	N/A	5,021
Subtotal Product Development			54,968	0		0		54968

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

II. Support Costs Cost ($ in Thousands)

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

Remarks

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

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

Remarks

Project Total Cost			54,968	0		0		54,968

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
C2BMC Element																												
Block 04 System Level Tests																												
Operation & Sustainment																												
Block 04 O&S																												

Legend

Significant Event (complete)		Significant Event (planned)	
Milestone Decision (complete)		Milestone Decision (planned)	
Element Test (complete)		Element Test (planned)	
System Level Test (complete)		System Level Test (planned)	
Complete Activity		Planned Activity	

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
C2BMC Element							
Block 04 System Level Tests	1Q-4Q						
Operation & Sustainment							
Block 04 O&S	1Q-4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006	171,942	0	0	0	0	0	0
RDT&E Articles Qty	7	0	0	0	0	0	0

Note: FY07 RDT&E Articles:

Spiral 6.0, 6.2; 1 Full C2BMC Suite; 3 Upgraded C2BMC Suites

The content previous planned in 0801 for FY08-13 has been captured in AX01, BX01, CX01, and XX01 in accordance with the MDA revised block structure

A. Mission Description and Budget Item Justification

In support of and in collaboration with the Missile Defense Agency's defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to systematically plan the fight, see it unfold, and dynamically direct and adjust ballistic missile defense networked sensors and weapons to engage and defeat ballistic missile threats at any range, in any phase, in all theaters. The C2BMC products will provide the warfighter the capability to optimize ballistic missile defense from a global level by combining the best sensor information with the most efficient weapon from complimentary weapons systems, which individually, provide only limited area protection.

Today, the center of gravity for integrated BMDS is with C2BMC at the Combatant Command (COCOM) Headquarters, where BMD mission planning, situation awareness, and decisions aids are focused. All processing is performed at Strategic Command (STRATCOM), Northern Command (NORTHCOM), and Pacific Command (PACOM) headquarters. Users of the system are either collocated with, or directly connected to the equipment suites at these COCOMs. As the system evolves, the center of gravity will shift from the COCOMs to the Air Operations Centers (AOCs) and supporting Service Components (e.g., Army), where real-time automated battle management will be introduced and deployed. Development of this Area of Operational Responsibility (AOR)-centric enterprise architecture will allow C2BMC workload to be focused on the “battle in front of the warfighter”, through the deployment of the Global Engagement Manager (GEM) functions within the Area Air Defense Commander's staff while also providing global situation awareness and senior leader decision aides at the COCOM Headquarters. Together, these separate capabilities enable integrated support of prioritized theater, regional, and homeland defense missions. To accomplish this shift in the center of gravity and meet the C2BMC mission objective of any sensor, any weapon, any threat, in any phase of flight, the C2BMC program of work in Block 2006 includes concentrated effort on developing complementary C2BMC system capabilities (i.e., global BMD planning and situation

awareness at the Combatant Commands Headquarters and Global Engagement Manager (GEM), based on dependable, trusted software at the Air Operations Center for initial deployment by the end of the Block.

In Block 2006, the C2BMC program will deliver to the warfighters the foundation for an integrated, layered defense against a rogue threat or accidental ballistic missile launch. Block goals are to deliver:

- Improved C2BMC system reliability and availability
- Initial GEM capability at the Air Operations Center
- Enhanced BMDS Planner - better user displays, flexible defense designs, faster analysis
- Enhanced situational awareness and command and control at the COCOM headquarters - consolidated essential elements of information for Commander's Vol 6 weapons release conference, more informative visual representations
- High availability, redundant communications
- Combined test and operations capability via a Parallel Staging Network (PSN)
- Engagement Sequence Groups (ESG) that involve the Ground Based Missile Defense Interceptor, Aegis BMD, Standard Missile 3 (SM-3) and Army/Navy/Surfaced Phased Array System (AN/SPY-1) Radar, Terminal High Altitude Area Defense (THAAD) Interceptors, Army/Navy/Transportable Phased Array Radar (AN/TPY-2), and Space Based Infrared Sensor (SBIRS)

C2BMC ELEMENT

The C2BMC Program accomplishes integrated BMDS and Block 2006 objectives by designing, developing and delivering enhanced and new capabilities via incremental spirals. Each spiral, 6.0, 6.2, and 6.4, represents an improvement in capability and functionality over its predecessor spiral. The delivery of these spirals includes the software, hardware, and network connectivity needed to operate an integrated Ballistic Missile Defense System (BMDS). C2BMC Program work is integrated across four product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Global Engagement Manager (GEM), and BMD Network. The C2BMC Program also includes development support and post analysis for BMDS-level wargames and tests with fielded spirals.

The BMDS Planner, a part of the BMDS test bed system, allows the warfighter to optimize the organization and configuration of the missile defense force (sensor, interceptors, and systems) to counter ballistic missile threats. Because of the global nature of ballistic missile threat, the BMDS requires the use of a BMDS planner to coordinate between the dispersed commanders with the primary focus of coordinating strategic ballistic missile defense and organizing and coordinating theater missile defense. Rapidly changing geo-political issues will require rapid analysis, planning, and adjustment to missile system platforms and courses of actions among U.S. forces and allied partners, which in turn enables protection of the Homeland while enabling maximum coverage of the troops in the field. The BMDS Planner uses defense designs that pair specific BMDS systems

and sensors (THAAD, GMD, Aegis BMD, AN/TPY-2) to defend specified prioritized defended assets (cities, military installations, command infrastructure) against a given threat or set of threats. The flexibility of the planner allows the user to function in the three modes of activity: Deliberate Planning (18-24 months before a battle), Crisis Action Planning (hours or days before an attack, based on updated information), and Dynamic Planning (near real time agility for changing situations). The BMDS Planner provides the theater and strategic commanders the ability to build, analyze and coordinate a global, integrated and layered defense at both the operational and strategic levels across all levels of command including across Combatant Commands. This type of coherent planning results in ballistic missile defense for the planned range and complexity of ballistic missile threats.

Specific BMDS Planner capabilities in Block 06 are: (1) The BMDS planner and analysis engines are rearchitected to run more efficiently and more quickly (as much as 4 times) than in Block 04. This increased efficiency results in the warfighters ability to rapidly assess the BMD protection capability (PROCAP) provided by estimating the performance and capability of the BMD systems against the assigned threats-- a unique and necessary capability required for strategic defense. (2) Operator displays and inputs are simplified and streamlined into a single graphical user interface, per Block 2004 user feedback. (3) The Block 2006 Planner incorporates the ability to create planning sequels and branches and adds merge and unmerge functions. This capability improves the warfighters ability to create and adapt integrated defense designs at the strategic and tactical levels by allowing the warfighter to copy plans from different COCOMs, merge them, and then modify them in order to determine what type of coverage is available across commands. This capability aids in the efficient allocation of resources across commands. (4) The BMDS Planner utilizes an open system architecture, which provides an evolutionary path for potential technology upgrades.

For the Block 06, the BMDS planner analysis capability, the analysis tool will be improved to include updated Element representations capabilities and Concept of Operations (CONOPS). This will continue through each of the spiral builds and Blocks. Current Block 06 Ballistic Missile Defense System (BMDS) capability assessments include the Ground Based Midcourse Defense System (GMD) with the Sea-Based X-band Radar (SBX), the Theater High Altitude Area Defense System (THAAD), one AN/TPY-2 radar, an interface to the AEGIS Ballistic Missile Defense System (AEGIS BMD), and an interface to the Army's Air and Missile Defense Work Station to enable interface with the PATRIOT systems.

The Combatant Command Command and Control (COCOM C2) product line consists of: situation awareness displays; decision aids that allow senior defense officials the ability to quickly see and evaluate the global missile defense threat and take appropriate defense responses; AN/TPY-2 radar sensor management; and, ability to forward radar tracks to other BMDS elements. Situation awareness emphasizes common, Single Integrated Ballistic Missile Picture (IBMP) and Summary Screens (SS) from the President down to the operational level of command. It combines the information from the BMDS Planner with real-world intelligence information to provide the “big picture” view of worldwide threats, as well as the ability to focus on specific regions and individual launch events. It provides decision-makers, at all levels of command, BMDS readiness status and

its ability to defend specific areas. Displayed data and assessment tools also provide the essential elements of information to enable senior-level decisions regarding defensive measures. COCOM C2 improvements in Block 2006 include executive summary screen enhancements such as Global Engagement Manager (GEM) situation awareness interaction with COCOM Headquarters, additional battlespace information, consolidated display of Essential Elements of Information (EEIs), to conduct the Commander's Vol 6 conference for weapons release authority, and improved ability to organize and manage on-screen information with filters and moveable screen windows. Additionally, AN/TPY-2 radar management functionality in Block 2004 is re-hosted in Block 2006 software with enhancements for AN/TPY-2 radar precision cueing and focused search plan selection, as well as improvements in user controls/displays. The ability to forward threat tracks from the AN/TPY-2 radar in Japan to U.S. Forces Japan and to Aegis BMD for cueing radars is also added in Block 2006. Finally, Block 2006 includes upgrades to interface with the Ground Based Missile Fire Control software version 6A and a direct data connection to Space Based Infrared System (SBIRS) information.

The Global Engagement Manager (GEM) product line provides the first true BMDS battle management capability through C2BMC. It contains algorithms, decision aids, user interfaces, and sensor controls to allow the Integrated Missile Defense Operations Cell inside the Kenney Air Operations Center (AOC) (Hawaii) to optimize available sensor energy and interceptor inventory. GEM capabilities are based on cutting-edge, dependable software development tools and techniques with significant testing performed up-front to prevent delivered software deficiencies. At the end of Block 2006, GEM will have the primary task of managing the AN/TPY-2 radar in Japan (with COCOM C2 providing a backup capability) and include PATRIOT and Aegis BMD interceptors in its weapons assignment calculations. From a developmental standpoint, it will have the logic to communicate intent to these elements using existing Link 16 message sets in the initial release, with eventual transition to BMDS Extensible Markup Language (XML) formatted messages throughout the BMDS network. As we develop the GEM product line, we are moving towards a Service Oriented Architecture (SOA) for the BMDS. This will allow independent development of the individual elements and well-managed interfaces for integration into the BMD Network. By applying advanced development techniques, the C2BMC Program will produce a highly dependable network that has predictable behavior, is scalable for future growth, and will provide advanced information assurance to protect the BMDS. It will provide these interfaces between BMDS elements, beginning with GEM in Spiral 6.4. Data Services will provide the right data to applications that need it throughout the BMDS network, and will minimize the number of interfaces required between individual elements.

The Network Communications portion of C2BMC ensures that communications and networking are not the limiting factor in fielding or operation of the BMDS. The intent is to develop products that provide robust, high availability, survivable connectivity to quickly and unambiguously share information across the global BMDS consisting of multiple sensors, weapon systems, and command and control nodes, as well as external users. Effective networking management and operations will rely on the ability to manage, coordinate, and integrate a wide variety of equipment platforms; interfaces with other DoD communications systems and existing/evolving information standards and capabilities. Defense Information Systems Agency (DISA) services are also highly leveraged in providing world-wide communications. In Block 2006, the Network portion of C2BMC will

provide initial Network Centric Enterprise Services (NCES) capabilities, starting with centralized detailed network performance monitoring and cryptographic device management, which will evolve to full Quality of Service (QoS) network monitoring to ensure messages and communications are properly routed to avoid bottlenecks. Network development also includes development and fielding of a Parallel Staging Network (PSN) which allows new software spirals to be developed, tested, and operationally checked-out on fielded communications and C2BMC equipment prior to switching over to operational use. The PSN assures the operator higher availability of the operational system while continuing development on the parallel system. Once the warfighter accepts the developmental system, with new spiral software, as being operationally ready, it is switched over to operational use and existing operational hardware is turned over to development for the next generation of software. This capability enables concurrent operations and test and seamless transition of new C2BMC capabilities to the warfighter. Also, during Block 2006, Aegis Extremely High Frequency (EHF) connectivity will be established with U.S. Forces Japan (USFJ) and the European Command (EUCOM) Gateway. Continued program planning and engineering support will be conducted for network products provided to the GMD and Sensor elements for development, integration, and test.

As the C2BMC products mature they are engineered and integrated into fielded spirals. The C2BMC program uses spiral development (incremental development, test, and fielding) to deliver the hardware and software required to provide a system-wide integrated BMD capability. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal Command and Control, Battle Management, and Communications (C2MBC) development and begins integration testing with other Ballistic Missile Defense System (BMDS) elements. Block 2006 matured products are integrated in Spirals 6.0, 6.2 and 6.4, and then delivered to the field for concurrent development testing and operational use in conjunction with Responsible Test Organization (RTO), Responsible Engineering Organization (REO), and Aegis BMD and Ground-based Midcourse Defense (GMD) schedules and guidance. Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software. Spiral 6.0 is a minor capability improvement to Spiral 4.5 that enables a host nation interface for the AN/TPY-2 radar and interfaces for new element software improvements. Spiral 6.2 is the first major capability delivery of Block 2006 with the primary focus on improved reliability and availability, particularly with the BMDS Planner. Spiral 6.4 delivers complete Block 2006 capability with a focus on the initial fielding of a Global Engagement Manager (GEM) at the Kenney Air Operations Center (AOC).

