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Exhibit R-2, RDT&E Budget Item Justification								Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N / 7					R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. MK48 ADCAP/0205632N					
COST (\$ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	10.3	17.4	20.4	15.6	17.1	18.2	22.8	30.3	CONT.	CONT.
MK48 ADCAP/ V0366	10.3	17.4	20.4	15.6	17.1	18.2	22.8	30.3	CONT.	CONT.
Quantity of RDT&E Articles & cost	26 / 2.3	3.2	3.5	5.1	1.8	0.6				

A. (U) Mission Description and Budget Item Justification:

The MK 48 ADCAP (ADvanced CAPability) torpedo R&D program focuses on two specific areas through FY05: Guidance and Control (G&C) software block upgrades and wideband 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 ADCAP G&C software block upgrade program.

(U) The focus of the MK 48 ADCAP torpedo R&D program for FY99 and out has shifted from being primarily concentrated on Software Block Upgrade efforts to a coordinated hardware/software upgrade for countering evolving threats and maintaining robust performance. Countermeasure (CM) sophistication and availability on the open market directly affects ADCAP kill proficiency and its ability to counter rapidly evolving threats. The Common Broadband Advanced Sonar System (CBASS) program will develop and field a wideband sonar capable of identifying CMs and discriminating them from the target. CBASS will procure 26 test articles (6 prototypes 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 FY04.

(U) The introduction of phased prototyping in FY03 will provide a more rapid technology transition path for incremental torpedo improvements and upgrades (including the development and test of New Technology Concepts from the R&D community (6.2/6.3) and contractor Independent Research and Development (IR&D)). This approach will incorporate accelerated in-water testing of the new concepts allowing early Fleet input into future ADCAP upgrades and help to provide the foundation for Next Generation Torpedoes. These efforts will continue torpedo development investment at a lower cost and shorter term than traditional torpedo programs.

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<p>1. (U) FY 1998 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none">• (U) (\$3.5) Continued G&C Software Block Upgrade IV Improvement efforts in support of DT. Conducted validation of safety features for new build releases of software block upgrades. Developed G&C Software improvements to optimize torpedo algorithm and processor effectiveness.• (U) (\$1.3) Continued support and upgrade of the Weapon Analysis Facility (WAF) simulator to reflect the latest G&C hardware and software. Continued incremental validation of the WAF to prepare for Block IV OT in FY00.• (U) (\$1.7) Conducted DT of Software Block Upgrade IV. Supported COMSUBPAC priority FOT&E of Software Block Upgrade III.• (U) (\$0.1) Provided for COMOPTEVFOR Block Upgrade IV DT test support.• (U) (\$3.4) Continued development efforts on the CBASS wideband sonar system for the ADCAP MODs torpedo. Awarded CBASS EMD contract for the development and manufacture of prototype wideband sonar systems. Continued to perform trade-offs and comparative analysis on various wideband configurations including technologies being developed through ONR 6.2/6.3 programs.• (U) (\$0.3) Continued development, design and prototype of new propulsion concepts resulting from 6.2 R&D technology. Began the land-based testing of alternate fuels/reduced maintenance propulsion concepts.		

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<p>2. (U) FY 1999 PLAN:</p> <ul style="list-style-type: none">• (U) (\$6.5) Continue the development of G&C Software Block Upgrade IV in preparation for OT in FY00. G&C Software development efforts continue in order to address fleet identified priorities. Conduct validation of safety features for new build releases of software block upgrades.• (U) (\$1.6) Continue to support and upgrade the Weapon Analysis Facility simulator to reflect latest G&C hardware and software. Conduct simulation in support of Block Upgrade IV DT and other software improvements. Continue model validation efforts.• (U) (\$2.8) Complete Developmental Testing and prepare for Operational Testing in FY00 of Software Block Upgrade IV. Support FOT&E of Software Block Upgrade III.• (U) (\$0.1) Provide for COMOPTEVFOR Block Upgrade IV DT test support.• (U) (\$5.7) CBASS EMD efforts continue toward integration of prototype components. Develop advanced wideband algorithms, signal processing, and tactical software. Conduct land-based testing of prototype hardware.• (U) (\$0.6) Continue to develop, design and prototype new propulsion concepts. Continue land-based testing of alternate fuels and reduced maintenance propulsion components.• (U) (\$0.1) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.	

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<p>3. (U) FY 2000 PLAN:</p> <ul style="list-style-type: none">• (U) (\$3.8) Complete the development of G&C Software Block Upgrade IV in support of OT. G&C Software development efforts continue in order to address fleet identified priorities. Conduct validation of safety features for new build releases of software block upgrades.• (U) (\$1.3) Continue to support and upgrade the Weapon Analysis Facility simulator to reflect latest G&C hardware and software. Conduct simulation in support of Block Upgrade IV OT and other software improvements. Continue model validation efforts.• (U) (\$4.4) Complete Operational Testing of Software Block Upgrade IV.• (U) (\$0.3) Provide for COMOPTEVFOR Software Block Upgrade IV test support.• (U) (\$10.4) CBASS EMD efforts continue toward integration of prototype components. Develop advanced wideband algorithms, signal processing, and tactical software. Continue land-based testing of prototypes, and begin in-water testing.• (U) (\$0.2) Continue to develop, design and prototype new propulsion concepts. Continue land-based testing of alternate fuels and reduced maintenance propulsion components.		
B. (U) Program Change Summary: (\$ in millions)		

