

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification						DATE:	
						February 2004	
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE			
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7				MK48 ADCAP/0205632N			
COST (\$ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost	21.323	17.036	21.620	22.131	26.018	26.564	27.052
MK48 ADCAP/0366	21.323	17.036	21.620	22.131	26.018	26.564	27.052
Quantity of RDT&E Articles	15	6	1	1		1	
<p>A. (U) Mission Description and Budget Item Justification: MK48 ADCAP RDT&E program executes spiral development of 3 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 leverage Future Naval Capability technologies being developed by ONR.</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 leverages 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.</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. Full rate production and IOC are 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 over current (MK48 Mod 5) capability.</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>							

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APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	R-1 ITEM NOMENCLATURE MK48 ADCAP/0205632N														
B. Accomplishments/Planned Program															
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 30%;">TORPEDO APB</th><th style="width: 20%;">FY 03</th><th style="width: 20%;">FY 04</th><th style="width: 30%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">7.809</td><td style="text-align: center;">9.123</td><td style="text-align: center;">11.836</td></tr><tr><td>RDT&E Articles Quantity*</td><td></td><td style="text-align: center;">1</td><td style="text-align: center;">1</td></tr></tbody></table> <p>* Denotes Torpedo APB software builds</p>				TORPEDO APB	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	7.809	9.123	11.836	RDT&E Articles Quantity*		1	1
TORPEDO APB	FY 03	FY 04	FY 05												
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RDT&E Articles Quantity*		1	1												
<p>FY03- Conducted additional developmental and operational testing of MK48 ADCAP MODS per TEMP to correct deficiencies.</p> <p>FY04 - FY05 Torpedo Advanced Processor Build efforts continue in order to address fleet identified performance priorities for MK48 ADCAP MODS and to address broadband algorithms. Provides for rapid delivery of incremental software improvements to fielded MODS torpedoes every 18-24 months. Efforts include software coding, modeling and simulation of software releases (including development and validation of models) and engineering tests in water for evaluation of proposed releases. Conduct validation of safety features for submarine crew safety. Torpedo APB software build release planned in FY05.</p>															
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CBASS	FY 03	FY 04	FY 05												
Accomplishments/Effort/Subtotal Cost	9.601	6.683	7.588												
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<p>FY03- Integration and delivery of CBASS EDM hardware. 15 CBASS kits (preamplifiers and BSARs) delivered by Northrop Grumman. Continued development of advanced wideband algorithms, signal processing, and tactical software. Begin integration of CBASS prototype hardware and software components and test equipment in preparation for development testing.</p> <p>FY04- Continue integration of CBASS prototype hardware and software components and test equipment. Conduct software testing, modeling and simulation predictions, and initial check-out in-water testing of EDM vehicles.</p> <p>FY05- Conduct in-water developmental testing, technical and operational testing with CBASS EDM vehicles. Efforts include torpedo preparations, model validation, post-run analysis, and range preparations.</p>															