SITE ACTIVATION

In addition to Block 2006 spiral software, fielding capability also includes installation and activation of C2BMC capabilities at U.S. Forces Korea (USFK), U.S. Forces Japan (USFJ), Cheyenne Mountain Operations Center (CMOC) equipment moves, and Kenney (Hawaii) AOC. Additionally, Pacific Command (PACOM) will receive a second C2BMC equipment suite. C2BMC fielding at these locations results in improved capability of the BMDS to meet global threats. All Combatant Commands (COCOMs) as well as Ft. Greely, AK will be installed with the parallel staging node hardware and capability. Additionally, Block 2006 site activation includes the procurement and deployment of a C2BMC AN/TPY-2 shelter (with

nine racks of equipment) in Japan, as well as extended situational awareness screens over leased communication lines to the United Kingdom. These international deployments enable BMDS global reach. Block 2006 expands on current capability with numerous BMDS Planner and web browser installs as identified by the warfighter throughout the Block. Site Activation will include participation in planning for future Global BMDS operations and site installations.

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
C2BMC Element	156,550	0	0
RDT&E Articles (Quantity)	2	0	0

The C2BMC Element accomplishes block objectives by integrating work across four product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Battle Management/Global Engagement Manager (GEM), and Networks, so that mature capabilities can be integrated and incrementally delivered to the warfighter. Three incremental deliveries, or spirals, are planned in Block 2006: Spirals 6.0, 6.2, and 6.4.

FY07 Accomplishments:
FY07 RDT&E Articles: Spiral 6.0 and Spiral 6.2

- Delivered Spiral 6.0 (RDT&E article). Spiral 6.0 is a minor software drop that enables the host nation (Japan) to receive data from the FY06 deployment of the AN/TPY-2 radar and establishes early C2BMC interfaces with emerging Ground Based Missile Defense (GMD) and Space Based Infrared System (SBIRS) capabilities. Spiral 6.0 includes the following additional capabilities to Spiral 4.5:
  -
  - AN/TPY-2 radar to U.S. Forces Japan interface (Host Nation Interface)
  - Interface for GMD Fire Control (GFC) version 6A
  - Direct data connection to SBIRS
- Delivered Spiral 6.2 (RDT&E article). Spiral 6.2 is a major capability increase over the functions found in Spiral 4.5. It also incorporates those capabilities delivered early in FY07 with Spiral 6.0. Spiral 6.2 includes the following additional capabilities:
- BMDS Planner
  - Rearchitected/Reengineered software to improve reliability, maintainability, and response
  - Redesigned user displays and data input
  - Improved plan integration (ability to combine individual plans and create excursions without affecting the core plan)
  - For development test only: interface with Aegis Global Command Control System (GCCS-M) planner
- Combatant Command Command and Control (COCOM C2)

- Operational Capability/Protection Capability (OPSCAP/PROCAP) integration and display
- Consolidation and display of warfighter essential elements of information (EEIs) for more informed decision making
- Improved ability to organize and manage display data through the use of configurable filters, information flags, and window sizing

- Battle Management
  - AN/TPY-2 radar management (improved ability to pass precision cues and select focused search plans)
  - AN/TPY-2 radar track forwarding to Aegis BMD via Air Defense System Integrator (ADSI) and Link 16
  - For development testing only: initial use of Multi-Hypothesis Correlator/BMDS Launch Event Association - Global Vision (MHC/BLEA-GV). MHC improves ability to create a single threat radar track from multiple sensors; BLEA-GV merges multiple radar tracks to an associated launch event. Both capabilities improve the accuracy of threat information for decision making and defensive responses
- Network
  - Synchronized data between Combatant Commands (COCOMs) that allows the same information to be displayed at any BMD display
  - Established Aegis Extremely High Frequency (EHF), United States Forces Japan (USFJ), United States Forces Korea (USFK) connectivity
  - Established initial BMDS Network Operation and Security Center (BNOSC) capability
  - Fielded communications Parallel Staging Network (PSN)
  - Provided network engineering support for testing AN/TPY-2 #3 at Vandenberg AFB
  - Conducted BMDS Communication System Complex-Transportable (BCSC-T) development, integration and test at Tobyhanna Army Depot, PA and VAFB
- Performed software deficiency analyses and develop solutions
- Performed monthly information assurance scans and correct deficiencies
- Participated in and analyzed results of Ballistic Missile Defense System integration, ground, and flight tests (minimum of 6 events)
- Participated in and analyzed results of wargames (minimum of 6 events)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

	FY 2007	FY 2008	FY 2009
Site Activation	15,392	0	0
RDT&E Articles (Quantity)	5	0	0

Block 2006 Site Activation efforts continue to address the fielding and upgrade of all C2BMC associated hardware and software (Suites, Enterprise Work Stations (EWS), web browsers, and communications equipment) which enable the warfighter to plan, see, and manage the ballistic missile defense battle.

FY07 Accomplishments:
FY07 RDT&E Articles: Full C2BMC Suite, 3 Upgraded C2BMC Suites (PSN), FGA PSN node

- Installed Strategic Command (STRATCOM) 6.2 Parallel Staging Node (RDT&E and Article)
- Installed Pacific Command (PACOM) 6.2 Parallel Staging Node (RDT&E and Article)
- Installed Northern Command (NORTHCOM) 6.2 Parallel Staging Node (RDT&E and Article)
- Installed Enterprise Work Stations (EWS) at Missile Operations Center
- Installed U.S. Forces Japan (USFJ) Web Browser
- Installed U.S. Forces Korea (USFK) Web Browser
- Installed New SecDef Web Browser 6.0
- Installed second Pacific Command (PACOM) C2BMC Suite (RDT&E and Article)
- Installed Spiral 6.0 software at NORTHCOM, PACOM, and STRATCOM
- Installed Spiral 6.2 software at NORTHCOM, PACOM, and STRATCOM
- Installed Enterprise Work Stations (EWS) at NORTHCOM/NORAD Command and Control Center
- Installed web browser at Joint Functional Component Command for Integrated Missile Defense (JFCC-IMD) / SMDC in Huntsville, AL
- Installed planner for 263rd Army Air Missile Defense Command (AAMDC)
- Installed Strategic Command (STRATCOM) Web Browser
- Installed Parallel Staging Network (PSN) at Ft. Greely, AK (FGA) (RDT&E and Article)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603893C Space Tracking & Surveillance System	311,402	231,528	242,441	266,509	560,130	735,727	938,191	3,285,928
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

D. Acquisition Strategy

The Command and Control Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) is charged to support fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Element								
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin Team/Colorado Springs, CO	32,627	0	N/A	0	N/A	32,627
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin Team/ Huntsville, AL	4,943	0	N/A	0	N/A	4,943
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin Team/ Arlington, VA	61,299	0	N/A	0	N/A	61,299
EW/CEW; SBIRS-DSP; GCCS; JDP; JRE; ISC2; ECPs		Services, DISA, Agencies	16,565	0	N/A	0	N/A	16,565
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIT/LL/ Washington, DC	11,441	0	N/A	0	N/A	11,441
MDA Civilian			5,387	0	N/A	0	N/A	5,387
Scientific Engineering Technical Assistance	SS/FFP	Sparta/Arlington, VA	18,720	0	N/A	0	N/A	18,720
Site Activation								
Suites and Comms Gateways	SS/CPAF	Lockheed Martin Team/COCOMS	15,392	0	N/A	0	N/A	15,392
Subtotal Product Development			166,374	0		0		166374

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

II. Support Costs Cost ($ in Thousands)

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

Remarks

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

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

Remarks

Project Total Cost			166,374	0		0		166,374

Remarks

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

Date: **February 2008**

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

R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
C2BMC Element																												
Spiral 6.0 Cycle 5 Testing	▲																											
Spiral 6.2 Cycle 2 Testing		▲	▬																									
Spiral 6.2 Cycle 5 Testing			▲	▬																								
GEM Increment 2	▲	▬	▬	▬																								
Block 06 System Level Tests	▲	▬	▬	▬																								
Site Activation																												
S6.0 at STRATCOM, NORTHCOM, and PACOM	▲																											
S6.2 at STRATCOM, NORTHCOM, and PACOM			▲																									
C2BMC upgrades (PSN) at STRATCOM, PACOM, NORTHCOM				▲																								

Legend

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
C2BMC Element							
Spiral 6.0 Cycle 5 Testing	1Q						
Spiral 6.2 Cycle 2 Testing	2Q-3Q						
Spiral 6.2 Cycle 5 Testing	3Q-4Q						
GEM Increment 2	1Q-4Q						
Block 06 System Level Tests	1Q-4Q						
Site Activation							
S6.0 at STRATCOM, NORTHCOM, and PACOM	1Q						
S6.2 at STRATCOM, NORTHCOM, and PACOM	3Q						
C2BMC upgrades (PSN) at STRATCOM, PACOM, NORTHCOM	4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008	16,000	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: The content previous planned in 0901 for FY08-13 has been captured in BX01,CX01, and XX01 in accordance with the MDA revised block structure

A. Mission Description and Budget Item Justification

In support of and in collaboration with the Missile Defense Agency's defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to plan the Ballistic Missile Defense (BMD) fight while concurrently tracking all potential ballistic missile threats, directing weapons to engage on a distributed network; and pairing any sensor with any shooter to defeat ballistic missile threats at any range, in any phase, in all theaters. The C2BMC Program will also work to increase coalition partners' capabilities via hardware, software, and operations and sustainment support.

The C2BMC Block 2008 Program enables a coordinated ballistic missile defense against medium size raids and asymmetric threats (as would occur from non-traditional threat trajectories from the south or ship-based). Specific Block goals are to deliver:

- Improved system reliability and availability through network monitoring, equipment upgrades, and maintainable software
- Fully integrated planner and situation awareness displays with integrated intelligence information and defended asset priority schemes
- Initial interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture to enable more rapid integration of new assets into the BMDS
- Initial Joint Integrated Air and Missile Defense (JIAMD) planning capability.
- Global Engagement Manager (GEM) coordination and optimization of increased “Launch-on and Engage-on” networked capability
- Communication capability which will extend BMDS mission success by providing information management and quality of service to the individual user
- Expanded C2BMC, hence the Ballistic Missile Defense System global coverage with activation of European Command (EUCOM) and Central Command (CENTCOM) C2BMC capability

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

C2BMC ELEMENT

The C2BMC Program accomplishes integrated BMDS and Block 2008 objectives by designing, developing and delivering enhanced and new capabilities via incremental spirals. Each spiral, represents an improvement in capability and functionality over its predecessor spiral. The delivery of these spirals includes the software, hardware, and network connectivity needed to operate an integrated Ballistic Missile Defense System (BMDS). C2BMC Program work is integrated across four product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Global Engagement Manager (GEM), and BMD Network. The C2BMC Program also includes development support and post analysis for BMDS-level wargames and tests with fielded spirals.

The BMDS Planner, allows the warfighter to optimize the organization and configuration of the missile defense force (sensor, interceptors, and systems) to counter ballistic missile threats. Because of the global nature of ballistic missile threat, the BMDS requires the use of a BMDS planner to coordinate between the dispersed commanders with the primary focus of coordinating strategic ballistic missile defense and organizing and coordinating theater missile defense. Rapidly changing geo-political issues will require rapid analysis, planning, and adjustment to missile system platforms and courses of actions among U.S. forces and allied partners, which in turn enables protection of the Homeland while enabling maximum coverage of the troops in the field. The BMDS Planner uses defense designs that pair specific BMDS systems and sensors (THAAD, GMD, Aegis BMD, AN/TPY-2) to defend specified prioritized defended assets (cities, military installations, command infrastructure) against a given threat or set of threats. The flexibility of the planner allows the user to function in the three modes of activity: Deliberate Planning (18-24 months before a battle), Crisis Action Planning (hours or days before an attack, based on updated information), and Dynamic Planning (near real time agility for changing situations). The BMDS Planner provides the theater and strategic commanders the ability to build, analyze and coordinate a global, integrated and layered defense at both the operational and strategic levels across all levels of command including across Combatant Commands. This type of coherent planning results in ballistic missile defense for the planned range and complexity of ballistic missile threats. Additionally, the BMDS Planner will add Joint Defense Planning (JDP) capability for air defense capabilities, as well as add new BMD systems as they become available. The Block 2008 BMDS Planner will continue to develop increased capability for planning to the Combatant Commanders and service components. The planner will evolve to a net centric capability. Initial integrated air and missile defense planning capability is also added in Spiral 8.4. The system will be designed to interface with the service components and their evolving systems and enable cross planning between the Combatant Commanders. The planner will continue to initialize the GEM capability as it comes on line and will continue to initialize situational awareness screens.

The Combatant Command Command and Control (COCOM C2) product line consists of: situation awareness displays; decision aids that allow senior defense officials the ability to quickly see and evaluate the global missile defense threat and take appropriate defense responses; AN/TPY-2 radar sensor management; and, ability to forward radar tracks to other BMDS elements. Situation awareness emphasizes common, Single Integrated

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Ballistic Missile Picture (IBMP) and Summary Screens (SS) from the President down to the operational level of command. It combines the information from the BMDS Planner with real-world intelligence information to provide the "big picture" view of worldwide threats, as well as the ability to focus on specific regions and individual launch events. It provides decision-makers, at all levels of command, BMDS readiness status and its ability to defend specific areas. Displayed data and assessment tools also provide the essential elements of information to enable senior-level decisions regarding defensive measures. COCOM C2 improvements in Block 2008 include the migration to a Network Enable Command and Control (NECC) architecture to take advantage of evolving command and control architectures, enhanced Protection Capability (PROCAP), display of engagement coordinations, and integrated common operating picture across the Combatant Commands.

