

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2000			
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/ 07					R-1 ITEM NOMENCLATURE Surface ASW Combat System Integration/ 0205620N					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost		15.692	23.504	29.585	24.240	13.055	9.968	6.395	CONT.	CONT.
High Dynamic Range Low Cost Towed Array Receiver/ V2662		3.872	6.962	0.000	0.000	0.000	0.000	0.000	0.000	10.834
ASW Combat Systems Integration V0896		1.897	2.944	0.000	0.000	0.000	0.000	0.000	0.000	4.841
Surface ASW System Improvements V1916		9.923	13.598	29.585	24.240	13.055	9.968	6.395	CONT.	CONT.
Quantity of RDT&E Articles										
<p>A. Mission Description and Budget Item Justification: The objective of this program element is to significantly improve existing AN/SQQ-89(V) and Surface Ship Sonar System capabilities. It will improve AN/SQQ-89(V) Measures of Performance (MOP) by enhancing detection, tracking, classification, data processing and display capabilities, and increasing acoustic sensor frequency bandwidth. This PE will take advantage of the AN/SQQ-89(V) open system architecture to develop and integrate the Multi-Function Towed Array (MFTA) with active sonar bistatics and torpedo defense capabilities into the AN/SQQ-89(V) as a backfit program for DDG51 class ships (AN/SQQ-89A(V)15). Further, this program element, under project V2662 in FY 1999 and FY 2000, will produce a single Towed Array Acoustic Intercept Subsystem (AISS) ship set and transition the AISS technology to the surface combatant AN/SQQ-89 A(V)15 baseline for integration.</p> <p>Note: In accordance with 15 USC 638, \$.506M in FY 2000 is reserved for the Small Business Innovation Research (SBIR) assessment.</p>										
		FY 1999	FY 2000	FY 2001						
FY 2000 President's Budget:		13.000	16.633	19.595						
Appropriated Value:		13.390	23.633							
Adjustments to FY 1999/2000 Appropriated Value/ FY 2000 President's Budget:		+2.302	-0.129	+9.990						
FY 2001 PRES Budget Submit:		15.692	23.504	29.585						
<p>Funding: FY 1999 increases for sponsor directed Below Threshold Reprogramming (BTR) (+1.000) and Composite Sonar Dome Prototype (+2.000). FY 1999 decreases for Small Business Innovative Research (SBIR) transfer (-0.246), Congressional undistributed reductions (-0.437), and Minor Pricing Adjustments (-0.015). FY 2000 decreases for Congressional Across-the-Board reductions (-0.129). FY 2001 increase for AN/SQQ-89A(V)15 program (+10.643) and Navy Working Capital Funds (NWCF) rate adjustments (+0.132). FY 2001 changes for SQQ-89 Improvements (+\$10.643), Strategic Sourcing Program (-\$.030), offsets to finance higher priority O&MN shortfall (-\$.453), and minor pricing adjustments (-\$.170).</p>										

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2000			
APPROPRIATION/BUDGET ACTIVITY	Surface ASW Combat System Integration/ 0205620N			ASW Combat System Integration/ V0896						
RDT&E, N/ 07		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
COST (\$ in Millions)										
Project Cost		1.897	2.944	0.000	0.000	0.000	0.000	0.000	0.000	4.841
RDT&E Articles Qty										
<p>A. Mission Description and Budget Item Justification: The Surface ASW Combat System Integration project will develop the MFTA system design specification, common processing subsystem, and design and fabricate the MFTA array hardware. The MFTA will improve AN/SQQ-89(V) MOP by increasing sensor acoustic bandwidth, providing towed array torpedo defense and active sonar bistatic receive capability, and making processing improvements to overcome the negative effects of shallow water. These MOPs relate directly to platform survivability and operational effectiveness in the littoral environment. Project V1916 will integrate the MFTA with active sonar bistatics and torpedo defense capabilities into the AN/SQQ-89(V) as a backfit program for DDG51 class ships (AN/SQQ-89A(V)15).</p> <p>PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. (U) FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> (\$0.694) Completed system design specification development for the MFTA array and processor. Completed array Preliminary Design Review (PDR). (\$0.600) Completed design of the MFTA processing. (\$0.303) Began design and fabrication of MFTA array hardware and performed array mechanical critical item testing. (\$0.300) Completed array self-noise critical item testing. <p>2. (U) FY 2000 Plan:</p> <ul style="list-style-type: none"> (\$0.600) Complete array Critical Design Review (CDR). (\$2.044) Complete design and fabrication of MFTA array hardware and deliver pre-production prototype. (\$0.300) Coordinate and conduct 4Q MFTA sea test and prepare analysis of results. 										

