

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: <b>February 2007</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY/BA-7</b>					R-1 ITEM NOMENCLATURE MK48 ADCAP/0205632N			
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	<b>21.594</b>	<b>24.870</b>	<b>17.941</b>	<b>18.709</b>	<b>23.009</b>	<b>28.196</b>	<b>28.703</b>	<b>29.224</b>
MK48 ADCAP/F0366	<b>21.594</b>	<b>24.870</b>	<b>17.941</b>	<b>18.709</b>	<b>23.009</b>	<b>28.196</b>	<b>28.703</b>	<b>29.224</b>
<p><b>A. (U) Mission Description and Budget Item Justification:</b>                      MK48 ADCAP RDT&amp;E program executes spiral development of weapon performance improvements in three development product areas: (1) Common Broadband Advanced Sonar System (CBASS); (2) Advanced Processor Builds (APBs), and (3) Torpedo Technology Insertion. The budget enables Acquisition Category (ACAT) III development to address Chief of Naval Operations (CNO) defined capability-based requirements and mission needs. This PE (0205632N/0366) is tied to development programs that leverage a joint US/Australia, Armaments Cooperative Project to develop MK48 ADCAP, and Future Naval Capability technologies being developed by Office of Naval Research (ONR).</p> <p>(U) Countermeasure (CM) sophistication and availability on the open market directly affects ADCAP kill proficiency and its ability to counter rapidly evolving threats. The focus of the MK 48 ADCAP torpedo R&amp;D program for FY01 and out shifted from being primarily concentrated on Software Block Upgrade efforts towards coordinated hardware upgrades, rapid Commercial-Off-the-Shelf insertion, and APBs to rapidly upgrade the ADCAP to counter evolving threats and maintain robust performance. The CBASS program will develop and field a broadband sonar capable of identifying CMs and discriminating them from the target. CBASS will develop 22 test articles (2 test vehicles and 20 Engineering Development Models (EDMs)). CBASS met Milestone II requirements on 6 March 1998 and received MDA approval to proceed into EMD. CBASS Phase I received FRP decision in June 2006. Initial Operational Capability (IOC) is scheduled for FY06. The Commonwealth of Australia, Royal Australian Navy (RAN) is participating to jointly develop CBASS torpedo and signed an Armaments Cooperative Project (ACP) Agreement Mar 2003. The intent of the CBASS program is to achieve improvements in shallow water torpedo performance.</p> <p>(U) The MK 48 ADCAP (Advanced Capability) torpedo R&amp;D program focuses on two specific areas near term: Torpedo Advanced Processor Builds (APBs) and broadband sonar capability. The CNO continues to stress shallow water (less than 600 feet) as a critical operating area to counter third world diesel electric submarines. Torpedo testing in shallow water has demonstrated that in-service ADCAP has less than full capability in this difficult environment. However, this testing, in conjunction with laboratory simulation efforts, has shown that significant performance improvements can be made by implementing changes to weapon tactics and software algorithms. Development, implementation and testing of these changes is being accomplished under the Torpedo APB program. This program also leverages the RAN joint torpedo program and Future Naval Capability (FNC) technologies being developed by the ONR in the areas of torpedo broadband signal processing, tactics processing, and alertment. The Torpedo APB program also will incorporate MK 54 Lightweight Torpedo algorithms and tactics software to create a Common Torpedo Development program. Future APB software builds will utilize the common torpedo software to deliver software and tactics to both the MK 48 ADCAP and MK 54 Lightweight torpedoes.</p> <p>(U) The Torpedo Technology Insertion program will provide for evolutionary torpedo improvements and upgrades (including the transition and testing of advanced technologies from the R&amp;D community (6.2/6.3) and contractors). This approach will incorporate developmental testing of the FNC transitioning technologies for ADCAP upgrades in the areas of torpedo sensors, weapon/platform connectivity, warhead lethality, speed and depth. These efforts will continue torpedo development investment at a lower cost and shorter term than traditional torpedo programs.</p> <p>(U) Both FNC technologies and MK 54 Lightweight torpedo developments will be transitioned into ADCAP through Tech Insertion packages. Priorities for Tech Insertion are a new array to improve torpedo effectiveness, an electric propulsion system to improve torpedo performance and reduce the cost of maintaining Fleet readiness, and an improved warhead that resists inadvertent detonation and fulfills commitments documented in the Program Executive Office-Submarines Insensitive Munitions Strategic Plan of 15 February 2006</p>								