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<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 35%; padding: 5px;">OPTEVFOR</td><td style="width: 15%; padding: 5px;">FY 03</td><td style="width: 15%; padding: 5px;">FY 04</td><td style="width: 35%; padding: 5px;">FY 05</td></tr><tr><td style="padding: 5px;">Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center; padding: 5px;">0.485</td><td style="text-align: center; padding: 5px;">0.880</td><td style="text-align: center; padding: 5px;">1.000</td></tr><tr><td style="padding: 5px;">RDT&E Articles Quantity</td><td style="padding: 5px;"></td><td style="padding: 5px;"></td><td style="padding: 5px;"></td></tr></table> <p style="margin-top: 10px;">FY03- Provided for COMOPTEVFOR trusted agent test analysis and model validation support. FY04-FY05 - Provide for accreditation requirements for Mod 7 shallow water environments required prior to OPEVAL and provide developmental test support.</p> <table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 35%; padding: 5px;">TACDEVEX 01-03</td><td style="width: 15%; padding: 5px;">FY 03</td><td style="width: 15%; padding: 5px;">FY 04</td><td style="width: 35%; padding: 5px;">FY 05</td></tr><tr><td style="padding: 5px;">Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center; padding: 5px;">2.459</td><td style="padding: 5px;"></td><td style="padding: 5px;"></td></tr><tr><td style="padding: 5px;">RDT&E Articles Quantity</td><td style="padding: 5px;"></td><td style="padding: 5px;"></td><td style="padding: 5px;"></td></tr></table> <p style="margin-top: 10px;">FY03- Conducted developmental testing of MK48 ADCAP Mod 6 in cold water environments. Efforts included torpedo preparations, modeling and simulation predictions, and post-run analysis, and preparations for required submarine hit-shot certification analysis prior to exercise.</p> <table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 35%; padding: 5px;">TECHNOLOGY INSERTIONS</td><td style="width: 15%; padding: 5px;">FY 03</td><td style="width: 15%; padding: 5px;">FY 04</td><td style="width: 35%; padding: 5px;">FY 05</td></tr><tr><td style="padding: 5px;">Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center; padding: 5px;">0.969</td><td style="text-align: center; padding: 5px;">0.350</td><td style="text-align: center; padding: 5px;">1.196</td></tr><tr><td style="padding: 5px;">RDT&E Articles Quantity</td><td style="padding: 5px;"></td><td style="padding: 5px;"></td><td style="padding: 5px;"></td></tr></table> <p style="margin-top: 10px;">FY03- Performed fiber optic connectivity technology study and military value analysis. FY04- Transition torpedo technologies selected under Torpedo Technology Insertion program. Continue advanced technology studies to evaluate and identify the candidate advanced technologies that would provide the greatest performance improvement or increased capability. Define a series of spiral development packages of several hardware improvements and to build on proven torpedo hardware platforms. FY05- Start development efforts (including planning and systems engineering) that would implement new technologies into the latest MK48 ADCAP torpedoes. Transition torpedo technologies selected under Torpedo Technology Insertion program. Award contracts to industry to develop technologies. Continue analysis of available technology solutions against desired performance objectives.</p>				OPTEVFOR	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.485	0.880	1.000	RDT&E Articles Quantity				TACDEVEX 01-03	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	2.459			RDT&E Articles Quantity				TECHNOLOGY INSERTIONS	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.969	0.350	1.196	RDT&E Articles Quantity			
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EXHIBIT R-2, RDT&E Budget Item Justification		DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	R-1 ITEM NOMENCLATURE MK48 ADCAP/0205632N		
C. PROGRAM CHANGE SUMMARY:			
Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 04 Pres Controls)	21.499	17.227	24.234
Current BES/President's Budget (FY 05 Pres Controls):	21.323	17.036	21.620
Total Adjustments	-0.176	-0.191	-2.614
Summary of Adjustments			
FY 03 SBIR	-0.121		
Cancel Accounts	-0.055		
Manpower Adjustment			-0.065
Management Improvement		-0.045	
Efficiencies (Sec. 8126)		-0.146	
Economic Assumptions			-0.149
Sea Enterprise (LOE II)			-2.400
Subtotal	-0.176	-0.191	-2.614
<p>Schedule: Delay fiber optic capability by 2 years from FY07 to FY09 due to Level of Effort (LOE) cuts. In addition, delay advanced Sonar IOC by 2 years from FY09 to FY11 and delay delivery of COTS processor upgrade from FY08 to FY10.</p> <p>Technical: FY05 -- Limit scope of tradeoff studies, Torpedo APB systems engineering, and Algorithm development as a result of reductions.</p>			

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APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE			
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7					MK48 ADCAP/0205632N			
D. OTHER PROGRAM FUNDING SUMMARY:								
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete CONT.
MK48 ADCAP MODS (WPN/PE0204284N/BA-3/P-1 Item 322500)	60.624	59.923	61.185	62.092	63.090	64.710	66.088	
Sub. Tactical Warfare Systems (RDT&E/PE0603562N/BA-4)	12.502	6.948	5.957	6.650	9.889	9.993	10.283	
Advanced Submarine Systems (RDT&E/PE0603561N/BA4)	126.891	92.539	81.160	117.311	116.065	138.838	136.507	
E. ACQUISITION STRATEGY:								
CBASS EMD contract was competitively awarded among qualified ADCAP producers.								
Contract award planned in FY 2004 for MK48 ADCAP MODS, Lightweight MK54 and CBASS kits, including RAN units.								
F. MAJOR PERFORMERS:								
NUWC Division Newport, Newport, RI - Continued integration of CBASS prototype hardware and software components and test equipment.								
Continued in-water testing to support algorithm development and initial software builds.								
Northrop Grumman, Annapolis, MD - Initiated fabrication of CBASS EDM hardware and delivered fifteen (15) CBASS kits (preamps and BSARs)								

