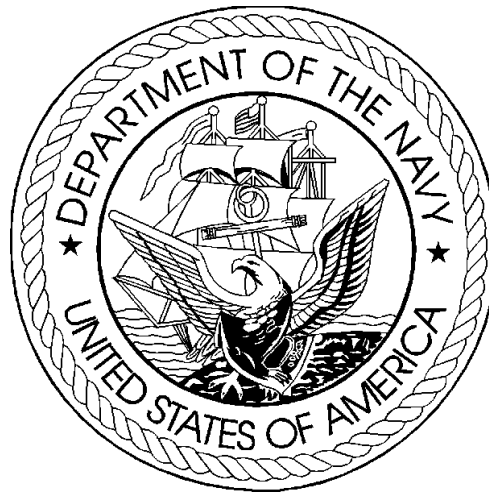


DEPARTMENT OF THE NAVY
FY 1999 AMENDED BUDGET ESTIMATES



JUSTIFICATION OF ESTIMATES
FEBRUARY 1998

RESEARCH, DEVELOPMENT, TEST &
EVALUATION, NAVY
BUDGET ACTIVITY 5

UNCLASSIFIED

Department of the Navy
FY 1999 RDT&E,N Program

Exhibit R-1

APPROPRIATION: 1319n Research, Development, Test and Evaluation, Navy

DATE: February 1998

R-1 Line Number	Program Element Number	Item Nomenclature	Millions of Thousands				Security Classification
			Budget Activity	FY 1997	FY 1998	FY 1999	
81	0603208N	Training System Aircraft	5	-	391	595	U
82	0603266N	AH-1T COMP ROTOR BLADE (Prior Year Only -- R2/R3 Not Required)	5	68,087	-	-	U
83	0604212N	ASW & Other Helo Development	5	63,218	124,877	231,120	U
84	0604214N	AV8B Aircraft (Eng)	5	15,801	10,689	13,787	U
85	0604215N	Standards Development	5	24,917	36,804	51,987	U
86	0604217N	S-3 Wpn System Improvement	5	8,010	2,097	31,469	U
87	0604218N	Air/Ocean Equipment Engineering	5	5,204	5,898	6,162	U
88	0604221N	P-3 Modernization Program	5	7,525	12,728	3,046	U
89	0604231N	Tactical Command System	5	29,049	41,631	50,713	U
90	0604245N	USMC H-1 Upgrades	5	-	83,608	98,542	U
91	0604261N	Acoustic Search Sensors	5	13,657	18,315	29,637	U
92	0604262N	V-22	5	605,641	512,139	355,142	U
93	0604264N	Air Crew Systems Development	5	25,596	17,366	9,454	U
94	0604270N	EW Development (R2/R3 Materials provided in Classified Budget Book)	5	117,809	95,646	128,586	U
95	0604307N	AEGIS Combat System Engineering	5	85,334	118,543	132,561	U
96	0604310N	Arsenal Ship	5	-	13,462	-	U
97	0604311N	LPD-17 Development	5	4,251	13,944	1,343	U
98	0604312N	Tri-Service Standoff Attack Missile	5	-	3,794	2,064	U
99	0604355N	Vertical Launch ASROC	5	-	8,733	-	U
100	0604366N	Standard Missile Improvements (R2/R3 Materials included in Classified Budget Book)	5	9,199	523	1,320	U
101	0604373N	Airborne MCM	5	30,432	17,905	24,967	U
102	0604503N	SSN-688 and Trident Modernization	5	56,922	56,024	50,300	U
103	0604504N	Air Control	5	12,513	8,947	4,198	U
104	0604507N	Enhanced Modular Signal Processor	5	20,733	2,370	1,599	U
105	0604512N	Shipboard Aviation Systems	5	9,710	8,931	8,531	U
106	0604516N	Ship Survivability	5	3,826	5,900	6,196	U

107	0604518N	CIC Conversion	5	9,574	10,943	4,704	U
108	0604524N	Submarine Combat System	5	17,543	17,745	11,710	U
109	0604561N	SWATH Oceanographic Ship	5	-	45,000	-	U
110	0604558N	New Design SSN Development	5	362,413	307,749	218,816	U
111	0604561N	SSN-21 Development	5	70,687	50,307	27,456	U
112	0604562N	Submarine Tactical Warfare System	5	21,460	43,066	28,573	U
113	0604567N	Ship Contract Design/Live Fire T&E	5	2,728	89,516	133,645	U
114	0604574N	Navy Tactical Computer Resources	5	27,500	33,862	8,249	U
115	0604601N	Mine Development	5	2,371	2,270	15	U
116	0604603N	Unguided Conventional Air-launched Weapons	5	30,333	28,020	5,183	U
117	0604610N	Lightweight Torpedo Development	5	11,517	18,615	8,106	U
118	0604612M	MC Mine Countermeasures (Eng)	5	3,813	912	3,855	U
119	0604618N	Joint Direct Attack Munition	5	30,047	12,003	11,738	U
120	0604651N	Joint Service Non-Lethal Technology (Program funded in 0603851M after FY-97)	5	9,326	-	-	U
121	0604654N	Jt Serv Explosive Ordnance Dev	5	5,609	6,416	7,037	U
122	0604703N	Personnel, Trng, Simulation & Human Factors	5	754	992	1,235	U
123	0604710N	Navy Energy Program	5	1,903	2,873	5,544	U
124	0604721N	Battle Group Passive Horizon Extension System	5	5,199	4,382	5,770	U
125	0604727N	Joint Standoff Weapon Systems	5	82,267	77,977	73,022	U
126	0604755N	Ship Self Defense	5	134,751	157,971	148,165	U
127	0604771N	Medical Development (Engineering)	5	3,173	16,418	4,321	U
128	0604777N	Navigation/ID System	5	49,054	37,460	42,301	U
129	0604784N	Distributed Surveillance System	5	54,455	41,586	42,017	U
130	0604805N	Commercial Operating & Support Savings	5	-	-	28,500	U
		Total Engineering and Manufacturing Development		2,153,911	2,227,348	2,063,281	

UNCLASSIFIED

Department of the Navy
FY 1999 RDT&E,N Program
Alphabetic Listing

Exhibit R-1

APPROPRIATION: 1319n Research, Development, Test and Evaluation, Navy

DATE: February 1998

R-1 Line Number	Program Element Number	Item Nomenclature	Millions of Thousands				Security Classification
			Budget Activity	FY 1997	FY 1998	FY 1999	
91	0604261N	Acoustic Search Sensors	5	13,657	18,315	29,637	U
95	0604307N	AEGIS Combat System Engineering	5	85,334	118,543	132,561	U
82	0603266N	AH-1T COMP ROTOR BLADE (Prior Year Only -- R2/R3 Not Required)	5	68,087	-	-	U
101	0604373N	Airborne MCM	5	30,432	17,905	24,967	U
103	0604504N	Air Control	5	12,513	8,947	4,198	U
93	0604264N	Air Crew Systems Development	5	25,596	17,366	9,454	U
87	0604218N	Air/Ocean Equipment Engineering	5	5,204	5,898	6,162	U
96	0604310N	Arsenal Ship	5	-	13,462	-	U
83	0604212N	ASW & Other Helo Development	5	63,218	124,877	231,120	U
84	0604214N	AV8B Aircraft (Eng)	5	15,801	10,689	13,787	U
124	0604721N	Battle Group Passive Horizon Extension System	5	5,199	4,382	5,770	U
107	0604518N	CIC Conversion	5	9,574	10,943	4,704	U
130	0604805N	Commercial Operating & Support Savings	5	-	-	28,500	U
129	0604784N	Distributed Surveillance System	5	54,455	41,586	42,017	U
104	0604507N	Enhanced Modular Signal Processor	5	20,733	2,370	1,599	U
94	0604270N	EW Development (R2/R3 Materials provided in Classified Budget Book)	5	117,809	95,646	128,586	U
119	0604618N	Joint Direct Attack Munition	5	30,047	12,003	11,738	U
125	0604727N	Joint Standoff Weapon Systems	5	82,267	77,977	73,022	U
121	0604654N	Jt Serv Explosive Ordnance Dev	5	5,609	6,416	7,037	U
120	0604651N	Joint Service Non-Lethal Technology (Program funded in 0603851M after FY-97)	5	9,326	-	-	U
117	0604610N	Lightweight Torpedo Development	5	11,517	18,615	8,106	U
97	0604311N	LPD-17 Development	5	4,251	13,944	1,343	U
120	0604719M	MC Command/Control/Communications Sys (Prior Year Only -- R2/R3 Not Required)	5	-	-	-	U
118	0604612M	MC Mine Countermeasures (Eng)	5	3,813	912	3,855	U

127	0604771N	Medical Development (Engineering)	5	3,173	16,418	4,321	U
115	0604601N	Mine Development	5	2,371	2,270	15	U
128	0604777N	Navigation/ID System	5	49,054	37,460	42,301	U
123	0604710N	Navy Energy Program	5	1,903	2,873	5,544	U
114	0604574N	Navy Tactical Computer Resources	5	27,500	33,862	8,249	U
110	0604558N	New Design SSN Development	5	362,413	307,749	218,816	U
88	0604221N	P-3 Modernization Program	5	7,525	12,728	3,046	U
122	0604703N	Personnel, Trng, Simulation & Human Factors	5	754	992	1,235	U
86	0604217N	S-3 Wpn System Improvement	5	8,010	2,097	31,469	U
113	0604567N	Ship Contract Design/Live Fire T&E	5	2,728	89,516	133,645	U
126	0604755N	Ship Self Defense	5	134,751	157,971	148,165	U
106	0604516N	Ship Survivability	5	3,826	5,900	6,196	U
105	0604512N	Shipboard Aviation Systems	5	9,710	8,931	8,531	U
111	0604561N	SSN-21 Development	5	70,687	50,307	27,456	U
102	0604503N	SSN-688 and Trident Modernization	5	56,922	56,024	50,300	U
100	0604366N	Standard Missile Improvements (R2/R3 Materials included in Classified Budget Book)	5	9,199	523	1,320	U
85	0604215N	Standards Development	5	24,917	36,804	51,987	U
108	0604524N	Submarine Combat System	5	17,543	17,745	11,710	U
112	0604562N	Submarine Tactical Warfare System	5	21,460	43,066	28,573	U
109	0604561N	SWATH Oceanographic Ship	5	-	45,000	-	U
89	0604231N	Tactical Command System	5	29,049	41,631	50,713	U
81	0603208N	Training System Aircraft	5	-	391	595	U
98	0604312N	Tri-Service Standoff Attack Missile	5	-	3,794	2,064	U
116	0604603N	Unguided Conventional Air-launched Weapons	5	30,333	28,020	5,183	U
90	0604245N	USMC H-1 Upgrades	5	-	83,608	98,542	U
92	0604262N	V-22	5	605,641	512,139	355,142	U
99	0604355N	Vertical Launch ASROC	5	-	8,733	-	U
		Total Engineering and Manufacturing Development		2,153,911	2,227,348	2,063,281	

RDT&E, Navy
Program and Financing (in Thousands of dollars)

Identification code	17-1319-0-1-051	Budget Plan (amounts for RESEARCH, DEV, TEST & EVAL actions programed)			Obligations		
		1997 actual	1998 est.	1999 est.	1997 actual	1998 est.	1999 est.
Program by activities:							
Direct program:							
00.0101	Basic research	345,606	338,743	362,679	347,232	321,791	361,241
00.0201	Applied Research	514,282	493,622	524,723	538,520	510,049	522,858
00.0301	Advanced technology development	462,002	514,781	460,725	526,719	488,623	463,967
00.0401	Demonstration/validation	1,904,375	2,219,002	2,358,359	1,948,060	2,132,484	2,350,003
00.0501	Engineering and manufacturing development	2,153,911	2,227,348	2,063,281	2,121,481	2,232,406	2,073,125
00.0601	Management support	681,340	551,033	616,973	707,119	555,438	613,016
00.0701	Operational system development	1,822,845	1,535,383	1,722,183	1,843,010	1,630,193	1,710,973
00.9101	Total direct program	7,884,361	7,879,912	8,108,923	8,032,141	7,870,984	8,095,183
01.0101	Reimbursable program	121,287	110,000	110,000	132,938	112,515	110,000
10.0001	Total	8,005,648	7,989,912	8,218,923	8,165,079	7,983,499	8,205,183
Financing:							
Offsetting collections from:							
11.0001	Federal funds(-)	-113,073	-110,000	-110,000	-110,978	-110,000	-110,000
14.0001	Non-Federal sources(-)	-8,214			-16,820		
17.0001	Recovery of prior year obligations				-33,145		
Unobligated balance available, start of year:							
21.4002	For completion of prior year budget plans				-605,401	-472,982	-479,395
21.4003	Available to finance new budget plans	-4,500	-53,879		-4,500	-53,879	
21.4009	Reprogramming from/to prior year budget plan	-12,643					
22.1001	Unobligated balance transferred to other acco		13,879			13,879	
22.2001	Unobligated balance transferred from other ac	-4,590			-4,590		
Unobligated balance available, end of year:							
24.4002	For completion of prior year budget plans				472,982	479,395	493,135
24.4003	Available to finance subsequent year budget	53,879			53,879		
25.0001	Unobligated balance expiring	355			355		
39.0001	Budget authority	7,916,862	7,839,912	8,108,923	7,916,862	7,839,912	8,108,923
Budget authority:							
40.0001	Appropriation	7,993,455	8,115,686	8,108,923	7,993,455	8,115,686	8,108,923
40.3601	Appropriation rescinded (unob bal)	-4,500	-40,000		-4,500	-40,000	
40.7601	Reduction pursuant to P.L. 105-56 (-), 8035		-251,265			-251,265	
40.7901	Line item veto cancellation (-)		-6,000			-6,000	
41.0001	Transferred to other accounts (-)	-182,207	-43,160		-182,207	-43,160	
42.0001	Transferred from other accounts	110,114	64,651		110,114	64,651	
43.0001	Appropriation (adjusted)	7,916,862	7,839,912	8,108,923	7,916,862	7,839,912	8,108,923

RDT&E, Navy
Program and Financing (in Thousands of dollars)

Identification code	17-1319-0-1-051	Budget Plan (amounts for RESEARCH, DEV, TEST & EVAL actions programed)			Obligations		
		1997 actual	1998 est.	1999 est.	1997 actual	1998 est.	1999 est.
Relation of obligations to outlays:							
71.0001	Obligations incurred				8,037,281	7,873,499	8,095,183
72.1001	Orders on hand, SOY				-156,141	-146,613	-146,613
72.4001	Obligated balance, start of year				4,310,635	4,003,286	4,251,788
74.1001	Orders on hand, EOY				146,613	146,613	146,613
74.4001	Obligated balance, end of year				-4,003,286	-4,251,788	-4,372,794
77.0001	Adjustments in expired accounts (net)				-82,345		
78.0001	Adjustments in unexpired accounts				-33,145		
90.0001	Outlays (net)				8,219,612	7,624,997	7,974,177

RDT&E, Navy
Object Classification (in Thousands of dollars)

Identification code	17-1319-0-1-051	1997 actual	1998 est.	1999 est.

Direct obligations:				
Personnel compensation:				
111.101	Full-time permanent	43,779	44,428	43,112
111.301	Other than full-time permanent	2,923	2,625	2,469
111.501	Other personnel compensation	1,494	1,563	1,527
111.801	Special personal services payments	27	27	28
		-----	-----	-----
111.901	Total personnel compensation	48,223	48,643	47,136
112.101	Personnel Benefits: Civilian personnel	10,194	10,653	10,207
113.001	Benefits for former personnel	522	484	441
121.001	Travel and transportation of persons	27,419	27,995	28,583
122.001	Transportation of things	544	556	567
123.201	Rental payments to others	3,256	3,324	3,394
123.301	Communications, utilities, and miscellaneous charges	4,895	4,998	5,103
124.001	Printing and reproduction	391	399	408
125.101	Advisory and assistance services	247,090	223,455	225,165
125.201	Other services with the private sector	11,212	235,465	95,918
Purchases goods/services (inter/intra) Fed accounts				
125.301	Purchase of goods/services from other Fed agencies	650,577	664,239	678,188
125.303	Purchases from revolving funds	2,385,085	2,077,579	2,183,869
125.401	Contract O&M of facilities including GOCOS	168	172	176
125.501	Research & Development Contracts	4,622,015	4,552,040	4,794,605
125.701	Contract O&M of equip. including ADP hard/software	1,706	1,742	1,779
126.001	Supplies and materials	7,767	7,930	8,097
131.001	Equipment	10,693	10,918	11,147
132.001	Land and structures	384	392	400
		-----	-----	-----
199.001	Total Direct obligations	8,032,141	7,870,984	8,095,183
Reimbursable obligations:				
Personnel Compensation:				
211.101	Full-time permanent	36,444	40,327	41,966
211.301	Other than full-time permanent	2,440	2,534	2,553
211.501	Other personnel compensation	977	899	937
		-----	-----	-----
211.901	Total personnel compensation	39,861	43,760	45,456
212.101	Personnel Benefits: Civilian Personnel	7,611	8,554	8,801
213.001	Benefits for former personnel	15		
221.001	Travel and transportation of persons	4,248	4,300	4,350
222.001	Transportation of things	227	240	251
223.201	Rental payments to others	1,647	1,702	1,735
223.301	Communications, utilities, and miscellaneous charges	1,826	1,880	1,890
224.001	Printing and reproduction	269	280	291

RDT&E, Navy
Object Classification (in Thousands of dollars)

Identification code	17-1319-0-1-051	1997 actual	1998 est.	1999 est.
225.201	Other services with the private sector		2,515	
	Purchases goods/services (inter/intra) Fed accounts			
225.301	Purchase of goods/services from other Fed agencies	263	270	278
225.501	Research & Development Contracts	62,207	33,789	31,603
226.001	Supplies and materials	10,586	10,945	11,030
231.001	Equipment	4,178	4,280	4,315
299.001	Total Reimbursable obligations	132,938	112,515	110,000
999.901	Total obligations	8,165,079	7,983,499	8,205,183

Comparison of FY 1997 Financing as reflected
in FY 1998 Budget with 1997 Financing as
Shown in the FY 1999 Budget

(\$ in Thousands)

	Financing per FY 1998 Budget	Financing Per FY 1999 Budget	Increase (+) or Decrease (-)
Program Requirements (Total)	7,855,754	7,884,361	+28,607
Program Requirements (Service Account)	(7,855,754)	(7,884,361)	(+28,607)
Program Requirements (Reimbursable)	121,831	121,287	-544
Appropriation (Adjusted)	7,977,585	7,916,862	+28,063

Explanation of Changes in Financing
(\$ in Thousands)

The Fiscal Year 1997 program has changed since the presentation of the FY 1998 budget as noted below:

1. Program Requirements (Total). There has been a net increase to the appropriation (adjusted) of +\$28,063, as a result of changes in program requirements as noted below.

2. Program Requirements (Service Account). There has been a net increase to the appropriation (adjusted) of +\$28,607. These changes included: a rescission to the FY 1997 program approved in the FY 1998 DoD Appropriations Act (-\$40,000); an Emergency Supplemental Appropriation based on reduced inflation rates to finance Bosnia contingency costs (-\$9,600); reductions reflected on the FY 1997 DoD Omnibus Reprogramming Action to specific programs (-\$1,232); reductions to finance Military Personnel, Navy (MPN) shortfalls (-\$10,270); and three transfers into the appropriation from a DoD central transfer account to support the RDT&E Counter Drug program (+\$23,774). Additionally, a number of Internal Reprogrammings were effected which reclassified funding between DoD and DoN appropriations to more properly align it into the correct programs for execution: (1) V-22 EMD (\$68,400--from APN); (2) Defense Finance and Accounting Service (DFAS)(\$9,240--from O&MN); (3) Large Area Tracking Radar (LATR) (-\$4,226--to OPN); (4) F-14 TARPS (+\$4,887--from APN); (5) Environmental Test Bed (+\$3,813--from Army); (6) Southeast Regional Network (SRN)(-\$2,300--to O&MN); (7) DDG-51 TBMD/CEC (-\$13,879).

3. Program Requirements (Reimbursable). There has been a net decrease to the appropriation of -\$544, as a result of changes in reimbursable program requirements (-\$544).

Comparison of FY 1997 Program Requirements as reflected
in the FY 1998 Budget with FY 1997 Program Requirements
as shown in the FY 1999 Budget

Summary of Requirements (\$ In Thousands)

	Total Program Requirements per FY 1998 Budget	Total Program Requirements per FY 1999 Budget	Increase (+) or Decrease (-)
01 - Basic Research	352,102	345,606	-6,496
02 - Applied Research	534,593	514,282	-20,311
03 - Advanced Technology Development	492,863	462,002	-30,861
04 - Demonstration and Validation (DEM/VAL)	1,937,283	1,904,375	-32,908
05 - Engineering and Manufacturing Development (EMD)	2,143,579	2,153,911	+10,332
06 - RDTE Management Support	540,473	681,340	+140,867
07 - Operational Systems Development	1,854,861	1,822,845	-32,016
Total Fiscal Year Program	7,855,754	7,884,361	+28,607

Explanation by Budget Activity
(\$ In Thousands)

01. Basic Research (-\$6,496) - Changes to this budget activity resulted from an Emergency Supplemental Appropriation rescission to finance Bosnia contingency costs (-\$430) based on reduced inflation rates, a transfer to support the Small Business Innovative Research (SBIR) program (-\$5,884), and other changes in program requirements which required minor reprogrammings (-\$182).

02. Applied Research (-\$20,311) - Changes to this budget activity resulted from an Emergency Supplemental Appropriation rescission to finance Bosnia contingency costs (-\$654) based on reduced inflation rates, a transfer to support the Small Business Innovative Research (SBIR) program (-\$7,186), and other changes in program requirements which required minor reprogrammings (-\$12,471).

03. Advanced Technology Development (-\$30,861) - Changes to this budget activity resulted from an Emergency Supplemental Appropriation rescission to finance Bosnia contingency costs (-\$609) based on reduced inflation rates, a transfer to support the Small Business Innovative Research (SBIR) program (-\$8,200), and other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (-\$21,872).
04. Demonstration and Validation (DEM/VAL) (-\$32,908) - Changes to this budget activity resulted from an Emergency Supplemental Appropriation rescission to finance Bosnia contingency costs (-\$2,358) based on reduced inflation rates, a transfer to support the Small Business Innovative Research (SBIR) program (-\$25,625), reductions to finance MPN shortfalls (-\$270), a reduction reflected on the FY 1997 DoD Omnibus Reprogramming Action (-\$1,232), a transfer from the Army for Environmental Test Bed at Puget Sound (+\$3,813) and from APN for the F-14 TARPS program (+\$4,887), and other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (-\$12,123).
05. Engineering and Manufacturing Development (EMD) (+\$10,332) - Changes to this budget activity resulted from an Emergency Supplemental Appropriation rescission to finance Bosnia contingency costs (-\$2,633) based on reduced inflation rates, a transfer to support the Small Business Innovative Research (SBIR) program (-\$45,752), reductions to finance MPN shortfalls (-\$500), transfers from APN for the V-22 (EMD) program (+\$68,400) and to SCN for the DDG-51 TBMD/CEC program (-\$13,879), three transfers into the appropriation from a DoD central transfer account to support the RDT&E Counter Drug program (+\$23,774), and other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (-\$19,078).
06. RDTE Management Support (+\$140,867) - Changes to this budget activity resulted from an Emergency Supplemental Appropriation rescission to finance Bosnia contingency costs (-\$658) based on reduced inflation rates, a transfer to support the Small Business Innovative Research (SBIR) program (+\$118,218), reductions to finance MPN shortfalls (-\$1,000), transfers from O&MN to properly fund the Defense Finance and Accounting Service (DFAS) program in RDT&E (+\$9,240), and other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (+\$15,067).
07. Operational Systems Development (-\$32,016) - Changes to this budget activity resulted from an Emergency Supplemental Appropriation rescission to finance Bosnia contingency costs (-\$2,258) based on reduced inflation rates, a transfer to support the Small Business Innovative Research (SBIR) program (-\$25,571), reductions to finance MPN shortfalls (-\$8,500), transfers to OPN for the Large Area Tracking Radar (LATR) program (-\$4,226) and to O&MN for the Southeast Regional Network (SRN) program (-\$2,300), and other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (+\$10,839).

Comparison of FY 1998 Financing as reflected
in FY 1998 Budget with 1998 Financing as
Shown in the FY 1999 Budget

(\$ In Thousands)

	Financing per FY 1998 Budget	Financing Per FY 1999 Budget	Increase (+) or Decrease (-)
Program Requirements (Total)	7,611,022	7,879,912	+268,890
Program Requirements (Service Account)	(7,611,022)	(7,879,912)	(+268,890)
Program Requirements (Reimbursable)	125,000	110,000	-15,000
Appropriation (Adjusted)	7,736,022	7,989,912	+253,890

Explanation of Changes in Financing
(\$ in Thousands)

The Fiscal Year 1998 program has changed since the presentation of the FY 1998 budget as noted below:

1. Program Requirements (Total). There has been a net increase to the appropriation (adjusted) of +\$268,890, as a result of changes in program requirements as noted below.

2. Program Requirements (Service Account). There has been a net increase to the appropriation (adjusted) of +\$268,890, resulting from changes in program requirements as a result of Congressional appropriation changes in the FY 1998 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-\$4,607)(Section 8035), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-\$23,400)(Section 8041), a general undistributed RDT&E and procurement reduction of 1.5 percent (-\$121,735)(Section 8043) to finance flying hours and readiness, a general undistributed RDT&E reduction of 1.25 percent (-\$101,523) to finance National Missile Defense (NMD)(Section 8048), and a general reduction for revised economic assumptions (lower inflation rate)(-\$18,000). Specific FY 1998 Congressional adjustments (to start, continue or discontinue 148 specific initiatives) resulted in a net increase of +\$517,064. Congress also transferred +\$9,500 from SCN for Fast Patrol Boats and +\$45,000 for a SWATH Ship. Also, appropriation changes include: a correction from APN for +\$5,600 for the H-1 helicopter program (which was not effected); transfers from APN for the F/A-18 E/F program (+\$26,000); to Military Personnel, Navy (MPN) to fund program shortfalls (-\$28,700); a transfer to Ballistic Missile Defense Organization (BMDO) for Theater Missile Defense (-\$25,000); a reprogramming to fully fund minimum Major

Ranges and Test Facilities Base (MRTFB) costs (+\$16,000)(only +\$3,851 is transferring into RDT&E,N--the balance is from sources within RDT&E,N); and a transfer for the Chemical-Biological Defense program (-\$4,160).