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EXHIBIT R-2, RDT&E Budget Item Justification			DATE: <b>February 2007</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N BA-7</b>	PROGRAM ELEMENT NUMBER AND NAME MK-48 ADCAP/0205632N	PROJECT NUMBER AND NAME MK-48 ADCAP/F0366		
<b>B. PROGRAM CHANGE SUMMARY:</b>				
Funding:	FY 2006	FY 2007	FY 2008	FY 2009
FY2007 President's Budget	21.724	24.988	25.915	26.425
FY08/09 President's Budget	21.594	24.870	17.941	18.709
Total Adjustments	-0.130	-0.118	-7.974	-7.716
Summary of Adjustments				
Congressional recissions	0.015	0.000	0.000	0.000
Program Reductions	-0.027	-0.118	-7.974	-7.716
SBIR Adjustments	-0.118	0.000	0.000	0.000
Subtotal	-0.130	-0.118	-7.974	-7.716
<b>Schedule:</b>				
Torpedo Advanced Processor Builds - Spiral 1 software delivery previously scheduled for FY07 Q1 to be delivered in Q4 instead due to submarine availability for testing. Software deliveries scheduled in both FY08 and FY10 to be delivered two quarters later than planned due to realignment of fleet assets for in-water testing.				
Technology Insertions –FY08 through FY10 efforts scaled back to reflect \$20M cut resulting in reduced hardware spiral delivery in FY11 and FY13. Aggressive development efforts to resume in FY11 to support FY15 delivery.				
<b>Technical:</b>				
Technology Insertions - Fiber Optics efforts eliminated due to \$20M cut in FY08 through FY10.				

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EXHIBIT R-2a, RDT&E Project Justification						DATE: <b>February 2007</b>		
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COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	<b>21.594</b>	<b>24.870</b>	<b>17.941</b>	<b>18.709</b>	<b>23.009</b>	<b>28.196</b>	<b>28.703</b>	<b>29.224</b>
RDT&E Articles Qty	<b>1</b>	<b>1</b>	<b>1</b>		<b>1</b>	<b>1</b>		<b>2</b>
<p>Notes: Articles reflect: FY06: delivery of CBASS Ph. I; FY07: delivery of APB Spiral 1; FY08: delivery of APB Spiral 2/3; FY10: delivery of APB-1/Spiral 4 (Common); FY11: delivery of Technology Insertion Package #1; FY13: delivery of APB Common and Technology Insertion Package #2.</p> <p><b>A. (U) Mission Description and Budget Item Justification:</b>                      MK48 ADCAP RDT&amp;E program executes spiral development of weapon performance improvements in three development product areas: (1) Common Broadband Advanced Sonar System (CBASS); (2) Advanced Processor Builds (APBs), and (3) Torpedo Technology Insertion. The budget enables Acquisition Category (ACAT) III development to address Chief of Naval Operations (CNO) defined capability-based requirements and mission needs. This PE (0205632N/0366) is tied to development programs that leverage a joint US/Australia, Armaments Cooperative Project to develop MK48 ADCAP, and Future Naval Capability technologies being developed by Office of Naval Research (ONR).</p>								

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EXHIBIT R-2a, RDT&E Project Justification	DATE: <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N BA-7</b>	PROGRAM ELEMENT NUMBER AND NAME MK-48 ADCAP/0205632N	PROJECT NUMBER AND NAME MK-48 ADCAP/F0366
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**B. Accomplishments/Planned Program**

<b>TORPEDO APB</b>	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	12.548	14.632	15.386	15.372

**FY06** - Torpedo Advanced Processor Build efforts to address fleet identified performance priorities for the Mk48 ADCAP torpedo. DT/OT for APB Spiral 1.