The Global Engagement Manager (GEM) product line provides BMDS battle management capability through C2BMC. It contains algorithms, decision aids, user interfaces, and sensor controls to optimize available sensor energy and interceptor inventory. GEM capabilities are based on cutting-edge, dependable software development tools and techniques with significant testing performed up-front to prevent delivered software deficiencies. At the end of Block 2008, GEM will have have an initial offensive/defensive integration capability, have a direct connection to the sea-based x-band radar, simultaneously manage multiple radars, provide discrimination of sophisticated threats, create and distribute an engageable system track of a threat, and create and publish an integrated engagement plan to BMDS elements in order to optimize the use of their finite missile magazines. GEM capabilities in Block 2008 will also expand beyond the Pacific area of operations to both NORTHCOM and EUCOM. With this expansion will also come cross-area of responsibility engagement coordination.

The Network Communications portion of C2BMC ensures that communications and networking are not the limiting factor in fielding or operation of the BMDS. The intent is to develop products that provide robust, high availability, survivable connectivity to quickly and unambiguously share information across the global BMDS consisting of multiple sensors, weapon systems, and command and control nodes, as well as external users. Effective networking management and operations will rely on the ability to manage, coordinate, and integrate a wide variety of equipment platforms; interfaces with other DoD communications systems and existing/evolving information standards and capabilities. Defense Information Systems Agency (DISA) services are also highly leveraged in providing world-wide communications. In Block 2008, the Network portion of C2BMC includes upgrades to its Parallel Staging Network, a dedicated SPIRNET point-of-presence for greater network service and security, computer network defense, and continued improvement in network monitoring for information assurance.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
C2BMC Element	16,000	0	0
RDT&E Articles (Quantity)	0	0	0

The C2BMC Element accomplishes block objectives by integrating work across four product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Global Engagement Manager (GEM), and BMD Networks, so mature capabilities are integrated and incrementally delivered to the warfighter.

FY07 Accomplishments

- Conducted block architecture, design trade studies
- Identified BMD Network requirements for Block 2008

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

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PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Element								
C2BMC HW/SW Development, I&T	SS/CPAF	Lockheed Martin Team/ Col. Springs, Co	5,452	0	N/A	0	N/A	5,452
C2BMC HW/SW Development, I&T	SS/CPAF	Lockheed Martin Team/ Huntsville, AL	826	0	N/A	0	N/A	826
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin Team/ Arlington, VA	10,242	0	N/A	0	N/A	10,242
Scientific Engineering and Technical Assistance	SS/FFP	Sparta/ Arlington, VA	0	0	N/A	0	N/A	
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIL/LL// Washington, DC	0	0	N/A	0	N/A	
MDA Civilian & Travel			0	0	N/A	0	N/A	
EW/CEW; NECC; JDP; JRE; ISC2; PATRIOT-JTAGS		Services, DISA, Agencies	0	0	N/A	0	N/A	
C2BMC Program Office Move			0	0	N/A	0	N/A	
Subtotal Product Development			16,520	0		0		16520

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

II. Support Costs Cost ($ in Thousands)

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

Remarks

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

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

Remarks

Project Total Cost			16,520	0		0		16,520

Remarks

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

Date
February 2008

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

R-1 NOMENCLATURE
0603896C BMD C2BMC

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
C2BMC Element																												
Block 08 Architecture Trade Studies			▲	▲																								

Legend

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
C2BMC Element							
Block 08 Architecture Trade Studies	3Q-4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
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COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
AX01 Ballistic Missile Defense C2BMC Block 1.0	0	101,592	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: The content in AX01 is a continuation of the efforts reported in 0701 and 0801 and was explained in those projects in PB08.

A. Mission Description and Budget Item Justification

In support of and in collaboration with the Missile Defense Agency's Ballistic Missile Defense System (BMDS) architectures and system specifications, the Command and Control, Battle Management, and Communications (C2BMC) program is the lynchpin of integrated missile defense providing the warfighter the capability of planning the Ballistic Missile Defense (BMD) fight while concurrently tracking potential ballistic missile threats; directing weapons to engage via a distributed network; and, pairing appropriate sensors with the appropriate weapon system to defeat ballistic missile threats of any range, in any phase of flight, in all theaters, and with coalition partners. The C2BMC Program delivers continually increasing capabilities via hardware, software, and network connectivity.

The Block 1.0 C2BMC Program delivers the rudimentary foundation for integrated, layered defense for initial defense against North Korean Long-Range threats. Block goals are to deliver:

- Common situational awareness capability/displays at the Combatant Commands (COCOMS) and National Military Command Center (NMCC)
- Sensor management of the AN/TPY-2 Radar in Japan
- Redundant communication/data paths and connections to GMD, Aegis BMD, and AN/TPY-2 radar
- Enhanced BMDS Planner - better user displays, flexible defense design, faster analysis
- Enhanced situational awareness and command and control at the COCOM headquarters - consolidated essential elements of information for Commander's Vol 6 weapons release conference, more informative visual representations
- High availability, redundant communications
- Combined test and operations capability via a Parallel Staging Network (PSN)
- Engagement Sequence Groups (ESG) involving Ground Based Interceptor (GBI), Standard Missile 3 (SM-3), Cobra Dane Upgraded Early Warning Radar, SPY-1 Sensor, and AN/TPY-2

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C2BMC Development

The Command and Control, Battle Management, and Communications (C2BMC) Program includes program management and the hardware/software engineering necessary to accomplish Block 1.0 objectives by balancing development in four product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Battle Management/Global Engagement Management, and BMD Network). The BMDS) Planner, a part of the BMDS test bed system, allows the warfighter to optimize the organization and configuration of the missile defense force (sensor, interceptors, and systems) to counter ballistic missile threats. Because of the global nature of ballistic missile threat, the BMDS requires the use of a BMDS Planner to coordinate between the dispersed commanders with the primary focus of coordinating strategic ballistic missile defense and organizing and coordinating theater missile defense. Rapidly changing geo-political issues will require rapid analysis, planning, and adjustment to missile system platforms and courses of actions among U.S. forces and allied partners, which in turn enables protection of the Homeland while enabling maximum coverage of the troops in the field. The BMDS Planner uses defense designs that pair specific BMDS systems and sensors (THAAD, GMD, Aegis BMD, AN/TPY-2) to defend specified prioritized defended assets (cities, military installations, command infrastructure) against a given threat or set of threats. The flexibility of the planner allows the user to function in the three modes of activity: Deliberate Planning (18-24 months before a battle), Crisis Action Planning (hours or days before an attack, based on updated information), and Dynamic Planning (near real time agility for changing situations). The BMDS Planner provides the theater and strategic commanders the ability to build, analyze and coordinate a global, integrated and layered defense at both the operational and strategic levels across all levels of command including across Combatant Commands. This type of coherent planning results in ballistic missile defense for the planned range and complexity of ballistic missile threats. Block 1.0 development includes the following BMDS Planner capabilities:

- Re-architected software for more efficient plan processing
- Operator displays and inputs are simplified and streamlined into a single graphical user interface, per user feedback
- Incorporates the ability to create planning sequels and branches and adds merge and unmerge functions. This capability improves the warfighters ability to create and adapt integrated defense designs at the strategic and tactical levels by allowing the warfighter to copy plans from different COCOMs, merge them, and then modify them in order to determine what type of coverage is available across commands. This capability aids in the efficient allocation of resources across commands. (4) The BMDS Planner utilizes an open system architecture, which provides an evolutionary path for potential technology upgrades
- Force level ballistic missile defense planning capability at the strategic and operational levels
- Planning load robustness that protects against incomplete/inaccurate data
- Initial interface with the Army Air and Missile Defense Work Station (AMDWS) planner
- Sensor management display (AN/TPY-2 Radar), Integrated Ballistic Missile Picture (IBMP), BMDS Summary Screen (SS), and Executive Displays (displays all BMDS track and status data)

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The Combatant Command Command and Control (COCOM C2) product line consists of: situation awareness displays; decision aids that allow senior defense officials the ability to quickly see and evaluate the global missile defense threat and take appropriate defense responses; AN/TPY-2 radar sensor management; and, ability to forward radar tracks to other BMDS elements. Situation awareness emphasizes common, Single Integrated Ballistic Missile Picture (IBMP) and Summary Screens (SS) from the President down to the operational level of command. It combines the information from the BMDS Planner with real-world intelligence information to provide the "big picture" view of worldwide threats, as well as the ability to focus on specific regions and individual launch events. It provides decision-makers, at all levels of command, BMDS readiness status and its ability to defend specific areas. Displayed data and assessment tools also provide the essential elements of information to enable senior-level decisions regarding defensive measures. COCOM C2 improvements in Block 1.0 include executive summary screen enhancements a consolidated display of Essential Elements of Information (EEIs) to conduct the Commander's Vol 6 conference for weapons release authority, and improved ability to organize and manage on-screen information with filters and moveable screen windows. Situation Awareness capability is further enhanced with the introduction of initial Protection Capability (PROCAP) which allows the operator to visually see status and capabilities of BMD assets. Remote situation awareness is also provided to the United Kingdom. Finally, Block 1.0 includes upgrades to interface with the Ground Based Missile Fire Control software version 6A and a direct data connection to Space Based Infrared System (SBIRS) information.

Battle Management comprises the decisions and actions executed in direct response to the activities of enemy forces. In Block 1.0, the battle management portion of C2BMC is focused at the Combatant Commands (COCOMs) Headquarters. Battle management develops and delivers AN/TPY-2 radar management including Operational State Control, Sensor Tasking (cue), and Resource Management, all which increase the effectiveness of the radar system within the Ballistic Missile Defense System (BMDS). Additionally, AN/TPY-2 radar management functionality is enhanced with capabilities radar precision cueing and focused search plan selection, as well as improvements in user controls/displays. The ability to forward threat tracks from the AN/TPY-2 radar in Japan to U.S. Forces Japan and to Aegis BMD for cueing radars is also added in Block 1.0. In addition, track data management capability is improved to include forwarding of AN/TPY-2 radar tracks to Ground Based Missile Defense Fire Control (GFC) via fiber and satellite.

The Network Communications portion of C2BMC ensures connectivity between all components of the BMDS on the BMD network. The intent is to develop and deliver products that provide robust connectivity to quickly and unambiguously share information across the global BMD and with external users. Effective networking relies on an interconnection of a variety of platforms and capabilities. In Block 1.0, network capability is delivered to enable Aegis BMD and GMD Engagement Sequence Groups (ESGs), Joint Range Extension and Air Defense System Integrator to convert Satellite Communications (SATCOM) formatted messages from Aegis to land line messages to interface with the rest of the BMDS, initial network monitoring and management, Communications Node Equipment (CNE) auto-failover to prevent system outages, BMDS Global Integrated Missile Defense Network Operations and Integration Center at the Joint Functional Component Commander for Integrated Missile Defense (JFCC

IMD) in Colorado Springs, CO for remote monitoring of the network, and support of dual redundant suites. Additionally, engineering planning is provided for communications to support products installed and tested by the GMD and Sensor elements.

FIELDING
The C2BMC program delivered both spiral software and operational hardware/capabilities to the Combatant Commands at Northern Command (NORTHCOM), Strategic Command (STRATCOM) and Pacific Command (PACOM), and within the National Capital Region (NCR) to provide BMDS operations. Hardware capabilities consist of Enterprise Work Stations (warfighter display monitors and access to BMDS Planner, situation awareness and battle manager capabilities), servers, processors, and communications racks and equipment (up to eight racks of equipment per C2BMC suite in Block 1.0), situational awareness web browsers, stand-alone laptop planners, and video distribution equipment. Additionally, Block 1.0 site activation included the procurement and deployment of a C2BMC AN/TPY-2 shelter (with nine racks of equipment) in Japan, as well as extended situational awareness screens over leased communication lines to the United Kingdom. These international deployments enable BMDS global reach. Additionally, fielding encompasses the deployment of a HMMWV based Communication Node (HBCN) to Juneau, AK to support AN/TPY-2 radar siting for realistic BMDS-level flight test (FTG-04).

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
C2BMC Development	0	75,326	0
RDT&E Articles (Quantity)	0	0	0

C2BMC Development accomplishes Block 1.0 objectives by balancing the development of four principle product lines: BMDS Planner, Situation Awareness, Battle Management, and BMD Network, enabling capabilities to be integrated and incrementally delivered to the warfighter via spirals. Block 1.0 includes infrastructure development, testing activity, and development support of fielded hardware and software.

FY08 Planned Program
- Perform software deficiency analyses and develop solutions
- Perform monthly information assurance scans and correct deficiencies
- Participate in and analyze results of Ballistic Missile Defense System integration, ground and flight tests per the BMDS Integrated Master Test Plan
- Participate in and analyze results of wargames in accordance with the BMDS Integrated Master Test Plan

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APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

	FY 2007	FY 2008	FY 2009
C2BMC AN/TPY-2 Fielding	0	26,266	0
RDT&E Articles (Quantity)	0	0	0

AN/TPY-2 Fielding Support

The C2BMC program will complete development, delivery and fielding of a communications capability to support an AN/TPY-2 radar which will be deployed to Juneau, AK to support GMD Flight Test number 4 (FTG-04) during FY08. This capability will be provided by the High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communication Node (HBCN) which is being integrated and tested with the radar at Vandenberg AFB prior to deployment of both to Alaska.