3. Program Requirements (Reimbursable). There has been a net decrease to the appropriation of -\$15,000, as a result of changes in reimbursable program requirements (-\$15,000).

Comparison of FY 1998 Program Requirements as reflected
in the FY 1998 Budget with FY 1998 Program Requirements
as shown in the FY 1999 Budget

Summary of Requirements (\$ in Thousands)

	Total Program Requirements per FY 1998 Budget	Total Program Requirements per FY 1999 Budget	Increase (+) or Decrease (-)
01 - Basic Research	382,117	338,743	-43,374
02 - Applied Research	490,273	493,622	+3,349
03 - Advanced Technology Development	433,305	514,781	+81,476
04 - Demonstration and Validation (DEM/VAL)	2,135,069	2,219,002	+83,933
05 - Engineering and Manufacturing Development (EMD)	2,085,768	2,227,348	+141,580
06 - RDTE Management Support	595,265	551,033	-44,232
07 - Operational Systems Development	1,489,225	1,535,383	+46,158
Total Fiscal Year Program	7,611,022	7,879,912	+268,890

Explanation by Budget Activity
(\$ in Thousands)

01. Basic Research (-\$43,374) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1998 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-\$15)(Section 8035), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-\$32)(Section 8041), a general undistributed RDT&E and procurement reduction of 1.5 percent (-\$5,226)(Section 8043) to finance flying hours and readiness, a general undistributed RDT&E reduction of 1.25 percent (-\$4,358) to finance National Missile Defense (NMD)(Section 8048), and a general reduction for revised economic assumptions (lower inflation rate)(-\$772). Specific FY 1998 Congressional adjustments resulted in a net reduction of -\$32,971.

02. Applied Research (+\$3,349) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1998 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-\$192)(Section 8035), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-\$430)(Section 8041), a general undistributed RDT&E and procurement reduction of 1.5 percent (-\$7,670)(Section 8043) to finance flying hours and readiness, a general undistributed RDT&E reduction of 1.25 percent (-\$6,395) to finance National Missile Defense (NMD)(Section 8048), and a general reduction for revised economic assumptions (lower inflation rate)(-\$1,134). Specific FY 1998 Congressional adjustments (to start, continue or discontinue 19 specific initiatives) resulted in a net increase of +\$18,250. Additionally, changes in program requirements required minor reprogrammings (+\$920).

03. Advanced Technology Development (+\$81,476) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1998 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-\$463)(Section 8035), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-\$693)(Section 8041), a general undistributed RDT&E and procurement reduction of 1.5 percent (-\$7,862)(Section 8043) to finance flying hours and readiness, a general undistributed RDT&E reduction of 1.25 percent (-\$6,552) to finance National Missile Defense (NMD)(Section 8048), and a general reduction for revised economic assumptions (lower inflation rate)(-\$1,163). Specific FY 1998 Congressional adjustments (to start, continue or discontinue 30 specific initiatives) resulted in a net increase of +\$89,640. Congress also transferred +\$9,500 from SCN for Fast Patrol Boats. Additionally, changes in program requirements required minor reprogrammings (-\$931).

04. Demonstration and Validation (DEM/VAL) (+\$83,933) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1998 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-\$1,258)(Section 8035), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-\$2,211)(Section 8041), a general undistributed RDT&E and procurement reduction of 1.5 percent (-\$34,422)(Section 8043) to finance flying hours and readiness, a general undistributed RDT&E reduction of 1.25 percent (-\$28,699) to finance National Missile Defense (NMD)(Section 8048), and a general reduction for revised economic assumptions (lower inflation rate)(-\$5,092). Specific FY 1998 Congressional adjustments (to start, continue or discontinue 35 specific initiatives) resulted in a net increase of +\$160,391. Also included is a transfer to MPN (-\$2,000). Additionally, changes in program requirements required minor reprogrammings (-\$2,776).

05. Engineering and Manufacturing Development (EMD) (+\$141,580) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1998 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-\$129)

(Section 8035), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-\$9,239)(Section 8041), a general undistributed RDT&E and procurement reduction of 1.5 percent (-\$34,619)(Section 8043) to finance flying hours and readiness, a general undistributed RDT&E reduction of 1.25 percent (-\$28,866) to finance National Missile Defense (NMD)(Section 8048), and a general reduction for revised economic assumptions (lower inflation rate) (-\$5,111). Specific FY 1998 Congressional adjustments (to start, continue or discontinue 41 specific initiatives) resulted in a net increase of +\$222,586. Congress also transferred +\$45,000 from SCN for a SWATH Ship. Also included are transfers to MPN (-\$22,700) and to BMDO for TBMD (-\$25,000), as well as a correction from APN for +\$5,600 for the H-1 helicopter program (which was not effected). Additionally, changes in program requirements required minor reprogrammings (-\$5,942).

06. RDTE Management Support (-\$44,232) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1998 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-\$2,362)(Section 8035), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-\$6,547)(Section 8041), a general undistributed RDT&E and procurement reduction of 1.5 percent (-\$8,491)(Section 8043) to finance flying hours and readiness, a general undistributed RDT&E reduction of 1.25 percent (-\$7,077) to finance National Missile Defense (NMD)(Section 8048), and a general reduction for revised economic assumptions (lower inflation rate)(-\$1,258). Specific FY 1998 Congressional adjustments (to start, continue or discontinue 8 specific initiatives) resulted in a net decrease of -\$26,606. Also included are a reprogramming to fully fund minimum Major Ranges and Test Facilities Base (MRTFB) costs (+\$16,000)(only +\$3,851 is transferring into RDT&E,N--the balance is from sources within RDT&E,N) and a transfer for the Chemical-Biological Defense program (-\$4,160). Additionally, changes in program requirements required minor reprogrammings (-\$3,731).

07. Operational Systems Development (+\$46,158) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1998 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-\$188)(Section 8035), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-\$4,248)(Section 8041), a general undistributed RDT&E and procurement reduction of 1.5 percent (-\$23,445)(Section 8043) to finance flying hours and readiness, a general undistributed RDT&E reduction of 1.25 percent (-\$19,576) to finance National Missile Defense (NMD)(Section 8048), and a general reduction for revised economic assumptions (lower inflation rate)(-\$3,470). Specific FY 1998 Congressional adjustments (to start, continue or discontinue 13 specific initiatives) resulted in a net increase of +\$79,774. Also included is a transfer from APN for the F/A-18 program (+\$26,000). Additionally, changes in program requirements required minor reprogrammings (-\$8,689).

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: Feb 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0603208N
PROGRAM ELEMENT TITLE: Training System Aircraft

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
H1150 Joint Primary Aircraft Trainer System	0	391	595	316	0	0	0	0	1,302

NOTE: JPATS FY97 funds are reflected in Budget Activity 4.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Primary Aircraft Training System (JPATS) is an ACAT 1C, non-developmental item (NDI), commercial off-the-shelf (COTS) pilot program initiated to provide a high degree of commonality between the flight training programs of the United States Navy (USN) and United States Air Force (USAF). The JPATS is to replace the T-34 and T-37 for the USN and USAF, respectively. JPATS shall employ a common primary training system, consisting of aircraft, aircrew training devices (simulators, computer-aided instruction terminals, etc.), syllabus, courseware, and logistics support. The JPATS mission will be to train entry-level USN/USAF student pilots and navigators. The U.S. Air Force is the executive service. This element funds Navy participation in the joint program and Navy unique requirements.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

R-1 Item No. 81
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Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, Page 1 of 4)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: Feb 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1150
PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: Joint Primary Aircraft Trainer

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS: NOT APPLICABLE
2. (U) FY 1998 PLAN:
 - (U) (\$391) Begin Navy unique courseware development.
3. (U) FY 1999 PLAN:
 - (U) (\$595) Continue Navy unique courseware development and begin courseware conversion.

R-1 Item No. 81
UNCLASSIFIED

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

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: Feb 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1150
 PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: Joint Primary Aircraft Trainer

B. (U) PROGRAM CHANGE SUMMARY

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	403	613
(U) Appropriated Value:			
(U) Adjustments from Pres Budget:	0	-12	-18
(U) FY 1999 President's Budget:	0	391	595

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY98 decrease of -\$12 thousand and FY99 decrease of -\$10 thousand are due to Congressional adjustments for inflation. FY99 decrease also reflects -\$1 thousand for balancing and -\$7 thousand for Navy Working Capital Fund adjustments.

(U) Schedule: No change

(U) Technical: Not Applicable

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u>	<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>TO</u>	<u>TOTAL</u>
	<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
• (U) APN-3									
JPATS	0	0	0	33,294	80,104	81,452	83,359	1,373,700	1,651,909
• (U) APN-6									
JPATS	0	0	0	0	0	0	21,642	128,100	149,742

**R-1 Item No. 81
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**Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, Page 3 of 4)**

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: Feb 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1150
PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: Joint Primary Aircraft Trainer

(U) RELATED RDT&E:

(U) PE 0603208N (Joint Primary Aircraft Trainer-Budget Activity 4)

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	N/A			1Q/00 MS III 4Q/03 USN IOC
Engineering Milestones			4Q GBTS CDR	
T&E Milestones		3Q A/C OA	3Q A/C MOT&E	
Contract Milestones		2Q LOT 5 AWD*	2Q LOT 6 AWD*	2Q/00 LOT 7 AWD*

* US Air Force manufacturing development contract. US Navy begins aircraft buy in Lot 7 in FY 00.

R-1 Item No. 81
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Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, Page 4 of 4)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
H0485, ALFS	14,551	0	0	0	0	0	0	0	166,924
H1109, CH/MH-53 RDT&E Test Articles	1,102 (1)	1,189	2,828	2,934	801	2,751	3,419	cont	cont
H1707, LAMPS III IMP RDT&E Test Articles	40,655	92,794 (2)	215,517	120,356	31,745 (1)	8,074 (2)	6,815	0	733,969
H1709, CH-60 VERTREP	6,910	30,894	12,775	7,832	0	0	0	0	6,910
TOTAL	62,270	124,877	230,773	123,290	32,546	10,825	10,234	cont	cont

FY 98 H1707 funding includes projects H2412 (\$15,000 thousand for SH-60R Block II), H2413 (\$5,000 thousand for Air Interoperability Center), and H2414 (\$5,000 thousand for Parametric Airborne Dipping Sonar). Additionally, H1709 includes project H2415 (\$31,837 thousand for CH-60 VERTREP).

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

(U) H0485 - This program develops Airborne Low Frequency Sonar (ALFS) and increases sonobuoy processing capability for the SH-60 helicopter to maintain and improve undersea warfare mission effectiveness against the quiet submarine threat in deep and shallow water environments. This project provides a dipping sonar with demonstrated capabilities typically 3 to 6 times (square miles of ocean searched per hour) the existing deep water capability. This improvement will significantly increase battle group and independent ship protection providing improved survivability and operating flexibility. ALFS provides longer detection ranges and a greater detection capability by using lower frequencies, less signal attenuation, longer pulse lengths, improved processing and increased transmission power. ALFS utilizes the Enhanced Modular Signal Processor, designated UYS-2A, for improved sonobuoy processing capability.

(U) H1109 - From FY 1996 through FY 1997, a Service Life Assessment Program (SLAP) was conducted to develop usage and fatigue life profile, and an Integrated Mechanical Diagnostic (IMD) system for the H-53E. FY 1998 Service Life Extension Program (SLEP) begins to correct deficiencies in aircraft dynamic components and mission systems. The effort will increase reliability, maintainability, and safety while reducing the cost of ownership.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

(U) H1707 - The Block II Upgrade improves the capability of the LAMPS MK III Weapons System to provide battle group protection and to add significant capability in coastal littorals and regional conflicts. The Block II Upgrade represents a significant avionics modification to the SH-60 by enhancing primary mission areas of ASW and Anti-Surface Warfare (ASUW). ALFS will be added to enhance the existing acoustic suite. An added multi-mode radar includes an inverse synthetic aperture radar mode (permits stand-off classification of hostile threats). An improved electronics surveillance measures system (ESM) will enable passive detection and targeting of radar sources not currently detectable.

(U) H1709 - The CH-60 Fleet Combat Support (HC) Helicopter provides the Navy's combat logistics force with a Vertical Replenishment (VERTREP) at-sea capability which is vital to sustain the Navy's power projection forces by a comprehensive and responsive combat logistics force support system. The HC helicopter will also serve as the primary Search and Rescue (SAR) aircraft for the Amphibious Task Force (ATF), providing essential support to amphibious operations. Within the context of "From the Sea" and in support of the national military strategy, the HC helicopter provides the Navy with a capability to conduct and sustain littoral power projection and peacekeeping/presence operations. The primary missions of the HC helicopter include day/night VERTREP operations, vertical onboard delivery, day/night amphibious SAR and airhead operations. Secondary missions include special warfare support; recovery of torpedoes, drones, unmanned aerial vehicles and unmanned undersea vehicles; noncombatant evacuation operations; aeromedical evacuation humanitarian assistance and disaster relief. Joint procurement and support strategies will be pursued to reduce costs and duplicative efforts. The CH-60 C4I equipment will be compatible with joint operations and NATO forces in support of multinational operations. Existing DoD and Navy support equipment is being used to the maximum extent possible.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under Engineering & Manufacturing Development because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H0485 ALFS	14,551	0	0	0	0	0	0	0	167,773

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops Airborne Low Frequency Sonar (ALFS) and increases sonobuoy processing capability for the SH-60 helicopter to maintain and improve undersea warfare mission effectiveness against the quiet submarine threat in deep and shallow water environments. This project provides a dipping sonar with demonstrated capabilities typically 3 to 6 times (square miles of ocean searched per hour) the existing deep water capability. This improvement will significantly increase battle group and independent ship protection providing improved survivability and operating flexibility. ALFS provides longer detection ranges and a greater detection capability by using lower frequencies, less signal attenuation, longer pulse lengths, improved processing and increased transmission power. ALFS utilizes the Enhanced Modular Signal Processor, designated UYS-2A, for improved sonobuoy processing capability. Beginning in FY98, ALFS is funded in project H1707 as part of the LAMPS III Improvement program.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$7,522) Logistics Support Analysis-depot analysis, test program sets and provisioning. DT/OT Support - Completed DT/OT; analyzed test data and implemented fixes identified during DT-IIA and OT-IIA in preparation for system technical evaluation (TECHEVAL) and operational evaluation (OPEVAL). Conducted Program Readiness Review. (contractor effort)
- (U) (\$2,038) Completed SH-60R/ALFS system integration development. Completed government logistics requirements. Analyzed test data and implemented fixes identified during DT-IIA and OT-IIA in preparation for system TECHEVAL and OPEVAL (government effort). Completed program support.
- (U) (\$4,991) Began system integration studies and initial design efforts in preparation for helicopter flight demonstration of Parametric Airborne Dipping Sonar (PADS) in FY 98.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H0485

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: ALFS

3. (U) FY 1998 PLAN: NOT APPLICABLE.

4. (U) FY 1999 PLAN: NOT APPLICABLE.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	14,004	0	0
(U) Appropriated Value:			
(U) Adjustments from PRESBUDG:	+547		
(U) FY 1999 President's Budget Submit:	14,551	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net increase of \$+547 thousand in FY 97 reflects a SBIR adjustment (\$-240 thousand), various reprogrammings (\$+811 thousand), revised economic indices (\$-17 thousand) and a FFRDC adjustment (\$-7 thousand).

(U) Schedule: Beginning in FY98, ALFS funding and Milestones have been incorporated into Project H1707 as part of the LAMPS III Improvement program.

(U) Technical: Not Applicable

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not Applicable

(U) RELATED RDT&E:

(U) PE 0604212N (ASW & Other Helo Developments, H1707 LAMPS III IMP)

(U) PE 0604507N (Enhanced Modular Signal Processor)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H0485

PROGRAM ELEMENT TITLE: ASW Other Helo Developments

PROJECT TITLE: ALFS

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				
Engineering Milestones				
T&E Milestones	OTIIA/ 3Q-4Q97			
Contract Milestones				

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H1109 CH/MH-53									
RDT&E Test Articles	1,102 (1)	1,189	2,828	2,934	801	2,751	3,149	Cont	Cont

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION From FY96 to FY97, a Service Life Assessment Program (SLAP), was conducted to develop usage and fatigue life profiles for the H-53E. The resultant SLAP report will serve to justify commencement of Phase I of the Service Life Extension Program (SLEP) which is funded in APN-5. In addition, from FY 96 to FY98 the program supports a White House requirement to competitively procure, install, test and evaluate an Integrated Mechanical Diagnostic (IMD) system on two Marine Corps CH-53E helicopters as an Early Operational Assessment (EOA). In FY 99 a two-year Service Life Assessment Program (SLAP) effort commences on the CH-53D. The Marine Corps Aviation Plan shows the CH-53D remaining in service through 2015. Therefore a Service Life Assessment Program (SLAP) must be conducted in order to ascertain what actions must be taken to safely operate the aircraft until it is replaced by the MV-22. The results of these efforts will be used to justify APN-5 funding of a SLEP for the CH-53D if warranted. FY 99 funding is also utilized for Phase II of the CH-53E SLEP.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$ 346) IMD-EOA - Continued incremental contract payments and awarded option II IMD-EOA. Conducted first In-Process Review (IPR) and commenced EOA Flight Testing (EOAT).
- (U) (\$ 741) In-house travel and field activities funded to support IMD program.
- (U) (\$ 15) Repair of Repairables (ROR) funded to support SLAP on the H-53E.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1109

PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT

PROJECT TITLE: CH/MH-53

2. (U) FY 1998 PLAN:

- (U) (\$ 372) IMD - Final incremental contract payment for completion of IMD-EOA. Initiate Open Architecture Study.
- (U) (\$ 817) Conduct In-house travel and field activity support funding of IMD program.

3. (U) FY 1999 PLAN:

- (U) (\$ 398) SLEP - (Phase II) Commence redesign of aircraft dynamic components.
- (U) (\$ 183) In-house travel and field activities funding to support SLEP program.
- (U) (\$ 2,297) In-house travel and field activities funding to support "D" SLAP program.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1109

PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT

PROJECT TITLE: CH/MH-53

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	1,052	1,235	639
(U) Appropriated Value:			
(U) Adjustments from PRESBUDG:	+50	-46	+2,189
(U) FY 1999 President's Budget Submit:	1,102	1,189	2,828

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net increase of \$50 thousand in FY 1997 is due to SBIR assessment (\$-26 thousand), a reprogramming for Integrated Mechanical Diagnostic (IMD) technical support (+77 thousand) and a minor pricing adjustment (\$-1 thousand). The net decrease of \$-46 thousand in FY 1998 reflects minor pricing adjustments. The net increase of \$+2,189 thousand in FY 1999 reflects an adjustment to the CH-53D SLAP (+2,300 thousand) and a minor pricing adjustment (\$-111 thousand).

(U) Schedule: MAT/Maint SLAP (1Q/97 - 4Q/97) was changed to perform unscheduled maintenance resulting from SLAP flight testing due to grounding of H-53s. SLAP contractor test flight commenced 3Q/97. The SLAP CH-53D study was added to assess the critical airframe and structural fatigue life limits for the aircraft and is scheduled for 1Q/99 - 4Q/99.

(U) Technical: Not applicable

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not Applicable

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1109

PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT

PROJECT TITLE: CH/MH-53

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	2Q IMD-EOA IPR		1Q-4Q SLAP CH-53D Airframe/Structural Fatigue Life limits	
Engineering Milestones	1Q-4Q MAT/MAINT SLAP			
T&E Milestones	3Q-4Q SLAP CONTR TESTFLT	3Q-3Q98 IMD EOAT		
Contract Milestones	1Q-4Q98 IMD EOAI	1Q-4Q ARCH STY	1Q-4Q SLEP CH-53E	

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Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, Page 9 of 27)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1109

PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT

PROJECT TITLE: CH/MH-53

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Travel	109	130	147
b. Reliability, Maintainability and Availability	0	0	2,367
c. Tech Engineering Support	464	180	106
d. Program Management Support	57	85	148
e. Engineering Development	346	372	0
f. Operational Flight Test Sup	126	422	60
Total	1,102	1,189	2,828

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1109

PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT

PROJECT TITLE: CH/MH-53

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
EER-Global Positioning Systems (GPS) Integration										
Vienna, VA										
N0001989C0166	SS-CPIF	8/90	22,764	22,764	22,764					22,764
SIKORSKY-Service Life Assessment Program (SLAP)										
Stratford, CT										
N0001992G0196	SS-CPFF	3/95	13,320	13,320	13,320					13,320
TBD-Service Life Extension Program (SLEP)										
TBD	SS-TBD	11/98	TBD	TBD				348	Con't	Con't
BF GOODRICH-Integrated Mechanical Diagnostics (IMD)										
N0001996C0097	C-FFP	4/96	2,242	2,242	1,524	346	372			2,242
NAVAVNDEPOT Cherry Point-Service Life Assessment										
Program H-53D (SLAP)										
			TBD	TBD				2,125	Con't	Con't
Miscellaneous (less than 1 million)										
		VARIOUS	VARIOUS	TBD	26,901	573	310	147	Con't	Con't
Support and Management										
Miscellaneous (less than 1 million)										
		VARIOUS	VARIOUS	TBD	3,829	57	85	148	Con't	Con't

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1109

PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT

PROJECT TITLE: CH/MH-53

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Test and Evaluation										
Miscellaneous (less than 1 million)										
	VARIOUS	VARIOUS		TBD	1,261	126	422	60	Con't	Con't

GOVERNMENT FURNISHED PROPERTY - Not Applicable

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	64,509	919	682	2,620	Con't	Con't
Subtotal Support and Management	3,829	57	85	148	Con't	Con't
Subtotal Test and Evaluation	1,261	126	422	60	Con't	Con't
 Total Project	 69,599	 1,102	 1,189	 2,828	 Con't	 Con't

R-1 Item No. 83

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, Page 12 of 27)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H1707 LAMPS III IMP	40,655	92,794	215,517	120,356	31,745	8,074	6,815	0	733,969
RDT&E Test Articles		(2)			(1)	(2)			

FY98 H1707 funding includes Congressionally directed projects H2412 (\$15,000 for SH-60R Block II), H2413 (\$5,000 for Air Interoperability Center), H2414 (\$5,000 for Parametric Airborne Dipping Sonar).

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Block II Upgrade improves the capability of the LAMPS MK III Weapons System to provide battle group protection and adds significant capability in coastal littoral and regional conflicts. The Block II Upgrade entered Engineering and Manufacturing Development (EMD) in FY93 and represents a significant avionics modification to the SH-60B greatly enhancing both primary mission areas of ASW and ASUW. The ALFS will be added to enhance the existing acoustic suite. ASUW effectiveness will be improved with the addition of a multi-mode radar which includes an inverse synthetic aperture radar mode to permit stand-off classification of hostile threats. An improved Electronic Surveillance/Support Measures (ESM) system will enable passive detection and targeting of radar sources not detectable with the current system. Aircrew and aircraft survivability in hostile environments will be significantly improved through software integration of the self-defense equipments. Provisions for a tactical data transfer system to improve platform interoperability by rapid, secure transfer of mission information between multiple air and surface units is included in the upgrade.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$37,445) Conducted system Critical Design Review (CDR), continue system software coding and test, continue laboratory simulation/stimulation development and testing, commence system integration and test, continue air vehicle and radar development, commenced EMD II/LRIP planning effort.
- (U) (\$2,243) Provided Navy system engineering support during CDR, limited Integrated Test Team planning, program management and travel.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1707

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: LAMPS III IMP

- (U) (\$967) Completed DT-IIA and continue plan for DTIIB.

2. (U) FY 1998 PLAN:

- (U) (\$47,328) Continue systems integration and test, complete radar development, complete Phase I air vehicle development, complete system software development.
- (U) (\$11,220) Refurbishment of ALFS systems for LRIP Test Articles, ALFS engineering support, Integrated Logistics Support, and test planning.
- (U) (\$6,662) Provide Navy systems engineering support, logistics support analysis, plan for EMD Phase II, trainer specification preparation, program management and travel.
- (U) (\$3,325) Test Team management and DT/OT test planning and support.
- (U) (\$14,555) Begin efforts to incorporate commercial off the shelf avionics technology into LRIP test articles.
- (U) (\$4,852) Congressional add for the Air Interoperability Center provides for engineering, development, integration, and testing efforts in support of test requirements.
- (U) (\$4,852) Congressional add provides funds to accomplish aircraft integration and flight demonstration of Parametric Airborne Dipping Sonar (PADS).

3. (U) FY 1999 PLAN:

- (U) (\$79,963) EMD Phase I and II: Start ESM development, redesign mission processor, initiate design of operator/tactical assistance software programs and integrated self defense suite, support DT-IIB/OT-IIA. Conduct Test Readiness Review (TRR) and CDR #2. Conduct first flights of prototype aircraft.
- (U) (\$33,838) Begin Contractor non-recurring engineering efforts including remanufacture kit design, Technical Drawings (TD)/tooling, and deconfiguration of LRIP test articles. Begin non-recurring engineering effort for Service Life Extension Program (SLEP) kits. Commence Non-recurring effort for avionics.
- (U) (\$36,500) Procurement of Contractor Furnished Equipment (CFE) and labor required for remanufacture kit build and SLEP.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1707

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: LAMPS III IMP

- (U) (\$9,000) Procurement of government furnished equipment (GFE) for LRIP Test Articles.
- (U) (\$25,000) Continue efforts to incorporate commercial off the shelf avionics technology into LRIP Test Articles.
- (U) (\$8,589) Complete documentation and processing requirements for a LRIP review. Procurement of lab assets for EMD Phase II. Continue Navy logistics, systems engineering and test support, trainer design and development support, update Naval Training Plan documentation, program management and travel. Support requirements for LRIP test articles including trainer systems development, Integrated Logistics Support, and field activity support.
- (U) (\$7,227) DT-IIB/OT-IIA testing for SH-60R and ALFS subsystem operational evaluation (OPEVAL). Conduct data reduction and analysis, and prepare test report.
- (U) (\$15,400) ALFS deficiency corrections, engineering and testing.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	40,425	72,119	218,931
(U) Appropriated Value:		97,119	
(U) Adjustments from PRESBUDG:	+230	+20,675	-3,414
(U) FY 1999 President's Budget Submit:	40,655	92,794	215,517

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net increase of \$+230 thousand in FY 97 reflects a SBIR adjustment (\$-1,020 thousand), a FFRDC adjustment (\$-17 thousand), various reprogramming actions (\$+16 thousand), revised economic indices (\$-49 thousand) and a reprogramming to provide funds for EMD Phase II/Low Rate Initial Production planning efforts (+1,300 thousand). The net increase of \$+20,675 in FY 98 reflects Congressional adds for SH-60R Block II, Air Interopreability Center, and Parametric Airborne Dipping Sonar (\$+25,000 thousand), a FFRDC adjustment (\$-25 thousand), a consulting services adjustment (\$-120 thousand), congressionally directed general reductions (\$-2,665), revised economic assumptions (\$-215 thousand), and a reprogramming to the S-3 program (\$-1,300 thousand). The net decrease of \$-3,414 thousand in FY 99 reflects several Navy Working Capital Fund (NWCF) adjustments (\$+1,300 thousand), reduction of one test article (\$-11,000 thousand), acceleration of COTS insertion effort (\$10,000 thousand, inflation adjustment (\$-3,798 thousand), and several pricing adjustments (\$+84 thousand).

