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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2013 Navy **DATE:** February 2012

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 7: <i>Operational Systems Development</i>				R-1 ITEM NOMENCLATURE PE 0205632N: <i>MK-48 ADCAP</i>							
COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
Total Program Element	33.912	46.759	28.717	-	28.717	25.333	25.273	25.716	26.347	Continuing	Continuing
0366: <i>MK 48 ADCAP</i>	25.953	39.259	28.717	-	28.717	25.333	25.273	25.716	26.347	Continuing	Continuing
9999: <i>Congressional Adds</i>	7.959	7.500	-	-	-	-	-	-	-	0.000	15.459

## A. Mission Description and Budget Item Justification

(U) Mission Description and Budget Item Justification:

MK-48 ADCAP (Advanced Capability) Research, Development, Test and Evaluation (RDT&E) program executes incremental 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 Program Element (0205632N/0366) is tied to development programs that leverage a joint United States/Australia Armaments Cooperative Project (ACP) to develop MK-48 ADCAP CBASS; and Future Naval Capability (FNC) technologies developed by the Office of Naval Research (ONR).

(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 Research and Development (R&D) program from FY 2001 and out shifted from being primarily concentrated on Software Block Upgrade efforts towards coordinated hardware upgrades, rapid Commercial-Off-the-Shelf (COTS) insertion, and APBs to rapidly upgrade the ADCAP to counter evolving threats and maintain robust performance. The CBASS program developed and fielded a broadband sonar capable of identifying CMs and discriminating them from the target. CBASS Phase I achieved IOC in FY 2006. The Commonwealth of Australia Royal Navy is jointly participating to develop CBASS Phase II to improve shallow water performance and signed a MOA extension Nov 2009. The MOA extension expires Nov 2019.

(U) The MK-48 ADCAP torpedo R&D program focuses on two specific areas near term: Torpedo APBs and hardware tech insertions. 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. The APB program also leverages the RAN joint torpedo program and FNC technologies developed by the ONR in the areas of torpedo broadband signal processing, tactics processing, and alertment. The Torpedo tech insertion program will leverage from MK-54 Lightweight torpedo algorithms. Further hardware investment involves development of Guidance & Control (G&C) replacement required to support production and development of Automated Test Equipment replacement to improve comprehensive system testing of full up CBASS Torpedoes.

(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 FNC transitioning technologies for ADCAP upgrades in the areas of torpedo

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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.						
(U) A modification to the CBASS Spiral 4 program was directed by CNO to address a Fleet Urgent Operation Need (UON), which enables the early fielding of specific Spiral 4 capabilities. Development of these changes are being accomplished under the APB program and are referred to as the Torpedo UON Rapid Fielding (TURF) effort. The TURF effort was inserted into CBASS Spiral 4 and was Fleet released in FY11, pushing spiral 4 IOC from 2nd Qtr FY12 to 4th Qtr FY12. The TURF effort also extended APB 5 development and delayed APB 5 IOC until 4th Qtr FY17.						
(U) Both FNC technologies and MK-54 Lightweight torpedo developments will be transitioned into ADCAP through Technology Insertion packages. Priorities for Technology Insertion are a new array to improve torpedo effectiveness, advanced processing, and advanced counter-countermeasure capability.						
It has been determined that program effectiveness can be improved by developing and delivering Automated Test Equipment (ATE) production restarts so development is planned to start in FY 2012. RDT&E is planned for redesign and development of obsolete components necessary to reconstitute Guidance & Control (G&C) torpedo sections.						
B. Program Change Summary (\$ in Millions)		FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Previous President's Budget		26.234	39.288	29.009	-	29.009
Current President's Budget		33.912	46.759	28.717	-	28.717
Total Adjustments		7.678	7.471	-0.292	-	-0.292
• Congressional General Reductions		-	-0.029			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	7.500			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.093	-			
• Program Adjustments		-	-	-0.108	-	-0.108
• Rate/Misc Adjustments		-	-	-0.184	-	-0.184
• Congressional General Reductions		-0.229	-	-	-	-
Adjustments						
• Congressional Add Adjustments		8.000	-	-	-	-
Congressional Add Details (\$ in Millions, and Includes General Reductions)					FY 2011	FY 2012
Project: 9999: Congressional Adds						
Congressional Add: Small Business Technology Insertion					7.959	7.500

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<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 7: <i>Operational Systems Development</i>		<b>R-1 ITEM NOMENCLATURE</b> PE 0205632N: <i>MK-48 ADCAP</i>	
<b><u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u></b>		<b>FY 2011</b>	<b>FY 2012</b>
Congressional Add Subtotals for Project: 9999		7.959	7.500
Congressional Add Totals for all Projects		7.959	7.500
<b><u>Change Summary Explanation</u></b> Technical: Not applicable.  Schedule: Not applicable.			