FY08 Planned Program

- Integrate and test HBCN communications capability with AN/TPY-2 radar at VAFB
- Deploy HBCN to Alaska along with AN/TPY-2 to support FTG-04
- Provide engineering support during planning and execution of FTG-04

C. Other Program Funding Summary

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

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	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603893C Space Tracking & Surveillance System	311,402	231,528	242,441	266,509	560,130	735,727	938,191	3,285,928
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

D. Acquisition Strategy

The Command and Control Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) is charged to support fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Development								
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin Team/ Colorado Springs, CO	0	7,654	1Q	0	N/A	7,654
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin Team/ Huntsville, AL	0	1,160	1Q	0	N/A	1,160
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin Team/ Arlington, VA	0	14,381	1Q	0	N/A	14,381
EHF Teleport, Planner, ECPs		Services, DISA, Agencies	0	10,905	1Q	0	N/A	10,905
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIT/LL// Washington, DC	0	11,717	1Q	0	N/A	11,717
MDA Civilian			0	5,503	1Q	0	N/A	5,503
Scientific Engineering Technical Assistance		Sparta/ Arlington, VA	0	24,006	1Q	0	N/A	24,006
C2BMC AN/TPY-2 Fielding								
AN/TPY-2 Fielding	SS/CPAF	Lockheed Martin Team	0	16,878	1Q	0	N/A	16,878
AN/TPY-2 Fielding	SS/CPAF	DISA/ Various	0	9,388	1Q	0	N/A	9,388
Subtotal Product Development			0	101,592		0		101592

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
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II. Support Costs Cost ($ in Thousands)

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

Remarks

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

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

Remarks

Project Total Cost			0	101,592		0		101,592

Remarks

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COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
BX01 Ballistic Missile Defense C2BMC Block 2.0	0	111,091	88,893	27,605	0	0	0
RDT&E Articles Qty	0	9	0	0	0	0	0

Note: RDT&E Articles: Spiral 6.4 software, NORTHCOM/STRATCOM/PACOM Track Servers, GEM Suite at Kenney HQ, EUCOM Communications Node, PACOM Communications Node, AN/TPY-2 BSCS-T, Shariki Japan BCN hardware upgrade, FGA hardware upgrade

The content in BX01 is a continuation of the efforts reported in 0801 and was explained in that project in PB08.

A. Mission Description and Budget Item Justification

In support of and in collaboration with the Missile Defense Agency's defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to systematically plan the fight, see it unfold, and dynamically direct and adjust ballistic missile defense networked sensors and weapons to engage and defeat ballistic missile threats at any range, in any phase, in all theaters. The C2BMC products will provide the warfighter the capability to optimize ballistic missile defense from a global level by combining the best sensor information with the most efficient weapon from complimentary weapons systems, which individually, provide only limited area protection.

Today, the center of gravity for integrated BMDS is with C2BMC at the Combatant Command (COCOM) Headquarters, where BMD mission planning, situation awareness, and decisions aids are focused. All processing is performed at Strategic Command (STRATCOM), Northern Command (NORTHCOM), and Pacific Command (PACOM) headquarters. Users of the system are either collocated with, or directly connected to the equipment suites at these COCOMs. As the system evolves, the center of gravity will shift from the COCOMs to the Air Operations Centers (AOCs) and supporting Service Components (e.g., Army), where real-time automated battle management will be introduced and deployed. Development of this Area of Operational Responsibility (AOR)-centric enterprise architecture will allow C2BMC workload to be focused on the “battle in front of the warfighter”, through the deployment of Global Engagement Manager (GEM) functions within the Area Air Defense Commander's staff while also providing global situation awareness and senior leader decision aides at the COCOM Headquarters. Together, these separate capabilities enable integrated support of prioritized theater, regional, and homeland defense missions. To accomplish this shift in the center of gravity and meet the C2BMC mission objective of any sensor, any weapon, any threat, in any phase of flight, the C2BMC program of work in Block 2.0 includes concentrated effort on developing complementary C2BMC system capabilities (i.e., global BMD planning and situation awareness at the Combatant Commands Headquarters and Global Engagement Manager (GEM), based on dependable, trusted software at the Air Operations Center for initial deployment by the end of the Block.

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In Block 2.0, the C2BMC program will defend allies and deployed forces from short- to medium- range threats in one region/theater. Block goals are to deliver:

- Improved C2BMC system reliability and availability
- Perform studies and C2BMC experimental lab activities to develop initial way ahead for combining Missile Defense/Missile Warning (MD/MW) capability and situational awareness screens
- Initial GEM capability at the Kenney HQ Air Operations Center
- Enhanced BMDS Planner - better user displays, flexible defense designs, faster analysis, air defense, and other necessary systems
- Enhanced situational awareness and command and control at the COCOM headquarters - additional GMD cluster-based essential elements of information, more informative visual representations
- Enhanced network monitoring
- Engagement Sequence Groups (ESG) that involve the Ground Based Missile Defense Interceptor, Aegis BMD, Standard Missile 3 (SM-3) and Army/Navy/Surfaced Phased Array System (AN/SPY-1) Radar, Terminal High Altitude Area Defense (THAAD) Interceptors, Army/Navy/Transportable Phased Array Radar (AN/TPY-2), and Space Based Infrared Sensor (SBIRS)

C2BMC ELEMENT

The C2BMC Program accomplishes integrated BMDS and Block 2.0 objectives by designing, developing and delivering enhanced and new capabilities via incremental spirals. Each spiral, represents an improvement in capability and functionality over its predecessor spiral. The delivery of these spirals includes the software, hardware, and network connectivity needed to operate an integrated Ballistic Missile Defense System (BMDS). C2BMC Program work is integrated across four product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Global Engagement Manager (GEM), and BMD Network. The C2BMC Program also includes development support and post analysis for BMDS-level wargames and tests with fielded spirals.

The Command BMDS Planner, allows the warfighter to optimize the organization and configuration of the missile defense force (sensor, interceptors, and systems) to counter ballistic missile threats. Because of the global nature of ballistic missile threat, the BMDS requires the use of a BMDS planner to coordinate between the dispersed commanders with the primary focus of coordinating strategic ballistic missile defense and organizing and coordinating theater missile defense. Rapidly changing geo-political issues will require rapid analysis, planning, and adjustment to missile system platforms and courses of actions among U.S. forces and allied partners, which in turn enables protection of the Homeland while enabling maximum coverage of the troops in the field. The BMDS Planner uses defense designs that pair specific BMDS systems and sensors (THAAD, GMD, Aegis BMD, AN/TPY-2) to defend specified prioritized defended assets (cities, military installations, command infrastructure) against a given threat or set of threats. The flexibility of the planner allows the user to function in the three modes of activity: Deliberate Planning

(18-24 months before a battle), Crisis Action Planning (hours or days before an attack, based on updated information), and Dynamic Planning (near real time agility for changing situations). The BMDS Planner provides the theater and strategic commanders the ability to build, analyze and coordinate a global, integrated and layered defense at both the operational and strategic levels across all levels of command including across Combatant Commands. This type of coherent planning results in ballistic missile defense for the planned range and complexity of ballistic missile threats. Additionally, the BMDS Planner will add Joint Defense Planning (JDP) capability for air defense capabilities, as well as add new BMD systems as they become available.

For the Block 2.0 BMDS Planner analysis capability, the analysis tool will be improved to include updated Element representations capabilities and Concept of Operations (CONOPS). This will continue through each of the spiral builds and Blocks. Current Block 2.0 Ballistic Missile Defense System (BMDS) capability assessments include the Ground Based Midcourse Defense System (GMD) with the Sea-Based X-band Radar (SBX), the Theater High Altitude Area Defense System (THAAD), one AN/TPY-2 radar, an interface to the AEGIS Ballistic Missile Defense System (AEGIS BMD), and an interface to the Army's Air and Missile Defense Work Station to enable interface with the PATRIOT systems.

The Combatant Command Command and Control (COCOM C2) product line consists of: situation awareness displays; decision aids that allow senior defense officials the ability to quickly see and evaluate the global missile defense threat and take appropriate defense responses; AN/TPY-2 radar sensor management; and, ability to forward radar tracks to other BMDS elements. Situation awareness emphasizes common, Single Integrated Ballistic Missile Picture (IBMP) and Summary Screens (SS) from the President down to the operational level of command. It combines the information from the BMDS Planner with real-world intelligence information to provide the “big picture” view of worldwide threats, as well as the ability to focus on specific regions and individual launch events. It provides decision-makers, at all levels of command, BMDS readiness status and its ability to defend specific areas. Displayed data and assessment tools also provide the essential elements of information to enable senior-level decisions regarding defensive measures. COCOM C2 improvements in Block 2.0 include executive summary screen enhancements such as Global Engagement Manager (GEM) situation awareness interaction with COCOM Headquarters, additional battlespace information and common threat track identification across BMDS elements.

The Global Engagement Manager (GEM) product line provides the first true BMDS battle management capability through C2BMC. It contains algorithms, decision aids, user interfaces, and sensor controls to allow the Integrated Missile Defense Operations Cell inside the Kenney Air Operations Center (AOC) (Hawaii) to optimize available sensor energy and interceptor inventory. GEM capabilities are based on cutting-edge, dependable software development tools and techniques with significant testing performed up-front to prevent delivered software deficiencies. At the end of Block 2.0, GEM will have the primary task of managing the AN/TPY-2 radar in Japan (with COCOM C2 providing a backup capability) and include Patriot and Aegis BMD interceptors in its weapons assignment calculations. It will communicate intent to these elements using existing Link

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APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

16 message sets in the initial release, with eventual transition to BMDS Extensible Markup Language (XML) formatted messages throughout the BMDS network. As we develop the GEM product line, we are moving towards a Service Oriented Architecture (SOA) for the BMDS. This will allow independent development of the individual elements and well-managed interfaces for integration into the BMD Network. By applying advanced development techniques, the C2BMC Program will produce a highly dependable network that has predictable behavior, is scalable for future growth, and will provide advanced information assurance to protect the BMDS. It will provide these interfaces between BMDS elements, beginning with GEM in Spiral 6.4. Data Services will provide the right data to applications that need it throughout the BMDS network, and will minimize the number of interfaces required between individual elements.

The Network Communications portion of C2BMC ensures that communications and networking are not the limiting factor in fielding or operation of the BMDS. The intent is to develop products that provide robust, high availability, survivable connectivity to quickly and unambiguously share information across the global BMDS consisting of multiple sensors, weapon systems, and command and control nodes, as well as external users. Effective networking management and operations will rely on the ability to manage, coordinate, and integrate a wide variety of equipment platforms; interfaces with other DoD communications systems and existing/evolving information standards and capabilities. Defense Information Systems Agency (DISA) services are also highly leveraged in providing world-wide communications. In Block 2.0, the Network portion of C2BMC will provide initial Network Centric Enterprise Services (NCES) capabilities, starting with centralized detailed network performance monitoring and cryptographic device management, which will evolve to full Quality of Service (QoS) network monitoring to ensure messages and communications are properly routed to avoid bottlenecks. A test communications gateway is installed in the European theater of operations with the capability to become operational in an emergency. Additionally, a BMDS Communications System Complex-Transportable (BCSC-T) is developed, constructed, and integrated with the AN/TPY-2 to connect it to the BMDS from deployed locations.

As the C2BMC products mature they are engineered and integrated into fielded spirals. The C2BMC program uses spiral development (incremental development, test, and fielding) to deliver the hardware and software required to provide a system-wide integrated BMD capability. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal Command and Control, Battle Management, and Communications (C2MBC) development and begins integration testing with other Ballistic Missile Defense System (BMDS) elements. Block 2.0 matured products are integrated in Spiral 6.4, and then delivered to the field for concurrent development testing and operational use in conjunction with Responsible Test Organization (RTO), Responsible Engineering Organization (REO), and Aegis BMD and Ground-based Midcourse Defense (GMD) schedules and guidance. Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
C2BMC Development	0	101,625	78,009
RDT&E Articles (Quantity)	0	1	0

RDT&E Articles: BCSC-T, Spiral 6.4 The C2BMC Element accomplishes block objectives by integrating work across four product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Global Engagement Manager (GEM), and Networks, so that mature capabilities can be integrated and incrementally delivered to the warfighter. One incremental delivery, or spiral, is planned in Block 2.0: Spiral6.4.