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1707

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: LAMPS III IMP

(U) Schedule: In accordance with the updated Acquisition Program Baseline, MS III changed from 2Q99 to 1Q03, TECHEVAL changed from 3Q-4Q/01 to 2Q01-2Q02 and OPEVAL from 1Q-3Q02 to 2Q01-2Q02. In addition, Critical Design Review #2 (to support EMD Phase II) has been added to the schedule as a result of a planned system rearchitecture. LRIP contract award has slipped two months from 1Q/00 to 2Q/00.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) APN-1 Line 8	0	0	0	337,529	366,083	424,018	460,050	2,603,749	4,191,429
(U) APN-6 Line 45	0	0	0	20,442	18,852	21,961	26,056	CONT	CONT

(U) RELATED RDT&E:

(U) PE 0604212N(ASW and Other Helo Developments, H0485, ALFS)

(U) PE 0604507N(Enhanced Modular Signal Processor)

(U) PE 0604261N(Acoustic Search Sensors)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1707

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: LAMPS III IMP

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				MS III 1Q/03 IOC 4Q/02
Engineering Milestones		CDR#1/3Q (EMD Phase I)	TRR 1Q CDR#2/2Q-4Q (EMD Phase II)	
T&E Milestones		DT-IIA 1Q-3Q	DT-IIB/ 2Q-3Q OT-IIA/ 3Q-4Q	TECHEVAL/ 2Q01-2Q02 OPEVAL/ 2Q01-2Q02
Contract Milestones				LRIP 2Q/00

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1707

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: LAMPS III IMP

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. EMD Hardware/Software Development	37,445	47,328	79,963
b. Program Management and Support	2,243	6,662	8,589
c. Development Test & Evaluation	967	3,325	7,227
d. ALFS System Procurement and Engineering		11,220	15,400
e. LRIP Non-recurring			33,838
f. Test Articles			36,500
g. GFE Procurement for LRIP Test Articles			9,000
h. Commercial Off The Shelf Avionics Technology		14,555	25,000
i. Air Interoperability Center		4,852	
j. Parametric Airborne Dipping Sonar (PADS)		4,852	
Total	40,655	92,794	215,517

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1707

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: LAMPS III IMP

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Lockheed Martin										
Owego, NY	SS/CPFF	Aug 93	366,392	366,392	137,472	37,445	47,328	79,963	64,184	366,392
Hughes Fullerton, CA	C/CPIF	Dec 91	25,530	25,530	6,805	0	7,575	11,150	0	25,530
TBD	TBD	TBD	193,292	193,292	0	0	19,407	104,338	69,547	193,292
Support and Management										
NAWCADWARMINSTER			13,435	13,435	13,435	0	0	0	0	13,435
MISC In-house		Oct 98	47,108	47,108	10,929	1,808	8,845	9,072	16,454	47,108
MISC Contracts		Oct 98	16,187	16,187	1,166	435	6,314	3,767	4,505	16,187
Test and Evaluation										
NAWCADPAX (WX)		Oct 98	24,612	24,612	793	967	3,325	7,227	12,300	24,612

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1707

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: LAMPS III IMP

GOVERNMENT FURNISHED PROPERTY

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development		Not Applicable							
Support and Management		Not Applicable							
Test and Evaluation		Not Applicable							

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	144,277	37,445	74,310	195,451	133,731	585,214
Subtotal Support and Management	25,530	2,243	15,159	12,839	20,959	76,730
Subtotal Test and Evaluation	793	967	3,325	7,227	12,300	24,612
Other FY93 and Prior Costs	47,413					47,413
Total Project	218,013	40,655	92,794	215,517	166,990	733,969

R-1 Item No. 83

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, Page 20 of 27)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

(U) COST: (Dollars in Thousands)

PROJECT
NUMBER &
TITLE

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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H1709 CH-60 Vertical Replenishment

6,910	30,894	12,775	7,832	0	0	0	0	58,411
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A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The CH-60 Fleet Combat Support (HC) Helicopter provides the Navy’s combat logistics force with a Vertical Replenishment (VERTREP) at sea capability which is vital to sustain the Navy’s power projection forces by a comprehensive and responsive combat logistics force support system. The HC helicopter will also serve as the primary Search and Rescue (SAR) aircraft for the Amphibious Task Force (ATF), providing essential support to amphibious operations. Within the context of “From the Sea” and in support of the national military strategy, the HC helicopter provides the Navy with a capability to conduct and sustain littoral power projection and peacekeeping/presence operations. The primary missions of the HC helicopter include day/night VERTREP operations, vertical onboard delivery, day/night amphibious SAR and airhead operations. Secondary missions include special warfare support; recovery of torpedoes, drones, unmanned aerial vehicles and unmanned undersea vehicles; noncombatant evacuation operations; aeromedical evacuation humanitarian assistance and disaster relief. Joint procurement and support strategies will be pursued to reduce costs and duplicative efforts. The CH-60 C4I equipment will be compatible with joint operations and NATO forces in support of multinational operations. Existing DoD and Navy support equipment is being used to the maximum extent possible.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$5,749) Initiated contract award to Sikorsky to design and assemble a prototype CH-60 helicopter to demonstrate VERTREP mission capability, Vertical Onboard Delivery (to include airhead operations), internal passenger and cargo capability, and SAR mission capability.
- (U) (\$1,161) Commenced Navy systems engineering and test support, trainer specification preparation, program management and travel.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1709

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: Vertrep Rep

2. (U) FY 1998 PLAN:

(U) (\$21,607) Initiate contract award to Sikorsky for development of a production representative CH-60 helicopter. Supplies and services include engineering investigations and studies, non-recurring engineering (NRE) and design, common cockpit analyses and integration studies, ground and flight tests, logistics support, NRE documentation, and a Production Engineering Change Proposal to the Army's UH-60L helicopter.

(U) (\$5,000) Contract award to Lockheed Martin for development of a new design common cockpit to be used in both the CH-60 and SH-60R.

(U) (\$1,492) Advisory and assistance services contracts for studies, analyses, and evaluations, professional support services, and engineering and technical services.

(U) (\$2,795) Continue Navy field activity systems engineering and test support, environmental analyses, logistics planning, program management, and travel.

3. (U) FY 1999 PLAN:

(U) (\$12,775) Complete common cockpit developmental efforts and anticipated pre-operational test efforts.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	7,193	0	0
(U) Appropriated Value:		31,837	
(U) Adjustments from PRESBUDG:	-283	+30,894	+12,775
(U) FY 1999 President's Budget Submit:	6,610	30,894	12,775

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1709

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: Vert Rep

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of -\$283 thousand in FY97 reflects an SBIR adjustment (\$-274 thousand) and adjustment for revised economic assumptions (\$-9 thousand). The net increase of +\$30,894 in FY98 reflects adjustments for revised economic assumptions (\$-70 thousand), general congressional reduction (\$-873 thousand) and a congressional add (\$+31,837 thousand). The net increase of +\$12,775 in FY99 reflects commercial purchases inflation adjustment (\$-225 thousand) and a plus up for common cockpit development efforts (\$+13,000 thousand).

(U) Schedule: FY98 President's budget funded the VERTREP demonstration flight only. A revised program schedule includes: MS II/LRIP and Completed Testing 2Q/98; Common Cockpit CDR, NRE Award, ECP negotiations 3Q/98; Multi-year contract award 1Q/99;and 1st Flight Test 4Q/99.

(U) Technical: Not Applicable

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
Line 11/12 APN-2	0	29,684	132,187	348,277	304,951	301,108	289,195	1,117,379	2,522,781
Line 45 APN-6	0	0	7,758	13,653	11,395	10,185	20,092	44,153	107,236

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1709

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: Vert Rep

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	3Q-4Q PR	2Q MSII/LRIP		
Engineering Milestones	3Q SRR	3Q Comp Production ECP Negotiation		
		3Q Common Cockpit CDR		
T&E Milestones	4Q DT/OP Assessment	2Q Complete Testing	4Q 1st Flight Start Integrated Test	
Contract Milestones	2Q Contract Award	3Q NRE Award	1Q Funds to Army Multi-Year Contract	

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Exhibit R-2, RDT&E Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1709

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: VERTREP Helo

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Product Development	5,799	26,607	11,521
b. Program Management and Support	1,063	3,493	769
c. Testing Support	12	732	485
d. Travel	36	62	0
Total	6,910	30,894	12,775

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Sikorsky	TBD	TBD	35,238	35,238	0	5,799	21,607	0	7,832	35,238
Lockheed	TBD	TBD	16,521	16,521	0	0	5,000	11,521	0	16,521
Martin										

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1709

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: VERTREP Helo

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Support and Management										
NAWCADPAX			1,054	1,054	0	0	1,054	0	0	1,054
MISC In-house			1,831	1,831	0	822	1,009	0	0	1,831
MISC Contracts		Jan 99	2,538	2,538	0	277	1,492	769	0	2,538
Test and Evaluation										
NAWCAD (WX)		Nov 98	1,229	1,229	0	12	732	485	0	1,229

GOVERNMENT FURNISHED PROPERTY

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development		Not Applicable							
Support and Management		Not Applicable							
Test and Evaluation		Not Applicable							

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H1709

PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

PROJECT TITLE: VERTREP Helo

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	0	5,799	26,607	11,521	7,832	51,759
Subtotal Support and Management	0	1,099	3,555	769	0	5,423
Subtotal Test and Evaluation	0	12	732	485	0	1,229
Total Project	0	6,910	30,894	12,775	7,832	58,411

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT

PROJECT NUMBER: H0652
PROJECT TITLE: AV-8B

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H0652 AV-8B	15,801	10,689	13,787	8,027	1,552	617	664	0	1,557,242

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The program provides AV-8B integration and testing of various aircraft weapons improvements including: incorporation of common integrated Night Attack/Radar software; redesigned Inlet Guide Vane Controller for the F402-RR-406A/406B/408A engines; airframe vulnerability, susceptibility and survivability improvements; Common Missile Warning System (CMWS) integration; flight test modifications that improve aircraft flight performance; and limited evaluation of advance concepts and activities to coordinate with ongoing independent advance weapons development. The AN/APG-65 software and associated avionics will be upgraded to provide wiring, controllers and relays for advanced weapon interface. C1.0 software is a combined Operational Flight Program (OFP) for the Night Attack and Radar Aircraft, which establishes the baseline OFP for future weapons. The title of the Operational Flight Program software development effort which integrates the Joint Direct Attack Munition (JDAM) and the Common Missile Warning System (CMWS) into the AV-8B was changed from C2.0 to OC1.2 to reflect the change of effort in accordance with the ASN (RD&A) approved AV-8B Open System Core Avionics Requirements (OSCAR) initiative. On 7 Oct 96 ASN (RD&A) directed the Program Manager to proceed immediately with the OSCAR initiative. OSCAR utilizes commercial off-the-shelf hardware and modular high order language software. Advanced weapons coordination includes requirements and interface liaison with efforts such as Joint Stand-Off Weapon (JSOW), AIM-9X, Digital Multiple Carriage Bomb Rack (DMCBR), Advanced Expendables and Electronic Warfare suite upgrades.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT to encompass engineering and manufacturing development of new end items prior to the production approval decision.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT

PROJECT NUMBER: H0652
PROJECT TITLE: AV-8B

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$136) Continued engineering studies/advanced weapons to define AV8B capabilities and limitations of upgrades and interface requirements.
- (U) (\$150) Completed engine inlet guide vane controller development.
- (U) (\$780) Completed DT/OT testing and release of common integrated Night Attack/Radar Software (C1.0).
- (U) (\$1,903) Continued software requirements development for common integrated Night Attack/Radar software (OC1.2).
- (U) (\$1,592) Continued aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) (\$40) Terminated all Survivability & Vulnerability (S&V) studies.
- (U) (\$11,200) Completed airframe installation/integration development of MIL-STD-1760B armament wiring.

2. (U) FY 1998 PLAN:

- (U) (\$9,155) Continue development of common integrated Night Attack/Radar software (OC1.2) to include integration of the 1000-pound Joint Direct Attack Munition (JDAM) weapon.
- (U) (\$1,431) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) (\$103) Orderly termination of all engineering studies/advanced weapons requirements.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT

PROJECT NUMBER: H0652
PROJECT TITLE: AV-8B

3. (U) FY 1999 PLAN:

- (U) (\$9,615) Continue integration of the 1000 pound JDAM weapon into the Night Attack/Radar OC1.2 software.
- (U) (\$1,522) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) (\$650) Commence integration of closure algorithm to All Weather Landing System Signal (AN/SPN-41) into common operational flight program.
- (U) (\$2,000) Commence integration and test of software to the ARC-210 HAVEQUICK and SINCGARS waveform full functionality.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	16,089	11,034	11,230
(U) Adjustments from Pres Budget:	-288	-345	+2,557
(U) FY 1999 President's Budget Submit:	15,801	10,689	13,787

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The reduction from PRESBUD in FY 1997 of \$-288 thousand reflects \$-266 thousand for Small Business Innovative Research and \$-22 thousand for minor adjustments. The net reduction for FY98 of \$-345 thousand reflects minor pricing adjustments. The net increase for FY99 of \$+2,557 thousand reflects \$+650 thousand for the AV-8B AN/SPN-41 project, \$+2,000 thousand for the ARC-210 HAVEQUICK/SINCGARS project, and \$-93 thousand for minor pricing adjustments.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT

PROJECT NUMBER: H0652
PROJECT TITLE: AV-8B

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) APN-1/Line 1/2/AV-8B 354,002	294,419	338,399	292,500	191,418	0	0		1,444,216
(U) QTY 12	12	12	12	8	0	0		
(U) APN-5/Line 20/AV-8 Series 22,163	31,879	99,109	73,625	60,560	25,014	32,748	CONT	CONT
(U) APN-6/Spares 5,076	24,725	25,716	12,241	8,438	45	46		76,006

(U) RELATED RDT&E: P.E. 0702207N, Project Unit H2453, AV-8B Aircraft Life Extension Program

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				
Engineering Milestones		1Q-2Q OC1.0 DT/OT Complete		2Q-3Q/00 OC1.2 DT/OT
T&E Milestones		3Q OC1.0 S/W RTF Complete		4Q/00 OC1.2 S/W RTF
Contract Milestones				

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT

PROJECT NUMBER: H0652
PROJECT TITLE: AV-8B

. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. CONTRACTS	205	202	220
Contractor Support (NON-ADD)	205	202	220
b. TECHNICAL SUPPORT	12,656	7,132	11,567
c. TRAVEL	340	330	340
d. T&E	2,600	3,025	1,660
Total	15,801	10,689	13,787

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Exhibit R-3, Budget Item Justification
(Exhibit R-3, Page 5 of 7 Pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT

PROJECT NUMBER: H0652
PROJECT TITLE: AV-8B

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)
PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NAWC-WD, CHINA LAKE, CA	WX	10/98	44,338	44,338	27,321	2,891	2,306	4,526	7,294	44,338
NAWC-AD PATUXENT RIVER, MD	WX	10/98	4,617	4,617	3,306	300	260	325	426	4,617
MISC/CONTRACTS	Var	Var	11,542	11,542	5,818	1,258	2,055	2,072	339	11,542
CONTRACTS/Boeing	Var	10/98	29,150	29,150	13,214	7,944	2,012	4,170	1,810	29,150
MISC/In-house	WX	Var	7,485	7,485	4,629	603	829	814	610	7,485
Support and Management	WX	N/A	43,538	43,538	43,538	0	0	0	0	43,538
MISC/Contracts	Var	Var	1,755	1,755	1,128	205	202	220	0	1,755
MISC/In-House	Var	Var	1,000	1,000	1,000	0	0	0	0	1,000
Test and Evaluation										
NAWC-WD CHINA LAKE,CA	WX	10/98	15,683	15,683	9,593	2,115	2,675	1,300	0	15,683
NAWC-AD,PATUXENT RIVER,MD	WX	10/98	4,557	4,557	3,391	200	225	360	381	4,557

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Exhibit R-3, Budget Item Justification
(Exhibit R-3, Page 6 of 7 Pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT

PROJECT NUMBER: H0652
PROJECT TITLE: AV-8B

GOVERNMENT FURNISHED PROPERTY

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development									
Support and Management									
Test and Evaluation									
Misc	WX	11/97	12/97	38,008	285	125	0	0	38,418

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	54,288	12,996	7,462	11,907	10,479	97,132
Subtotal Support and Management	45,666	205	202	220	0	46,293
Subtotal Test and Evaluation	50,992	2,600	3,025	1,660	381	58,658
Other FY-95 and Prior Costs	1,355,159	0	0	0	0	1,355,159
Total Project	1,506,105	15,801	10,689	13,787	10,860	1,557,242

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Exhibit R-3, Budget Item Justification
(Exhibit R-3, Page 7 of 7 Pages)

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROGRAM ELEMENT TITLE: Standards Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1857 Calibration Standards	1,936	1,905	1,799	1,662	1,657	1,750	1,814	CONT.	CONT.
S2416 Integrated Condition Assessment System (ICAS)	0	1,941	0	0	0	0	0	0	1,941
W0572 Joint Services/Navy Standard Avionics Components and Subsystems	22,981	25,218	42,147	29,600	22,755	16,762	5,504	CONT.	CONT.
W2310 Flight Polynomials	0	289	293	291	0	0	0	0	873
W2311 Stores Planning and Weaponering Module	0	7,451	7,295	7,559	7,906	8,577	729	0	39,517
W2312 Common Helicopters	0	0	453	1,468	1,979	2,770	1,186	0	7,856
TOTAL	24,917	36,804	51,987	40,580	34,297	29,859	9,233	CONT.	CONT.
RDT&E Articles		33	109	58					200

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Project S1857, Calibration Standards: This project is a Navy-wide program to develop required calibration standards (hardware) in all major measurement technology areas. It funds Navy lead-service responsibilities in the DoD metrology RDT&E program. This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) Project W0572, Joint Services/Navy Standard Avionics Components and Subsystems: This project provides for the identification, design, development, test, evaluation and qualification of standard avionics for Navy use, and wherever practicable, use across all Services and Foreign Military Sales. Such air combat electronics developments include communications, navigation, flight avionics, and flight mission information systems for both forward fit and retrofit aircraft. These efforts continue to maintain federated systems while encouraging transition of procurements to support a modular system for enhanced performance and affordability. Consideration is given up front to reduce acquisition costs through larger procurement quantities that satisfy multi-aircraft customer requirements and that reduce life cycle costs in the areas of reliability, maintainability, and training. Several examples of past successful tasks under this project include the Standard Central Air Data Computer, Solid State Barometric Altimeter, and Downed Aircraft Location System, jointly developed with the Air Force and Army and currently installed on numerous Navy, Air Force and Army aircraft. This project also funds Navy participation involving the Joint Services Review Committee (JSRC) for Avionics Standardization.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROGRAM ELEMENT TITLE: Standards Development

(U) Project W2310, Flight Polynomials: The Tactical Automated Mission Planning System (TAMPS) is the Naval standard unit level automated mission planning system. It automatically calculates fuel, time, distance, altitude, speed, and weight for each leg of a mission adjusted for wind and magnetic variation for all of the following aircraft: F/A-18, E-2C, F-14, AH-1W, UH-1N, AV-8B, EA-6B, H-60, and S-3B. Full accuracy requires implementation of Government Furnished Information (GFI) performance polynomials (drop-in polynomials). The TAMPS CORE will perform operational loading and replacement of aircraft polynomials reflecting COMNAVAIRSYSCOM approved Naval Aviation Training and Operating Procedures Standardization (NATOPS) Manuals. TAMPS will use the drop-in polynomials developed as part of the Joint Services Program and distributed by Eglin Air Force Base. This project funds the development of the required drop-in polynomials.

(U) Project W2311, Stores Planning and Weaponing Module: This project funds an incrementally developed software product that will provide a certified unit level weaponing Tactical Decision Aid (TDA) in the Tactical Automated Mission Planning System (TAMPS) version 6.2.

(U) Project W2312, Common Helicopters: The Tactical Automated Mission Planning System (TAMPS) is the Naval standard unit level automated mission planning system. It loads data for several aviation platforms and subsystems, including the Amphibious Warfare community (MH-53, CH-53, UH-1, AH-1, HH-60, SH-60B/R, CH-46, AV-8B and V-22). As part of a migration plan, the Amphibious Warfare community has identified the Common Helicopter Mission Planning Functionality required on TAMPS to support Amphibious Assault mission planning.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: These programs are funded under ENGINEERING & MANUFACTURING DEVELOPMENT because they encompass engineering and manufacturing development of new end-items prior to production approval decision.

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Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, Page 2 of 22 Pages)

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: S1857

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Calibration Standards

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1857 Calibration Standards	1,936	1,905	1,799	1,662	1,657	1,750	1,814	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides the engineering development of measurement reference/calibration standards (hardware) required to ensure measurement accuracy in support/maintenance of new advanced technology weapon systems and associated support equipment. These individual tasks have been assigned to the Navy as lead-service responsibilities as part of a Joint Service/DoD program.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$ 66) Began development (to 50% completion) of 1 calibration standard (hardware) in support of radars (2 GHz to millimeter-wave).
- (U) (\$ 115) Continued development (to 66% completion) of 1 calibration standard (hardware) in support of Joint Service Automation.
- (U) (\$1,755) Completed development of 11 calibration standards (hardware) in support of dynamic scene generators, polarization based target identifiers/trackers, fiber optic communications, infrared target illuminators, radar systems, mines and mine sweepers, ship temperature gage calibration, night vision goggles, and MILSTAR hazard probes.

2. (U) FY 1998 PLAN:

- (U) (\$ 580) Complete the development of 2 calibration standards (hardware) in support of Joint Service Automation and radar's (2 GHz to millimeter-wave).
- (U) (\$ 999) Begin and complete development of 4 calibration standards (hardware) in support of fiber optic communications systems (2 standards), shipboard sensors, and high current circuit breakers.
- (U) (\$ 326) Begin development (to 50% completion) of 2 calibration standards (hardware) in support of laser tracker systems, and system electromagnetic vulnerability measurements.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: S1857

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Calibration Standards

3. (U) FY 1999 PLAN:

- (U) (\$ 198) Complete the development of 1 calibration standards (hardware) in support of system electromagnetic vulnerability measurement..
- (U) (\$ 252) Continue development (to 66% completion) of 1 calibration standards (hardware) in support of laser tracker systems.
- (U) (\$1,349) Begin development (to 50% completion) of 6 calibration standards (hardware) in support of aircraft and ship color display systems, underwater acoustic systems, Infrared (IR) systems, optical systems, radar cross section measurements, and multi-function electrical test equipment.

(U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	2,021	1,962	2,662
(U) FY 1997 Appropriated Value:	2,021	1,962	
(U) Adjustments from FY 1998/FY 1999 PRESBUD:			
a. Congressional Undistributed Reductions	(84)	(57)	
b. Small Business Innovative Research Adjustment	(1)		
c. Calibration Standards Reduction			(466)
d. Various NWCF Adjustments			(397)
(U) FY 1999 President's Budget:	1,936	1,905	1,799

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UNCLASSIFIED

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: S1857

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Calibration Standards

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 reduction of \$85K is due to Congressional Undistributed Reductions (\$84K) and Small Business Innovative Research (SBIR) adjustment (\$1K). FY 1998 Reduction of \$57K is due to Congressional Undistributed Reductions (\$57K). FY 1999 reduction of \$876K is due to Calibration Standards reduction (\$466K) and minor pricing adjustments (\$397K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands). Not applicable.

(U) RELATED RDT&E: PE 0604215N Joint Services/Navy Standard Avionics Components and Subsystems.

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	To Complete
Program				
Milestones	Radars (2ghz to mm wave) 1Q Begin	Radars (2ghz to mm wave) 4Q Complete		
	Joint Service Automation Continue	Joint Service Automation 4Q Complete		
		Laser Tracking Systems 1Q Begin	Laser Tracking Systems Continue	Laser Tracking Systems 4Q 00
		Electromagnetic Vulnerability 1Q Begin	Electromagnetic Vulnerability 4Q Complete	
			Color Display Systems 1Q Begin	Color Display Systems 4Q FY01
			U/W Acoustic Systems 1Q Begin	U/W Acoustic Systems 4Q 01
			Infrared Systems 1Q Begin	Infrared Systems 4Q 01
			Optical Systems 1Q Begin	Optical Systems 4Q 01
			Radar Cross Sec 1Q Begin	Radar Cross Sec 4Q 01
			Multifunction Electrical Test 1Q Begin	Multifunction Electrical Test 4Q 01

DATE: February 1998

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: S1857

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Calibration Standards

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Program Management Support	200	200	198
b. Government Engineering Support	205	235	223
c. Primary Hardware Development	1,360	1,296	1,226
d. Travel	24	26	20
e. Misc.	147	148	132
Total	1,936	1,905	1,799

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W0572

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Joint Services/Navy Standard Avionics Components and Subsystems

(U) COST: (Dollars in Thousands)

<u>PROJECT NUMBER & TITLE</u>	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
W0572 Joint Services/Navy Standard Avionics Components and Subsystems									
RDT&E Articles	22,981	25,218 33	42,147 109	29,600 58	22,755	16,762	5,504	CONT.	CONT. 200

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION The Joint Services/Navy Standard Avionics Components and Subsystems project provides for the identification, design, development, test, evaluation and qualification of standard avionics and mandatory safety improvements for Navy use, and wherever practicable, use across all services. Standard avionics systems under development include the Ground Proximity Warning System (GPWS) for Tactical Aircraft (TACAIR) CAT II and Helicopters CAT III; Low Probability of Intercept Altimeter (LPIA), Tactical Aircraft Moving Map Capability (TAMMAC), GPS Guidance Package (GGP), Flight Avionics Displays (FAD), Communication Navigation Surveillance Air Traffic Management (CNS/ATM). Participates in Human Factors Quality Management Board (HFQMB) which defines required Navy safety upgrades and mandatory safety improvements for naval aircraft.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$2,155) Safety: Continued integration and testing of the GPWS CAT II into the F/A-18 A/B/C/D aircraft and completed AV-8B.
- (U) (\$1,748) Safety: Completed integration and testing of GPWS CAT III into lead H-53 series aircraft and achieved a MS III decision.
- (U) (\$2,024) Conducted Systems Requirements Review (SRR), conducted Preliminary Design Review (PDR), and began development/integration efforts for LPIA.
- (U) (\$13,836) Achieved Milestone II and awarded Engineering and Manufacturing Development (EMD) contract for TAMMAC. Conducted PDR.
- (U) (\$1,006) Began requirements definition, prepared the request for proposal (RFP), and developed the acquisition strategy for FAD.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W0572

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Joint Services/Navy Standard Avionics Components and Subsystems

- (U) (\$1,592) Continued to support and participate in Joint Services Review Committee (JSRC) tri-service coordination to promote commonality and joint programs with focus on interoperability communications and Communication Navigation System Air Traffic Management (CNS/ATM). Supported and participated in Avionics Operator's Advisory Group (OAG) panels.
- (U) (\$ 620) Provided technical and test support to the Defense Advanced Research Projects Agency (DARPA) and released Request for Information (RFI) for GGP.