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Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy								DATE: February 2012			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 7: Operational Systems Development				R-1 ITEM NOMENCLATURE PE 0205632N: MK-48 ADCAP				PROJECT 0366: MK 48 ADCAP			
COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
0366: MK 48 ADCAP	25.953	39.259	28.717	-	28.717	25.333	25.273	25.716	26.347	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
A. Mission Description and Budget Item Justification											
Completion of TURF and continue Spiral 4 software development and testing; delivery of final report and completion of Spiral 4 DT/OT in FY 2012 with IOC in FY 2012;											
(U) Mission Description and Budget Item Justification: MK-48 ADCAP RDT&E program executes incremental development of weapon performance improvements in two development product areas: (1) APBs, and (2) Torpedo Technology Insertion. The budget enables ACAT III development to address CNO defined capability-based requirements and mission needs. This Program Element (0205632N/0366) is tied to development programs that leverage a joint United States/Australia ACP to develop MK-48 ADCAP; and FNC technologies being developed by the ONR.											
APB Software upgrades will improve torpedo performance in challenging water, countered environments through incorporation of new algorithms designed to address broadband, multiband, classifications and tactics processing changes. Hardware technology insertions will improve weapon availability through development of a G&C replacement and an Automated Test Equipment replacement.											
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2011	FY 2012	FY 2013	
Title: TORPEDO APB  Articles:								24.953	37.759	28.717	
								0	0	0	
FY 2011 Accomplishments: Finalize Spiral 4 Software development and start OT (\$20,147K). Develop UON specific software version and support Quick Reaction Assessment (QRA) to field TURF by 2nd Qtr FY11(\$4,806K).											
FY 2012 Plans: Operational Support, Program Sustainment, and Spiral 4 OT (\$21,359K). Conduct development of the RDTE Guidance Control (G&C) initiative to support production restart efforts on G&C components so 50 G&Cs can be matched up with arrays and AB/TCs thus increasing inventory numbers(\$11,500K). Start development of Automated Test Equipment (ATE) replacement (\$4,900K).											
FY 2013 Plans: Operational Support, Program Sustainment, and APB 5 development(\$14,895K). Conduct Test & Evaluation of APB 5 (\$8,922K).											

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2013 Navy							<b>DATE:</b> February 2012				
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 7: <i>Operational Systems Development</i>				<b>R-1 ITEM NOMENCLATURE</b> PE 0205632N: <i>MK-48 ADCAP</i>			<b>PROJECT</b> 0366: <i>MK 48 ADCAP</i>				

  

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013</b>
Restart development of Automated Test Equipment (ATE) replacement (\$4,900K).						
<b>Title:</b> OPERATIONAL TEST SUPPORT  <div style="text-align: right;"><b>Articles:</b></div>				1.000 0	1.500 0	-
<b>FY 2011 Accomplishments:</b> Continue Spiral 4 development. Complete TURF.  <b>FY 2012 Plans:</b> Complete Spiral 4 OT.						
<b>Accomplishments/Planned Programs Subtotals</b>				25.953	39.259	28.717

  

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u> <u>Base</u>	<u>FY 2013</u> <u>OCO</u>	<u>FY 2013</u> <u>Total</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• WPN/3225: <i>MK-48 Torpedo ADCAP Mods</i>	29.628	42.493	54.281	0.000	54.281	59.395	63.753	64.728	52.999	Continuing	Continuing

  

<b>D. Acquisition Strategy</b>
Sole Source Production Contract awarded in FY 2004 for MK-48 ADCAP MODS, Lightweight MK-54, and Common Broadband Advanced Sonar System (CBASS) kits, including Royal Australian Navy (RAN) units. A full and competitive procurement for MK46 Mod 7 CBASS production kits was awarded in March 2011 with a FY 2010/2011 base year and four option years for FY 2012-2015.

  