R-1 SHOPPING LIST - Item No. 170 - 2 of 170 -12

Exhibit R-2a, RDT&E Project Justification

(Exhibit R-2a, page 2 of 12)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification		DATE:							
APPROPRIATION/BUDGET ACTIVITY	Surface ASW Combat System Integration/ 0205620N	February 2000							
RDT&E, N/ 07	ASW Combat System Integration/ V0896								
B. Other Program Funding Summary:									
	<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>
OPN Budget Line Item 213600/5	23.2	31.7	14.3	23.3	39.7	58.6	63.5	342.6	596.9
Related RDT&E: N/A									
C. Acquisition Strategy: Development work in this project is performed primarily by:									
- Naval Undersea Warfare Center, Newport - AN/SQQ-89(V) Technical Direction Agent									
- Lockheed Martin Corporation - Incumbent AN/SQQ-89(V) Design Agent. This contract was awarded competitively and will extend through FY 2002.									
- Chesapeake Sciences Corporation - SBIR Phase III Award (June 98) for common Navy Towed Array Telemetry.									
- Applied Hydro Acoustics - Competitive Contract awarded by SPAWARSYSCOM.									
Procurement of the MFTA array components will be from Chesapeake Sciences Corporation and array fabrication will be done by Lockheed Martin Corporation.									

R-1 SHOPPING LIST - Item No. 170 - 3 of 170 - 12

Exhibit R-2a, RDT&E Project Justification

(Exhibit R-2a, page 3 of 12)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2000					
APPROPRIATION/BUDGET ACTIVITY	Surface ASW Combat System Integration/ 0205620N		ASW Combat System Integration/ V0896				
RDT&E, N/ 07							
D. Schedule Profile							
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Program Milestones		Complete Development of MFTA System					
Engineering Milestones	4Q Completed MFTA System Specification	2Q00 Complete Array Critical Design Review					
	4Q Completed Array Mechanical Critical Item Testing	3Q00 Pre-Production Prototype Array Delivery					
		4Q00 MFTA Sea Test					
T&E Milestones							
Contract Milestones							

R-1 SHOPPING LIST - Item No. 170 - 4 of 170 -12

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page 4 of 12)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			Surface ASW Combat System Integration/ 0205620N			ASW Combat System Integration/ V0896						
RDT&E, N/ 07												
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary H/W & S/W Development	Var.	Misc.	0.200	1.797	Var.	2.784	Var.			0.000	4.781	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Product Development			0.200	1.797		2.784		0.000		0.000	4.781	
Remarks:												
Studies, Analysis, & Evaluations	Var.	Misc.	0.100							0.000	0.100	
Engineering & Technical Services	Var.	Misc.	0.100							0.000	0.100	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Support			0.200	0.000		0.000		0.000		0.000	0.200	
Remarks:												

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 2)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			Surface ASW Combat System Integration/ 0205620N			ASW Combat System Integration/ V0896						
RDT&E, N/ 07												
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Program Management Support	Var.	Misc.	0.097	0.100	Var.	0.160	Var.			0.000	0.357	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Management			0.097	0.100		0.160		0.000		0.000	0.357	
Remarks:												
Total Cost			0.497	1.897		2.944		0.000		0.000	5.338	

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification							DATE:			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/ 07							February 2000			
Surface ASW Combat System Integration/ 0205620N			Surface ASW System Improvements/ V1916							
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		9.923	13.598	29.585	24.240	13.055	9.968	6.395	CONT.	CONT.
RDT&E Articles Qty										
<p>A. Mission Description and Budget Item Justification: The Surface ASW System Improvements project will support essential performance enhancements on AN/SQQ-89(V) and Surface Ship Sonar Systems. This project will develop and refine active classification and display upgrades to support implementation in both the AN/SQQ-89(V) hull subsystem and the MFTA. This project will integrate the MFTA, completed in project V0896, with active sonar bistatics and torpedo defense capabilities, into the AN/SQQ-89(V) as a backfit program on DDG51 class ships (AN/SQQ-89A(V)15). Additionally, project V1916 will develop the AN/SQQ-89(V) design and interface with the Light Airborne Multi-Purpose System (LAMPS) Mk III Blk II system, and improve torpedo recognition algorithms.</p> <p>PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. (U) FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> (\$1.300) Completed analysis of data from Towed Active Receive System (TARS) FY 1998 sea tests. (\$0.700) Completed performance specification development for the TARS Engineering Development Model (EDM) to include active classification display upgrades to support implementation with the MFTA. (\$1.410) Continued transition of active classification upgrade algorithms for Echo Tracker Classifier (ETC) to support implementation with the hull sensor and mid-frequency active MFTA. (\$0.300) Evaluated feasibility of an ASW Data Link (virtual) to support multi-platform coordinated ASW. (\$0.180) Continued support of Navy-wide towed array commonality development efforts. (\$0.410) Completed at-sea test, DT-IIIAN, and analysis on an AN/SQQ-89(V)6 system with adjunct processing including torpedo alertment capabilities. (\$0.200) Began program planning and requirements definition for the LAMPS Mk III Blk II system, identified critical system performance items, established new interfaces for the KuBand LAMPS Common Datalink (CDL), and explored methods of backfitting these changes to the maximum number of ships. (\$1.200) Continued upgrades to the Torpedo Recognition Alertment Functional Segment (TRAFS) as well as develop improved torpedo detection algorithms for the AN/SQQ-89(V). 										