2. (U) FY 1998 PLAN:

- (U) (\$3,223) Safety: Continue with integration, testing, and deficiency correction for the GPWS CAT II installed in the F/A-18 A/BC/D/E/F aircraft.
- (U) (\$4,448) Continue development of the LPIA program. Conduct Critical Design Review (CDR), Test Analyze And Fix (TAAF) testing, and Design Approval Testing (DAT). Begin combined Developmental Testing/Operational Testing (DT/OT).
- (U) (\$8,540) Conduct CDR and continue development effort on TAMMAC. Receive first asset deliveries, continue F/A-18, AV-8B, and TAMPS integration efforts, begin qualification testing, and initiate combined DT/OT on the F-18 C/D for the TAMMAC program.
- (U) (\$7,440) Develop acquisition documentation, achieve Milestone II decision, award EMD contract, and complete PDR for FAD.
- (U) (\$1,567) Continue to support and participate in JSRC tri-service coordination to promote commonality and joint programs with focus on interoperability communications and CNS/ATM. Support and participate in Avionics OAG panels.

3. (U) FY 1999 PLAN:

- (U) (\$3,414) Complete combined DT/OT, and commence TECHEVAL for the LPIA program.
- (U) (\$7,419) Complete qualification testing, continue F/A-18, AV-8B and TAMPS integration efforts, conduct operational assessments, complete combined DT/OT on the F-18 C/D, and conduct TECHEVAL on the TAMMAC program.
- (U) (\$14,389) Conduct CDR and continue development and integration of FAD for F/A-18 E/F.

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Exhibit R-2, RDT&E Budget Item Justification
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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

PROJECT NUMBER: W0572
PROJECT TITLE: Joint Services/Navy Standard Avionics Components and Subsystems

- (U) (1,452) Continue to support and participate in JSRC tri-service coordination to promote commonality and joint programs with focus on interoperability communications and CNS/ATM. Support and participate in Avionics OAG panels.
- (U) (\$2,068) Safety: Continue with deficiency correction of the GPWS CAT II in the F/A-18 C/D/E/F aircraft.
- (U) (\$2,405) Safety: Begin HFQMB systems integration of the GPWS with the TAMMAC Digital Map on the F/A-18 to increase the GPWS operational envelope. Begin HFQMB system modification and integration of the Formation Collision Avoidance System (FCAS) into the CH-46E aircraft.
- (U) (\$11,000) Safety: Plan, develop and test required modifications to Navy common avionics to enable required mandatory operations for commercial derivative and tactical naval aircraft for CNS/ATM.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	23,428	26,358	30,183
(U) Appropriated Value		26,358	
(U) Adjustments from PRESBUD:	(447)	(1140)	11,964
(U) FY 1999 President's Budget:	22,981	25,218	42,147

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 net decrease of -\$447 thousand reflects decreases of -\$394 thousand for the Small Business Innovative Research (SBIR) assessment, -\$21 thousand for FFRDC, -\$29 thousand for revised economic reduction and -\$3 thousand for program adjustments. FY 1998 reflects a decrease of \$1140 thousand for congressional undistributed reductions. FY 1999 net increase of \$11,964 thousand reflects -\$1,258 thousand as a result of a program adjustment, -\$1,133 thousand due to the cancellation of GGP, +\$48 thousand for minor pricing adjustments, +\$549 thousand for TAMMAC Validation, +\$3,300 thousand for HFQMB +\$200 thousand due to the Navy Working Capital Fund (NWCF) rate increase, +\$11,000 thousand for CNS/ATM, and -\$742 for Commercial Purchases Inflation.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W0572

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Joint Services/Navy Standard
Avionics Components and
Subsystems

(U) Schedule: FY 1997 reflects a change in LPIA PDR from 2Q 97 to 3Q 97 as a result of a contractual protest. The TAMMAC PDR date changed from 2Q 97 to 3Q 97 as a result of acquisition reform and incremental PDRs held by the contractors. FY 1998 reflects a change in FAD PDR from 2Q 98 to 3Q 98 resulting from requirement for additional program definition. The TAMMAC CDR changed from 4Q 97 to 1Q 98 as a result of acquisition reform and incremental CDRs held by contractors. TAMMAC DT/OT added the test phase in 4Q 98 to support a Low Rate Initial Production (LRIP) decision. The LPIA CDR schedule changed from 4Q 97 to 1Q 98 as a result of a contractual protest which also resulted in change of DT/OT from 3Q 98 to 4Q 98. FY 1999 reflects a FAD CDR schedule change from 4Q 98 to 1Q 99 resulting from requirement for additional program definition.. The LPIA program test schedule changed as a result of the contractual protest, starting TECHEVAL in 4Q 99. New since the President's Budget added 2Q/98 GPWS CAT II DT and 4Q/99 GPWS CAT II OT to correct anomalies found during the initial DT/OT conducted in FY 96.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: PE 0204161N GPWS CAT III

(U) RELATED RDT&E:

(U) PE 0204136N F-18 Squadrons

(U) PE 0604574N Standards Embedded Computer Resources

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

PROJECT NUMBER: W0572
PROJECT TITLE: Joint Services/Navy Standard Avionics Components and Subsystems

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	1Q MS II TAMMAC (12/96) 3Q MS III GPWS CAT III (6/97)	2Q MS II FAD (3/98)		
Engineering Milestones	3Q LPIA PDR (6/97) 3Q TAMMAC PDR (5/97)	3Q FAD PDR (6/98) 1Q LPIA CDR (10/97) 1Q TAMMAC CDR (12/97)	1Q FAD CDR (11/98)	
T&E Milestones		3Q LPIA DT/OT (9/98-6/99) 2Q GPWS CAT II DT (15C OFF) (2/98-9/98) 4Q TAMMAC DT/OT (8/98-3/99)		4Q GPWS CAT II OT (15C OFF) (7/99-9/99)
	1Q GPWS CAT II OT (11C OFF) (10/96-3/97)		4Q LPIA TECHEVAL (7/99-9/99) 3Q TAMMAC TECHEVAL (5/99-9/99)	
Contract Milestones		2Q FAD EMD AWD (3/98)		
	1Q TAMMAC EMD AWD (12/96)			

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

PROJECT NUMBER: W0572
PROJECT TITLE: Joint Services/Navy Standard Avionics Components and Subsystems

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Program Planning	813	524	2,158
b. Technical Program Mgmt Support	808	477	430
c. Prime Eqpmt/E&MD Prime Contract	12,566	14,950	27,144
d. System T&E/OT&E	1,258	3,773	4,479
e. System Engineering	4,286	2,462	3,988
f. Travel	351	297	367
g. Contract Services	2,899	2,735	3,581
Total	22,981	25,218	42,147

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W0572

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Joint Services/Navy Standard Avionics Components and Subsystems

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
McDonnell Douglas/Boeing		12-96	22,750	22,750	0	10,900	5,740	4,110	CONT.	CONT.
GEC Marconi		01-97	5,361	5,361	1,320	661	2,800	1,380	CONT.	CONT.
Boeing		03-98	TBD	TBD	0	367	6,410	12,915	CONT.	CONT.
TBD		03-99	TBD	TBD	0	0	0	8,739	CONT.	CONT.
Miscellaneous		12-98	TBD	TBD	33,033	6,896	3,760	6,943	CONT.	CONT.
Support and Management										
Miscellaneous		12-98	TBD	TBD	7,444	2,899	2,735	3,581	CONT.	CONT.
Test and Evaluation										
Miscellaneous		12-98	TBD	TBD	8,718	1,258	3,773	4,479	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	34,353	18,824	18,710	34,087	CONT.	CONT.
Subtotal Support and Management	7,444	2,899	2,735	3,581	CONT.	CONT.
Subtotal Test and Evaluation	8,718	1,258	3,773	4,479	CONT.	CONT.
Total Project	50,515	22,981	25,218	42,147	CONT.	CONT.

*FY 96 & prior includes program information from FY 90 through FY 96 on programs still remaining in the FYDP years.

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

PROJECT NUMBER: W2310
PROJECT TITLE: Flight Polynomials

(U) COST (Dollars in thousands)

<u>PROJECT NUMBER & TITLE</u>	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
W 2310 Flight Polynomials	0	289	293	291	0	0	0	0	873

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Tactical Automated Mission Planning System (TAMPS) is the Naval standard unit level automated mission planning system. It automatically calculates fuel, time, distance, altitude, speed, and weight for each leg of a mission adjusted for wind and magnetic variation for all the following aircraft: F/A-18, E-2C, F-14, AH-1W, UH-1N, AV-8B, EA-6B, H-60, S-3B. Full accuracy requires implementation of Government Furnished Information (GFI) performance polynomials (drop-in polynomials). The TAMPS CORE will perform operational loading and replacement of aircraft polynomials reflecting COMNAVAIRSYSCOM approved NATOPS manuals. TAMPS will use the drop-in polynomials developed as part of the Joint Services Program and distributed by Eglin Air Force Base.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS: Not Applicable.

2. (U) FY 1998 PLAN:

- (U) (\$289) The process for implementation of the GFI drop-in polynomials will commence in TAMPS version 6.3. This effort requires the migration of each aircraft to drop-in polynomials. FY 1998 will migrate the following aircraft: F/A-18 and EA-6B.

3. (U) FY 1999 PLAN:

- (U) (\$293) The process for implementation of the GFI drop-in polynomials will continue in TAMPS version 6.4. This effort requires the migration of each aircraft to drop-in polynomials. FY-99 will migrate the following aircraft: F-14, UH-1, AH-1W, and E2-C.

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W2310

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Flight Polynomials

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	298	297
(U) Appropriated Value	0	0	0
(U) Adjustments from PRESBUD:	0	(9)	(4)
(U) FY 1999 President's Budget Submit:	0	289	293

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 98 decrease consists of -\$9 thousand for various Congressional adjustments..
FY 99 decrease consists -\$4 thousand for minor inflation adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not Applicable.

(U) RELATED RDT&E:

(U) PE 0604231N Mission Planning (E2213)

D. (U) SCHEDULE PROFILE: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W2311

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Stores Planning and Weaponing Module

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W 2311 Stores Planning and Weaponing Module	0	7,451	7,295	7,559	7,906	8,577	729	0	39,517

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Stores Planning and Weaponing Module (SPWM) is an incrementally developed software product that will provide a certified unit level weaponing Tactical Decision Aid (TDA) in the Tactical Automated Mission Planning System (TAMPS) version 6.2. SPWM will provide planning results for specific aircraft type and model and will reflect program unique current store and weapon carriage authorizations, restrictions and limitations, store/weapon delivery restrictions and limitations (including safe-escape aspects of the planned delivery profile), and will provide mandatory weapons employment planning information including weapons optimization. Selected functions of the Automated Tactical Manual Supplement (ATACS) will be rehosted in a UNIX environment and integrated with Joint Munitions Effectiveness Manual (JMEM) software, TDA and mission planning functions to comprise SPWM. A total of 22 aircraft and weapon platforms will be incorporated. F/A-18 A/B/C/D is the first platform to be introduced in SPWM, followed by F-14B/D.

1. (U) FY 1997 ACCOMPLISHMENTS: Not Applicable.

2. (U) FY 1998 PLAN:

- (U) (\$7,451) Introduce SPWM in TAMPS version 6.2 as a TDA for F/A-18A/B/C/D aircraft. Begin software development of F-14B/D capability in SPWM. Continue analysis and design of integrated mission planning for subsequent releases of TAMPS. Begin analysis of helicopter stores loads and weapon delivery requirements. Conclude support of ATACS as a separate software product as SPWM is integrated into TAMPS.

3. (U) FY 1999 PLAN:

- (U) (\$7,295) Complete F-14B/D SPWM software design. Begin development of AH-1 capability in SPWM. Begin analysis of AV-8B stores loads and weapon delivery requirements.

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W2311

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Stores Planning and Weaponneering Module

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	7,679	7,212
(U) Appropriated Value:	0	0	0
(U) Adjustments from PRESBUD:	0	(228)	83
(U) FY 1999 President's Budget:	0	7,451	7,295

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 decrease consists of -\$228 thousand for various congressional adjustments. FY 99 net increase consists of +\$681 thousand pricing adjustments; -\$470 thousand program adjustment and -\$128 thousand inflation adjustment.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not Applicable

(U) RELATED RDT&E:

(U) PE 0604231N Mission Planning (E2213)

D. (U) SCHEDULE PROFILE: Not Applicable.

DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

PROJECT NUMBER: W2311
PROJECT TITLE: Stores Planning and Weaponing Module

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a .SOFTWARE DEVELOPMENT	0	7,451	7,295
Total	0	7,451	7,295

(U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NAWC	WX	12/99	39,517	39,517	0	0	7,451	7,295	24,771	39,517
Patuxent River										
Support and Management					0	0	0	0	0	0
Test and Evaluation					0	0	0	0	0	0

GOVERNMENT FURNISHED PROPERTY: Not Applicable

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	0	0	7,451	7,295	24,771	39,517
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	7,451	7,295	24,771	39,517

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development
R-1 Item No. 85

PROJECT NUMBER: W2312
PROJECT TITLE: Common Helicopters

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(U) COST (Dollars in thousands)

<u>PROJECT NUMBER & TITLE</u>	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
W2312 Common Helicopters	0	0	453	1,468	1,979	2,770	1,186	0	7,856

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Tactical Automated Mission Planning System (TAMPS) is the Naval standard unit level automated mission planning system. It loads data for several aviation platforms and subsystems, including the Amphibious Warfare community (MH-53, CH-53, UH-1, AH-1, HH-60, SH-60B/R, CH-46, AV-8, V-22). In keeping with the Assistant Secretary of Defense C3I direction, TAMPS has been identified as a migration system. Various platform specific aircraft mission planning systems (e.g., Tactical EA-6B Mission Support System (TEAMS), Map Operator and Maintenance Station (MOMS), Common Helicopter Aviation Mission Planning System (CHAMPS), MOMS/AV-8B Maintenance Data Systems, ES-3 Mission Planning System, Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES) are planned to migrate into TAMPS. As part of the migration plan, the Amphibious Warfare community has identified the common helicopter mission planning functionality required on TAMPS to support Amphibious Assault aircraft mission planning.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS: Not Applicable.
2. (U) FY 1998 PLAN: Not applicable.
3. (U) FY 1999 PLAN:

(U) (\$453) To conduct a feasibility analysis of Common Helicopter Mission Planning requirements to be implemented as Navy Portable Flight Planning System (NPFPS) and TAMPS 7.0 requirements and to commence common airframe data loading.

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DATE: February 1998

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W2312

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Common Helicopters

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	4,941
(U) Appropriated Value:	0	0	0
(U) Adjustments from PRESBUD:	0	0	(4,488)
(U) FY 1999 President's Budget Submit:	0	0	453

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1999 net decrease consists of -\$4,445 thousand changes in program requirements; -\$8 thousand inflation adjustment and -\$35 thousand for the Navy Working Capital fund (NWCF) adjustment.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not Applicable

(U) RELATED RDT&E:

(U) PE 0604231N Mission Planning (E2213)

D. (U) SCHEDULE PROFILE: Not Applicable.

DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W2312

PROGRAM ELEMENT TITLE: Standards Development

PROJECT TITLE: Common Helicopters

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. SOFTWARE DEVELOPMENT	0	0	453
Total	0	0	453

(U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development NAWC Pt. Mugu	WX	11/99	7,856	7,856	0	0	0	453	7,403	7,856
Support and Management Test and Evaluation					0	0	0	0	0	0

GOVERNMENT FURNISHED PROPERTY: Not Applicable

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	0	0	0	453	7,403	7,856
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	0	453	7,403	7,856

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, Page 22 of 22 Pages)

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H0489 S-3 WSIP	8,010	2,097	4,376	2,130	468	465	470	0	307,416
W2217 Common Support Aircraft (CSA)	0	0	27,093	51,962	94,295	103,024	261,639	CONT	CONT
TOTAL	8,010	2,097	31,469	54,092	94,763	103,489	262,109	CONT	CONT

(U) MISSION DESCRIPTION AND BUDGET ITEM DESCRIPTION: H0489 S-3 WSIP - The current program provides continuation of a series of progressive modular improvements which began with the S-3 Weapon System Improvement Program (WSIP) Phase I (S-3A modified to S-3B configuration). Based upon the S-3 WSIP Operational Requirement, the full program achieves the required multi-mission operational capability through time-phased, selective mission avionics/processing upgrades that are pursued in priority order. Initial Nunn-funded development focused on the Co-Processor Memory Unit (CPMU) hardware, a joint U.S./Canadian industrial base development program which provides the core processing capability and open architecture required for future modular S-3B modification. This program will complete CPMU integration and test and rewrite existing Tactical Mission Program (TMP) code into Ada high order language.

(U) W2217 COMMON SUPPORT AIRCRAFT (CSA) - This project replaces the S-3B/ES-3A/E-2C/C-2 aircraft. The CSA project will study and determine the optimum aircraft design to provide a multi-place, common airframe/engine/core-avionics aircraft having sufficient internal volume, internal and external carriage capability, and provisions for mission-specific avionics, sensors, stores, and weapons. In addition to meeting the aircraft requirement of the S-3B/ES-3A/E-2C/C-2 aircraft, the common support airframe will be a primary candidate for the organic tanker mission.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604217N
PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

(U) COST: (Dollars in Thousands)

<u>PROJECT NUMBER & TITLE</u>	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
H0489 S-3 WSIP	8,010	2,097	4,376	2,130	468	465	470	0	307,416

A. (U) MISSION DESCRIPTION AND BUDGET ITEM DESCRIPTION: The current program provides continuation of a series of progressive modular improvements which began with the S-3 Weapon System Improvement Program (WSIP) Phase I (S-3A modified to S-3B configuration). Based upon the S-3 WSIP Operational Requirement, the full program achieves the required multi-mission operational capability through time-phased, selective mission avionics/processing upgrades that are pursued in priority order. Initial Nunn-funded development focused on the Co-Processor Memory Unit (CPMU) hardware, a joint U.S./Canadian industrial base development program which provides the core processing capability and open architecture required for future modular S-3B modification. This program will complete CPMU integration and test and rewrite existing Tactical Mission Program (TMP) code into Ada high order language.

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$200) Continued Ada software development for the CPMU.
- (U) (\$1,217) Began Ada software evaluation and verification. (NAWC/AD, PAX)
- (U) (\$ 800) Continued hardware and software development and integration.
- (U) (\$ 503) Began Navy combined developmental and operational (DT/OT) testing of CPMU.
- (U) (\$5,290) Identified for Synthetic Aperture Radar (SAR) demonstration.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: H0489

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: S-3 WSIP

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

2. (U) FY 1998 PLAN

- (U) (\$ 1,420) Continue Ada software development for the CPMU.
- (U) (\$ 677) Continue hardware and software development and integration.

3. (U) FY 1999 PLAN:

- (U) (\$3,646) Continue Ada software development for the CPMU.
- (U) (\$ 491) Continue hardware and software integration.
- (U) (\$ 239) Begin preliminary qualification testing of hardware and software.

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Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, Page 3 of 14)

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05	PROGRAM ELEMENT: 0604217N	PROJECT NUMBER: H0489
	PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement	PROJECT TITLE: S-3 WSIP

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	9,553	930	6,413
(U) Appropriation Value:		930	0
(U) Adjustments from PRESBUDG:	-1,543	+1,167	-2,037
(U) FY 1999 President's Budget Submit:	8,010	2,097	4,376

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of \$-1,543 thousand in FY97 reflects a SBIR adjustment (\$-230 thousand), a reprogramming (out) to support Lamps III Improvements (\$-1,300 thousand) and revised economic indices (\$-13 thousand). FY98 reflects a reprogramming (in) from LAMPS III Improvements (+\$1,300 thousand) as well as a net decrease of \$-133 thousand in FY98 reflects OSD/PBD adjustments. The net decrease of \$-2,037 thousand in FY99 reflects a Department of the Navy FY99 Program Review adjustment (\$-2,000 thousand) and a Navy Working Capital Fund (NWCF) adjustment (\$+37 thousand).

(U) Schedule: FY 1998 Milestone III decision changed from second to fourth quarter. FY 1997 development test milestone changed to first and second quarters FY 1998. FY 1998 operational test changed to second and third quarters FY 1998.

(U) Technical: Not Applicable

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u>	<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>TO</u>	<u>TOTAL</u>
	<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
(U) APN S-3* (OSIP 04-96) Co-Processor Memory Unit	3,974	6,556	6,444	7,922	6,927	5,524	7,481	18,691	67,780

* Reflects dollar amounts for the Co-Processor Memory Unit only.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: H0489

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: S-3 WSIP

(U) RELATED RDT&E:

(U) PE 0604261N (Air Deployed Active Receiver (ADAR)/Low Frequency Active (LFA))

(U) PE 0603790D (NUNN Funds)-Co-Processor Memory Unit (CPMU) (previously Mass Memory Unit))

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones		4Q/CPMU MS III		3Q/00 CPMU FLEET INTRODUCTION
Engineering Milestones			3Q/CPMU ADA FQT	
T&E Milestones		1Q-2Q CPMU DT II 2Q-3Q CPMU OT II		
Contract Milestones				

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Exhibit R-2, RDT&E Budget Item Justification
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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: H0489

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: S-3 WSIP

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Developmental Testing	503	411	610
b. Travel	40	44	20
c. Technical Support (CS)	290	100	100
d. Software Development	7,177	1,542	3,646
Total	8,010	2,097	4,376

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, Page 6 of 14)

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: H0489

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: S-3 WSIP

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Canadian Commercial Corp.										
	CPFF/Competition	7/91	14,500*	14,500*	2,183	0	0	0	0	2,183
*Includes NUNN Amendment funding (RDT&E), Defense Agencies, P.E. 0603700N) and Canadian funding (joint venture)										
LMTDS	CPFF/	1/95	29,818	29,818	18,860	156	1,542	3,646	5,614	29,818
Eagan,MN	Sole Source									
TI	SAR	5/97	4,519	4,519	0	4,519	0	0	0	4,519
Texas	Sole Source									
	Other Contracts less than \$1.0M	Var	6,321	6,321	6,321	0	0	0	0	6,321
	Miscellaneous	Var	2,291	2,291	865	495	0	0	931	2,291
Support and Management										
	Other Contracts less than \$1.0M									
	Miscellaneous	Var	1,731	1,731	1,118	330	144	120	19	1,731
Test and Evaluation										
	NAWC/AD PAX	6/97	5,767	5,767	0	2,163	411	610	2,583	5,767
	Other Contracts less than \$1.0M									
	Miscellaneous	Var	1,927	1,927	1,424	503	0	0	0	1,927

GOVERNMENT FURNISHED PROPERTY: Not Applicable

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, Page 7 of 14)

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: H0489

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: S-3 WSIP

	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	28,229	5,014	1,542	3,646	6,545	44,976
Subtotal Support and Management	1,118	330	144	120	19	1,731
Subtotal Test and Evaluation	1,424	2,666	411*	610*	2,583	7,694
Other FY95 and Prior Costs	253,015					253,015
Total Project	283,786	8,010	2,097	4,376	9,147	307,416

* Includes AVDLR

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

(U) COST: (Dollars in Thousands)

PROJECT

NUMBER &
TITLE

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W2217 Common Support Aircraft (CSA) - Proposed)	0	0	27,093	51,962	94,295	103,024	261,639	CONT	CONT

A. (U) W2217 COMMON SUPPORT AIRCRAFT (CSA) - This project replaces the S-3B/ES-3A/E-2C/C-2 aircraft. The CSA project will study and determine the optimum aircraft design to provide a multi-place, common airframe/engine/core-avionics aircraft having sufficient internal volume, internal and external carriage capability, and provisions for mission-specific avionics, sensors, stores, and weapons. In addition to meeting the aircraft requirement of the S-3B/ES-3A/E-2C/C-2 aircraft, the common support airframe will be a primary candidate for the organic tanker mission.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) Continued CSA study under PE #0605152N, Project Element W2092.

2. (U) FY 1998 PLAN:

- (U) Develop program strategies, budgets, and plans in preparation for initial milestone in FY99, under PE # 0605152N, Project Element N2092.