**FY07** - Spiral 1 Phase 2 torpedo APB software build planned for release in FY07 which provides full Spiral 1 capability and torpedo effectiveness gain. Efforts to focus on APB Spiral 2/3 development in preparation for software release in FY08. Tasking to include software coding, modeling and simulation and engineering test in water. Steps in the APB process include 1) evaluation, 2) assessment, 3) implementation, and 4) system assessment. Complete operational testing for APB Spiral 1.

**FY08** - Delivery APB Spiral 2/3. Continue APB Spiral 4 development.

**FY09** - Continue development of APB Spiral 4 in preparation for software release in FY10.

<b>CBASS</b>	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	2.390	0.000	0.000	0.000

**FY06** - CBASS Full Rate Production Decision completed and IOC planned for 4Q FY06.

**FY07** - CBASS hardware development completed in FY06.

**FY08** - CBASS hardware development completed in FY06.

**FY09** - CBASS hardware development completed in FY06.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N BA-7</b>	PROGRAM ELEMENT NUMBER AND NAME MK-48 ADCAP/0205632N	PROJECT NUMBER AND NAME MK-48 ADCAP/F0366
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**B. Accomplishments/Planned Program (Cont.)**

<b>OPERATIONAL TEST SUPPORT</b>	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	0.500	0.500	1.000	0.500

- FY06-** Conducted analysis and prepared final report for test and evaluation (OPEVAL) efforts prior to CBASS Torpedo release.
- FY07-** Provide for accreditation requirements and conduct analysis relating to APB software release planned in FY08.
- FY08 -** Conduct analysis and prepare final report for test and evaluation efforts prior to APB Spiral 2/3 release.
- FY09 -** Provide for accreditation requirements and conduct analysis relating to APB Spiral 4 software release planned in FY10.

<b>TECHNOLOGY INSERTIONS</b>	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	6.156	9.738	1.555	2.837

- FY06-** Transitioned torpedo technologies selected under Torpedo Technology Insertion program. Analyzed available technology solutions against desired performance objectives, and continued integration of first technology insertion package. Conducted System Design Review for Technology Insertion Package #1.
- FY07-** Conduct studies to support development of Heavyweight Torpedo Capability Development Document (CDD) and Capability Production Document (CPD). Technology Insertion Package #1. Begin development of new array and support plan for Insensitive Munitions (IM) warhead documented in Strategic Plan.
- FY08 -** Continue development of new array and support plan for an IM warhead. Begin development of an electric propulsion system.
- FY09 -** Continue development of new array, an electric propulsion system, and support plan for an IM warhead.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N BA-7</b>			PROGRAM ELEMENT NUMBER AND NAME MK-48 ADCAP/0205632N			PROJECT NUMBER AND NAME MK-48 ADCAP/F0366		
<b>C. OTHER PROGRAM FUNDING SUMMARY:</b>								
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
MK48 ADCAP MODS (WPN/PE0204284N/BA-3/P-1 Item 322500)	63.634	64.568	63.754	62.021	63.846	65.344	66.649	67.979
<b>D. ACQUISITION STRATEGY:</b>								
Sole Source Production Contract awarded in FY 2004 for MK48 ADCAP MODS, Lightweight MK54 and CBASS kits, including Royal Australian Navy (RAN) units.								
LRIP Contract for CBASS units awarded in FY 2004 and to include RAN units.								
<b>E. MAJOR PERFORMERS:</b>								
NUWC Division Newport, Newport, RI - System Integrator and Software Developer. Continued integration and development testing of CBASS hardware and software components and test equipment.								
Raytheon awarded Sole Source Production Contract for MK48 ADCAP MODS, Lightweight MK54 and CBASS kits, including RAN units.								
Commander Operational Test and Evaluation Force (COTF) - Test Planning, Independent operational Evaluation.								