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Exhibit R-3 Cost Analysis (page 1)								DATE: February 2004				
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 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NUWC NPT	CONT.	0.000	10/02	0.776	10/03	1.205		CONT.	CONT.	N/A
Primary Hardware Development	Various	Various - TBD	0.000	0.000		0.000		0.096	11/04	CONT.	CONT.	N/A
Primary Hardware Development	C,CPIF	Northrop Grumman	27.770	3.904	11/02	0.200	11/03	0.200	11/04	0.000	32.074	32.074
Ancillary Hardware Development	C,CPFF	TRI / Austin	0.000	0.075	01/03	0.000		0.000				N/A
Systems Engineering	WR	NUWC NPT	CONT.	6.252	10/02	5.570	10/03	6.059	10/04	CONT.	CONT.	N/A
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			CONT.	10.231		6.546		7.560		CONT.	CONT.	
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.	3.023	10/02	3.867	10/03	3.978	10/04	CONT.	CONT.	N/A
Software Development	Various	Various	0.000	0.681	11/02	0.237	12/03	0.300	12/04	CONT.	CONT.	N/A
Software Development	C,CPFF	ARL / PSU	0.000	0.217	05/03	0.353	12/03	0.650	12/04	CONT.	CONT.	N/A
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			CONT.	3.921		4.457		4.928		CONT.	CONT.	
Remarks: FY03 software development includes small business and industry participants (Paul Greenblatt Consulting, Anteon Corporation, Lockheed Martin) in the Torpedo APB program.												

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Exhibit R-3, Project Cost Analysis
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Exhibit R-3 Cost Analysis (page 2)								DATE: February 2004				
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 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NUWC NPT	CONT.	2.813	10/02	2.760	10/03	4.919	10/04	CONT.	CONT.	N/A
Operational Test & Evaluation	WR	OPTEVFOR	CONT.	0.485	11/02	0.880	11/03	1.000	11/04	CONT.	CONT.	N/A
Modeling & Simulation	WR	NUWC NPT	CONT.	2.407	10/02	1.675	10/03	2.362	10/04	CONT.	CONT.	N/A
Modeling & Simulation	Various	MIT	CONT.	0.650	11/02							
GFE												
Subtotal T&E			CONT.	6.355		5.315		8.281		CONT.	CONT.	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	Various	Anteon	CONT.	0.500	MISC.	0.500	MISC.	0.500	MISC.	CONT.	CONT.	N/A
Travel			CONT.	0.045		0.020		0.045		CONT.	CONT.	N/A
Labor (Research Personnel)												
Overhead			CONT.	0.271		0.198		0.306		CONT.	CONT.	N/A
Subtotal Management			CONT.	0.816		0.718		0.851		CONT.	CONT.	
Remarks:												
Total Cost			CONT.	21.323		17.036		21.620		CONT.	CONT.	
Remarks:												

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Exhibit R-3, Project Cost Analysis
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EXHIBIT R-4, Schedule Profile

DATE:

February 2004

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7

MK48 ADCAP/0205632N

PROGRAM EFFORTS	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09
Torpedo Advanced Processor Builds		ADCAP Mods DT/OT ▲ ▼	△	ADCAP Performance Upgrades based on Fleet Priorities △	△		△	→
CBASS Development		Engineering Tests in Support of CBASS Algorithm and Software Development		DT/OT ▽ ▲ ▼	OPEVAL △ ▼			
Torpedo Technology Insertion			△		△ MSIII	△ SDR	Tech Insertion Package #1 DT/OT △	▽ △ →
						△ PDR	△ DRR	

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Exhibit R-4, RDT&E Budget Item Justification

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