3. (U) FY 1999 PLAN:

- (U) (\$ 4,693) Stand up program team, initiate in-house studies, and develop concept exploration phase contractual documentation.
- (U) (\$22,400) Perform concept exploration studies.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: W2217

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: CSA

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	3,805	17,636
(U) Appropriation Value:			
(U) Adjustments from PRESBUDG:		-3,805	+9,457
(U) FY 1999 President's Budget Submit:	0	0	27,093

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: FY98 adjustment reflects HAC/SAC Conference Committee zeroing of CSA line "without prejudice". FY99 net increase of +\$9,457 thousand reflects an increase of +\$9,900 thousand for Resource Sponsor reprioritization of requirements, a balancing adjustment of -\$38 thousand, a Commercial Purchase Inflation adjustment of -\$478 thousand, and an increase for Navy Working Capital Fund (NWCF) surcharges of +\$73 thousand.
- (U) Schedule: Reflecting FY98 funding adjustments, Milestone 0 decision changed from 2Q/98 to 2Q/99 and Milestone I decision advanced from 1st quarter FY03 to 4th quarter FY01, reflecting revisions to program schedule.
- (U) Technical: Not Applicable

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) N/A

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: W2217

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: CSA

(U) RELATED RDT&E:

(U) PE 0605152N (Naval Aviation Studies)

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999 TO COMPLETE</u>	
Program			2Q/MS 0	3Q/00 MS I
Milestones				4Q/01 MS II
Engineering				
Milestones				
T&E				
Milestones				
Contract				
Milestones				

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Exhibit R-2, RDT&E Budget Item Justification
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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: W2217

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: CSA

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Travel	0	0	43
b. Technical Support (CS)	0	0	668
c. Product Development	0	0	26,382
Total	0	0	27,093

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Exhibit R-3, RDT&E Program Element/Project Cost breakdown
(Exhibit R-3, Page 12 of 14)

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: W2217

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: CSA

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
TBD	TBD	TBD				0	0	26,257	CONT	CONT
Other Contracts less than \$1.0M		TBD				0	0	793	CONT	CONT
Miscellaneous						0	0	0	CONT	CONT
Support and Management										
Other Contracts less than \$1.0M		TBD				0	0	0	CONT	CONT
Miscellaneous						0	0	43	CONT	CONT
Test and Evaluation										
Other Contracts less than \$1.0M						0	0	0	CONT	CONT

GOVERNMENT FURNISHED PROPERTY: Not Applicable

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: W2217

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement

PROJECT TITLE: CSA

	<u>Total</u> <u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Actual</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Production Development	0	0	0	27,050	CONT	CONT
Subtotal Support and Management	0	0	0	43	CONT	CONT
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	0	27,093	CONT	CONT

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Exhibit R-3, RDT&E Program Element/Project Cost breakdown
(Exhibit R-3, Page 14 of 14)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N
 PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & Title	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	To Complete	Total Program
X0532 FLEET AIR OCEAN EQUIPMENT	1,518	1,965	0	0	0	0	0	0	12,410
R/X1740 AIR/OCEAN SURVEY ENGINEERING Sensors (Beginning in FY 1998 claimancy shifts from ONR to SPAWAR)	1,700	1,809	0	0	0	0	0	0	13,559
X1752 TACTICAL ENVIRONMENTAL SUPPORT SYSTEM - TESS (ENG)	1,986	2,124	0	0	0	0	0	0	16,293
X2345 Fleet METOC Equipment	0	0	4,309	4,471	4,611	4,745	4,889	CONT.	CONT.
X2346 METOC Sensor Engineering	0	0	1,853	1,653	1,581	1,558	1,582	CONT.	CONT.
TOTAL	5,204	5,898	6,162	6,124	6,192	6,303	6,471	CONT.	CONT.

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Budget Item Justification
 (Exhibit R-2, Page 1 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Air/Ocean Equipment Engineering (AOEE) Program Element provides for the engineering and manufacturing development of onboard and remote sensors, communication interfaces, and processing and display devices. This equipment is specifically designed to measure, ingest, store, process, distribute and display meteorological and oceanographic (METOC) parameters essential to the optimum employment of Naval warfare systems. AOEE also develops increased capabilities for shipboard and shore based tactical systems. In addition, AOEE provides for the engineering development of specialized equipment and measurement techniques to obtain METOC data in denied and remote areas.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2345
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: Fleet METOC Equipment

(U) COST (Dollars in thousands)

PROJECT NUMBER & Title	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	To Complete	Total Program
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X2345 Fleet METOC Equipment (Beginning in FY99 this is the consolidation of projects X0532 and X1752).

	0	0	4,309	4,471	4,611	4,745	4,889	CONT.	CONT.
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A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides for the engineering and manufacturing development of sensors, communication interfaces, and processing and display equipment. This equipment is designed to measure, ingest, store, process, distribute and display meteorological and oceanographic (METOC) parameters and derived products. Major emphasis areas include the Tactical Environmental Support System (TESS), the Navy Integrated Tactical Environmental Subsystem (NITES), the Marine Corps Meteorological Mobile Facility (METMF), the AN/SMQ-11 satellite receiver/recorder, weather radars, and the development of new sensors such as active and passive atmospheric profilers for incorporation into the Shipboard Meteorological and Oceanographic Observing System (SMOOS). This project also exploits new GOTS/COTS technologies for the Navy's computer-based tactical shipboard and shore capability used to predict and assess the impact of the operating environment on the performance of platforms, weapons and sensor systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

From Project X0532:

- (U) (\$446) Continued test, evaluation and adaptation of GOTS/COTS technology in support of data connectivity, interfaces and C2 systems.
- (U) (\$215) Continued engineering development of the TAC-4 TESS/NITES workstation.
- (U) (\$360) Continued system engineering of AN/SMQ-11.
- (U) (\$450) Continued system engineering of METMF (Replacement).

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Budget Item Justification
(Exhibit R-2, Page 3 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2345
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: Fleet METOC Equipment

- (U) (\$47) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conduct associated C4ISR analyses and studies.

From Project X1752:

- (U) (\$703) Continued NRL Lead Laboratory tasks of software integration, assisting model developers and providing technical assistance to other activities.
- (U) (\$695) Continue integration of TAC-4 TESS/NITES software build.
- (U) (\$526) Continue convergence of TESS and NITES software.
- (U) (\$62) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conduct associated C4ISR analyses and studies.

2. (U) FY 1998 PLAN:

From Project X0532:

- (U) (\$250) Continue test, evaluation and adaptation of GOTS/COTS technology in support of data connectivity, interfaces and C2 systems.
- (U) (\$265) Complete engineering development of the TAC-4 TESS/NITES workstation.
- (U) (\$232) Begin engineering development of electro-optical profiler.
- (U) (\$221) Begin engineering development of Moriah.
- (U) (\$479) Continue system engineering of AN/SMQ-11.

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Budget Item Justification
(Exhibit R-2, Page 4 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2345
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: Fleet METOC Equipment

- (U) (\$480) Continue systems engineering of METMF (Replacement).
- (U) (\$38) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conduct associated C4ISR analyses and studies.

From Project X1752:

- (U) (\$680) Continue NRL Lead Laboratory tasks of software integration, assisting model developers and providing technical assistance to other activities.
- (U) (\$250) Complete integration of TAC-4 TESS/NITES software build.
- (U) (\$500) Begin integration of TAC-5 TESS/NITES software build.
- (U) (\$496) Continue convergence of TESS and NITES software.
- (U) (\$158) Begin integration of advanced data base and visualization tools.
- (U) (\$40) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conduct associated C4ISR analyses and studies.

R-1 Line Item 87

Budget Item Justification
(Exhibit R-2, Page 5 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2345
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: Fleet METOC Equipment

3. (U) FY 1999 PLAN:

- (U) (\$295) Continue test, evaluation and adaptation of GOTS/COTS technology in support of data connectivity, interfaces and C2 systems.
- (U) (\$400) Continue engineering development of electro-optical profiler.
- (U) (\$400) Continue engineering development of Moriah.
- (U) (\$488) Continue system engineering of AN/SMQ-11.
- (U) (\$300) Continue systems engineering of METMF (Replacement).
- (U) (\$725) Continue NRL Lead Laboratory tasks of software integration, assisting model developers and providing technical assistance to other activities.
- (U) (\$314) Continue integration of TAC-5 TESS/NITES software build.
- (U) (\$575) Complete convergence of TESS and NITES software.
- (U) (\$467) Begin integration of converged TESS/NITES software.
- (U) (\$251) Continue integration of advanced data base and visualization tools.
- (U) (\$94) Develop and update overarching C4ISR mission requirements and conduct associated C4ISR analyses and studies.

R-1 Line Item 87

Budget Item Justification
(Exhibit R-2, Page 6 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2345
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: Fleet METOC Equipment

B. (U) PROGRAM CHANGE SUMMARY:	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Adjustments from FY 1998 PRESBUDG:	0	0	+4,309
(U) FY 1999 President's Budget Submit:	0	0	4,309

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1999: (+\$4,401) Zero sum restructuring of the Oceanographer of the Navy's program by consolidating all RDT&E under a single Program Manager; reducing total number of projects and aligning them with the new Battlespace METOC Data Acquisition, Assimilation, and Applications (BMDA³) Program Architecture. Project X2345 supports the METOC Data Acquisition portion of BMDA3 and merges the engineering and manufacturing development of installed equipment and sensors previously conducted under Projects X0532 and X1752. The funding profile also reflects the reprogramming of a portion of FY 1999 and out-year RDT&E funds to OPN. (-\$92) Minor Navy adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

R-1 Line Item 87

Budget Item Justification
(Exhibit R-2, Page 7 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2345
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: Fleet METOC Equipment

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	To Complete	Total Program
(U) OPN line 4226	9,789	14,233	24,986	26,774	28,334	28,856	29,423	CONT.	CONT.

(U) RELATED RDT&E: PE 0603207N, Air/Ocean Tactical Applications.

D. (U) SCHEDULE PROFILE: Not applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2345
 PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: Fleet METOC Equipment

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware Engineering	0	0	3,530
b. Software Engineering	0	0	729
c. Travel	0	0	50
Total	0	0	4,309

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1995 & Prior</u>	<u>FY 1996 Budget</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development											
NRL	WX	N/A	CONT.	CONT.	0	0	0	0	4,309	CONT.	CONT.

Support and Management

Test and Evaluation

GOVERNMENT FURNISHED PROPERTY: N/A

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2345
 PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: Fleet METOC Equipment

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1995 & Prior</u>	<u>FY 1996 Budget</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Support and Management										
Test and Evaluation										
Subtotal Product Development				0	0	0	0	4,309	CONT.	CONT.
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project				0	0	0	0	4,309	CONT.	CONT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2346
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: METOC Sensor Engineering

(U) COST (Dollars in Thousands)

PROJECT NUMBER & Title	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	To Complete	Total Program
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X2346 METOC Sensor Engineering (Beginning in FY98, project R1740 becomes X2346).

	0	0	1,853	1,653	1,581	1,558	1,582	CONT.	CONT.
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A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides for the engineering and manufacturing development of specialized, high resolution instrumentation systems and measurement techniques for obtaining near real-time in-situ meteorological and oceanographic (METOC) data in denied or remote areas. The objectives are to ruggedize and package systems, sensors and instruments to survive the harsh littoral environment and also to meet demanding requirements for timeliness and accuracy. Engineering is performed within this project to ensure that air and safety certification for deployment from fleet aircraft or ships is met and that the proper data formats are employed for integration into existing or planned communications and displays. The end products are sensors and systems that will provide the tactical commander with near real-time, in-situ METOC data for operational use. In addition, this difficult to obtain data will provide important inputs for predictive models in areas of potential interest.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

From Project R1740:

- (U) (\$1,100) Continued sensor development/transition plans on AN/WSQ-6 buoys. Continued wind/wave buoy sensor development for AN/WSQ-6, XAN-5 and XAN-6 variants.
- (U) (\$600) Tactical Air Vehicle METOC sensors; transition Tactical Dropsonde sensors from 6.4 Ocean Measurement Sensors (OMS) program to 6.5 development for Tactical Aircraft applications.

2. (U) FY 1998 PLAN:

From Project R1740:

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2346
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: METOC Sensor Engineering

- (U) (\$948) Continue development/transition of wind/wave variants of AN/WSQ-6 (series) buoys for NAVOCEANO. Add Global Positioning System (GPS)/self mooring capability to wave variants.
 - (U) (\$861) Continue tactical air vehicle METOC Sensor 6.5 development. Institute transition of tactical dropsonde capability to NAVAIR PMA 222/299 (Program Offices for Air Expendable and SH60 community), coordinate joint requirements with U.S. Air Force/U.S. Marine Corp/U.S. Army.
3. (U) FY 1999 PLAN:
- (U) (\$373) Complete AN/WSQ-6 buoy development/transition to NAVOCEANO.
 - (U) (\$756) Continue development transition of tactical dropsonde capability to NAVAIR PMA 264 for P-3 S-3 community, PMA 299 for SH60R transition and acquisition sponsorship by PMA 222.
 - (U) (\$294) Initiate 6.5 development of microsensor based miniature weather stations/buoys based on Defense Advanced Research Projects Agency/Office of Naval Research developed Micro Electro Mechanical (MEMS) technology.
 - (U) (\$400) Begin engineering development of METOC Air, Surface, Undersea Reconnaissance Equipment (MEASURE).
 - (U) (\$30) Develop and update overarching C4ISR mission requirements and conduct associated C4ISR analyses and studies.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2346
PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: METOC Sensor Engineering

B. (U) PROGRAM CHANGE SUMMARY:	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Adjustments from FY 1998 PRESBUDG:	0	0	+1,853
(U) FY 1999 President's Budget Submit:	0	0	1,853

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1999: (+\$1,886) Zero sum restructuring of the Oceanographer of the Navy's program by consolidating all RDTE under a single Program Manager. Other than the number modification from R1740 to X2346, this project remains unchanged. (-\$33) Minor Navy adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not Applicable.

(U) OTHER RDT&E: PE 0602435N (Ocean and Atmospheric Technology)
PE 0603207N (Air/Ocean Tactical Applications)

D. (U) SCHEDULE PROFILE: Not Applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2346
 PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: METOC Sensor Engineering

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware Engineering	0	0	1,476
b. Travel	0	0	28
c. Software Engineering	0	0	349
Total	0	0	1,853

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1995 & Prior</u>	<u>FY 1996 Budget</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
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Product Development

NRL	WX	N/A	CONT.	CONT.	0	0	0	0	1,853	CONT.	CONT.
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Support and Management

Test and Evaluation

GOVERNMENT FURNISHED PROPERTY: N/A

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Budget Item Justification
(Exhibit R-3, Page 14 of 15)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604218N PROJECT NUMBER: X2346
 PROGRAM ELEMENT TITLE: Air/Ocean Equipment Engineering PROJECT TITLE: METOC Sensor Engineering

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1995 & Prior	FY 1996 Budget	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Support and Management										
Test and Evaluation										
Subtotal Product Development				0	0	0	0	1,853	CONT.	CONT.
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project				0	0	0	0	1,853	CONT.	CONT.

R-1 Line Item 87

Budget Item Justification
(Exhibit R-3, Page 15 of 15)

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604221N

PROGRAM ELEMENT TITLE: P-3 Modernization Program

(U) COST: (Dollars in Thousands)

<u>PROJECT NUMBER & TITLE</u>	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
H1152 and H2417 P-3 Sensor Integration	7,525	13,025	3,046	3,118	3,171	3,215	3,284	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM DESCRIPTION: This program provides upgrades to P-3C aircraft systems to enhance surface and subsurface tracking, classification, and attack capabilities. The P-3C Sensor Integration project develops software necessary to integrate advanced sensors into embedded P-3C Update III computer systems.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$3,825) Continued developmental testing of Tactical Mission Software (TMS)/Airborne Operational Program (AOP) supporting IEER integration.
- (U) (\$2,000) Continued Antisurface Warfare Improvement Program (AIP) Pre-Planned Product Improvement (P³I).
- (U) (\$1,000) Began Programmable Entry Panel development (PEP).
- (U) (\$700) Continued system engineering support for proper integration of new sensors.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604221N

PROJECT NUMBER: H1152

PROGRAM ELEMENT TITLE: P-3 Modernization Program

PROJECT TITLE: P-3 Sensor Integration Program

2. (U) FY 1998 PLAN:

- (U) (\$500) Continue system engineering support for proper integration of new sensors.
- (U) (\$1,896) Complete developmental and operational testing of TMS/AOP supporting IEER integration and conduct SRR.
- (U) (\$629) Aviation Depot Level Repairable (AVDLR).
- (U) (\$2,000) Design APS-137 upgrade for Precision Targeting and Enhanced SAR mode.
- (U) (\$8,000) Design workload sharing between tactical crew station and data fusion of off-board and on-board sensor data, as well as improve sensor capabilities.

3. (U) FY 1999 PLAN:

- (U) (\$500) Continue system engineering support for proper integration of new sensors.
- (U) (\$1,826) Continue IEER integration and conduct PDR and CDR.
- (U) (\$720) Aviation Depot Level Repairable (AVDLR).

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Exhibit R-2, RDT&E Budget Item Justification
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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604221N

PROJECT NUMBER: H1152

PROGRAM ELEMENT TITLE: P-3 Modernization Program

PROJECT TITLE: P-3 Sensor Integration Program

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	7,703	3,191	3,023
(U) Appropriation Value:		13,191	0
(U) Adjustments from PRESBUDG:	-178	+9,834	+23
(U) FY 1999 President's Budget Submit:	7,525	13,025	3,046

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of \$-178 thousand in FY97 reflects a SBIR adjustment (\$-168 thousand) and a minor pricing adjustment (\$-10 thousand). The net increase of +\$9,537 thousand in FY98 reflects a Congressional add of \$10,000 thousand for P-3 AIP Sensors as well as a net decrease of \$-463 thousand for congressional adjustments. The net increase of \$+23 thousand in FY99 reflects an adjustment from the NWCF (\$+86 thousand), inflation adjustments (\$-29 thousand) and minor program adjustments (\$-34 thousand).

(U) Schedule: FY98 Test and Evaluation milestones are changed from 2nd quarter to 3rd quarter and title changed to TMS/AOP. TMS/AOP DT/OT III has been consolidated with IEER DT III and OT III. FY98 Engineering milestones adds 3rd quarter IEER Systems Requirements Review (SRR) and FY99 Engineering milestones adds 1st quarter IEER Preliminary Design Review (PDR) which were previously scheduled but erroneously not reported.

(U) Technical: Not Applicable

C. (U) OTHER PROGRAM FUNDING SUMMARY: None

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604221N
PROGRAM ELEMENT TITLE: P-3 Modernization Program

PROJECT NUMBER: H1152
PROJECT TITLE: P-3 Sensor Integration Program

(U) RELATED RDT&E:

(U) PE 0606261N (Acoustic Search Sensors developing software and acoustic algorithms).

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				
Engineering Milestones		3Q/IEER SRR	1Q/IEER PDR 3Q/IEER CDR	
T&E Milestones		3Q/TMS/AOP		2Q/01 IEER DT III 4Q/01 IEER OT III
Contract Milestones				

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Exhibit R-2, RDT&E Budget Item Justification
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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604221N
PROGRAM ELEMENT TITLE: P-3 Modernization Program

PROJECT NUMBER: H1152
PROJECT TITLE: P-3 Sensor Integration Program

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering Support	5,131	10,311	1,766
b. Technical Support (CS)	700	1,120	500
c. Travel	180	165	60
d. Test and Evaluation	1,514	1,429	720
Total	7,525	13,025	3,046

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, Page 5 of 7)

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604221N
PROGRAM ELEMENT TITLE: P-3 Modernization Program

PROJECT NUMBER: H1152
PROJECT TITLE: P-3 Sensor Integration Program

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
RBC (Arl, VA) C/FFP		8/89	4,894	4,894	4,894	0	0	0	0	4,894
RBC (Arl, VA) C/FFP		11/94	4,165	4,165	2,165	0	0	0	2,000	4,165
LMTDS (Eagan, MN) SS		3/96	9,860	9,860	7,860	2,000	0	0	0	9,860
LMTDS (Eagan, MN) SS		7/98	4,000	4,000	0	0	4,000	0	0	4,000
LMFS (Manassas,VA)SS		9/97	1,000	1,000	0	1,000	0	0	0	1,000
CDI(Bloomington,MN)SS		6/97	3,000	3,000	3,000	0	0	0	0	3,000
RTIS (McK.,TX) C/FFP		2/98	1,500	1,500	0	0	1,500	0	0	1,500
Other contracts less than \$1.0M		Var			6,388	0	0	0	0	6,388
NAWC/AD		10/98			11,638	2,831	5,486	2,266	CONT	CONT
Support and Management										
Miscellaneous > \$1.0M		Var			259	180	60	60	CONT	CONT
Test and Evaluation										
NAWC/AD		N/A			0	1,514	0	0	CONT	CONT
Miscellaneous > \$1.0M					200	0	979	720	CONT	CONT

GOVERNMENT FURNISHED PROPERTY: Not Applicable

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604221N
PROGRAM ELEMENT TITLE: P-3 Modernization Program

PROJECT NUMBER: H1152
PROJECT TITLE: P-3 Sensor Integration Program

	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	35,945	5,831	11,986	2,266	CONT	CONT
Subtotal Support and Management	259	180	60	60	CONT	CONT
Subtotal Test and Evaluation	200	1,514	979*	720*	CONT	CONT
Total Project	36,404	7,525	13,025	3,046	CONT	CONT

* Includes AVDLR

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY:5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E2213 Mission Planning	3,849	9,478	13,637	11,330	14,402	14,645	14,571	CONT.	CONT.
R2295 JDISS	2,439	0	0	0	0	0	0	0	2,439
X0486 JMCIS Tactical/Mobile	2,571	2,924	3,129	3,040	3,215	3,858	4,213	CONT.	CONT.
X0709 JMCIS Afloat	7,264	6,344	9,174	8,742	9,905	10,649	9,992	CONT.	CONT.
X2009 JMCIS OED	1,158	1,995	1,964	2,020	2,026	2,233	2,278	CONT.	CONT.
X2041 JMCIS Ashore	5,727	6,318	6,030	5,891	6,119	8,240	9,921	CONT.	CONT.
X0521 Shipboard Tactical Intelligence Processing (STIP)	6,041	4,919	6,803	7,037	6,714	6,544	6,430	CONT.	CONT.
X2215 Joint Interoperability	0	0	2,463	2,714	2,991	4,096	3,787	CONT.	CONT.
X2216 C4I for Joint Littoral Warfare (JLW)	0	0	3,426	3,636	7,272	11,032	13,240	CONT.	CONT.
X2305 Navy Common Operating Environment (COE)/JSTARS	0	6,777	1,860	2,000	2,048	2,089	2,136	CONT.	CONT.
X2306 Naval Simulation System	0	2,392	1,746	2,305	2,364	2,511	2,713	CONT.	CONT.
X2307 Shipboard LAN/WAN	0	484	481	479	518	527	537	CONT.	CONT.
TOTAL	29,052	41,631	50,713	49,194	57,574	66,424	69,818	CONT.	CONT.

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Budget Item Justification

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY:5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Tactical Command System (TCS) upgrades the Navy's Command Control, Computer and Intelligence (C³I) systems and processes C³I information for all warfare mission areas including planning, direction and reconstruction of missions for peacetime, wartime and times of crises. A major component of the TCS is the Joint Maritime Command Information System (JMCIS). JMCIS is the Navy's fielded Command and Control system, a key component of the *Copernicus ... Forward* C4I strategy, and is the Navy's tactical implementation of the Global Command and Control System (GCCS). JMCIS has aggressively pursued an evolutionary acquisition strategy in rapidly developing and fielding new C4I capabilities for JMCIS Afloat, JMCIS Ashore, JMCIS Tactical /Mobile and JMCIS OED users. JMCIS latest phase includes migration to the Defense Information Infrastructure (DII), incorporation of Fleet requirements for merging tactical and non-tactical networks, and application of mature Web and Personal Computer (PC) technologies to provide required information/capabilities. This phase will provide, in the short term, deployment of a PC/COTS based Naval implementation of GCCS which will provide the warfighter with a cost-effective, user-friendly, comprehensive C4I solution and, in the long-term, a continuous, integrated command and control link from sensor to shooter, including full-range real-time or near-real-time information to weapon systems for decision makers.

JMCIS Afloat provides tactical commanders with an accurate, reliable, survivable and consistent tactical picture which includes complete all-source information management, display and dissemination, rapid access to organic/theater/national intelligence and databases, and multi-source data fusion and imagery exploitation. JMCIS Afloat development is provided in the JMCIS Afloat project and, additionally, in these projects: Shipboard Tactical Intelligence Processing (STIP) - an integrated tactical intelligence shipboard processing system which is the central database for the shipboard Tactical Flag Command Center, the Command and Control Warfare Commander (C2WC) and tactical mission planning systems; Joint Interoperability - a program which develops updates to JMCIS software applications to meet Joint interoperability requirements for sharing of C4I data and reuse; and Joint Littoral Warfare - a program to add and/or enhance JMCIS in such areas as mine warfare and countermeasures, Theater Air Traffic Defense, Theater Ballistic Missile Defense, and coastal ASW and amphibious assault. JMCIS Ashore develops systems which provide the Chief of Naval Operations (CNO), Fleet Commanders in Chief (FLTICINCs) and Unified Commanders a single, integrated command and control system to process the combat readiness, positional information, and employment scheduling of own and allied forces. JMCIS Tactical/Mobile develops systems which provide fixed-site and mobile command centers and provide support for Maritime patrol and surveillance missions. JMCIS Tactical/Mobile systems provide the current tactical picture, preflight mission planning, postflight data analysis, data management, safety of flight communications, and tactical data communications. JMCIS OED develops a shore-based intelligence system which provides on-line, automated, near-real time, multiple level secure command and control support to the Unified and Specified Commanders afloat and ashore. A peripheral JMCIS development, the Navy Common Operating Environment (COE) will design, develop, update, integrate, test and evolve a Navy COE for all Naval C4I systems based on the Joint DII COE.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY:5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

This program contains the fundamental building blocks for all fielded JMCIS C4I systems in the Navy, Marine Corps, and Coast Guard.

The Naval Simulation System (NSS) provides the capability to simulate warfare and operations other than war for Course of Action Assessment. This assessment will be used by acquisition planners for requirements analysis and cost effectiveness analysis determination for future naval systems. NSS will also support Command Level training for operational forces and will be integrated into JMCIS.

The Shipboard LAN/WAN, a component of the Naval Tactical Command Support System (NTCSS) (a support system for management of the information, personnel, material and funds required to maintain and operate ships, submarines and aircraft), develops and integrates multi-level security capabilities on unclassified networks used by/managed by NTCSS.

The Tactical Aircraft Mission Planning System (TAMPS) is the Naval standard unit level aircraft mission planning system and provides data loading capabilities for all aviation platforms and subsystems. TAMPS is interoperable with and uses TCS components for data feed.