FY08 Planned Program

- Develop and code Spiral 6.4
- Conduct Element to Element (pairwise) development testing
- Initiate and conduct Spiral 6.4 requirements verification testing
- Delivery BSCS-T to Vandenburg AFB for integration testing with the AN/TPY-2
- Perform software deficiency analyses and develop solutions
- Participate in and analyze results of wargames in accordance with the BMDS Integrated Master Test Plan

FY09 Planned Program

- Deliver Spiral 6.4 (RDT&E Article) to the field for Cycle 5 testing. Spiral 6.4 is a major capability increase and includes the following additional capabilities over the functions found in Spiral 6.2
- BMDS Planner
  - Provide defense designs (individual BMD plans) to data services for Global Engagement Manager (GEM) consumption
  - Provide an initial integration of the BMDS Planner and Joint Engine for Defense Analysis (JEDA) graphical user interface “with Defended Area Analysis” which provides a quick visualization of how well a particular plan performs its mission
  - External Interface Improvements with Element Planners (Army Missile Defense Warning System (AMDWS), Aegis Global Command Control System (GCCS-M)) and Intel database
- COCOM C2
  - Operationalize Multi-Hypothesis Correlation/BMDS Launch Event Association - Global Vision (MHC/BLEA-GV)
  - Synchronize GEM to COCOM track ID association for consistent threat tracks at all levels of command
  - GEM Summary Information Displays at COCOM headquarters which provides the same “sight-picture” to both the theater and strategic commanders

- COCOM Processing of Implemented BXF Messages to speed processing and display of information
- Retain Spiral 6.2 AN/TPY-2 radar management capability at the COCOM C2 as fail over from GEM
- Retain Spiral 6.2 track forwarding capability at the COCOM C2 as fall back from GEM

- GEM
  - Initial GEM capability
  - Correlate tracks, lethal tracks automatically identified based on high quality information
  - Primary control, monitoring, and tasking of AN/TPY-2 radar
  - Weapon system health and monitoring
  - Optimize weapon usage; de-conflict weapon intent and integrated engagement plan
  - Track forwarding via Link 16 for communication with Aegis BMD
  - Provide an Integrated Engagement Plan as a developmental capability
  - Provide a system track as a developmental capability
  - Provide the following data services: Defense Design, Blue Force Operations Capability (OPSCAP), AN/TPY-2 Data, System Track, Battle Manager Alert, integrated Engagement Plan, Object Reporting, Weapon Tasking, Health & Status Reporting
- Networks
  - Full Quality of Service Network Monitoring implementation
  - Improve system management to identify communication failure/overloads for immediate corrective action
  - Improve message handling reliability to ensure transmission even in a degraded communications environment
- Implementation of upgrades to increase system performance/survivability of network to support GEM
- Perform software deficiency analyses and develop solutions
- Perform monthly information assurance scans and correct deficiencies
- Participate in and analyze results of Ballistic Missile Defense System integration, ground and flight tests per the BMDS Integrated Master Test Plan
- Participate in and analyze results of wargames

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

	FY 2007	FY 2008	FY 2009
C2BMC Fielding	0	9,466	10,884
RDT&E Articles (Quantity)	0	8	0

RDT&E Articles: NORTHCOM/STRATCOM/PACOM Track Servers, GEM Suite at Kenney HQ, EUCOM Communications Node, PACOM Communications Node, Shariki Japan BCN hardware upgrade, FGA hardware upgrade Block 2.0 Site Activation efforts continue to address the fielding and upgrade of all C2BMC associated hardware and software (Suites, Enterprise Work Stations (EWS), web browsers, and communications equipment) which enable the warfighter to plan, see, and manage the ballistic missile defense battle.

FY08 Planned Program:

FY08 RDT&E Articles: NORTHCOM/STRATCOM/PACOM Track Servers, GEM Suite at Kenney HQ, EUCOM Communications Node, PACOM Communications Node, Shariki Japan BCN hardware upgrade, FGA hardware upgrade

- Install Global Engagement Manager (GEM) hardware at PACOM (RDT&E and Article)
- Install Northern Command (NORTHCOM) track server and hardware upgrades for Spiral 6.4
- Install Strategic Command (STRATCOM) track server and hardware upgrades for Spiral 6.4
- Install Pacific Command (PACOM) track server and hardware upgrades for Spiral 6.4
- Install Enterprise Work Stations and Web Browsers, Planners
- Install EUCOM Gateway (C2 Node, communications equipment only) for development testing
- Install Ft. Greely, AK (FGA) Spiral 6.4 HW
- Install Pacific Command (PACOM) Test Gateway
- Install CENTCOM Web Browser
- Install AN/TPY-2 Spiral 6.4 hardware upgrades

FY09 Planned Program:

- Install Spiral 6.4 COCOM software at NORTHCOM, STRATCOM, and PACOM
- Install Spiral 6.4 GEM software at Kenny HQ
- Update production drawings and installation procedures
- Install Enterprise Work Stations and Web Browsers, Planners

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603893C Space Tracking & Surveillance System	311,402	231,528	242,441	266,509	560,130	735,727	938,191	3,285,928
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

D. Acquisition Strategy

The Command and Control Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) is charged to support fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Development								
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin Team/ Colorado Springs, CO	0	31,918	1Q	26,034	1Q	57,952
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin Team/ Huntsville, AL	0	4,837	1Q	3,879	1Q	8,716
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin Team/ Arlington, VA	0	59,970	1Q	48,096	1Q	108,066
BNOSC/MDA Study Group			0	4,900	1Q	0	N/A	4,900
C2BMC Fielding								
Suites and Comms Gateways	SS/CPAF		0	9,466	1Q	10,884	1Q	20,350
Subtotal Product Development			0	111,091		88,893		199984

Remarks

II. Support Costs Cost ($ in Thousands)

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

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

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

Remarks

Project Total Cost			0	111,091		88,893		199,984

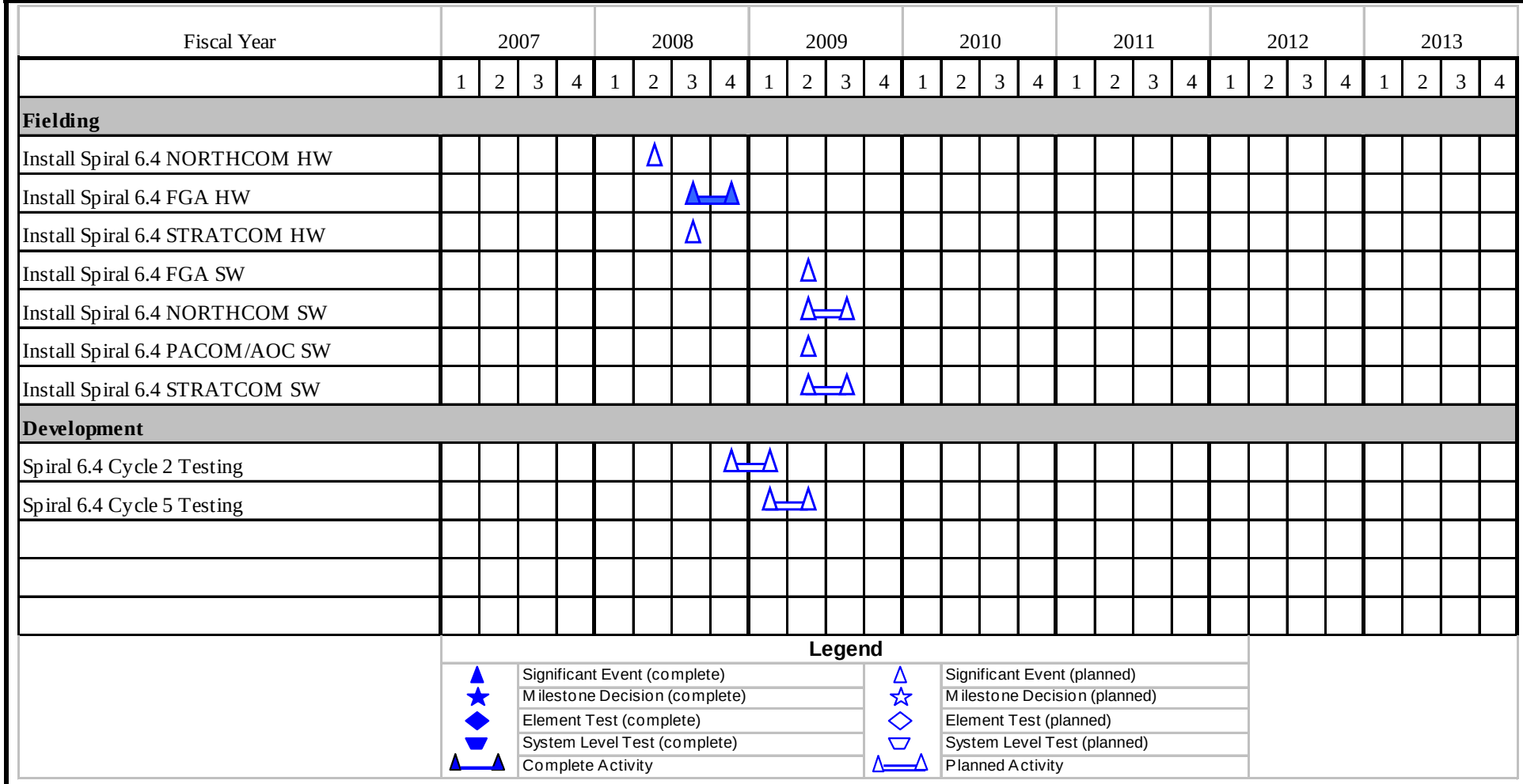
Remarks

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

Date: **February 2008**

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

R-1 NOMENCLATURE: **0603896C BMD C2BMC**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Fielding							
Install Spiral 6.4 NORTHCOM HW		2Q					
Install Spiral 6.4 FGA HW		3Q-4Q					
Install Spiral 6.4 STRATCOM HW		3Q					
Install Spiral 6.4 FGA SW			2Q				
Install Spiral 6.4 NORTHCOM SW			2Q-3Q				
Install Spiral 6.4 PACOM/AOC SW			2Q				
Install Spiral 6.4 STRATCOM SW			2Q-3Q				
Development							
Spiral 6.4 Cycle 2 Testing		4Q	1Q				
Spiral 6.4 Cycle 5 Testing			1Q-2Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
CX01 Ballistic Missile Defense C2BMC Block 3.0	0	85,192	147,551	203,115	215,508	166,794	98,765
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: The content in CX01 is a continuation of the efforts reported in 0901 and 0001 and was explained in those projects in PB08.

A. Mission Description and Budget Item Justification

In support of and in collaboration with the Missile Defense Agency's defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to plan the Ballistic Missile Defense (BMD) fight while concurrently tracking all potential ballistic missile threats, directing weapons to engage on a distributed network; and pairing any sensor with any shooter to defeat ballistic missile threats at any range, in any phase, in all theaters. The C2BMC Program will also work to increase coalition partners' capabilities via hardware, software, and operations and sustainment support.

The C2BMC Block 3.0 Program expands defense of the United States to include limited Iranian Long-Range Threats. Specific Block goals are to deliver:

- Fully integrated BMDS Planner and situation awareness displays with integrated intelligence information and defended asset priority schemes
- Initial interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture
- NORTHCOM, EUCOM, and CENTCOM expansion of GEM coordination and optimization of increased “Launch-on and Engage-on” networked capability
- Joint Integrated Air and Missile Defense (JIAMD) Planner capability

C2BMC ELEMENT

The C2BMC Program accomplishes integrated BMDS and Block 3.0 objectives by designing, developing and delivering enhanced and new capabilities via incremental spirals. Each spiral, represents an improvement in capability and functionality over its predecessor spiral. The delivery of these spirals includes the software, hardware, and network connectivity needed to operate an integrated Ballistic Missile Defense System (BMDS). C2BMC Program work is integrated across four product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Global Engagement Manager (GEM), and BMD Network. The C2BMC Program also includes development support and post analysis for BMDS-level wargames and tests with fielded spirals.

The BMDS Planner, allows the warfighter to optimize the organization and configuration of the missile defense force (sensor, interceptors, and systems) to counter ballistic missile threats. Because of the global nature of ballistic missile threat, the BMDS requires the use of a BMDS planner to

coordinate between the dispersed commanders with the primary focus of coordinating strategic ballistic missile defense and organizing and coordinating theater missile defense. Rapidly changing geo-political issues will require rapid analysis, planning, and adjustment to missile system platforms and courses of actions among U.S. forces and allied partners, which in turn enables protection of the Homeland while enabling maximum coverage of the troops in the field. The BMDS Planner uses defense designs that pair specific BMDS systems and sensors (THAAD, GMD, Aegis BMD, AN/TPY-2) to defend specified prioritized defended assets (cities, military installations, command infrastructure) against a given threat or set of threats. The flexibility of the planner allows the user to function in the three modes of activity: Deliberate Planning (18-24 months before a battle), Crisis Action Planning (hours or days before an attack, based on updated information), and Dynamic Planning (near real time agility for changing situations). The BMDS Planner provides the theater and strategic commanders the ability to build, analyze and coordinate a global, integrated and layered defense at both the operational and strategic levels across all levels of command including across Combatant Commands. This type of coherent planning results in ballistic missile defense for the planned range and complexity of ballistic missile threats. Additionally, the BMDS Planner will add Joint Defense Planning (JDP) capability for air defense capabilities, as well as add new BMD systems as they become available. The Block 3.0 BMDS Planner will continue to develop increased capability for planning to the Combatant Commanders and service components. The planner will evolve to a net centric capability and add in initial integrated air and missile defense capability by Spiral 8.4. The system will be designed to interface with the service components and their evolving systems and enable cross planning between the Combatant Commanders. The planner will continue to initialize the GEM capability as it comes on line and will continue to be the initializes for situational awareness

The Combatant Command Command and Control (COCOM C2) product line consists of: situation awareness displays; decision aids that allow senior defense officials the ability to quickly see and evaluate the global missile defense threat and take appropriate defense responses; AN/TPY-2 radar sensor management; and, ability to forward radar tracks to other BMDS elements. Situation awareness emphasizes common, Single Integrated Ballistic Missile Picture (IBMP) and Summary Screens (SS) from the President down to the operational level of command. It combines the information from the BMDS Planner with real-world intelligence information to provide the “big picture” view of worldwide threats, as well as the ability to focus on specific regions and individual launch events. It provides decision-makers, at all levels of command, BMDS readiness status and its ability to defend specific areas. Displayed data and assessment tools also provide the essential elements of information to enable senior-level decisions regarding defensive measures. COCOM C2 improvements in Block 3.0 include the migration to a Network Enable Command and Control (NECC) architecture to take advantage of evolving command and control architectures, enhanced Protection Capability (PROCAP), display of engagement coordinations, and integrated common operating picture across the Combatant Commands.