<b>E. Performance Metrics</b>
Milestone Reviews.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Navy										DATE: February 2012			
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT					
1319: Research, Development, Test & Evaluation, Navy BA 7: Operational Systems Development				PE 0205632N: MK-48 ADCAP				0366: MK 48 ADCAP					
Product Development (\$ in Millions)				FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NUWC Newportt (NPT):Newport RI	12.515	11.500	Oct 2011	11.206	Oct 2012	-		11.206	Continuing	Continuing	Continuing
Primary Hardware Development	C/CPFF	Progeny:Manassas VA	10.852	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			23.367	11.500		11.206		-		11.206			
Support (\$ in Millions)				FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NUWC NPT:Newport RI	15.096	4.986	Oct 2011	3.069	Oct 2012	-		3.069	Continuing	Continuing	Continuing
Software Development	Various	Various:Not Specified	36.317	3.672	Dec 2011	-		-		-	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NUWC NPT:Newport RI	2.243	0.263	Oct 2011	-		-		-	Continuing	Continuing	Continuing
Systems Engineering WCF	WR	NUWC NPT:Newport RI	17.750	1.650	Oct 2011	-		-		-	Continuing	Continuing	Continuing
Systems Engineering	Various	NUWC NPT:Newport RI	0.110	4.900	Dec 2011	4.900	Dec 2012	-		4.900	0.000	9.910	
Subtotal			71.516	15.471		7.969		-		7.969			
Test and Evaluation (\$ in Millions)				FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NUWC NPT:Newport RI	10.586	3.467	Oct 2011	-		-		-	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	Operational Test Force:Norfolk VA	7.033	0.250	Nov 2011	0.450	Oct 2012	-		0.450	Continuing	Continuing	Continuing
Modeling & Simulation	WR	NUWC NPT:Newport RI	9.745	-		-		-		-	Continuing	Continuing	Continuing
Modeling & Simulation	C/CPFF	ARL / PSU:State College PA	5.700	1.500	Dec 2011	1.988	Dec 2012	-		1.988	Continuing	Continuing	Continuing
Test & Evaluation	WR	NUWC Keyport (KPT):Keyport WA	21.696	6.400	Oct 2011	6.484	Dec 2012	-		6.484	0.000	34.580	
Subtotal			54.760	11.617		8.922		-		8.922			

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<b>Management Services (\$ in Millions)</b>				<b>FY 2012</b>		<b>FY 2013 Base</b>		<b>FY 2013 OCO</b>		<b>FY 2013 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Years Cost</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Program Management Support	C/FFP	Alion Science:Mclean VA	2.680	0.488	Oct 2011	0.462	Oct 2012	-		0.462	Continuing	Continuing	Continuing
Travel	WR	NAVSEA:Washington DC	0.730	0.183	Oct 2011	0.158	Oct 2012	-		0.158	Continuing	Continuing	Continuing
<b>Subtotal</b>			3.410	0.671		0.620		-		0.620			

  

	<b>Total Prior Years Cost</b>	<b>FY 2012</b>		<b>FY 2013 Base</b>		<b>FY 2013 OCO</b>		<b>FY 2013 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	153.053	39.259		28.717		-		28.717			

  

**Remarks**

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Exhibit R-4, RDT&E Schedule Profile: PB 2013 Navy		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 7: <i>Operational Systems Development</i>	R-1 ITEM NOMENCLATURE PE 0205632N: <i>MK-48 ADCAP</i>	PROJECT 0366: <i>MK 48 ADCAP</i>



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2013 Navy			<b>DATE:</b> February 2012
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 7: <i>Operational Systems Development</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0205632N: <i>MK-48 ADCAP</i>	<b>PROJECT</b> 0366: <i>MK 48 ADCAP</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 0366</b>				
Software Development: Spiral 4 Developmental Test (DT)	1	2011	2	2011
Software Development: Spiral 4 Operational Test (OT)	2	2011	4	2012
Software Development: Spiral 4 IOC	4	2012	4	2012
Software Development: TURF QRA	1	2011	2	2011
Software Development: TURF QRA 1	2	2011	2	2011
Software Development: TURF 1 Fielded (IOC)	2	2011	2	2011
Software Development: APB 5 Development	1	2011	3	2013
Software Development: APB 5 Developmental Test (DT)	3	2013	2	2015
Software Development: APB 5 Operational Test (OT)	3	2015	4	2017
Software Development: APB 5 IOC	4	2017	4	2017
Software Development: APB 6 Development	1	2016	4	2017
Technology Insertion -1 (TI-1): Technical Insertion (TI-1) Development	1	2016	4	2017
Guidance and Production Restart Efforts: Guidance and Production Restart Efforts	1	2012	4	2013
Automated Test Equipment Production Restart Efforts: Automated Test Equipment Production Restart Efforts	1	2012	4	2013

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2013 Navy									<b>DATE:</b> February 2012		
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<b>COST (\$ in Millions)</b>	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
9999: <i>Congressional Adds</i>	7.959	7.500	-	-	-	-	-	-	-	0.000	15.459
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

**A. Mission Description and Budget Item Justification**  
Congressional add for Small Business Technology Insertion.

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2011</b>	<b>FY 2012</b>
<b><i>Congressional Add:</i></b> Small Business Technology Insertion	7.959	7.500
<b><i>FY 2011 Accomplishments:</i></b> FY11 Congressional Add used to develop array and array electronics upgrades.		
<b><i>FY 2012 Plans:</i></b> Continue array electronics upgrades.		
<b>Congressional Adds Subtotals</b>	7.959	7.500

**C. Other Program Funding Summary (\$ in Millions)**  
N/A

**D. Acquisition Strategy**  
Congressional Adds

**E. Performance Metrics**  
Congressional Adds