Joint Surveillance Target Attack Radar System (JSTARS) is an airborne surveillance and target acquisition system that provides real-time, accurate information for peacekeeping or decision making on the battlefield. JSTARS detects, locates, classifies, tracks, and targets potentially hostile ground movement in all weather.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: These programs are funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY:5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E2213 Mission Planning	3,849	9,478	13,637	11,330	14,402	14,465	14,571	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Tactical Automated Mission Planning System (TAMPS) is the Naval standard unit level aircraft mission planning system. It loads data for the following aviation platforms and subsystems: F/A-18, F-14, E-2C, V-22, C-2, KC-130, AH-1, SH-60, MH-53, HH-60, UH-1, VH-1, P-3C, High-speed Anti Radiation Missile (HARM), Joint Stand-Off Weapon (JSOW), Joint Directed Attack Munitions (JDAM), Stand-off Land Attack Missile (SLAM), Joint Tactical Information and Distribution System (JTIDS), Global Positioning System (GPS), ARC-210, and Forward Area Minefield Planner (FAMP). TAMPS loads the F/A-18 Data Storage Unit (DSU) with route of flight data (way points, sequential steering files), air-to-air radar presets, Tactical Aircraft Navigation Aid (TACAN) and channel identification files. The Data Storage Unit (DSU) in turn provides this TAMPS information to the F/A-18 flight software. Without the TAMPS load of "independent overlays" for the aircraft software and bulk files for missile software, weapons such as SLAM, JSOW and JDAM will be unusable. TAMPS currently is the primary means of loading JTIDS data for the F-14D/E-2C. Future systems such as Tactical Aircraft Moving Map Capability (TAMMAC) are planning to use TAMPS for mission planning and data loads. In keeping with the Assistant Secretary of Defense (C³I) direction, TAMPS has been identified as a migration system. Various platform specific aircraft mission planning systems (e.g., Tactical EA-6B Mission Support System (TEAMS), Map Operator and Maintenance Station (MOMS), Common Helicopter Aviation Mission Planning System (CHAMPS), MOMS/AV-8B Maintenance Data System, ES-3 Mission Planning System, Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES) are planned to neck down into TAMPS. TAMPS is interoperable with and uses the Joint Maritime Command Information System (JMCIS) for data feeds. FY 96 is the first year of RDT&E funding for this project.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: E2213

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: Mission Planning

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$3,849) Developed and integrated TAMPS version 6.2. Efforts included the integration of the following modules and functionalities: TAMMAC, H-1 mission planning module, Joint Service Imagery Processing System (JSIPS) interface, Tactical Strike Coordination Module (TSCM), and Tactical Operational Scene (TOPSCENE). This release included improvements to the following modules and functionalities: E-2C module and SLAM module. The inclusion of the following requirements was part of TAMPS version 6.2: full duplex security, Local Area Network (LAN), Commercial Off-the Shelf (COTS) and operating system upgrades, port to a new hardware suite, intelligence data base in standard extract format and update (MIDB 2.0). System Engineering studies were conducted to identify requirements for various platform specific aircraft mission planning systems (e.g. CHAMPS, MOMS, H-60, Anti Submarine Warfare (ASW)) to continue with the execution of the migration plan.

2. (U) FY 1998 PLAN:

- (U) (\$9,478) The TAMPS version 7.0 major release development will commence. The Navy mission planning system will transition to a PC based environment. TAMPS will no longer be a UNIX based system. The initial phase of the PC based system transition begins with development and deployment of the Navy PC Flight Planning System (PFPS). This effort is in conjunction with Air Force. Begin Defense Information Infrastructure-Common Operating Environment (DII-COE) compliant architecture development. Conduct System Engineering studies to identify requirements for various platform specific aircraft mission planning systems. (Note: The previously planned TAMPS version 6.3 effort has been redefined as a maintenance release 6.2.1). Develop Force Level Decision Support Tools to fulfill the TAMPS Operational Requirements Document (ORD) Integrated Strike Planning Support requirement.

3. (U) FY 1999 PLAN:

- (U) (\$13,637). Continue TAMPS 7.0 development effort. Development and deployment of Navy PFPS will be completed. Continue development of DII-COE compliant architecture. This new architecture will culminate with TAMPS Mission Planning capabilities fully operational in the PC environment. (Note: Tamps version 6.4 has been redefined as

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: E2213

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: Mission Planning

continued maintenance of version 6.2) Continue maturity of Force Level Decision Support Tools by developing tools for weaponeering and threat suppression and weapons to targets allocation managers.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	2,226	2,412	9,061
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG:	+1,623	+7,066	+4,576
(U) FY 1999 PRESIDENT'S Budget Submit:	3,849	9,478	13,637

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

The FY 1997 net increase consists of +\$1,623K for TAMPS HMI Improvements.

The FY 1998 net increase reflects +\$7,423K for TAMPS Version 7.0 development, a decrease of -\$66K for Contract Advisory and Assistance Services; and -\$291K for various other Congressional general reductions.

The FY 1999 net increase consists of +\$4,849K to migrate TAMPS client servers; -\$240K inflation adjustment; and -\$33K for NWCF minor pricing adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: E2213

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Mission Planning

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN	9,451	15,338	23,666	23,052	16,947	20,467	14,355	CONT	CONT
(U) O&MN	1,811	2,234	4,330	5,821	7,469	7,195	7,245	CONT	CONT

(U) RELATED RDT&E:

(U) PE 0204229N (TOMAHAWK)

(U) PE 0604215N (Standards Development)

D. (U) SCHEDULE PROFILE: Not Applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: E2213

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: Mission Planning

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. SOFTWARE DEVELOPMENT	3,849	9,478	13,637
Total	3,849	9,478	13,637

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: E2213

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Mission Planning

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands):

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>FY 1996 &Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Contract	C/TBD	10/98			0	0	4,596	8,626	Cont	Cont
NAWC Pt Mugu	WX	10/98			3,186	2,267	2,511	2,750	Cont	Cont
Misc.	WX	10/98			249	1,224	1,296	852	Cont	Cont
Support and Management										
Misc	WX	10/98			351	358	1,000	1,300	Cont	Cont
Test and Evaluation										
NAWC	WX	10/98			77	0	75	109	Cont	Cont
Patuxent River										

GOVERNMENT FURNISHED PROPERTY: Not Applicable

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: E2213

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: Mission Planning

	<u>FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	3,435	3,491	8,403	12,228	Cont	Cont
Subtotal Support and Management	351	358	1,000	1,300	Cont	Cont
Subtotal Test and Evaluation	77	0	75	109	Cont	Cont
Total Project	3,863	3,849	9,478	13,637	Cont	Cont

C. (U) FUNDING PROFILE: Not Applicable

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
JMCIS Tactical/Mobile (JTM) X0486	2,571	2,924	3,129	3,040	3,215	3,858	4,213	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The JMCIS Tactical/Mobile (JTM) Systems include both fixed sites (Tactical Support Centers (TSCs)) and mobile components (Mobile Operations Control Centers (MOCCs), Mobile Ashore Support Terminals (MASTs) and Mobile Integrated Command Facilities (MICFACs)). These centers provide the Navy Component Commander, the Maritime Sector Commander (Ashore), the Theater Commander (Ashore) or the Naval Liaison Element Commander (Ashore) with the capability to plan, direct and control the tactical operations of Joint and Naval Expeditionary Forces and other assigned units within his respective area of responsibility. These operations include littoral and open ocean surveillance, anti-surface warfare, over-the-horizon targeting, counter-drug operations, power projection, antisubmarine warfare, mining, search and rescue, and special operations. TSCs consist of C⁴I systems (based on the Joint Maritime Command Information System (JMCIS) common architecture) which will evolve to the JMCIS architecture based upon NT personal computers, and in compliance with the implementation of the Defense Information Infrastructure (DII) Common Operating Environment (COE); air-ground, satellite and point-to-point communications systems; sensor analysis capabilities; avionics and weapons system interfaces and facilities equipment. MOCC is a rapidly-deployable, self-contained, take-what-you-need C⁴I system which can be transported in two fleet-configured P-3 aircraft for contingency operations. For example, a MOCC has been deployed to Bosnia for support of P-3 operations and to provide an on-site C4I capability. MAST and MICFAC are miniaturized mobile facilities designed to support a theater commander or naval liaison element ashore. MAST provides a deployable (in a C-130 aircraft) basic C4I capability for rapid deployment to remote locations. Support of the Liberian contingency operations is an example. The MICFAC is a robust C4I system deployable (in a C-5 / C-17 class aircraft) that can support a numbered fleet commander's staff ashore. MICFAC Bahrain has acted as the C4I command center when the hard site was undergoing upgrades. This program assures that existing TSC's, MOCC's, MAST's and MICFAC's remain interoperable with other JMCIS '98 platforms, Joint, NATO and allied forces. JTM systems leverage other JMCIS '98 systems while following the Copernicus Forward Architecture. TSC/MOCC's will continue to support P-3C/S-3B updates to sensors and weapons systems, such as the Anti-Surface Warfare Improvement Program (AIP).

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X0486

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JTM

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$20) Supported Milestone IIIB decision (Q1) for Fleet Release of TMS 2.0.
- (U) (\$174) Updated common JMCIS/DII software, in conjunction with other programs.
- (U) (\$356) Continued to upgrade data server to operate on standard tactical computer workstations; include additional USMTF, Link 11 message data, technical data (ESM, acoustic, NIPS) and utilize the JMCIS/DII core software.
- (U) (\$162) Captured/integrated tactical decision aids and imagery segment updates with maximum utilization of existing segments.
- (U) (\$84) Continued to investigate and apply available trusted software technology.
- (U) (\$225) Updated TMS LAN/WAN interface to the NCCS Ashore system and SIPRNET.
- (U) (\$209) Updated tape operating system, imagery and ESM Analysis Workstation functionality in TMS software.
- (U) (\$717) Conducted system integration, testing, documentation, training for Increment III (JMCIS 3.1) to incorporate updated mission planning, communication, and post mission analysis capabilities, as well as interoperability among post-mission analysis, aircrew brief, PID, and tactical planning modules in both TSC and MOCC configurations. Supported the P-3C Anti-Surface Warfare Improvement Program (AIP) interoperability requirements. Continued TSC migration to multi TADIL interfaces.
- (U) (\$307) Developed measures for system achievement of major effectiveness parameters of the OR in areas of mission-supported and communications system performance for Increment III. Migrated to DII COE.
- (U) (\$67) Continued security certification and support security accreditation for JMCIS 3.1.
- (U) (\$70) Continued progress to DTIIC and plan to update one TSC site to an operational test configuration; leading to a Milestone IIIC (FY98) decision for Fleet Release of JMCIS 3.1 which will be DII compliant. Captured and incorporated additional WAN capabilities into TSC/MOCC for interface to other JMCIS/DII systems.

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X0486

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JTM

- (U) (\$180) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.
2. (U) FY 1998 PLAN:
- (U) (\$1,519) Complete JMCIS 3.1 system integration with an objective of an Operational Test 1st Qtr 1998 and a Milestone IIIC review 2nd Qtr 1998. JMCIS 4.0 software will continue to implement DII compliant software, P-3C AIP support systems and the initial introduction of NT-PC servers and workstations to act as TSC workstations. The Tactical Mobile Variants (TMV) (MOCC, MAST, MICFAC), will also receive C4I upgrades and undergo a concurrent Operational Test with the TSC.
 - (U) (\$296) Support an OT IIC (Q1) leading to a Milestone IIIC decision (Q2) for fleet release and installation of TSC 3.0.
 - (U) (\$847) Provide support for new aircraft sensor capabilities associated with the P-3C AIP, and upgrades to support EER, high resolution Synthetic Aperture Radar (SAR), shallow water acoustic analysis and advanced ESM systems. Evaluate support for new acoustic sensors on P-3/S-3 aircraft such as Broadband and digital uplinks with the ADAR sonobuoy. Continue transition from TAC UNIX based to NT-PC workstations. Develop communications interfaces with required security features to take advantage of NCCS connectivity to SIPRNET and available WAN/WEB technology for insertion into fixed sites TSC and MOCC.
 - (U) (\$210) Upgrade the communications of TSC and mobile variants to improve compliance with Defense Message System (DMS) and with appropriate Joint Maritime Communications (JMCOMS) standards.
 - (U) (\$52) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X0486

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JTM

3. (U) FY 1999 PLAN:

- (U) (\$1,453) Initiate system integration, testing, documentation and training for JMCIS 4.0 software. Continue DII compliance implementation and replacement of TAC UNIX workstations with NT-PCs. Continue replacing client workstations with NT's. Continue development of support of P-3C AIP and P-3C Counter Drug Upgrade (CDU) improvements in sensors and communication systems such as the P-3 Communications Improvement Program (CIP).
- (U) (\$806) Support P-3C AIP and pre-planned product improvements in open system architecture and sensor integration. Provide improved PID for increased sensor effectiveness and automated post-flight analysis for rapid information dissemination via the SIPRNET.
- (U) (\$260) Continue development of TSC/MOCC multi-TADIL interfaces to provide two-way TADIL support.
- (U) (\$265) Continue development of communications interfaces with required security features to take advantage of higher capacity connectivity to SIPRNET and available WAN/WEB technology for insertion into fixed and mobile TSC variants.
- (U) (\$345) Support an OT IID (Q3) leading to a Milestone IIID decision (Q4) for fleet release and installation of JMCIS 4.0.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	2,896	3,032	3,299
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG:	-325	-108	-170
(U) FY 1999 President's Budget Submit:	2,571	2,924	3,129

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X0486

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JTM

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Reflects minor programmatic adjustment \$-99K, revised economic assumptions \$-4K, SBIR transfer -\$22K, and MPN reprogramming action \$-200K. {total: \$-325K}

FY 1998: Reflects congressional undistributed general reductions \$-101K, \$-7K revised economic assumptions. {total: \$-108K}

FY 1999: Reflects NWCF adjustment \$-43K; congressional undistributed general reductions \$-25K; revised economic assumptions \$-49K; -53K redirected to develop and update overarching C4ISR mission requirements. {total: \$-170K}

(U) Schedule: Schedule (See Section D) has been adjusted to accommodate incorporation of the MAST/MICFAC into the TSC Program and to allow for the availability of DII COE software for the core of JMCIS 3.1.

(U) Technical: This program is driven by availability of DII core software and by development requirements arising from support of the P-3C AIP.

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X0486

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JTM

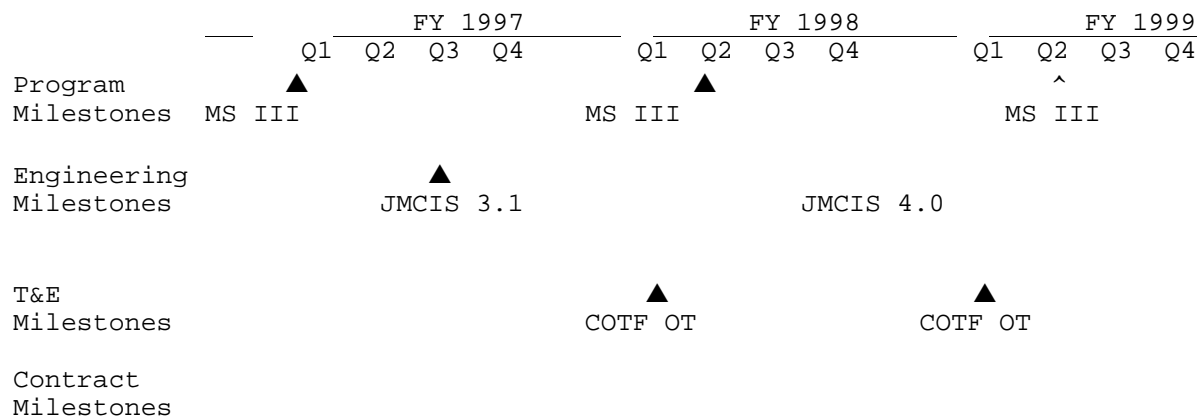
C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
• (U) OPN LI 2246	9,772	5,137	2,658	5,408	6,448	6,332	5,794	CONT.	CONT.
• (U) OPN LI 2906 (TSC and MAST/MICFAC)	2,303	2,824	3,982	4,748	5,242	7,144	7,599	CONT.	CONT.
• (U) OMN	12,928	12,530	11,587	11,380	11,859	12,255	12,547	CONT.	CONT.

(U) RELATED RDT&E:

- (U) PE 0604261N: (Acoustic Search Sensors): TSC maintains interoperability with S-3 weapon systems and future improvements.
- (U) PE 0604221N: (P-3 Modernization): TSC maintains interoperability with, and fully supports P-3 system changes and enhancements.

D. (U) SCHEDULE PROFILE:



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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0486

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JTM

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	400	417	443
b. Software Development	1,256	1,578	1,561
c. Systems Engineering	307	294	360
d. Systems Integration	483	495	615
e. Test & Evaluation	125	140	150
CURRENT ALLOCATION:	2,571	2,924	3,129

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands) NOT APPLICABLE

C. (U) FUNDING PROFILE:

C. 1. (U) FISCAL YEAR OBLIGATION/EXPENDITURE ACTUALS AND PLANS (BY QUARTER) (\$ in thousands): NOT APPLICABLE

C. 2. (U) FY 1997 OBLIGATIONS/EXPENDITURES (\$ in thousands): NOT APPLICABLE

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0709

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS Afloat

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0709 JMCIS Afloat	7,264	6,344	9,174	8,742	9,905	10,649	9,992	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Maritime Command Information System Afloat (JMCIS Afloat), formerly Navy Tactical Command System - Afloat (NTCS-A), AN/USQ-119(V), is the afloat component of the Joint Maritime Command Information System (JMCIS) architecture. JMCIS Afloat meets the requirements of the tactical commander for a near real-time, fused common tactical picture with integrated intelligence services and data bases. JMCIS Afloat supports the Command, Control, Communication, Computers and Intelligence (C4I) mission requirements of the Numbered Fleet Commanders (NFC), Officer in Tactical Command/Composite Warfare Commander (OTC/CWC), Commander Amphibious Task Force (CATF), Commander Landing Force (CLF), Ship's Commanding Officer/Tactical Action Officer (CO/TAO), and Joint Task Force (JTF) Commanders, as well as other functional commanders such as the Command and Control Warfare Commander (C2WC). It also integrates both joint and service-unique command and control projects in order to support joint task force and Navy afloat requirements. Efforts include design, integration, and test of Tactical Decision Aids (TDAs) and integration of JMCIS Afloat baselines with weapons systems and Combat Direction Systems to provide the Battle Group/Force Commanders with the information needed to enhance their warfighting capabilities. JMCIS Afloat is also initiating a transition to Commercial Off The Shelf (COTS) hardware and software as part of the current JMCIS initiative to capitalize on the latest Web/PC industry/commercial technology.

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$854) Developed, integrated and tested FY 1997 software enhancements. Integrated and tested Fleet release to meet Increment III ORD requirements. Initiated latest phase of JMCIS evolutionary development to incorporate Fleet requirements for merging tactical and non-tactical networks and application of mature Web and PC technologies.
- (U) (\$616) Continued development of intelligence and tactical analysis tools e.g., TDAs, TIAAs, etc. for incorporation into GENSER and SCI software for analyst workstations, EWCS and supporting the C2WC.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0709

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS Afloat

- (U) (\$1,063) Continued development and implementation of segment applications software in a JMCIS mandated GCCS/DII standard compliant open system architecture to include integration of Joint C4I requirements working toward an interoperable COP.
- (U) (\$350) Continued development of DNS which will allow JMCIS Afloat connection to the JWICS, SIPRNET and other intelligence networks.
- (U) (\$309) Implemented and tested required Joint Mission Applications including hardware and software interfaces with JMCIS Afloat including incorporation of Asynchronous Transfer Mode (ATM) technology.
- (U) (\$700) Continued integration and testing of implemented Internet related security capabilities in JMCIS Afloat.
- (U) (\$1024) Continued development of the architecture to support world wide data base access to all fleet users to fully support interoperability with the MIDB, GCCS/Defense Information Infrastructure (DII) Common Operating Environment (COE) and the Copernicus Architecture to operate with USMC, USCG, USAF and other Joint Command, Control, Intelligence, C2WC and Imagery systems to include the display, processing and exploitation of Unmanned Aerial Vehicle (UAV) video and digital imagery products.
- (U) (\$437) Procured development hardware and COTS software to support hardware evaluation and software development.
- (U) (\$509) Continued migration of the TEOB, MIDB, GALE, and JDISS.
- (U) (\$300) Implemented technology upgrade to TAC-x computer including, porting and integration of application/segment software.
- (U) (\$912) Continued to develop, procure and integrate two-way Link 16 efforts associated with JMCIS DII COE compliant software applications.
- (U) (\$190) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0709

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS Afloat

2. (U) FY 1998 PLAN:

- (U) (\$801) Develop, integrate and test FY 1998 software segment enhancements. Continue to integrate and test Fleet software releases to meet Increment III ORD requirements. Continue to incorporate Fleet requirements for merging tactical and non-tactical networks and application of Web and PC technologies.
- (U) (\$550) Continue development of TDAs and COTS tactical analysis tools for incorporation into GENSER and SCI Software for analyst workstations, EWCS, and supporting the C2WC.
- (U) (\$1,337) Continue development and testing of segment applications software in a GCCS/DII compliant open system architecture, including transition to COTS PC technology to provide a COP to the warfighter. Initiate development of the interfaces between JMCIS Afloat baselines and weapons systems, two way Link 16 and Combat Direction Systems.
- (U) (\$349) Continue development of DNS which will allow JMCIS Afloat connection to the JWICS, SIPRNET and other information networks.
- (U) (\$773) Implement and test required upgraded Joint mission application hardware and software interfaces (using the CDBS with the Joint Targeting Tools and Target Nomination modules) with JMCIS Afloat including 3-D visualization capability in support of situation awareness, mission/strike planning, terrain analysis and C2 support.
- (U) (\$699) Continue integration and test of implemented Internet related security capabilities.
- (U) (\$871) Continue to develop the architecture to support world wide data base access to all fleet users to fully support the GCCS/DII COE and the Copernicus Architecture to operate with USMC, USCG and other Joint Command, Control, Intelligence and Imagery systems interface with JMCIS Afloat.
- (U) (\$336) Procure development hardware and COTS software to support hardware evaluation and software development.
- (U) (\$508) Develop approaches to integrate JMCIS Afloat LANs, WANs and transition JMCIS Afloat legacy application segments to GCCS.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0709

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS Afloat

- (U) (\$120) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.
3. (U) FY 1999 PLAN:
- (U) (\$826) Continue to develop, integrate and test FY 1998 software segment enhancements. Continue to integrate and test Fleet software releases to meet Increment III ORD requirements. Continue to incorporate Fleet requirements for merging tactical and non-tactical networks and application of Web and PC technologies..
 - (U) (\$900) Continue development of TDAs and COTS tactical analysis tools for incorporation into GENSER and SCI Software for analyst workstations, EWCS, and supporting the C2WC.
 - (U) (\$2,604) Continue development/implementation and begin integration/testing of segment applications software in a GCCS/DII compliant open system architecture to include continued transition to COTS PC technology, working toward a COP including interfaces for the JSIPS-N, JBS/GBS, two-way LINK 16, and IPL/IPA.
 - (U) (\$504) Continue development of DNS which will allow JMCIS Afloat connection to the JWICS, SIPRNET and other information networks.
 - (U) (\$445) Integrate and test upgraded JFACC/CTAPS hardware and software interfaces (using the CDBS with the RAAP and Target Nomination modules) with JMCIS Afloat including 3-D visualization capability in support of situation awareness, mission/strike planning, terrain analysis and C2 support.
 - (U) (\$830) Continue integration and test of Internet security capability in JMCIS Afloat. Investigate and evaluate COTS multi-level secure (MLS) software packages for possible inclusion in the JMCIS Afloat architecture.
 - (U) (\$700) Continue to develop the architecture to support world wide data base access to all fleet users to fully support the GCCS/DII COE and the Copernicus Architecture to operate with USMC, USCG and other Joint Command, Control, Intelligence and Imagery systems interface with JMCIS Afloat.
 - (U) (\$629) Procure development hardware and COTS software to support hardware evaluation and software development.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0709

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS Afloat

- (U) (\$733) Continue to develop approaches to integrate JMCIS Afloat LANs, WANS and transition JMCIS Afloat legacy application segments to GCCS.
- (U) (\$500) Initiate development and implementation of collaborative planning capability in JMCIS Afloat.
- (U) (\$503) Implement technology upgrade to TAC-X computer including, porting and integration of application/segment software.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	7,365	6,568	9,525
(U) ADJUSTMENTS FROM FY1997 PRESBUDG:	-101	-224	-351
(U) FY 1999 PRESIDENT'S Budget Submit:	7,264	6,344	9,174

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Reflects programmatic adjustments; SBIR adjustments, revised economic assumptions, NWCF adjustments, and Congressional Undistributed General Reductions. {total: \$-\$101K}

FY 1998: Reflects Congressional Undistributed General Reductions \$-209K; revised economic assumptions \$-15K. {total: \$-224K}

FY 1999: Reflects NWCF adjustment \$-50K; revised economic assumptions \$-161K; Congressional Undistributed General Reductions \$+12K; -\$152K redirected to develop and update overarching C4ISR mission requirements. {total: \$-351K}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X0709

PROGRAM ELEMENT TITLE: Tactical Command System

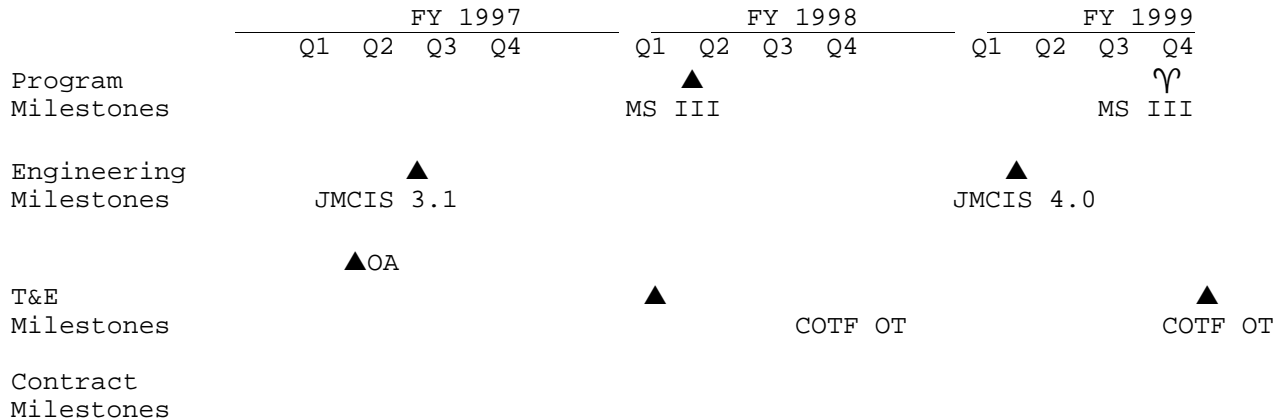
PROJECT TITLE: JMCIS Afloat

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN LI#2608	34,845	27,696	38,324	27,962	23,159	24,768	25,229	CONT.	CONT.
(U) OMN	10,002	10,140	18,274	18,673	16,911	14,237	13,569	CONT.	CONT.