The Global Engagement Manager (GEM) product line provides BMDS battle management capability through C2BMC. It contains algorithms, decision aids, user interfaces, and sensor controls to optimize available sensor energy and interceptor inventory. GEM capabilities are based on cutting-edge, dependable software development tools and techniques with significant testing performed up-front to prevent delivered software

deficiencies. At the end of Block 3.0, GEM will have have an initial offensive/defensive integration, have a direct connection to the sea-based x-band radar, simultaneously manage multiple radars, provide discrimination of sophisticated threats, create and distribute an engageable system track of a threat, and create and publish an integrated engagement plan to BMDS elements in order to optimize the use of their finite missile magazines. GEM capabilities in Block 3.0 will also expand beyond the Pacific area of responsibility to both NORTHCOM and EUCOM. With this expansion also come the a cross-area of responsibility engagement coordination.

The Network Communications portion of C2BMC ensures that communications and networking are not the limiting factor in fielding or operation of the BMDS. The intent is to develop products that provide robust, high availability, survivable connectivity to quickly and unambiguously share information across the global BMDS consisting of multiple sensors, weapon systems, and command and control nodes, as well as external users. Effective networking management and operations will rely on the ability to manage, coordinate, and integrate a wide variety of equipment platforms; interfaces with other DoD communications systems and existing/evolving information standards and capabilities. Defense Information Systems Agency (DISA) services are also highly leveraged in providing world-wide communications. In Block 3.0, the Network portion of C2BMC includes upgrades to its Parallel Staging Network, a dedicated SPIRNET point-of-presence for greater network service and security, computer network defense, and continued improvement in network monitoring for information assurance.

SITE ACTIVATION
C2BMC capabilities (hardware and software) will be deployed to NORTHCOM and EUCOM with existing sites receiving upgrades as needed. Deployment to these combatant commands continues to expand BMDS on a global scale, providing increased protection to the U.S., and its friends and Allies. Block 3.0 expands current capability with numerous BMDS Planner, web browser, and Enterprise Workstation installations per warfighter requirements. Site Activation also includes participation in planning for future BMDS operations and site installations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
C2BMC Development	0	45,892	147,551
RDT&E Articles (Quantity)	0	0	0

The C2BMC Element accomplishes block objectives by integrating work across four product lines: BMDS Planner, Combatant Command Command and Control (COCOM C2), Global Engagement Manager (GEM), and BMD Networks, so mature capabilities are integrated and incrementally delivered to the warfighter. Spirals 8.2, 8.4, 10.2 and 10.4 are planned in Block 3.0:

FY08 Planned Program
- Spiral 8.2 architecture design
- Spiral 8.2 application and network software engineering
- Establish Spiral 8.2 Element Requirements
- Establish Spiral 8.2 Content Agreement specifically defining those capabilities to be developed in the software

FY09 Planned Program
- Perform Spiral 8.2 COCOM C2, GEM, and Network software development, coding, and integration
- Incrementally integrate and test COCOM C2, GEM, and Network software and hardware prior to integration in the Missile Defense Integrated Operations Center (MDIOC)
- Spiral 8.4 architecture design
- Spiral 8.2 application and network software engineering
- Establish Spiral 8.4 Element Requirements
- Participate in and analyze results of wargames

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

	FY 2007	FY 2008	FY 2009
C2BMC Test Beds	0	21,927	0
RDT&E Articles (Quantity)	0	0	0

The C2BMC Test Beds function as the core integration activity for exercising, evaluating, analyzing and refining advanced missile defense concepts that can then be used to improve follow-on blocks to the BMDS. It does this by planning, providing technical support, and executing Operator-in-the-Loop and Element-in-the-Loop Wargames; Joint Warfighter Exercises and Experiments; Missile Defense Ground Tests; C2BMC integration testing and experiments, and System Level Missile Defense Analyses. These activities allow the developer, tester, and operator to assess capabilities in the same operationally representative environment. The C2BMC Test Beds supports all Blocks. For ease of understanding and reporting the entire C2BMC Test Beds effort is included in the Block.

FY08 Planned Program:

- Plan, collect data, assess, examine, and report on MDA directed C2BMC spiral integration testing
- Support integration and testing of Distributed Track Processing
- Support integration and testing of the Global Engagement Manager (GEM)
- Support integration and testing of the BMDS Network and Parallel Staging Network Tests
- Support experimentation, integration and testing of the C2BMC Net Centric Architecture
- Continue to support the integration of missile defense elements into the BMDS command and control structure
- Build out and upgrade the Missile Defense Integration & Operations Center (MDIOC) C2BMC Testbed facilities to support integration and testing of C2BMC Spiral 6.4 and Spiral 8.2 functionality and architecture
- Plan, prepare, and conduct for FY08 BMDS tests, wargames, and exercises
  - Combined Test Force (CTF) Tests
  - Aegis Flight Tests
  - Patriot Flight Tests
  - THAAD Tests
  - SBX Tests
  - GMD Tests
  - Other tests as scheduled
  - Exercises and Wargames

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

- Conduct C2BMC X-Lab Events and Experimentation such as: Network Enable Command and Control (NECC) Development/Prototyping/Integration, Over-head Non-imaging Infra Red (ONIR) Sensors, and SKYLOS; maturing and transitioning technologies to development and operations
- Refine C2BMC interfaces to BMDS Elements and Space-based Sensors

	FY 2007	FY 2008	FY 2009
C2BMC Joint Early Warning Laboratory	0	2,073	0
RDT&E Articles (Quantity)	0	0	0

The C2BMC Joint Early Warning Lab (JEWL) is a computing and analysis resource located at the Missile Defense Integration and Operations Center (MD IOC). The JEWL conducts analysis and studies to assess and improve theater Early Warning (EW) and Ballistic Missile Defense (BMD) performance.
The JEWL is the STRATCOM designated facility for testing all changes or additions to the Theater Event System (TES) architecture. JEWL replicates all known theater EW architecture and maintains a replay capability for fault isolation, anomaly identification, and can modify data to isolate anomalies. JEWL supports BMD system by providing timely analysis and comparisons of BMD legacy EW data.

FY08 Planned Program:
- Perform Early Warning Target of Opportunity (TOO) comparative analysis
- Provide C2BMC Test support
- Provide C2BMC Early Warning Integration support
- Perform Operational Early Warning Anomaly Tracking and Analysis
- Perform Operator/Warfighter Theater Missile Warning Exercise Data Analysis
- Establish the Early Warning Incident / Anomaly tracking
- Perform USSTRATCOM Configuration Control Board (CCB) check-out of new systems for inclusion in Theater Missile Warning Architecture
- Upgrade JEWL hardware/software/communications

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

	FY 2007	FY 2008	FY 2009
C2BMC Thule Fielding	0	3,300	0
RDT&E Articles (Quantity)	0	0	0

FY08 Planned Program:

- Establish single, consolidated Command and Control (C2) shielded communications room with site C2 systems
- Collocate all C2 equipment to include data switches (Secret Internet Protocol Router / Non-secure Internet Protocol Router (SIPR/NIPR) equipment, GMD node equipment, C2BMC Communications Network Interface Processor (CNIP)) and voice switches (Plain Old Telephone Service (POTS) and Defense Red Switch Network (DRSN)).

	FY 2007	FY 2008	FY 2009
C2BMC Technology	0	12,000	0
RDT&E Articles (Quantity)	0	0	0

FY08 Planned Program:

Commence/continue activities to enable the integration of advanced C2BMC capabilities into new BMDS subsystems:

- Integrate the C2BMC X-Lab and Missile Defense Space Experimentation Center (MDSEC) at a level higher than SECRET to enable demonstration of advanced C2BMC capabilities
- Support development testing and integration of Overhead Non-imaging Infra Red (ONIR) sensors with C2BMC
- Transition Network Enable Command and Control (NECC) pilot project to the operational C2BMC system
- Conduct sensor netting experiments associated with BMDS registration, sensor tracking (local), network tracking, discrimination, sensor resource tasking, and communications/bandwidth constraints.
- Conduct assessments of expanded distributed track processing capabilities for the BMDS, to include measurement and track-level sensor information. Assess both tracking and discrimination constructs for adapting Tactical Component Network (TCN) to achieve BMDS and Integrated Air and Missile Defense (IAMD) system tracking and discrimination needs

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603893C Space Tracking & Surveillance System	311,402	231,528	242,441	266,509	560,130	735,727	938,191	3,285,928
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
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PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

D. Acquisition Strategy

The Command and Control Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) is charged to support fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Development								
C2BMC HW/SW Development, I&T	SS/CPAF	Lockheed Martin Team/ Col. Springs, Co	0	6,027	1Q	24,540	1Q	30,567
C2BMC HW/SW Development, I&T	SS/CPAF	Lockheed Martin Team/ Huntsville, AL	0	913	1Q	3,609	1Q	4,522
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin Team/ Arlington, VA	0	11,323	1Q	44,745	1Q	56,068
Scientific Engineering and Technical Assistance	SS/FFP	Sparta/ Arlington, VA	0	0	N/A	20,391	1Q	20,391
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIL/LL/ Washington, DC	0	0	N/A	11,963	1Q	11,963
MDA Civilian & Travel			0	0	N/A	5,618	1Q	5,618
BM Sppt, Planner Interfaces, SBIRS		Services, DISA, Agencies	0	14,629	1Q	21,685	1Q	36,314
C2BMC Program Office Move			0	0	N/A	15,000	1Q	15,000
GCN Transition		DISA	0	8,000	1Q	0	N/A	8,000
GCN Transition		Midcousre Defense (GMD)	0	5,000	1Q	0	N/A	5,000
C2BMC Test Beds								
C2BMC Testbed	C/CPFF	MDIOC/Northrop Grumman Mission Systems/ Colorado Springs, CO	0	20,226	1/2Q	0	N/A	20,226

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Testbed	C/FFP	MDIOC/SRS/ Mantech/ Colorado Springs, CO	0	1,051	N/A	0	N/A	1,051
C2BMC Testbed	C/FFRDC	IDA/Colorado Springs, CO	0	650	N/A	0	N/A	650
C2BMC Joint Early Warning Laboratory								
JEWL	Various	MULT/ Colorado Springs, CO	0	2,073	1/3Q	0	N/A	2,073
C2BMC Thule Fielding								
C2BMC Thule Fielding	SS/CPAF	DISA	0	3,300	1Q	0	N/A	3,300
C2BMC Technology								
Benchmark	SS/CPAF	GTRI via ONR	0	1,600	1Q	0	N/A	1,600
Architectural Engineering Analysis	SS/CPAF	SPARTA	0	200	1Q	0	N/A	200
Sensor Netting Experiments	SS/CPAF	MIT/LL	0	1,700	1Q	0	N/A	1,700
Mockup BCW Engineering Sppt	SS/CPAF	Dahlgren	0	200	1Q	0	N/A	200
GCCS-J and MLS Sppt	SS/CPAF	MDIOC	0	785	1Q	0	N/A	785
Sensor Registration Health/Status	SS/CPAF	Torch via THAAD/ SPARTA	0	1,392	1Q	0	N/A	1,392
Post Intercept WMD Consequence Management Demo	SS/CPAF	DTRA	0	1,900	1Q	0	N/A	1,900
Mockup Project, PC Based Landing Zone	SS/CPAF	USARDECOM	0	300	1Q	0	N/A	300
Service Lab Benchmark Sppt	SS/CPAF	AFIT	0	50	1Q	0	N/A	50
Advanced Technology Efforts	SS/CPAF	Lockheed Martin Team/IDA/Modus Operandi	0	3,873	1Q	0	N/A	3,873
Subtotal Product Development			0	85,192		147,551		232743

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

Remarks

II. Support Costs Cost ($ in Thousands)

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

Remarks

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Management Services								
Remarks								
Project Total Cost			0	85,192		147,551		232,743

