

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: February 2006	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7				R-1 ITEM NOMENCLATURE MK48 ADCAP/0205632N			
COST (\$ in Millions)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	21.237	21.724	24.988	25.915	26.425	27.279	28.053
MK48 ADCAP/0366	21.237	21.724	24.988	25.915	26.425	27.279	28.053
<p>Note: \$2.1M Congressional Plus-up for MK48 ADCAP Torpedo APB Improvements in (PE 0603561N/9039) for FY05.</p> <p>A. (U) Mission Description and Budget Item Justification: MK48 ADCAP RDT&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 ACAT III development to address CNO defined capability-based requirements and mission needs. This PE (0205632N/0366) is tied to development programs that leverage a Congressionally funded Torpedo APB program (in PE 0603561N/9039), a joint US/Australia, Armaments Cooperative Project to develop MK48 ADCAP, and Future Naval Capability technologies being developed by 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&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 Torpedo APBs to rapidly upgrade the ADCAP to counter evolving threats and maintain robust performance. The Common Broadband Advanced Sonar System (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. 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 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&D program focuses on two specific areas near term: Torpedo Advanced Processor Builds (APBs) and broadband sonar capability. The Chief of Naval Operations 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 Office of Naval Research (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&D community (6.2/6.3) and contractors). This approach will incorporate developmental testing of the Future Naval Capability (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>							

R-1 SHOPPING LIST - Item No. 182

Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, page 1 of 9)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification		DATE: February 2006									
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7		R-1 ITEM NOMENCLATURE MK48 ADCAP/0205632N									
B. Accomplishments/Planned Program											
<table border="1"><thead><tr><th>TORPEDO APB</th><th>FY 05</th><th>FY 06</th><th>FY 07</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td>9.958</td><td>12.678</td><td>14.750</td></tr></tbody></table>				TORPEDO APB	FY 05	FY 06	FY 07	Accomplishments/Effort/Subtotal Cost	9.958	12.678	14.750
TORPEDO APB	FY 05	FY 06	FY 07								
Accomplishments/Effort/Subtotal Cost	9.958	12.678	14.750								
<p>FY05 - Torpedo Advanced Processor Build efforts in order to address fleet identified performance priorities for MK48 ADCAP MODS. Funding provided for rapid delivery of incremental software improvements to fielded MODS torpedoes and included budgeting previously allocated from Congressional plus-ups. Efforts included software coding, modeling and simulation of software releases (including development and validation of models) and engineering tests in water for evaluation of proposed releases. Torpedo APB software build release planned in FY05 (Spiral 1 Phase 1).</p> <p>FY06 - Torpedo Advanced Processor Build efforts to address fleet identified performance priorities for the Mk48 ADCAP torpedo. FY06 to include developmental and operational testing for Spiral 1.</p> <p>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.</p>											
<table border="1"><thead><tr><th>CBASS</th><th>FY 05</th><th>FY 06</th><th>FY 07</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td>9.286</td><td>2.390</td><td>0.000</td></tr></tbody></table>				CBASS	FY 05	FY 06	FY 07	Accomplishments/Effort/Subtotal Cost	9.286	2.390	0.000
CBASS	FY 05	FY 06	FY 07								
Accomplishments/Effort/Subtotal Cost	9.286	2.390	0.000								
<p>FY05- Conducted in-water developmental testing with CBASS EDM vehicles. Efforts involved torpedo preparations, model validation, post-run analysis, and range preparations including cooperative test series scheduled in Australia as part of joint US/Australia Armaments Cooperative Project.</p> <p>FY06- Complete In-water developmental, technical, and operational testing in preparation for CBASS Full Rate Production Decision and IOC planned for 3Q FY06.</p>											

R-1 SHOPPING LIST - Item No. 182

Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, page 2 of 9)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: February 2006
--	----------------------------

APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	R-1 ITEM NOMENCLATURE MK48 ADCAP/0205632N
---	--

B. Accomplishments/Planned Program (Cont.)

OPERATIONAL TEST SUPPORT	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	1.093	0.500	0.500

FY05- Provided for accreditation requirements and developmental test support for shallow water environments required prior to OPEVAL.

FY06- Conduct analysis and prepare 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.

TECHNOLOGY INSERTIONS	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	0.900	6.156	9.738

FY05 - Defined a series of spiral development packages of several hardware improvements building on proven torpedo hardware platforms. Started development efforts (including planning and systems engineering) that will implement these new technologies into the latest MK48 ADCAP torpedoes. Awarding contracts to industry to develop technologies.

FY06- Transition torpedo technologies selected under Torpedo Technology Insertion program. Analysis of available technology solutions against desired performance objectives, and continue integration of first technology insertion package. Conduct System Design Review for Spiral 1.

FY07- Finalization of Spiral 1 development efforts prior to developmental and operational testing in FY08. Efforts to include a Preliminary Design Review.

R-1 SHOPPING LIST - Item No. 182

Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, page 3 of 9)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: February 2006		
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE		
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	MK48 ADCAP/0205632N		
C. PROGRAM CHANGE SUMMARY:			
Funding:	FY 2005	FY 2006	FY 2007
Previous President's Budget: (FY2006 President's Controls)	21.367	21.619	25.761
Current BES/President's Budget: (FY 07 President's Controls)	21.237	21.724	24.988
Total Adjustments	-0.130	0.105	-0.773
Summary of Adjustments			
Programmatic changes	0	0.429	-0.773
SBIR	-0.114	0	0
Rescissions	0	-0.324	0
DOE Transfer (Issue 74501)	-0.016	0	0
Subtotal	-0.130	0.105	-0.773
Schedule: Not Applicable.			
Technical: Not Applicable.			