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APPROPRIATION/BUDGET ACTIVITY: RDT&E,N / 7						R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. MK48 ADCAP/0205632N				
	FY 1998	FY 1999	FY 2000							
(U) FY 1999 President's Budget:	10.5	17.6	18.5							
(U) Appropriated Value:	10.8	17.6								
(U) Adjustments to FY1998 Appropriated Value/FY 1999 President's Budget:	-0.5	-0.2	+1.9							
(U) FY 2000/01 PRES Budget Submit:	10.3	17.4	20.4							
(U) Funding:										
FY98: Reduction of -\$0.5M is due to Congressional Undistributed reductions (-\$0.3M) and SBIR (-\$0.2M).										
FY99: Reduction of -\$0.2M is due to Congressional Undistributed reductions.										
FY00: \$2.0M added to support completion of Software Block Upgrade IV and its OPEVAL and a net reduction of -\$0.1M (due to Congressional Undistributed reductions -\$0.2M and minor pricing adjustments \$0.1M).										
(U) Schedule: Not applicable.										
(U) Technical: The addition of \$2.0M to FY00 permits incorporation of fleet priorities into Software Block Upgrade IV in support of its operational evaluation.										
C. (U) Other Program Funding Summary (\$ in millions)										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Complete</u>	<u>Total Cost</u>
MK48 ADCAP MODS (WPN / PE 0204284N / BA3 / P-1 Item 322500)	53.5	49.3	52.8	38.8	46.6	60.2	59.4	71.2	CONT.	CONT.
D. (U) Acquisition Strategy: CBASS EMD contract was competitively awarded among qualified ADCAP producers.										
E. Schedule Profile:										

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APPROPRIATION/BUDGET ACTIVITY: RDT&E,N / 7

R-1 ITEM NOMENCLATURE

Program Element (PE) Name and No. MK48 ADCAP/0205632N

M K 4 8 A D C A P P l a n n i n g S c h e d u l e

<u>PROGRAM EFFORTS</u>	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05
Software Block Upgrades		BLOCK IV	BLK IV OPEVAL ▽ ▲	BLK III/IV FOT&E ▲ ▼	Continued Software Improvements →			
CBASS (Development)			DT ▲ ▼	DT ▲ ▼	DT/OT ▲ ▼	OPEVAL ▲ ▼		
Torpedo Technology Improvement - Phased Prototyping	▲ MS II	▲ AWARD EMD CONTRACT	▲ PDR	▲ CDR	▲ MDA Review		▲ MSIII	

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Exhibit R-3 Cost Analysis				Date: February 1999								
APPROPRIATION/BUDGET ACTIVITY: RDT&E/7			PROGRAM ELEMENT NAME AND NUMBER: MK48 ADCAP/0205632N				PROJECT NAME AND NUMBER: MK48 ADCAP/V0366					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NUWC Newport, RI	CONT.	1.4	11/98	1.1	10/99	0.2	10/00	CONT.	CONT.	N/A
	C,CPFF	ARL/PSU State College, PA	CONT.	0.3	01/99	0		0		CONT.	CONT.	N/A
	C,CPIF	Northrop Grumman	CONT.	3.2	10/98	3.5	10/99	5.1	10/00	2.4	16.5	16.5
Software Development	WR	NUWC Newport, RI	CONT.	3.4	11/98	2.6	10/99	1.7	10/00	CONT.	CONT.	N/A
	C,CPFF	ARL/PSU State College, PA	CONT.	0.5	01/99	0.5	10/99	0.4	10/00	CONT.	CONT.	N/A
Systems Engineering	WR	NUWC Newport, RI	CONT.	3.5	11/98	2.9	10/99	2.1	10/00	CONT.	CONT.	N/A
Subtotal Product Development			CONT.	12.3		10.6		9.5		CONT.	CONT.	
Remarks: None.												
Subtotal Support												
Remarks: None.												

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APPROPRIATION/BUDGET ACTIVITY: RDT&E/7				PROGRAM ELEMENT NAME AND NUMBER: MK48 ADCAP/0205632N			PROJECT NAME AND NUMBER: MK48 ADCAP/V0366					
Cost Categories (Tailor to WBS or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY 99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Comple te	Total Cost	Target Value of Contract
Test and Evaluation	WR	NUWC Newport, RI	CONT.	2.7	11/98	5.1	10/99	3.9	10/00	CONT.	CONT.	N/A
	VAR	VARIOUS	CONT.	0.1	10/98	0.7	10/99	0.2	10/00	CONT.	CONT.	N/A
Modeling & Simulation	WR	NUWC Newport, RI	CONT.	2.0	11/98	3.6	10/99	1.7	10/00	CONT.	CONT.	N/A
	C,CPFF	ARL/PSU State College, PA	CONT.	0		0.1	10/99	0		CONT.	CONT.	N/A
Subtotal T&E			CONT.	4.8		9.5		5.8		CONT.	CONT.	
Remarks: None.												
Program Management Support	VAR	VARIOUS	CONT.	0.3	MISC.	0.3	MISC.	0.3	MISC.	CONT.	CONT.	N/A
Subtotal Management			CONT.	0.3		0.3		0.3		CONT.	CONT.	
Remarks: None.												
Total Cost			CONT.	17.4		20.4		15.6		CONT.	CONT.	
Remarks: None.												