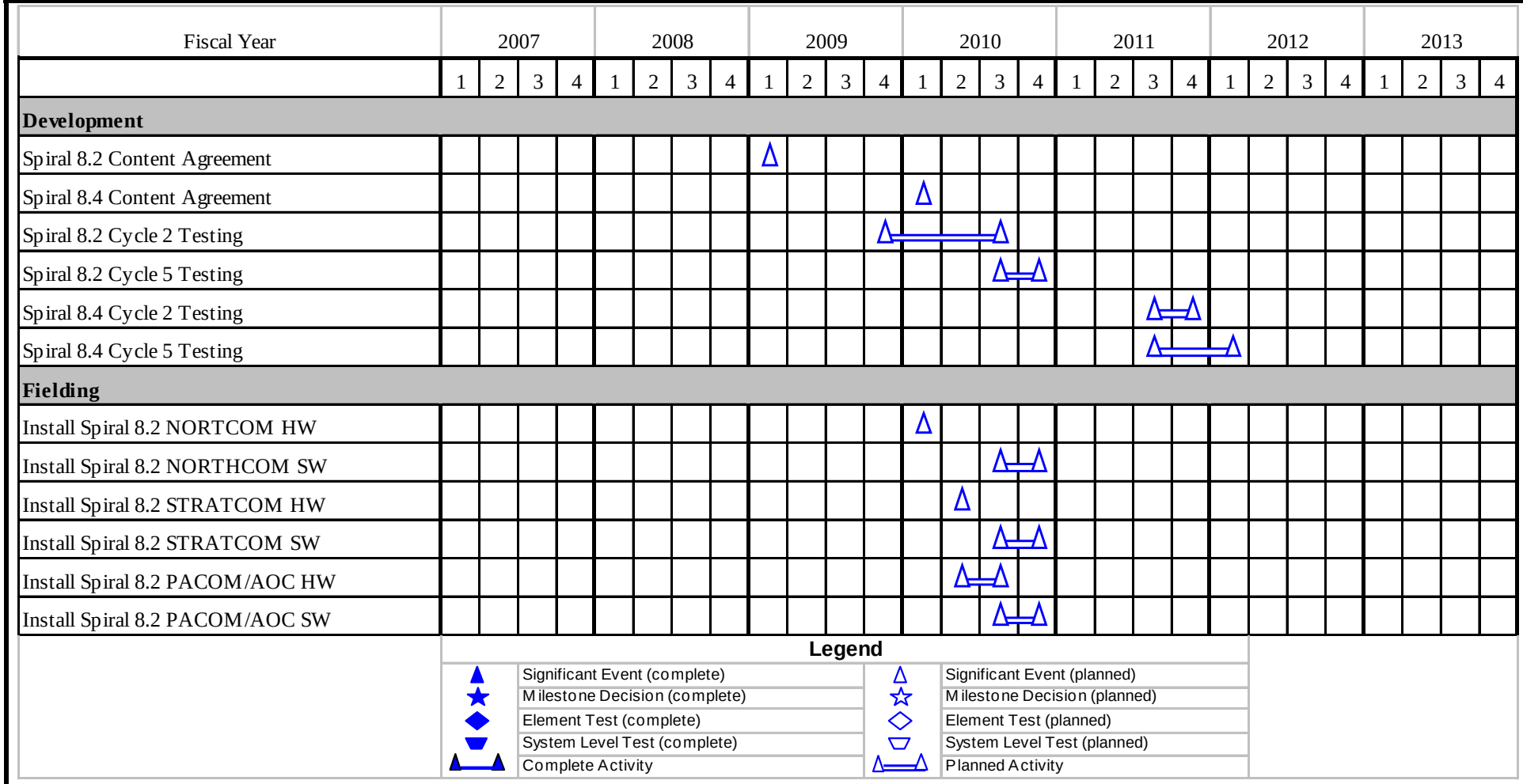
Remarks

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

Date: **February 2008**

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

R-1 NOMENCLATURE: **0603896C BMD C2BMC**



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

Date: **February 2008**

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

R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Fielding																												
Install Spiral 8.2 FGA HW															△													
Install Spiral 8.4 NORTHCOM HW													△															
Install Spiral 8.4 NORTHCOM SW																			△—△									
Install Spiral 8.4 STRATCOM HW																				△								
Install Spiral 8.4 PACOM/AOC HW																		△—△										
Install Spiral 8.4 PACOM/AOC SW																			△—△									
Install Spiral 8.4 FGA HW																			△									
Install Spiral 8.4 FGA SW																				△								
Install Spiral 8.4 STRATCOM SW																			△—△									

Legend

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Development							
Spiral 8.2 Content Agreement			1Q				
Spiral 8.4 Content Agreement				1Q			
Spiral 8.2 Cycle 2 Testing			4Q	1Q-3Q			
Spiral 8.2 Cycle 5 Testing				3Q-4Q			
Spiral 8.4 Cycle 2 Testing					3Q-4Q		
Spiral 8.4 Cycle 5 Testing					3Q-4Q	1Q	
Fielding							
Install Spiral 8.2 NORTCOM HW				1Q			
Install Spiral 8.2 NORTHCOM SW				3Q-4Q			
Install Spiral 8.2 STRATCOM HW				2Q			
Install Spiral 8.2 STRATCOM SW				3Q-4Q			
Install Spiral 8.2 PACOM/AOC HW				2Q-3Q			
Install Spiral 8.2 PACOM/AOC SW				3Q-4Q			
Install Spiral 8.2 FGA HW				3Q			
Install Spiral 8.2 FGA SW				4Q			
Install Spiral 8.4 NORTHCOM HW				1Q			
Install Spiral 8.4 NORTHCOM SW					3Q-4Q		
Install Spiral 8.4 STRATCOM HW					4Q		
Install Spiral 8.4 PACOM/AOC HW					2Q-3Q		
Install Spiral 8.4 PACOM/AOC SW					3Q-4Q		
Install Spiral 8.4 FGA HW					3Q		
Install Spiral 8.4 FGA SW					4Q		
Install Spiral 8.4 STRATCOM SW					3Q-4Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
DX01 Ballistic Missile Defense C2BMC Block 4.0	0	66,033	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

BMDS Block 4.0 defends allies and deployed forces in Europe from limited Iranian long-range threats; and continues to expand protection in the U.S. The increase in C2BMC capability developed under Blocks 1.0, 2.0, and 3.0 also supports the defense of allies and deployed forces in Europe. The focus in the block is on infrastructure.

Major goals include:

- European Interceptor Site (EIS) communications
- European Midcourse Radar (EMR) communications
- Southern radar site AN/TPY-2 #6 BMDS Communications and sensor resource management

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
European Midcourse Radar (EMR) Comms Fielding	0	14,336	0
RDT&E Articles (Quantity)	0	0	0

The BMDS Communication System Complex (BCSC) consolidates all of the communications systems in one facility: Satellite Communications (SATCOM) , Defense Information Systems Network (DISN) core, campus communications, gateway, communications management, and wide area networks. This capability will provide the communications connectivity from the radar site to the BMDS Communications Network.

FY08 Planned Program

- Initiate the design and procure long-lead items for BCSC
- Initiate the design and long lead acquisition for the Modernization Enterprise Terminal (Ka and X band)
- Initiate the long lead procurement for the auxiliary High Energy Magnetic Pulse (HEMP) power for the BCSC

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

	FY 2007	FY 2008	FY 2009
AN/TPY-2 #6 Comms Fielding	0	21,142	0
RDT&E Articles (Quantity)	0	0	0

The BMDS Communication System Complex - Transportable (BCSC-T) consolidates all of the communications systems in a transportable configuration: Satellite Communications (SATCOM), Defense Information Systems Network (DISN) core, campus communications, Gateway, communications management, and wide area networks. This capability will provide the communications connectivity from the AN/TPY-2 site to the BMDS Communications Network.

FY08 Planned Program:

- Initiate design and procure long-lead items for BCSC-T
- Initiate the procurement of the Defense Red Switch Network (DRSN) and baseband equipment to be installed in the BCSC-T
- Initiate engineering support to ensure the AN/TPY-2/BCSC-T integration into the overall Ballistic Missile Defense Systems (BMDS)

	FY 2007	FY 2008	FY 2009
European Interceptor Site (EIS) Comms Fielding	0	17,020	0
RDT&E Articles (Quantity)	0	0	0

The BMDS Communication System Complex (BCSC) consolidates all of the communications systems in one facility: Satellite Communication (SATCOM), Defense Information Systems Network (DISN) core, campus communications, Gateway, communications management, and wide area networks. This capability will provide the communications connectivity from the interceptor site to the BMDS Communications Network.

FY08 Planned Program:

- Initiate design and procure long-lead items for BCSC
- Initiate the design and long-lead acquisition for the Modernization Enterprise Terminal (Ka and X band)
- Initiate the long lead procurement for the auxiliary High Energy Magnetic Pulse (HEMP) power for the BCSC
- Initiate engineering support to integrate the BCSC, including the Gateway equipment

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	FY 2007	FY 2008	FY 2009
European Site Comms - GEM Site/US Comms	0	13,535	0
RDT&E Articles (Quantity)	0	0	0

European site comms provides communications connectivity of the Global Engagement Manager (GEM) and Aegis to the BMDS Communications Network via Satellite Communications (SATCOM) and Fiber Communications. This capability will provide the communications connectivity from the BMDS Communications Network.

FY08 Planned Program:

- Procure long-lead Satellite Communication (SATCOM) equipment
- Initiate the acquisition of the Defense Red Switch (DRSN) equipment to be installed in the European theater
- Initiate the design and long lead acquisition for the Modernization Enterprise Terminal (Ka and X band)
- Initiate the engineering support to ensure the communication are in place to support European Global Engagement Manager (GEM) integration into the overall Ballistic Missile Defense System (BMDS)

C. Other Program Funding Summary

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PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
European Midcourse Radar (EMR) Comms Fielding								
European Midcourse Radar (EMR) Comms Fielding	SS/CPAF	Lockheed Martin Team	0	3,636	1Q	0	N/A	3,636
European Midcourse Radar (EMR) Comms Fielding	SS/CPAF	DISA/Various	0	10,700	1Q	0	N/A	10,700
AN/TPY-2 #6 Comms Fielding								
AN/TPY-2 #6 Comms Fielding	SS/CPAF	Lockheed Martin Team	0	10,042	1Q	0	N/A	10,042
AN/TPY-2 #6 Comms Fielding	SS/CPAF	DISA/Various	0	11,100	1Q	0	N/A	11,100
European Interceptor Site (EIS) Comms Fielding								
European Interceptor Site (EIS) Comms Fielding	SS/CPAF	Lockheed Martin Team	0	3,716	1Q	0	N/A	3,716
European Interceptor Site (EIS) Comms Fielding	SS/CPAF	DISA	0	13,304	1Q	0	N/A	13,304
European Site Comms - GEM Site/US Comms								
European Site Comms - GEM Site/US Comms	SS/CPAF	Lockheed Martin Team	0	4,535	1Q	0	N/A	4,535
European Site Comms - GEM Site/US Comms	SS/CPAF	DISA/ Various	0	9,000	1Q	0	N/A	9,000
Subtotal Product Development			0	66,033		0		66033

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

II. Support Costs Cost ($ in Thousands)

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

Remarks

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

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

Remarks

Project Total Cost			0	66,033		0		66,033

Remarks

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
EX01 Ballistic Missile Defense C2BMC Block 5.0	0	30,321	0	0	0	33,854	103,012
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: The content in EX01 is a continuation of the efforts reported in 0001 and R101 and was explained in those projects in PB08.

A. Mission Description and Budget Item Justification

In collaboration with MDA Systems Engineering and Integration defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to plan the Ballistic Missile Defense (BMD) fight while concurrently: tracking all potential ballistic missile threats, directing weapons to engage on a distributed network and pairing any sensor with any shooter to defeat ballistic missile threats at any range, in any phase, in all theaters, with coalition partners increase capabilities via hardware, software, and operations and sustainment support in two-year blocks. The C2BMC Block 5.0 Program expands defense of allies and deployed forces by enabling a coordinated defense against short-to intermediate- range threats in two regions/theaters. Specific Block goals are to deliver:

- Capability to easily and quickly incorporate new sensors and weapon systems into global integrated C2BMC network
- Command and Control decision aids to re-direct coordinated engagements
- BMDS-level discrimination for boost/early ascent and expanded engagement coordination to include intelligence projections
- Continued BMDS global expansion with additional C2BMC deployed locations

C2BMC ELEMENT

In Block 5.0, the BMDS Planner, COCOM C2, GEM, and BMD Network will all be expanded to include additional BMDS sensors and weapons. This includes planning capability for Kinetic Energy Interceptors, Space Tracking and Surveillance System (STSS), and Third Site deployment in Europe. The BMDS Planner and COCOM C2 functions will be matured, supporting operators in rapid battle plan adjustments with incorporation of more robust simulation/wargaming/modeling tools to improve “what-if” assessments of the battlespace; and, command and control decision aids to re-direct coordinated engagements based on GEM hit/kill assessments. COCOM C2 will also add consequence management displays. The C2BMC GEM evolves to a mature real-time battle management system fully utilizing the growing network of BMDS sensors and weapons, including direct feed of space-based detections and tracking to improve the timeliness of weapon delivery. GEM will also incorporate BMDS-level discrimination, to include classification and feature-based discrimination fusion, for target boost/early ascent. Additionally, GEM will expand engagement coordination to include intelligence projections. The BMD Network product features a more redundant, high availability network with diverse paths and increased communications support to the BMDS elements to include added sensors and weapons to the overall BMDS. Capabilities such as dynamic real-time network management and monitoring will enable the warfighter to monitor the connection to BMDS weapons and anticipate and remedy any issues as they occur, vice having to wait for a human-in-the-loop to report a problem and provide a correction. Additionally, an expanded network centric

capability (worldwide connectivity of separately developed sensors and weapon systems) supporting Internet Protocol Version 6 will extend BMDS mission success by providing information management and quality of service to the individual user. As C2BMC products mature they are engineered and integrated into fielded Spirals. The C2BMC Program uses spiral development (incremental development, test, and fielding) to produce the software required to provide a system-wide integrated BMD capability. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal C2MBC development and begins integration testing with other BMDS elements. Block 2010 matured products are integrated in Spiral 10.2 and 10.4, and delivered to the field for concurrent development testing and operational use in conjunction with Responsible Test Organization and Responsible Engineering Organization schedules and guidelines. Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software. The planner will continue to be evolve into a joint air and missile defense planner to be placed at the AOC and AAMDC locations with the first instantiation expected in Spiral 8.2.