R-1 SHOPPING LIST - Item No. 182

Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, page 4 of 9)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: February 2006		
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7						R-1 ITEM NOMENCLATURE MK48 ADCAP/0205632N		
D. OTHER PROGRAM FUNDING SUMMARY:	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete CONT.
MK48 ADCAP MODS (WPN/PE0204284N/BA-3/P-1 Item 322500)	60.596	57.501	61.528	64.431	66.045	67.688	69.269	
Sub. Tactical Warfare Systems (RDT&E/PE0603562N/BA-4/1739)	5.891	7.017	10.357	9.909	10.219	10.400	10.650	
Advanced Submarine Systems * (RDT&E/PE0603561N/BA4/9039)	89.790	149.531	140.432	158.361	164.053	164.759	144.597	
* Congressional Plus-up of \$2.032M in FY05 for MK48 ADCAP/APB upgrades.								
E. ACQUISITION STRATEGY:								
CBASS EMD contract was competitively awarded among qualified ADCAP producers. 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.								
Tech Insertion Spiral 1 EDM contract(s) to be awarded among qualified producers in FY08.								
F. MAJOR PERFORMERS:								
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.								
Northrop Grumman, Annapolis, MD - Fabricated and delivered CBASS EDM hardware in fulfillment of contract that was completed in August 2005 (CBASS kits consisting of preamps and BSARs).								

R-1 SHOPPING LIST - Item No. 182

Exhibit R-2, RDT&E Budget Item Justification

(Exhibit R-2, page 5 of 9)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 1)								DATE: February 2006				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT		PROJECT NAME AND NUMBER							
RDT&E, N/BA-7			MK48 ADCAP/0205632N		MK48 ADCAP/0366							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NUWC NPT	CONT.	0.660	10/04	3.056	10/05	4.388	10/06	CONT.	CONT.	N/A
Primary Hardware Development	Various	Various - TBD	0.000	0.000		2.750	03/06	5.000	12/06	CONT.	CONT.	N/A
Primary Hardware Development	C,CPIF	Northrop Grumman	32.896	0.200	11/04	0.000		0.000		0.000	33.096	33.096
Systems Engineering	WR	NUWC NPT	CONT.	4.339	10/04	7.367	10/05	6.666	10/06	CONT.	CONT.	N/A
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			CONT.	5.199		13.173		16.054		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.	4.292	10/04	2.970	10/05	3.732	10/06	CONT.	CONT.	N/A
Software Development	Various	Various	0.000	1.300	12/04	1.350	03/06	0.727	12/06	CONT.	CONT.	N/A
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			CONT.	5.592		4.320		4.459		CONT.	CONT.	N/A
Remarks:												

R-1 SHOPPING LIST - Item No. 182

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 6 of 9)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 2)								DATE: February 2006				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT		PROJECT NAME AND NUMBER							
RDTE&E, N/BA-7			MK48 ADCAP/0205632N		MK48 ADCAP/0366							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NUWC NPT	CONT.	5.515	10/04	1.395	10/05	1.299	10/06	CONT.	CONT.	N/A
Operational Test & Evaluation	WR	Operational Test Support	CONT.	1.093	11/04	0.500	11/05	0.500	11/06	CONT.	CONT.	N/A
Modeling & Simulation	WR	NUWC NPT	CONT.	2.712	10/04	0.925	10/05	1.244	10/06	CONT.	CONT.	N/A
Modeling & Simulation	C,CPFF	ARL / PSU	0.000	0.342	12/04	0.650	12/05	0.650	12/06	CONT.	CONT.	N/A
Subtotal T&E			CONT.	9.662		3.470		3.693		CONT.	CONT.	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	Various	Anteon	CONT.	0.451	MISC.	0.451	MISC.	0.451	MISC.	CONT.	CONT.	N/A
Travel			CONT.	0.090		0.045		0.045		CONT.	CONT.	N/A
Overhead			CONT.	0.243		0.265		0.286		CONT.	CONT.	N/A
Subtotal Management			CONT.	0.784		0.761		0.782		CONT.	CONT.	
Remarks:												
Total Cost			CONT.	21.237		21.724		24.988		CONT.	CONT.	
Remarks:												

R-1 SHOPPING LIST - Item No. 182

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 7 of 9)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-4, Schedule Profile

DATE:

February 2006

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7

MK48 ADCAP/0205632N

<u>PROGRAM EFFORTS</u>	FY05	FY06	FY07	FY08	FY09	FY10	FY11
	ADCAP Performance Upgrades based on Fleet Priorities (DT/OT testing scheduled prior to each software delivery)						
Torpedo Advanced Processor Builds	△		△	△		△	→
CBASS Development	Engineering Tests in Support of CBASS Algorithm and Software Development						
	DT/OT ▼	OPEVAL ▲					
		IOC ▲					
		FRP ▲					
Torpedo Technology Insertion	Advanced Tech Studies	Tech Develop. Contract Awards			Tech Insertion Package #1 DT/OT		Tech Insertion Package #2
				△	▽ △		DT/OT △ ▽ △
			△ SDR	△ PDR	△ DRR	△ SDR △ PDR △ DRR	

R-1 SHOPPING LIST - Item No. 182

Exhibit R-4, RDT&E Budget Item Justification

(Exhibit R-4, page 8 of 9)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

[illegible]

R-1 SHOPPING LIST - Item No. 182

UNCLASSIFIED

Exhibit R-4a, RDT&E Budget Item Justification

(Exhibit R-4a, page 9 of 9)