R-1 SHOPPING LIST - Item No. 170 - 7 of 170 - 12

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page 7 of 12)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification		DATE:
APPROPRIATION/BUDGET ACTIVITY	Surface ASW Combat System Integration/ RDT&E, N/ 07	February 2000
	0205620N	V1916
<p>(\$0.147) Provided performance data analysis, modeling, and simulation using MOP and Measures of Effectiveness (MOE) methods.</p> <p>(\$2.076) Completed system requirements specification PDR and System Design Review (SDR) for the AN/SQQ-89A(V)15, including the integration of the MFTA, active sonar bistatics, and torpedo defense capabilities.</p> <p>(\$2.000) Contracted for completion of preliminary design, test and analysis, preparation of detail design, tooling modifications and development of room-temperature-cured composite sonar dome prototype.</p> <p>2. (U) FY 2000 Plan:</p> <p>(\$2.484) Develop active sonar bistatic processing (ETC) to support implementation with the AN/SQQ-89A(V)15.</p> <p>(\$1.336) Develop torpedo detection, classification, and localization (DCL) software to support implementation with the AN/SQQ-89A(V)15.</p> <p>(\$9.391) Begin integration of MFTA, active sonar bistatic processing (ETC), and torpedo detection, classification, and localization software into the AN/SQQ-89A(V)15.</p> <p>(\$0.387) Conduct Computer Aided Dead Reckoning Tracer (CADRT) TECHEVAL and operational test and evaluation, OT-IIIG, of an AN/SQQ-89(V)6 system with active adjunct processing and improved contact management.</p> <p>3. (U) FY 2001 Plan:</p> <p>(\$3.237) Complete active sonar bistatic processing (ETC) to support implementation with the AN/SQQ-89A(V)15.</p> <p>(\$1.153) Complete torpedo detection, classification, and localization software to support implementation with the AN/SQQ-89A(V)15.</p> <p>(\$22.815) Continue integration of MFTA, active sonar bistatic processing (ETC), and torpedo detection, classification, and localization software into the AN/SQQ-89A(V)15.</p> <p>(\$2.000) Begin LAMPS MkIII Blk II integration, write system performance specification changes, complete KuBand LAMPS data definition, write shipboard and aircraft computer program design changes, and begin writing source code changes.</p>		

R-1 SHOPPING LIST - Item No. 170 - 8 of 170 - 12

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, 8 page of 12)

UNCLASSIFIED

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2000																							
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/ 07		Surface ASW Combat System Integration/ 0205620N			Surface ASW System Improvements/ V1916																								
<p>(\$0.080) Complete analysis of FY 2000 CADRT TECHEVAL and OT-IIIG at-sea test of an AN/SQQ-89(V)6 system with active adjunct processing and improved contact management.</p> <p>(\$0.300) Coordinate and conduct integrated AN/SQQ-89A(V)15 sea test.</p> <p>B. Other Program Funding Summary:</p> <table border="1"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> <th>FY 2002</th> <th>FY 2003</th> <th>FY 2004</th> <th>FY 2005</th> <th>To Complete</th> <th>Total Cost</th> </tr> </thead> <tbody> <tr> <td>OPN Budget Line Item 213600/5</td> <td>23.2</td> <td>31.7</td> <td>14.3</td> <td>23.3</td> <td>39.7</td> <td>58.6</td> <td>63.5</td> <td>342.6</td> <td>596.9</td> </tr> </tbody> </table> <p>Related RDT&E: N/A</p> <p>C. Acquisition Strategy: Development work in this project is performed primarily by:</p> <ul style="list-style-type: none"> - Naval Undersea Warfare Center, Newport - AN/SQQ-89(V) Technical Direction Agent - Naval Surface Warfare Center, Dahlgren - AN/SQQ-89(V) Technical Direction Agent - Lockheed Martin Corporation - Incumbent AN/SQQ-89(V) Design Agent. This contract was awarded competitively and will extend through FY 2002. - Digital System Resources, Inc. - SBIR Phase III award for common acoustic processor. <p>Procurement of production AN/SQQ-89A(V)15 ship sets developed in this project will commence in FY 2003.</p>											FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost	OPN Budget Line Item 213600/5	23.2	31.7	14.3	23.3	39.7	58.6	63.5	342.6	596.9
	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost																				
OPN Budget Line Item 213600/5	23.2	31.7	14.3	23.3	39.7	58.6	63.5	342.6	596.9																				