SITE ACTIVATION
C2BMC capability is expanded with the installation of Spirals 10.2 and 10.4. Installations also include numerous BMDS Planner, web browser, and Enterprise Workstations per warfighter requirements. Site Activation continues participation in planning for future BMDS operations and site installations to include GEM at EUCOM, GEM on the Parallel Support Network (PSN) at NORTHCOM, and NECC at various locations.

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
AN/TPY-2 #3 Comms Fielding	0	30,321	0
RDT&E Articles (Quantity)	0	0	0

The BMDS Communication System Complex - Transportable (BCSC-T) consolidates all of the communications systems in a transportable configuration: SATCOM (UHF, EHF, Ka, X & C-bands), DISN core, campus communications, Gateway, communications management, and wide area networks. This capability will provide the communications connectivity from the AN/TPY-2 #3 site to the BMDS Communications Network

FY08 Planned Program - Procure items for BCSC-T
- Procurement of the Defense Red Switch Network (DRSN) and baseband equipment to be installed in the BCSC-T
- Engineering support to ensure AN/TPY-2 #3 / BCSC -T integration into the overall Ballistic Missile Defense System (BMDS)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603893C Space Tracking & Surveillance System	311,402	231,528	242,441	266,509	560,130	735,727	938,191	3,285,928
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

D. Acquisition Strategy

The Command and Control Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) is charged to support fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
AN/TPY-2 #3 Comms Fielding								
AN/TPY-2 #3 Comms Fielding	SS/CPAF	Lockheed Martin Team	0	14,821	1Q	0	N/A	14,821
AN/TPY-2 #3 Comms Fielding		DISA	0	15,500	1Q	0	N/A	15,500
Subtotal Product Development			0	30,321		0		30321

Remarks

II. Support Costs Cost ($ in Thousands)

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

Remarks

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

IV. Management Services Cost ($ in Thousands)

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

Remarks

Project Total Cost			0	30,321		0		30,321

Remarks

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

Date: **February 2008**

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

R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Fielding																												
Install Spiral 10.0 NORTHCOM SW																							▲	▲				
Install Spiral 10.0 STRATCOM SW																											▲	▲
Install Spiral 10.0 PACOM/AOC HW																						▲	▲					
Install Spiral 10.0 PACOM/AOC SW																							▲	▲				
Install Spiral 10.2 NORTHCOM SW																											▲	▲
Install Spiral 10.2 PACOM/AOC HW																										▲	▲	
Install Spiral 10.2 PACOM/AOC SW																											▲	▲
Install Spiral 10.2 FGA SW																												▲

Legend

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Fielding							
Install Spiral 10.0 NORTHCOM SW						3Q-4Q	
Install Spiral 10.0 STRATCOM HW						4Q	
Install Spiral 10.0 STRATCOM SW							3Q-4Q
Install Spiral 10.0 PACOM/AOC HW						2Q-3Q	
Install Spiral 10.0 PACOM/AOC SW						3Q-4Q	
Install Spiral 10.0 FGA HW						3Q	
Install Spiral 10.0 FGA SW						4Q	
Install Spiral 10.2 NORTHCOM SW							3Q-4Q
Install Spiral 10.2 PACOM/AOC HW							2Q-3Q
Install Spiral 10.2 PACOM/AOC SW							3Q-4Q
Install Spiral 10.2 STRATCOM HW							4Q
Install Spiral 10.2 FGA HW							3Q
Install Spiral 10.2 FGA SW							4Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
XX01 Ballistic Missile Defense C2BMC Sustainment	0	45,620	44,495	46,455	47,507	48,656	49,652
RDT&E Articles Qty	0	0	0	0	0	0	0

Note: The content in XX01 is a continuation of the efforts reported in 0801, 0901, and 0001 and was explained in those projects in PB08.

A. Mission Description and Budget Item Justification

OPERATIONS and SUPPORT

C2BMC Program Operations and Support consists of on-site support, C2BMC Control Center activities, off-site and vendor support, training, and hardware and software maintenance to ensure 24 X 7 continuity of C2BMC operations.

On-site support provides:

- Assistance to the System Administrator assigned by the site (e.g., Combatant Commands), with the general operational support of the C2BMC system
- Integration of the C2BMC support processes into the site's support regiment
- Daily network operations and security support for the C2BMC system as part of a transition plan
- Prime contractor “over-the-shoulder” support to users when requested
- On-site maintenance of hardware and software

The C2BMC Control Center is located in Colorado Springs, CO and provides:

- Technical support to on-site personnel and to the C2BMC end-user
- Review of hardware/software problems and coordination of Commercial Off-the-Shelf (COTS) developer/vendor service calls
- Tracking and implementing documented escalation procedures
- Maintenance of the C2BMC Control Center Web Site
- Collect of reliability, availability and maintainability data for development of readiness metrics
- Schedule development for maintenance, systems upgrades, test and exercise

Off-site Operations and Sustainment support includes:

- Collect and prioritize failure data as identified by site support staff; implement corrective actions and recommend changes to be implemented in future spirals
- Maintain and manage vendor service agreements

- Provide hardware and software maintenance and logistics functions beyond the capability of on-site support

Training support includes:
- Develop and maintain Operator and Maintenance training material for C2BMC components/capabilities
- Provide new equipment training to end-users and training organizations

Maintenance of the C2BMC System includes both software and hardware maintenance and sustaining engineering. Sustaining engineering consists of network and development engineering in support of system anomalies. Operations and Support also includes the procurement of communications lines from the Defense Information Service Agency (DISA), as well as fielding and maintaining, Communications Nodal Equipment (CNE), to include the Joint Range Extension (JRE) equipment, which enables a global network grid.

C2BMC Operations and support for AN-TPY-2 #3 consists of on-site and off-site support during tests, deployment and operations for the communications equipment, shelters and vehicles associated with providing communications connectivity to the BMDS, controlling the AN-TPY-2 Radar via the C2BMC system, and maintaining auxiliary communications capability.

On-Site Support:
- Daily network operations and security support for the C2BMC equipment hardware and software and auxiliary communications capabilities(NIPRNET/SIPRNET) located at the Radar Site
- Prime contractor support to Radar and C2BMC operations when requested
- On-site maintenance of hardware and software
- Capability to provide 24/7 Network and Equipment Operations monitoring
- Providing operations and maintenance during tests and exercises prior to deployment of the Radar

Off-Site Support:
- Technical support to on-site personnel
- Sustaining engineering support from the prime contractor and Government activities
- Review of hardware/software problems and coordination of vendor services
- Maintenance of software licenses and vendor support agreements
- Provide hardware and software maintenance agreements

- Provide training to on-site operations and maintenance personnel

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
Sustainment	0	37,170	44,495
RDT&E Articles (Quantity)	0	0	0

Operations and Support procedures are planned for all fielded hardware and software. Maintenance agreements will be established and spare parts will be procured and delivered to each site. At each location an agreement in the form of a site support plan will be drafted and approved to outline the details of support for each site. An overarching system Integrated Logistics Support Plan (ILSP) will be developed to outline the roles and responsibilities of each site.

FY08 Planned Program:

- Provide on-site C2BMC support of fielded sites for hardware and software
- Maintain C2BMC Control Center at the Missile Defense Integration & Operations Center (MDIOC) for fielded capabilities
- Provide C2BMC operator training for fielded capabilities
- Provide and support communications circuits for fielded C2BMC locations
- Provide sustaining engineering support for fielded hardware and software

FY09 Planned Program:

- Provide on-site C2BMC support of fielded sites for hardware and software
- Maintain C2BMC Control Center at the Missile Defense Integration and Operations Center (MDIOC) for fielded capabilities
- Provide C2BMC operator training for fielded capabilities
- Provide and support communications circuits for fielded C2BMC locations
- Provide sustaining engineering support for fielded hardware and software

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

	FY 2007	FY 2008	FY 2009
AN/TPY-2 #3 Sustainment	0	8,450	0
RDT&E Articles (Quantity)	0	0	0

C2BMC Operations and Support for AN-TPY-2 #3 during the test, deployment and operations of the radar. Operations and Support personnel will be hired, trained and phased in to support the development and deployment of communications shelters and equipment associated with the AN-TPY2 #3 Radar. Logistics support elements will be delivered and verified. Maintenance agreements will be established and spare parts will be procured and delivered.

FY08 Planned Program

- Provide on-site operations and sustainment during communications shelters test, deployment and initial operations
- Verify logistics requirements, ensure initial spares, support equipment, training elements are provided
- Provide and support initial communications capability

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603893C Space Tracking & Surveillance System	311,402	231,528	242,441	266,509	560,130	735,727	938,191	3,285,928

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

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

D. Acquisition Strategy

The Command and Control Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) is charged to support fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Sustainment								
Unit Personnel, Cont System Improv, Sustaining Suppt	SS/CPAF	Lockheed Martin Team/ Washington, DC	0	24,686	1Q	30,833	1Q	55,519
Indirect Support	MIPR	DISA DECC	0	3,121	1Q	3,042	1Q	6,163
Unit Operations - Leased Circuits	MIPR	DISA	0	6,353	1Q	9,955	1Q	16,308
DOTMLPF		SETAC	0	500	1Q	500	1Q	1,000
AN/TPY-2 Misawa Sppt			0	160	1Q	165	1Q	325
Thule Transponder O&M			0	550	1Q	0	N/A	550
SBX Comms			0	1,800	1Q	0	N/A	1,800
AN/TPY-2 #3 Sustainment								
AN/TPY-2 #3 Sustainment	C/CPAF	Lockheed Martin Team	0	8,450	1Q	0	N/A	8,450
Subtotal Product Development			0	45,620		44,495		90115

Remarks

II. Support Costs Cost ($ in Thousands)

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

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

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

Remarks

Project Total Cost			0	45,620		44,495		90,115

Remarks

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

Date: **February 2008**

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

R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Sustainment																												
Sustainment					△																							△

Legend

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Sustainment							
Sustainment		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0602 Program-Wide Support	6,520	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0

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

A. Mission Description and Budget Item Justification

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

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
Civilian Salaries and Support	6,520	0	0
RDT&E Articles (Quantity)	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,082,454	1,045,276	1,019,073	795,659	719,847	548,283	439,752	5,650,344
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,985,140	2,243,213	2,209,262	2,276,848	1,385,258	946,437	1,103,532	13,149,690
PE 0603883C Ballistic Missile Defense Boost Defense Segment	622,218	510,241	421,229	423,927	652,642	799,792	991,839	4,421,888
PE 0603884C Ballistic Missile Defense Sensors	514,989	586,121	1,221,143	1,184,280	1,099,649	1,077,632	823,583	6,507,397
PE 0603886C Ballistic Missile Defense System Interceptors	341,358	340,107	386,817	500,966	708,803	815,433	553,136	3,646,620
PE 0603888C Ballistic Missile Defense Test and Targets	584,615	621,861	673,691	672,976	690,938	708,991	719,209	4,672,281
PE 0603890C Ballistic Missile Defense System Core	425,889	413,934	432,262	482,947	605,219	561,947	571,498	3,493,696
PE 0603891C Special Programs - MDA	347,377	196,892	288,315	304,234	538,050	818,136	786,349	3,279,353
PE 0603892C Ballistic Missile Defense Aegis	1,125,426	1,126,337	1,157,783	1,234,220	1,078,539	1,066,712	1,102,542	7,891,559
PE 0603893C Space Tracking & Surveillance System	311,402	231,528	242,441	266,509	560,130	735,727	938,191	3,285,928
PE 0603894C Multiple Kill Vehicle	133,615	229,943	354,455	488,294	649,632	708,582	879,385	3,443,906
PE 0603895C BMD System Space Program	0	16,552	29,771	41,638	56,199	133,915	157,548	435,623
PE 0603897C BMD Hercules	46,268	52,462	55,955	55,289	56,400	51,902	52,784	371,060
PE 0603898C BMD Joint Warfighter Support	49,833	49,394	69,982	73,997	77,205	80,168	81,948	482,527
PE 0603904C Missile Defense Integration & Operations Center	104,389	78,557	96,404	100,437	100,366	101,512	102,840	684,505
PE 0603905C BMD Concurrent Test and Operations	21,870	0	0	0	0	0	0	21,870
PE 0603906C Regarding Trench	0	1,986	2,978	4,964	4,963	8,933	8,933	32,757
PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
PE 0901598C Management Headquarters - MDA	93,350	80,392	86,453	70,355	69,855	69,855	69,855	540,115

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
ZX40 Program-Wide Support	0	7,767	8,338	10,019	7,747	7,463	7,730
RDT&E Articles Qty	0	0	0	0	0	0	0

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

A. Mission Description and Budget Item Justification

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

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
Civilian Salaries and Support	0	7,767	8,338
RDT&E Articles (Quantity)	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0207998C BRAC	0	103,219	159,938	61,931	8,724	0	0	333,812
PE 0603175C Ballistic Missile Defense Technology	183,849	108,423	118,718	115,234	120,152	127,012	130,358	903,746
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PE 0603907C Sea Based X-Band Radar (SBX)	0	165,243	0	0	0	0	0	165,243
PE 0605502C Small Business Innovative Research - MDA	142,510	0	0	0	0	0	0	142,510
PE 0901585C Pentagon Reservation	15,527	6,019	19,734	5,040	5,284	5,370	5,456	62,430
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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2008
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

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