(U) RELATED RDT&E:PE 0604231N (Tactical Command Systems) Shipboard Tactical Intelligence Processing

D. (U) SCHEDULE PROFILE:



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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0709

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS Afloat

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. PROJECT MANAGEMENT	350	300	400
b. SYSTEMS ENGINEERING	880	684	1,125
c. SOFTWARE DEVELOPMENT	5,006	4,325	5,943
d. HARDWARE DEVELOPMENT	428	435	1,106
e. SYSTEM TEST & EVALUATION	600	600	600
CURRENT ALLOCATION:	7,264	6,344	9,174

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands): NOT APPLICABLE.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2009 JMCIS OBU Evolutionary Development	1,158	1,995	1,964	2,020	2,026	2,233	2,278	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The JMCIS OBU Evolutionary Development (JMCIS OED), formerly Ocean Surveillance Information System (OSIS) Baseline Upgrade (OBU) development, is a subsystem of the Navy Command and Control System (NCCS) Ashore. It is a designated migration system. JMCIS OED provides for the analysis of intelligence information from multiple sources to produce a comprehensive report of foreign forces and potential hostile activity. The system is required to be able to generate multiple, automated near-real-time event-by-event (NRT EBE) data streams at various classification/releasability levels, tailorable to unique customer requirements and capable of being transmitted over multiple communications paths (including DSNET) simultaneously. In addition, it is required to provide near-real-time (NRT) all-source fusion, correlation and analysis tools (including robust graphics presentation and geospatial analysis capabilities), directly feeding automated reporting capabilities. OSIS provides positional data and operational intelligence to commanders at all levels. It consists of three Joint Intelligence Centers, and one Joint Intelligence Center Detachment, a software support activity, and a training site. JMCIS OED functions encompass establishing and maintaining characteristics and performance data on hostile weapons platforms systems, collecting non-organic data from ashore and afloat sensors, developing an all-source tactical picture, and analyzing intelligence information. The data derived from this process is disseminated as an Operation Intelligence (OPINTEL) product to the operating forces for tactical threat warnings, decision making support, and support of Over-the-Horizon-Targeting.

(U) JMCIS OED uses the Joint Logistics Commander's Guidance of March 1987 on Evolutionary Acquisition (EA) as the strategy for future software development which includes a plan for incremental achievement of desired capability building on the core system provided by OBU Phases I and II. The JMCIS OED Phase III EA strategy will provide a mechanism for adding future capabilities including the incorporation of proven fleet initiated prototypes.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X2009

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS OED

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$338) Developed multi-level record communications with SCI/Genser Newsdealer and CSP record message systems.
- (U) (\$687) Performed multi-level security core software development.
- (U) (\$97) Integrated and tested NCSC B1-certified multi-level secure operating system (CMW) into OED software baseline, with mirrored system backup and restoration over a trusted network.
- (U) (\$36) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conducted associated C4ISR analyses and studies.

2. (U) FY 1998 PLAN:

- (U) (\$387) Integrate key JMCIS warfare components (EW segments) into OED MLS software baseline.
- (U) (\$663) Improve/revise JMCIS/OED tactical decision aids and database architecture to work with large scale national level databases (>10,000 tracks); implement JMCIS 3.10 or later baseline into MLS baseline software.
- (U) (\$261) Full implementation of user-selectable NATO and US symbology.
- (U) (\$338) Implement classified NRTI interface (with MLS support) at all operational sites; ensure analyst display tools meet NRTI performance requirements.
- (U) (\$309) Implement and deploy user/site-defined functional requirements within MLS environment.
- (U) (\$37) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X2009

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS OED

3. (U) FY 1999 PLAN:

- (U) (\$290) Implement, accredit and deploy MLS changes needed to support email-based and DMS record message traffic.
- (U) (\$444) Develop and deploy wide area imagery and characteristics databases using an object-oriented MLS commercial database package.
- (U) (\$759) Automated, real time Indications and Warning/Situation Assessment capability to detect and auto alert users concerning movement patterns, complex threat conditions and other pre-defined spatial and data detection events.
- (U) (\$126) Upgrade system capabilities for providing tailored MLS support.
- (U) (\$345) Incorporate current state of art data correlation and data fusion software and hardware technology.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	1,226	2,065	2,414
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG	-68	-70	-450
(U) FY 1999 PRESIDENT'S Budget Submit:	1,158	1,995	1,964

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X2009

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS OED

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY97: Reflects programmatic adjustment \$-46K, revised economic assumptions \$-2K, SBIR adjustments \$-20K. {total: \$-68K}

FY98: Reflects revised economic assumptions \$-5K, Congressional Undistributed General Reductions \$-65K. {total: \$-70K}

FY99: Reflects inflation adjustment \$-35K, Congressional Undistributed General Reductions \$+7K, NWCF adjustments \$-22K, \$37K redirected to develop and update overarching C4ISR mission requirements; programmatic adjustments \$-363K. {total: \$-450K}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN LI#2906 (JMCIS OED only)	226	0	0	0	0	0	0	0	710
OPN LI#2805 (JMCIS OED)	0	335	343	474	496	564	549	CONT.	CONT.
OMN 1C1C/4B7N	2,233	2,028	1,513	1,232	1,216	1,282	1,312	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2009

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JMCIS OED

D. (U) SCHEDULE PROFILE:

	FY 1997				FY 1998				FY 1999				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Program Milestones													^ NPDM
Engineering Milestones													
T&E Milestones							▲ DT-IIE					▲ OT-IIE	
Contract Milestones													

Note: APBA in process. Dates reflect proposed APBA Milestones.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2009
 PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: JMCIS OED

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. SYSTEMS ENGINEERING	510	500	592
b. SOFTWARE DEVELOPMENT	618	1,465	1,342
c. SYSTEM TEST AND EVALUATION	30	30	30
CURRENT ALLOCATION:	1,158	1,995	1,964

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
NAVSUP	RADIUS	8/97			1,343				N/A	1,343
OTHER		OPTIONS			3,507	698	1,465	1,362	CONT.	CONT.
Support and Management										
OTHER	WX				3,411	430	500	572	CONT.	CONT.
Test and Evaluation										
OPTEVFOR	PD				480	30	30	30	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not Applicable

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X2009

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS OED

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development				4,850	698	1,465	1,362	CONT.	CONT.
Subtotal Support and Management				3,411	430	500	572	CONT.	CONT.
Subtotal Test and Evaluation				480	30	30	30	CONT.	CONT.
Total Project				8,741	1,158	1,995	1,964	CONT.	CONT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2041

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JMCIS Ashore

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2041 JMCIS Ashore	5,727	6,318	6,030	5,891	6,119	8,240	9,921	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Chief of Naval Operations (CNO), Fleet Commanders in Chief (CINCs) and Unified Commanders (USCINCLANT and USCINCPAC) require a single, integrated command and control system at the Navy Command Center (NCC), Fleet Command Centers (FCC), and the Unified Command Centers, respectively, to receive, process, display and assess the readiness and disposition of own, neutral, and potentially hostile forces. The JMCIS Ashore Program uses the Joint Logistics Commanders Guidance of March 1987 on Evolutionary Acquisition (EA) as the strategy for development. The EA concept includes a plan for incremental achievement of desired capability, early fielding of initial incremental operational capability and continual feedback from the users. OSS Increment I integrated existing prototype command center support systems on a Local Area Network (LAN) and provides a baseline command center support capability to designated OSS sites. Increment II developed an integrated, logistically supportable, and cost effective single system, which includes Ocean Surveillance Information System (OSIS) Baseline Upgrade (OBU) interface, Navy Worldwide Military Command and Control System (WWMCCS) Software Standardization (NWSS) replacement, Status of Forces data (Status of Readiness and Training System (SORTS), Casualty Reporting (CASREP), Movement Reporting (MOVREP), and Employment Scheduling (EMPSKD)) current system functionality improvement, and latest state-of-the-art Commercial Off The Shelf (COTS) technologies to local as well as remote users. Increment III will incorporate Employment Scheduling System (ESS) and Information Presentation and Distribution System (IPDS) capabilities into JMCIS Ashore. Increment III will also provide initial interfaces to the GCCS architecture. Increment IV (FY 96-99) will port JMCIS Ashore software to PC's and the DII COE. It will implement and field ESS functionality and incorporate TYCOM required databases and decision aids. Multi-Level Security (MLS) features will be incorporated as they become commercially available. International, as well as intra and inter-service Command, Control, Communication and Computer integration, will be established and achieved through the implementation of JMCIS Ashore at selected NATO and U.S. Navy sites and Unified Commands. JMCIS Ashore is being developed and implemented in conjunction with the open system C⁴I for the Warrior (C⁴I^{FTW}), Global Command and Control System (GCCS) and Joint Maritime Command Information System (JMCIS) architectures.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2041

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JMCIS Ashore

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1,067) Conducted Developmental Testing, Beta Testing and Navy and Joint Interoperability Certification Tests on OSS software releases. Completed Increment III testing.
- (U) (\$225) Completed development, testing and fielding of ESS prototype upgrades to reach full functional baseline.
- (U) (\$550) Supported Joint, Allied (NATO and other), coalition efforts, Foreign (through FMS cases), collaborative planning and JMCIS Ashore Navy users to ensure interoperability among users. Continued execution of Cooperative Development with SACLANT.
- (U) (\$450) Developed integrated interface using a common architecture for JMCIS Ashore users to existing DOD Data bases. Incorporated state-of-the-art technologies such as distributed data bases and WEB technology.
- (U) (\$562) Continued implementation of appropriate MLS features.
- (U) (\$300) Continued to integrate/analyze JMCIS Ashore sites in conjunction with COTS hardware upgrades, and state-of-the art displays, video distribution systems and briefing aids (including multimedia, 3-D visualization and very high resolution images).
- (U) (\$520) Continued enhancing UB software to satisfy JMCIS Ashore requirements; integrated successive JMCIS Ashore releases into JMCIS Ashore/JMCIS baseline.
- (U) (\$250) Maintained JMCIS Ashore architectural compatibility with GCCS, C⁴IFTW and JMCIS.
- (U) (\$300) Implemented Navy unique USMTF SORTS and MOVREP Messages.
- (U) (\$300) Planned, developed and began implementation of USMTF CASREP and EMPSKD Messages.
- (U) (\$372) Continued interfacing/integrating with readiness data from other Navy sources. Completed system integration and review of USN message and data flow.

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2041

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JMCIS Ashore

- (U) (\$350) Completed and fielded PC EMPSKD message capability to assist units to create error free CASREP, SORTS and MOVREP messages.
 - (U) (\$150) Continued efforts to incorporate super computer and/or parallel processor solutions into JMCIS Ashore to improve system performance.
 - (U) (\$150) Continued systems engineering and prototype development on AI/Expert System driven decision aids to provide real time decision making support to operational commanders.
 - (U) (\$181) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conducted associated C4ISR analyses and studies.
2. (U) FY 1998 PLAN:
- (U) (\$410) Continue to integrate/analyze JMCIS Ashore sites in conjunction with COTS hardware upgrades, and state-of-the art displays, video distribution systems and briefing aids (including multimedia, 3-D visualization and very high resolution images).
 - (U) (\$180) Continue interfacing/integrating with readiness data from other Navy sources.
 - (U) (\$431) Plan, conduct systems engineering and prototype development of object oriented/design solution into JMCIS Ashore to improve system performance.
 - (U) (\$542) Develop database modules to support WAN access by JMCIS Ashore remote users, i.e., distributed databases and data standardization. Develop integrated interface using a common architecture. Continue to incorporate state-of-the-art technologies such as distributed data bases and WEB technology.
 - (U) (\$356) Update JMCIS Ashore software and databases to accommodate Navy unique and Joint message format changes.
 - (U) (\$520) Maintain architectural compatibility with DoD mandated standards (i.e., Defense Information Infrastructure (DII)).

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2041

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JMCIS Ashore

- (U) (\$180) Plan, develop, and begin implementation of Human Computer Interface Standards for software development and data retrieval.
- (U) (\$270) Incorporate unique decision aids, data elements, message text types and report formats required by Type Commanders (TYCOMs).
- (U) (\$405) Conduct developmental testing and beta testing on JMCIS Ashore software.
- (U) (\$135) Modify JMCIS Ashore system and configuration to accommodate TENCAP sanitization products and support evolutionary software upgrades. Implement commercially available MLS.
- (U) (\$450) Begin extension of full JMCIS Ashore access and functionality into PC domain consistent with FLTCINC and TYCOM requirements. Evolve JMCIS Ashore LANs to take advantage of current networking technology (e.g., Asynchronous Transfer Mode (ATM) in conjunction with IPDS.
- (U) (\$483) Port JMCIS Ashore software to run on current GCCS, Navy TAC-series computer platforms, and PC's. Integrate JMCIS Ashore/GCCS LANs.
- (U) (\$450) Complete migration of SORTS, CASREP, MOVREP, and EMPSKD to USMTF format.
- (U) (\$405) Continue Cooperative Development of NACCIS with SACLANT, implement NATO message parsing and editing features, expand JMCIS Ashore database to reflect NATO/Allied units, and continue to support Joint, Allied (NATO and other), coalition efforts, collaborative planning, and Foreign (FMS) users to ensure interoperability among users.
- (U) (\$425) Incorporate current FLTCINC, TYCOM and numbered Fleet Commander Logistics planning and support tools in support of Fleet operations (Personnel, fuel, ammunition, supplies, medical, etc).
- (U) (\$100) Maintain compatibility with Defense Messaging System (DMS)/Automated Message Handling System software requirements.
- (U) (\$119) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.
- (U) (\$277) Continue transition/integration of Shore Targeting functionality (near real-time weapons targeting data to submarines) to JMCIS Ashore.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2041

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JMCIS Ashore

- (U) (\$180) Integrate and make interoperable JMCIS Ashore ASW capability with Joint ASW functionality.

3. (U) FY 1999 PLAN:

- (U) (\$450) Continue to integrate/analyze JMCIS Ashore sites in conjunction with COTS hardware upgrades, and state-of-the art displays, video distribution systems and briefing aids (including multimedia, 3-D visualization and very high resolution images).
- (U) (\$483) Continue to incorporate state-of-the-art technologies such as distributed data bases and WEB technology.
- (U) (\$180) Continue interfacing/integrating with readiness data from other Navy sources.
- (U) (\$300) Continue development of object oriented/design solution into JMCIS Ashore to improve system performance.
- (U) (\$270) Continue development of database modules to support WAN access by JMCIS Ashore remote users, i.e., distributed databases and data standardization.
- (U) (\$225) Update JMCIS Ashore software and databases to accommodate Navy unique and Joint message format changes.
- (U) (\$520) Maintain architectural compatibility with DoD mandated standards (i.e., Defense Information Infrastructure (DII)).
- (U) (\$282) Continue implementation of appropriate security features and documentation. Continue security engineering efforts, Certification Test and Evaluation (CT&E), Security Test and Evaluation (ST&E), documents (e.g., Computer Security Accreditation Plan (CSAP), operating procedures, safeguards and site accreditation.
- (U) (\$85) Continue development and implementation of Human Computer Interface Standards for software development and data retrieval.
- (U) (\$405) Conduct developmental testing and beta testing on JMCIS Ashore software.
- (U) (\$475) Continue extension of full JMCIS Ashore access and functionality into PC domain consistent with FLTCINC and TYCOM requirements.

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2041

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JMCIS Ashore

- (U) (\$225) Port JMCIS Ashore software to run on current GCCS and Navy TAC and PC computer platforms.
- (U) (\$460) Continue Cooperative Development of NACCIS with SACLANT, implement NATO message parsing and editing features, expand JMCIS Ashore database to reflect NATO/Allied units, and continue to support Joint, Allied (NATO and other) and Foreign (FMS) users to ensure interoperability among users.
- (U) (\$360) Incorporate decision aids, data elements, and message formats and reports to support Navy blockage enforcements, choke point, port evacuation Navy Control of Shipping (NCS) operations, and other Navy missions associated with Operations other than War.
- (U) (\$697) Incorporate decision aids, data elements, and message formats and reports to support Non-Combatant Evacuation Operations (NEO). Incorporate current FLTCINC, TYCOM and numbered Fleet Commander Logistics planning and support tools in support of Fleet operations (Personnel, fuel, ammunition, supplies, medical, etc).
- (U) (\$208) Maintain compatibility with Defense Messaging System (DMS)/Automated Message Handling System software requirements.
- (U) (\$225) Complete development, testing and fielding of Shore Targeting functionality (near real-time weapons targeting data to submarines) to JMCIS Ashore.
- (U) (\$180) Continue to integrate and make interoperable JMCIS Ashore ASW capability with Joint ASW functionality.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	6,116	6,521	6,959
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG:	-389	-203	-929
(U) FY 1999 President's Budget Submit:	5,727	6,318	6,030

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2041

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JMCIS Ashore

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Reflects SBIR adjustments \$-144K, Programmatic adjustments \$-238K, and revised economic assumptions \$-7K. {total: \$-389K}

FY 1998: Reflects Congressional Undistributed General Reductions \$-189K, and revised economic assumptions \$-14K. {total: \$-203K}

FY 1999: Reflects programmatic reductions \$-683K for IT-21; -\$106K redirected to develop and update overarching C4ISR mission requirements; NWCF adjustment \$+7K; Congressional Undistributed General Reduction \$-41K; and inflation adjustments \$-106K. {total: \$-929K}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2041

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: JMCIS Ashore

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN 2906(OSS only)	3,839	0	0	0	0	0	0	0	9,076
(U) OPN 2804	0	3,315	4,517	7,238	7,232	7,943	9,154	CONT.	CONT.
(U) OMN	12,055	10,533	11,423	11,153	9,983	11,261	12,435	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0604231N: JMCIS OED, JMCIS Tactical/Mobile, JMCIS Afloat.

D. (U) SCHEDULE PROFILE:

	FY 1997				FY 1998				FY 1999			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Program Milestones						▲ MS III					▲ MS III	
Engineering Milestones			▲ JMCIS 3.1							▲ JMCIS 4.0		
T&E Milestones						▲ COTF OT				▲ COTF OT		
Contract Milestones												

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X2041

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: JMCIS Ashore

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	470	530	590
b. Software Development	4,089	4,572	4,082
c. Systems Engineering	1,098	1,116	1,248
d. Test and Evaluation	70	100	110
CURRENT ALLOCATION:	5,727	6,318	6,030

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands): Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0521

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: STIP

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0521 STIP	6,041	4,919	6,803	7,037	6,714	6,544	6,430	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Shipboard Tactical Intelligence Processing (STIP) system is an integrated tactical intelligence shipboard processing system which is the central database server for JMCIS Afloat, the Command and Control Warfare Commander (C2WC) and tactical mission planning systems. Development of this integrated data base server provides for data distribution, dynamic update of Naval Warfare Tactical Database (NWTDB) and military integration with digital map and imagery systems. STIP began interface development with the Joint Services Imagery Processing - Navy (JSIPS) in FY 1990. STIP also includes providing intelligence data distribution to multiple shipboard warfighters via an analog video distribution system. Efforts are being initiated in FY 97/98 to develop a digital video distribution system to take advantage of latest LAN technology. STIP will integrate Radiant Mercury (RM) into the JMCIS Afloat architecture to meet downgrading and releasability requirements. STIP is also initiating a transition to Commercial Off The Shelf (COTS) hardware and software as part of the current JMCIS initiative to capitalize on the latest Web/PC industry/commercial technology.

•
1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$907) Developed, integrated and tested an MIDB based CDBS/AMH and associated intelligence applications to support C2WC and other Warfare Commander functions.
- (U) (\$838) Developed, integrated and tested advanced digital imagery applications to keep pace with CIO and DARO evolving imagery architectures.
- (U) (\$380) Continued development and integration of multi-media display technologies into an Integrated Video System (IVS) including 3-D visualization capability in support of situation awareness, mission/strike planning, STRED improvements, terrain analysis and intelligence support.
- (U) (\$694) Continued to develop data base support for TDAs.
- (U) (\$575) Continued object oriented data base development.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0521

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: STIP

- (U) (\$327) Continued to develop CIO, DARO, NRO, USMC, USCG, USAF, USA and other joint intelligence and imagery collection and exploitation systems interfaces with JMCIS Afloat to meet GCCS/DII COE criteria; e.g., CHBDL, JBS/GBS, Challenge Athena, etc.
 - (U) (\$300) Began integration of CDBS (providing automated tactical updates) with the Target Development Models for Target Nomination List modules/applications.
 - (U) (\$1,890) Continued to develop, procure, test and integrate intelligence applications efforts associated with the fielding of Radiant Mercury capabilities on JMCIS platforms.
 - (U) (\$130) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.
2. (U) FY 1998 PLAN:
- (U) (\$915) Continue developing, integrating and testing MIDB (v 2.0, 3.0, 4.0 etc.) based CDBS (GENSER and SCI) and associated intel applications in accordance with the JMCIS COTS/PC hardware and software initiative/GCCS ("MIG") evolutionary directions and in conjunction with Cryptologic/C2W developments.
 - (U) (\$861) Continue developing, integrating and testing advanced digital imagery server(s) and Navy-Marine Team unique client applications to keep pace with evolving CIO, DARO and NRO imagery architectures.
 - (U) (\$200) Begin development of enhanced GENSER-SCI LAN and JMCIS-"RelX" data exchange capabilities based on MIDB 2.0 "filter" approach, and emerging MLS technologies for both alpha-numeric data and imagery.
 - (U) (\$364) Continue development and integration of multi-media data capture, storage and display technologies into the IVS including 3-D visualization capability in support of situation awareness, mission/strike planning, STRED improvements, UAV data integration, terrain analysis and intelligence support.
 - (U) (\$732) Continue evolving Navy-USMC Team unique intel and intel-related data base support for JMCIS and Marine Air Ground Task Force C4I (MAGTFC4I)/Expeditionary Warfare applications as required outside MIDB capability.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

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PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0521

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: STIP

- (U) (\$598) Continue object-oriented data base exploratory development.
 - (U) (\$369) Continue investigating and developing USAF, Army and other Joint intel/imagery system interfaces.
 - (U) (\$338) Investigate enhancements to unit level JMCIS Afloat intel capabilities including access to imagery recognition and associated data (Characteristics and Performance (C&P)); e.g., SEALINK connection via JDISS.
 - (U) (\$100) Begin to converge JMCIS OED intel capability with JMCIS development; provide OED-unique intel tools afloat.
 - (U) (\$350) Initiate development to transfer digital video data/information among workstations on the same platform and among workstations on multiple platforms.
 - (U) (\$92) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.
3. (U) FY 1999 PLAN:
- (U) (\$1,274) Continue developing, integrating and testing MIDB (v 2.0, 3.0, 4.0 etc.) based CDBS (GENSER and SCI) and associated intel applications in accordance with GCCS ("MIG") evolutionary directions and in conjunction with Cryptologic/C2W and other Warfare Commander developments
 - (U) (\$1,112) Continue developing, integrating and testing advanced digital imagery server(s) and Navy-Marine Team unique client applications to keep pace with evolving CIO, DARO and NRO imagery architectures.
 - (U) (\$250) Continue to develop enhancements to the GENSER-SCI LAN and JMCIS-"RelX" data exchange capabilities based on MIDB "filter" approach, and emerging MLS technologies for both alpha-numeric data and imagery.
 - (U) (\$266) Continue development and integration of multi-media data capture, storage and display technologies into the IVS including 3-D visualization capability in support of situation awareness, mission/strike planning, STRED improvements, UAV data integration, terrain analysis and intelligence support.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT:

0604231N

PROJECT NUMBER: X0521

PROGRAM ELEMENT TITLE:

Tactical Command System

PROJECT TITLE: STIP

- (U) (\$788) Continue evolving Navy-USMC Team unique intel and intel-related data base support for JMCIS and MAGTFC4I/Expeditionary Warfare applications as required outside MIDB capability.
- (U) (\$733) Continue object-oriented data base exploratory development.
- (U) (\$445) Continue investigating and developing USAF, Army and other Joint intel/imagery system interfaces.
- (U) (\$409) Develop and test enhancements to unit level JMCIS Afloat intel capabilities including access to imagery recognition and associated support data; e.g., C&P.
- (U) (\$261) Initiate convergence and testing of OBU/OED intel capability with JMCIS development; provide OED-unique intel tools afloat.
- (U) (\$515) Integrate Radiant Mercury (RM) capability into JMCIS to meet the high priority Fleet requirement of C4 data downgrading and releasability for coalition interoperability. RM is a certified, accreditable, automated method to downgrade highly sensitive data over security levels.
- (U) (\$400) Implement the Modernized Integrated Database (MIDB) replication in JMCIS to meet the validated Fleet requirements to generate and maintain a consistent intelligence picture among general purpose C2 systems, mission planning systems, and combat direction systems while reducing numbers of databases which have to be maintained.
- (U) (\$350) Continue development to transfer digital video data/information among workstations on the same platform and among workstations on multiple platforms.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5	PROGRAM ELEMENT: 0604231N	PROJECT NUMBER: X0521
	PROGRAM ELEMENT TITLE: Tactical Command System	PROJECT TITLE: STIP

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 PRESIDENT'S BUDGET:	6,317	5,069	6,153
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG:	-276	-150	+650
(U) FY 1999 President's Budget Submit:	6,041	4,919	6,803

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Reflects SBIR transfer adjustment \$-43K; revised economic assumptions \$-8K; and programmatic adjustments \$-225K. {total: \$-276K}

FY 1998: Reflects Congressional Undistributed General Reductions \$-139K; and revised economic assumptions \$-11K. {total: \$-150K}

FY 1999: Reflects programmatic adjustment of \$+915K for Radiant Mercury; NWCF adjustments \$-37K; inflation adjustment \$-120K; Congressional Undistributed General Reduction \$+5K; -\$113K redirected to develop and update overarching C4ISR mission requirements. {total: \$650}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN LI#2608	34,845	27,696	38,324	27,962	23,159	24,768	25,229	CONT.	CONT.
(U) OMN	10,002	10,140	18,274	18,673	16,911	14,237	13,569	CONT.	CONT.