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification						DATE:	
APPROPRIATION/BUDGET ACTIVITY						February 2000	
RDT&E, N/ 07		Surface ASW Combat System Integration/ 0205620N		Surface ASW System Improvements/ V1916			
D. Schedule Profile							
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Program Milestones		Begin AN/SQQ-89A(V)15 Integration	Begin LAMPS Mk III Blk II Integration		First AN/SQQ-89A(V)15 Install		Complete LAMPS Mk III Blk II Integration First AN/SQQ-89A(V)15 Production Unit Installed
Engineering Milestones	2Q CompletedFY98 TARS ADM Sea Test Analysis 4Q Completed TARS EDM Performance Spec Dev 4Q Completed AN/SQQ-89A(V)15 SDR		4Q Integrated AN/SQQ-89A(V)15 Sea Test	Complete AN/SQQ-89A(V)15 Integration and Fabrication of First Unit			
T&E Milestones	4Q DT-IIIAN Sea Test	2Q CADRT TECHEVAL 3Q OT-IIIG Sea Test			4Q AN/SQQ-89A(V)15 DT Sea Test		2Q AN/SQQ-89A(V)15 OT Sea Test
Contract Milestones				Award new competitive AN/SQQ-89A(V)15 procurement contract	Order First AN/SQQ-89A(V)15 Production Unit		

R-1 SHOPPING LIST - Item No. 170 - 10 of 170 - 12

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page 10 of 12)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			Surface ASW Combat Systems Integration/ 0205620N			Surface ASW System Improvement/ V1916						
RDT&E, N/ 07												
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary H/W & S/W Development	WR	NUWC/NPT	17.500	1.987	10/99	0.343	11/99	2.907	10/00	CONT.	CONT.	
Primary H/W & S/W Development	C/CPAF	Lockheed Martin, NY	2.500	2.881	12/99	9.408	11/99	19.925	12/00	0.000	34.714	34.714
Primary H/W & S/W Development	Var.	Misc.	21.600	3.645	Var.	2.588	Var.	5.654	Var.	CONT.	CONT.	
Common Systems Engineering	Var.	Misc.	0.400	0.180	Var.					0.000	0.580	
											0.000	
											0.000	
											0.000	
Subtotal Product Development			42.000	8.693		12.339		28.486		CONT.	CONT.	
Remarks: Budgeted for Lockheed Martin award fees (\$M): 0.1 in FY00, and 0.1 in FY01. Lockheed Martin's performance has been excellent in prior years, earning close to 100% of possible award fee for the most recent award fee periods.												
Studies, Analysis, & Evaluations	Var.	Misc.	0.900							0.000	CONT.	
Engineering & Technical Services	Var.	Misc.	1.500							0.000	CONT.	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Support			2.400	0.000		0.000		0.000		0.000	CONT.	
Remarks:												

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 2)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			Surface ASW Combat Systems Integration/ 0205620N			Surface ASW System Improvement/ V1916						
RDT&E, N/ 07												
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Development & Operational T&E	Var.	Misc.	3.600	0.410	Var.	0.387	Var.	0.080	N/A	CONT.	CONT.	
Miscellaneous T&E	Var.	Misc.	2.300	0.147	Var.	0.000	Var.	0.000	Var.	CONT.	CONT.	
											0.000	
											0.000	
Subtotal T&E			5.900	0.557		0.387		0.080		CONT.	CONT.	
Remarks:												
Program Management Support	Var.	Misc.	3.400	0.673	Var.	0.872	Var.	1.019	Var.	CONT.	CONT.	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Management			3.400	0.673		0.872		1.019		CONT.	CONT.	
Remarks:												
Total Cost			53.700	9.923		13.598		29.585		CONT.	CONT.	

R-1 SHOPPING LIST - Item No. 170 - 12 of 170 - 12

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 12 of 12)

UNCLASSIFIED