R-1 Line Item No. 182

Page 6 of 10

Exhibit R-2a, RDT&E Project Justification

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Exhibit R-3 Cost Analysis (page 1)											DATE: <b>February 2007</b>			
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NAME AND NUMBER							
<b>RDT&amp;E, N/BA-7</b>			MK48 ADCAP/0205632N				MK48 ADCAP/F0366							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NUWC NPT	CONT.	5.806	10/05	4.388	10/06	0.778	10/07	1.419	10/08	CONT.	CONT.	N/A
Primary Hardware Development	Various	Various/Progeny	CONT.	0.000	03/06	5.000	12/06	0.777	12/07	1.418	12/08	CONT.	CONT.	N/A
Systems Engineering	WR	NUWC NPT	CONT.	7.367	10/05	6.548	10/06	2.903	10/07	3.119	10/08	CONT.	CONT.	N/A
Subtotal Product Development			CONT.	13.173		15.936		4.458		5.956		CONT.	CONT.	N/A
Remarks: Total Cost and Target Value of Northrop Grumman contract represents contract Latest Revised Estimate based on completed negotiations and CBASS hardware technical requirements. Various - TBD; Primary hardware development activity to be selected after evaluation of technologies from various vendors.														
Development Support Equipment														
Software Development	WR	NUWC NPT	CONT.	2.970	10/05	3.732	10/06	3.453	10/07	3.698	10/08	CONT.	CONT.	N/A
Software Development	Various	Various	CONT.	1.350	03/06	0.727	12/06	1.800	12/07	1.800	12/08	CONT.	CONT.	N/A
Integrated Logistics Support	Various	Various		0.000		0.000		0.100	10/07	0.040	10/08			
Subtotal Support			CONT.	4.320		4.459		5.353		5.538		CONT.	CONT.	N/A
Remarks:														

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Exhibit R-3 Cost Analysis (page 2)											DATE: <b>February 2007</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA-7</b>			PROGRAM ELEMENT MK48 ADCAP/0205632N				PROJECT NAME AND NUMBER MK48 ADCAP/F0366								
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
Test & Evaluation	WR	NUWC NPT	CONT.	1.410	10/05	1.299	10/06	3.639	10/07	2.849	10/08	CONT.	CONT.	N/A	
Operational Test & Evaluation	WR	Operational Test Support	CONT.	0.500	11/05	0.500	11/06	1.000	11/07	0.500	11/08	CONT.	CONT.	N/A	
Modeling & Simulation	WR	NUWC NPT	CONT.	0.925	10/05	1.244	10/06	2.190	10/07	2.565	10/08	CONT.	CONT.	N/A	
Modeling & Simulation	C,CPFF	ARL / PSU	CONT.	0.650	12/05	0.650	12/06	0.800	12/07	0.800	12/08	CONT.	CONT.	N/A	
Subtotal T&E			CONT.	3.485		3.693		7.629		6.714		CONT.	CONT.		
Remarks:															
Program Management Support	Various	Anteon	CONT.	0.451	MISC.	0.451	MISC.	0.451	MISC.	0.451	MISC.	CONT.	CONT.	N/A	
Travel			CONT.	0.045		0.045		0.050		0.050		CONT.	CONT.	N/A	
Overhead			CONT.	0.120		0.286		0.000		0.000		CONT.	CONT.	N/A	
Subtotal Management			CONT.	0.616		0.782		0.501		0.501		CONT.	CONT.		
Remarks:															
Total Cost			CONT.	21.594		24.870		17.941		18.709		CONT.	CONT.		
Remarks:															

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EXHIBIT R-4, Schedule Profile						DATE: <b>February 2007</b>		
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME			PROJECT NUMBER AND NAME			
<b>RDT&amp;E, N BA-7</b>		MK-48 ADCAP/0205632N			MK-48 ADCAP/F0366			
<b>PROGRAM EFFORTS</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>	<b>FY11</b>	<b>FY12</b>	<b>FY13</b>
Torpedo Advanced Processor Builds					APB 1/Spiral 4 (Common)		APB (Common)	
CBASS Development	OPEVAL ▲▼	Engineering Tests in Support of CBASS Algorithm and Software Development IOC ▲△* FRP						
Torpedo Technology Insertion	Tech Develop. Contract Awards SDR ▲				DT/OT ▲	Tech Insertion Package #1 OPEVAL ▼▲	Tech Insertion Package #2 DT/OT ▲	OPEVAL ▼▲
				PDR ▲	PDR ▲	PDR ▲	SDR ▲	DRR ▲
* Program baseline of July 2003 established goal of 3rd QTR and threshold of 4th QTR.								

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