Note: O&M,N for FY 96-01 and CONT. is integrated into JMCIS Afloat

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PROGRAM ELEMENT: 0604231N

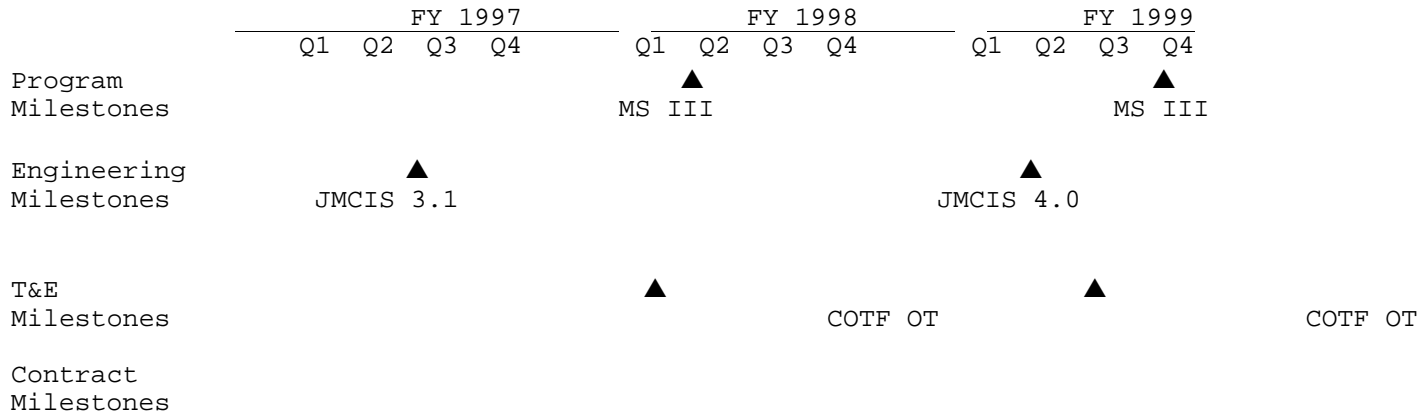
PROJECT NUMBER: X0521

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: STIP

(U) RELATED RDT&E:PE 0604231N (Tactical Command Systems) JMCIS Afloat (formerly Navy Tactical Command System-Afloat (NTCS-A)

D. (U) SCHEDULE PROFILE:



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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X0521

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: STIP

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	215	250	250
b. Systems Engineering	2,907	1,569	3,091
c. Software Development	2,217	2,300	2,552
d. Hardware Development	352	450	560
e. System Test & Evaluation	350	350	350
CURRENT ALLOCATION	6,041	4,919	6,803

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X0521

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: STIP

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NRAD	WX	VAR			3,159	1,523	1,535	2,205	CONT.	CONT.
All Other Contracts	W/OPT	VAR			8,934	886	869	968	CONT.	CONT.
Lockheed Martin Denver, CO	W/OPT	VAR				1,067	915	1,030	CONT.	CONT.
Support and Management Various	W/OPT	VAR			1,694	215	250	250	CONT.	CONT.
Test and Evaluation PD OPTEVFOR		VAR				1,166	350	350	350	CONT. CONT.
PRC San Diego, CA	Radius, PD	VAR			5,350	1,184	1,000	2,000	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X0521

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: STIP

<u>Total</u> <u>Item</u> <u>Description</u>	<u>Fund Type</u> <u>Vehicle</u>	<u>Oblig</u> <u>Date</u>	<u>Delivery</u> <u>Date</u>	<u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development				12,093	3,476	3,319	4,203	CONT.	CONT.
Subtotal Support and Management				1,694	215	250	250	CONT.	CONT.
Subtotal Test and Evaluation				7,331	2,350	1,350	2,350	CONT.	CONT.
Total Project				21,118	6,041	4,919	6,803	CONT.	CONT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2215 Joint Interoperability	0	0	2,463	2,714	2,991	4,096	3,787	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Joint Interoperability. This program will develop common services for the Naval Services implementation of GCCS and GCSS joint interoperability requirements for sharing of C4I data and for software application reuse by Joint forces. It will provide and implement applications algorithms and interfaces updated for Joint interoperability, saving considerable time and resources that would need to be expended if new/additional software applications were required to be developed. It will produce Naval software products compliant with DII COE software engineering standards and conventions and perform integration with components and mission applications of GCCS, GCSS, TBMCS, JDP, AADC, and ABCS. Approaches to exchange digital video data/information between Joint forces using the latest COTS software will be reviewed, tested and deployed as prototypes. The Joint Interoperability program will ensure compatibility of Navy C2, USMC MAGTAF, and USCG C4I systems with other DII COE based systems to provide common reference and tactical data for afloat, ashore, amphibious and ground based tactical components. COTS licenses for common services to support interoperability with Joint systems will be procured.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2215

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Joint Interoperability

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) Not Applicable.

2. (U) FY 1998 PLAN:

- (U) Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2215

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Joint Interoperability

3. (U) FY 1999 PLAN:

- (U) (\$253) Revise JMCIS architecture to be compatible with DoD requirements in DII. Produce requirements engineering data and documentation.
- (U) (\$620) Port Navy JMCIS applications to Joint standard hardware platforms and update for compliance with DII requirements. Update algorithms, data and display formats for Joint interoperability.
- (U) (\$257) Implement plan for migration of data to common data link.
- (U) (\$259) Procure Joint standard hardware for developers and testers of common services.
- (U) (\$100) Develop and implement processes to support development and integration of Joint warfare applications.
- (U) (\$200) Provide training and technical services for developers of common services and mission applications.
- (U) (\$225) Plan and conduct integration and development testing of common services.
- (U) (\$99) Develop program documentation and data.
- (U) (\$200) Develop improvements to two-way data exchange capabilities to ensure system interoperability.
- (U) (\$250) Develop approach to exchange digital video data/information among Joint forces.

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2215

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Joint Interoperability

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	0	0	3,552
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG:	0	0	-1,089
(U) FY 1999 PRESIDENT'S Budget Submit:	0	0	2,463

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1999: Reflects reduction of \$-1000K for IT-21; NWCF adjustments \$-5K; inflation adjustment \$-43K; -\$41K redirected to develop and update overarching C4ISR mission requirements. {total: \$-1089K}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2215

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Joint Interoperability

D. (U) SCHEDULE PROFILE:

	FY 1997				FY 1998				FY 1999			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Program Milestones											▲	
											MS III	
Engineering Milestones										▲		
										JMCIS 4.0		
T&E Milestones											▲	
											COTF OT	
Contract Milestones												

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2215

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Joint Interoperability

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Project Management			199
Systems Engineering			478
Software Development			1,036
Hardware Development			400
System Test & Evaluation			350
Total			2,463

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>	
Product Development											
XYZ	CPFF	10/98						1,436	CONT.	CONT.	NRAD
WX	10/98							478	CONT.	CONT.	
Support and Management											
XYZ	CPFF	10/98						199	CONT.	CONT.	
Test and Evaluation											
NRAD	WX	10/98						350	CONT.	CONT.	

GOVERNMENT FURNISHED PROPERTY: Not applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2215

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Joint Interoperability

<u>Item</u>	<u>Fund Type</u>	<u>Oblig</u>	<u>Delivery</u>	<u>Total</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To</u>	<u>Total</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>FY 1996</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development							1,914	CONT.	CONT.
Subtotal Support and Management							199	CONT.	CONT.
Subtotal Test and Evaluation							350	CONT.	CONT.
Total Project							2,463	CONT.	CONT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2216 C4I for Joint Littoral Warfare (JLW)	0	0	3,426	3,636	7,272	11,032	13,240	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The C4I for Joint Littoral Warfare (JLW) program supports Joint Service and Navy commanders ashore and afloat, including a wide range of command echelons from the CINC to Joint Task Force to the tactical command level by integrating the components of a JLW evolution. JLW systems will be developed by applying new technology to reduce life-cycle costs and platform independence and will be scaleable to each application. JLW software products will operate on a family of tactical computer configurations, including stand alone single processor configurations, man-portable units, and local area network configurations. JLW capabilities include: (1) a gateway for wide area C4I network communications and interfaces for tactical and common user communications; (2) a common tactical picture based upon intelligence data exploitation and fusion and own force data processing; (3) a common view of battle space area(s) including graphical presentation of environmental, navigational, and mapping data; (4) tactical support data base management and manipulation. The program will use and build upon the Defense Information Infrastructure (DII) Software Development Environment (SDE) and core software developed for NTCS-A and JMCIS Ashore programs. Through a series of evolutionary builds, JLW capabilities will add and/or enhance JMCIS in the areas of mine warfare and mine countermeasures, Theater Air Traffic Defense, Intelligence data exploitation (traditional and non-traditional sources), Theater Ballistic Missile Defense, improved environmental and navigational data for tactical decision areas, coastal ASW and amphibious assault, Tactical Data Link (TADIL) improvements, improved Navy and Joint system interfaces and interoperability. JLW will also introduce Artificial Intelligence to provide counter-proliferation alerts and tactical intelligence. JLW products will be initially deployed at JMCIS Afloat sites and will become part of the JMCIS software re-use library available to all programs using the JMCIS architecture.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2216

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: C4I for Joint Littoral Warfare

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1.(U) FY 1997 ACCOMPLISHMENTS:

- (U) Not Applicable.

2. (U) FY 1998 PLAN:

- (U) Not Applicable.

3. (U) FY 1999 PLAN:

- (U) (\$385) Perform system requirements analysis and systems design.
- (U) (\$175) Develop program documentation and data.
- (U) (\$350) Transition to latest technologies to achieve a field deployable JLW capability.
- (U) (\$450) Develop new Application Program Interfaces (APIs) to support new JLW mission capabilities.
- (U) (\$600) Update JMCIS C4I systems architecture and update/integrate JMCIS software segments to provide Tactical Data Link (TADIL) improvement, improved navigational and environmental data for Tactical Decision Aids and Theater Ballistic Missile Defense.
- (U) (\$300) Procure components of the DII Software Development Environment for use by JMCIS/DII developers.
- (U) (\$411) Develop/integrate JLW Application Software Segments supporting mine warfare and countermeasures, and amphibious assault.
- (U) (\$255) Complete initial phase of JLW/JMCIS Systems Integration.
- (U) (\$300) Conduct JLW Developmental Testing.
- (U) (\$200) Complete an JLW initial OA.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2216

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: C4I for Joint Littoral Warfare

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	0	0	6,215
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG:	0	0	-2,789
(U) FY 1999 President's Budget Submit:	0	0	3,426

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1999:Reflects reduction for IT21 \$-2,500K; NWCF adjustments \$+5K; minor Navy/OSD offsets \$-175K; inflation adjustments \$-60K; and -\$59K redirected to develop and update overarching C4ISR mission requirements. {total: \$2,789K}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2216

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: C4I for Joint Littoral Warfare

D. (U) SCHEDULE PROFILE:

	FY 1997				FY 1998				FY 1999			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Program Milestones											▲	
											MS III	
Engineering Milestones										▲		
										JMCIS 4.0		
T&E Milestones											▲	
											COTF OT	
Contract Milestones												

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2216

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: C4I for Joint Littoral Warfare

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Project Management			200
Systems Engineering			626
Software Development			1,875
Hardware Development			300
System Test & Evaluation			425
Total			3,426

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
XYZ	CPFF	10/98						2,051	CONT.	CONT.
NRAD	WX	10/98						675	CONT.	CONT.
Support and Management										
XYZ	CPFF	10/98						200	CONT.	CONT.
Test and Evaluation										
NRAD	WX	10/98						500	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2216

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: C4I for Joint Littoral Warfare

<u>Item</u>	<u>Fund Type</u>	<u>Oblig</u>	<u>Delivery</u>	<u>Total</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To</u>	<u>Total</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>FY 1996</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development							2,726	CONT.	CONT.
Subtotal Support and Management							200	CONT.	CONT.
Subtotal Test and Evaluation							500	CONT.	CONT.
Total Project							3,426	CONT.	CONT.

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DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2305 Navy Common Operating Environment (COE)	0	6,777	1,860	2,000	2,048	2,089	2,136	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Design, develop, update, integrate, test, configuration manage, support and evolve a Naval Common Operating Environment (COE), based on the Joint Defense Information Infrastructure (DII) COE, for all Naval C4I Systems. The Naval COE program contains the fundamental building blocks for all of our fielded Joint Maritime Command Information System (JMCIS) C4I systems in Navy, Marine Corps, and Coast Guard. It is the Navy's tactical implementation of the Global Command and Control System (GCCS) and the Global Combat Support System (GCSS) which provides the warfighter: (1) timely access to battlefield information, and (2) state-of-the-art information processing capability to support the command and control of maritime forces through a combination of communications, intelligence and combat system interfaces.

As the Navy migrates to the DII COE, it will maintain compatibility with the core tactical services of our Joint Command and Control systems (e.g., GCCS) as well as functioning as the COE for the Navy's JMCIS Command and Control systems afloat and ashore. Its core services include communications interfaces, message processing, track database management, track correlation, relational database management, and tactical display capabilities. The Navy COE must continue to service the Marine Corps, foreign military sales, joint and Coast Guard Command and Control programs.

The Navy COE serves as the system integration point for command and control systems in the Naval services. The program has the responsibility of working with each developer to incorporate the requirements of their users so that they might quickly and efficiently integrate and transform present stovepipe capabilities into an interoperable common operational environment. As the number of legacy systems migrating to the DII COE continues to grow, resources for rapidly folding them into the service extensions must keep pace as the complexity and size of the COE grows. As a product of evolutionary acquisition, the Navy COE will continue to evolve with the DII COE, new technology, and Commercial Off-the-shelf products.

Joint Surveillance Target Attack Radar System (JSTARS) is an airborne surveillance and target acquisition system that provides real-time accurate information for peacekeeping or decision-making on the battlefield. JSTARS detects, locates, classifies, tracks and targets potentially hostile ground movement in all weather. The Navy and Marine Corps aviation forces, future variants of the Tomahawk missile, shore fire support systems, and amphibious forces will require highly capable moving target indicator (MTI) radar support for situational assessment and targeting. Thus, the Navy and Marine Corps have a requirement for Joint STARS data that goes beyond the capability that has been demonstrated to date of simply

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

putting a stand alone DGSS terminal on board ship. The requirement for this data is specified in the S-3 and P-3 Operational Requirements Documents, the Marine Corps' Operational Requirements Document for Joint STARS connectivity and concept of employment. The data must be made available via existing communications paths and within existing command and control and weapons control systems to augment both the common operational picture and the targeting solution. These flexibility and interoperability requirements lead to the conclusion that the core capability to receive, process, display and store Joint STARS data must be integrated within the DII COE in order to maximize utilization of existing naval technical and operational resources and provide a path for future migration of user systems to the DII COE.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2305

PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Navy COE

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) Not Applicable.

2. (U) FY 1998 PLAN:

- (U) (\$ 200) Improve processes for integrating to the COE and develop supporting program documentation. Maintain the on-line software library which supports the Naval and DII COE and naval warfare applications for integration and configuration control. Provide on-line distribution of documentation and help desk. Conduct problem reporting and tracking of Naval COE components.
- (U) (\$1,343) Integrate and transform Naval core services to be interoperable extensions of the DII COE. Develop tools for integration. Develop updates to keep pace with new technology and commercial-off-the-shelf products. Obtain and manage COTS licenses. Upgrade Application Programmer Interfaces to improve the JMCIS systems integration process. Distribute COE software and provide engineering support for developers to the COE.
- (U) (\$ 350) Conduct compliance and functional level testing and Naval COE component certification testing. Conduct development test and evaluation and certification of evolutionary COE products.
- (U) (\$32) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.
- (U) (\$4,852) Provide Navy and Marine Corp. units JSTARS data to support situational awareness and targeting.

3. (U) FY 1999 PLAN:

- (U) (\$193) Continue development of program documents and data.
- (U) (\$1,327) Integrate and transform Naval core services to be interoperable extensions of the DII COE. Develop tools for integration. Develop updates to keep pace with new technology and commercial-off-the-shelf products.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2305

PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Navy COE

Obtain and manage COTS licenses. Upgrade Application Programmer Interfaces to improve the JMCIS systems integration process. Distribute COE software and provide engineering support for developers to the COE.

- (U) (\$340) Continue compliance and functional level testing and Naval COE component certification testing. Conduct development test and evaluation and certification of evolutionary COE products.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	0	1,984	2,027
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG:	0	+4,793	-167
(U) FY 1999 President's Budget Submit:	0	6,777	1,860

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1998: Reflects Congressional Plus-up for JSTARS \$+5,000K; Congressional Undistributed General Reductions \$-192K; revised economic assumptions \$-15K. {total: \$+4,793K}

FY 1999: Reflects programmatic adjustments \$-100K; NWCF adjustments \$-2K; inflation adjustment \$-33K; and \$-32K redirected to develop and update overarching C4ISR mission requirements. {total: \$-167K}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

Not Applicable

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Budget Item Justification

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2305

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Navy COE

D. (U) SCHEDULE PROFILE:

	FY 1997				FY 1998				FY 1999			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Program Milestones						▲ MS III				▲ MS III		
Engineering Milestones										▲ GCCS-M 4.0		
T&E Milestones						▲ COTF OT				▲ COTF OT		
Contract Milestones												

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2305

PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Navy COE

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Project Management		500	193
Systems Engineering		450	
Software Development		4,967	1,327
System Test & Evaluation		860	340
 Total		 6,777	 1,860

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands): Not Applicable (new Project).

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
XYZ	CPFF	10/97,98				4,967		1,327	CONT.	CONT.
Support and Management										
XYZ	CPFF	10/97,98				950		193	CONT.	CONT.
Test and Evaluation										
NRAD	WX	10/97,98				860		340	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2305

PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Navy COE

<u>Item</u> <u>Description</u>	<u>Fund Type</u> <u>Vehicle</u>	<u>Oblig</u> <u>Date</u>	<u>Delivery</u> <u>Date</u>	<u>Total</u> <u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development						4,967	1,327	CONT.	CONT.
Subtotal Support and Management						950	193	CONT.	CONT.
Subtotal Test and Evaluation						860	340	CONT.	CONT.
Total Project						6,777	1,860	CONT.	CONT.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2306 Naval Simulation System	0	2,392	1,746	2,305	2,364	2,511	2,713	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Naval Simulation System (NSS) provides a capability to simulate the execution of Naval Warfare and Operations Other Than War to be used for a number of related purposes. Fleet Command Centers, both ashore and afloat will use this capability for Course of Action Assessment; that is, to assess the effectiveness of operational plans with respect to measures defined by the fleet planner. NSS also supports fleet operations by providing a capability to inject simulated platform, system, or commander level entities into real world Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems, and by providing automated tools for conducting post-exercise analyses. Acquisition Planners in OPNAV will use this capability to conduct requirements analysis and cost effectiveness analysis for new Naval systems. NSS provides a comprehensive ability to simulate and assess Naval and joint CONOPS and system/platform/force level capabilities. NSS explicitly accounts for C4ISR interactions among all Warfare Mission Areas (WMAs). In each of these applications, NSS provides detailed analyses of performance including traceability of the warfighting outcome to specific components of the "sensor to decision-maker to shooter" architecture.

The Naval Simulation System will also support Command Level training for operational forces at the Task Force or Battlegroup level. To be accessible to fleet planners, the Naval Simulation System will be integrated into the Joint Maritime Command Information System (JMCIS), both afloat and ashore configurations, in such a way as to be compliant with the Global Command and Control System (GCCS). In addition, the Naval Simulation System will support distributed computing on multiple High Performance Computers connected together on a network such as the Defense Information Infrastructure and Fleet Operational Communication Links at multiple classification levels. The same networks that are used to provide access to distributed computing will also be used for Distributed Collaborative Planning by means of which planners at different sites with responsibility for different aspects of the plan can work together collaboratively to produce a single coherent plan. This collaborative planning capability will be used to support Joint Planning between different service components. The Naval Simulation System will undergo Verification and Validation during its design and implementations phases, and will be Accredited for each intended major application. This effort funds the development and maintenance of the Naval Simulation System and the infrastructure of subject matter experts needed for ongoing Verification, Validation, and Accreditation (VV&A) and Configuration Control Management.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2306

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT TITLE: Naval Simulation System

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) Not Applicable. FY 1998 New Start Program

2. (U) FY 1998 PLAN:

- (U) (\$75) Develop an NSS Analyst Human Computer interface (HCI) Requirements Document and an NSS Analyst HCI Design and Implementation Plan.
- (U) (\$150) Develop an NSS Web-based Fleet HCI and Engine Requirements Document and an NSS Web-based Fleet HCI and Model Engine Design and Implementation Plan.
- (U) (\$320) Implement, test, and document the NSS analyst HCI and Model Engine. Provide for training and maintenance.
- (U) (\$690) Implement, test, and document the Fleet HCI and Model Engine for Fleet Strike/C4ISR applications and JFACC support operations. Become JMCIS'98 and DII-COE compliant. Provide for training and maintenance. Integrate with the Target Information Management System (TMS).
- (U) (\$257) Design, implement, and test a Personal Computer (PC-based) NSS Strike/C4ISR demonstration system illustrating the unique C4ISR capabilities of NSS for strike applications. Provide for training and maintenance.
- (U) (\$250) Implement, test, and document the Fleet HCI and Model Engine for Fleet Theater Ballistic Missile Defense (TBMD) applications. Provide for training and maintenance.
- (U) (\$300) Support the necessary subject matter expert review to provide VV&A and Configuration Control Management.
- (U) (\$350) Provide analysis support to JTFEX 98-1 and 98-2. Implement required NSS software modifications.

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Budget Item Justification

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2306

PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Naval Simulation System

3. (U) FY 1999 PLAN:

- (U) (\$100) Develop a Web-based Common NSS Analyst/Fleet Human Computer interface (HCI) Requirements Document and an NSS Common HCI Design and Implementation Plan.
- (U) (\$100) Implement, test, and document the Common HCI and Model Engine. Provide for Training and Maintenance.
- (U) (\$400) Add/Improve Warfare Area representations (AMW, MIW, ASW, Kinematic Strike, C4ISR and Logistics) in NSS as specified by the NSS Requirements Working Group and directed by the NSS Configuration Control Board.
- (U) (\$76) Identify and import the standard/validated data and information needed to characterize the additional/improved warfare area representations directed by the NSS Configuration Control Board.
- (U) (\$250) Add/improve the interfaces between NSS and similar simulation systems from other services to improve interoperability with other services for an improved Joint Simulation capability to support Joint Assessments and Joint Command Level Training.
- (U) (\$220) Add/Improve the NSS functionality supported by NSS in the JMCIS/GCCS environment as specified by the JMCIS Requirements Working Group and directed by the NSS Configuration Control Board.
- (U) (\$300) Provide analysis support to JTFEX 99-1 and 99-2. Implement required NSS software modifications.
- (U) (\$300) Support the necessary subject matter expert review to provide VV&A and Configuration Control Management.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2306

PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Naval Simulation System

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	0	3,369	3,416
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG:	0	-977	-1,670
(U) FY 1999 PRESIDENT'S Budget Submit:	0	2,392	1,746

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1998: Reflects Congressional Undistributed General Reductions \$-92K; revised economic assumptions \$-7K; and reduction of \$-878K for Navy/OSD offsets. {total: \$-977K}

FY 1999: Reflects reduction of \$-770K for Navy/OSD offsets; Other programmatic adjustments \$-803K; NWCF adjustments \$+1K; Congressional Undistributed General Reductions \$-18K; inflation adjustment \$-31K; -\$49 redirected to develop and update overarching C4ISR mission requirements.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) Not Applicable

D. (U) SCHEDULE PROFILE: Not Applicable

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2306

PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Navy Simulation System

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management		160	132
b. Software Development		1,824	1,230
c. Test and Evaluation		408	384
Total		2,392	1,746

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/</u> Government Performing Activity	<u>Contract</u> Method/ Fund Type Vehicle	<u>Award/</u> Oblig Date	<u>Perform</u> Activity EAC	<u>Project</u> Office EAC	<u>Total</u> FY 1996 & Prior	<u>FY 1997</u> Budget	<u>FY 1998</u> Budget	<u>FY 1999</u> Budget	<u>To</u> Complete	<u>Total</u> Program
Product Development										
Various							1,600	991	CONT.	CONT.
		VAR								
Support and Management										
Various							100	110	CONT.	CONT.
SSC-SD	WX						300	271	CONT.	CONT.
Test and Evaluation PD										
Various		VAR					92	84	CONT.	CONT.
SSC-SD	WX	VAR					300	300	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROJECT NUMBER: X2306

PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Navy Simulation System

<u>Item</u> <u>Description</u>	<u>Fund Type</u> <u>Vehicle</u>	<u>Oblig</u> <u>Date</u>	<u>Delivery</u> <u>Date</u>	<u>Total</u> <u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development						1,600	991	CONT.	CONT.
Subtotal Support and Management						400	371	CONT.	CONT.
Subtotal Test and Evaluation						392	384	CONT.	CONT.
Total Project						2,392	1,746	CONT.	CONT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

(U) COST (Dollars in thousands)

PROJECT NUMBER TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2307 Shipboard LAN/WAN	0	484	481	479	518	527	537	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Shipboard LAN/WAN project is a component of the Naval Tactical Command Support System (NTCSS), which is a multi-function program designed to provide standard tactical support information systems to various afloat and associated shore-based fleet activities. The NTCSS mission is to provide the full range of responsive tactical support ADP hardware and software in support of the management of information, personnel, material and funds required to maintain and operate ships, submarines, and aircraft. NTCSS is to provide an efficient management of afloat tactical support data, through the use of standardized hardware and software, to meet the mission support information management requirements for force sustainment in support of the new direction of the Navy and Marine Corps. On 6 June 1995, NTCSS and its component subsystems, discussed below, were selected as Command and Control migration systems under the auspices of ASD(C3I).

NTCSS incorporates the functionality of the Shipboard Non-Tactical ADP Processing (SNAP) systems, the Naval Aviation Logistics Command Management Information System (NALCOMIS), and the Maintenance Resource Management System (MRMS).

SNAP is an automated information system that supports organizational level maintenance, supply, financial and administrative functions on afloat units, at Marine Aviation Logistic Squadrons (MALS), and at associated shore activities. Due to the age and obsolescence of SNAP I, which is currently deployed on the larger ships and at the MALS, and SNAP II, which is currently deployed on the smaller ships and submarines, these systems are being replaced with SNAP III in the 1994 through 2000 time frame. SNAP improves equipment supportability and maintainability and thus readiness through: the improvement in the accuracy of the maintenance, supply, financial and related support data maintained and reported by the ship; and the acceleration of management report preparation and data transmission.

NALCOMIS is an automated, real time, interactive, management information system that provides a modern management tool for day-to-day management of aircraft maintenance at the organizational and intermediate levels. NALCOMIS automates the management of the aviation repairables inventory providing nose-to-tail tracking through the repair and operations cycles. The scope of NALCOMIS includes 71 intermediate maintenance activities located afloat (CV/LHA/LHD) and ashore at MALS and Naval Air Stations (NAS's), and approximately 359 Navy and Marine squadrons.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

MRMS is an automated information system that supports ship intermediate maintenance management of the Atlantic and Pacific Fleets. MRMS supports Type Commands, Group Commanders, Area Coordinators, Readiness Support Groups, Submarine Squadrons, Ship Repair Facilities, and various intermediate Maintenance Activities, both afloat and ashore, for budgeting, planning, production and analysis of ship maintenance. MRMS improves ship readiness through improved maintenance and ship repair management, information resource management, and maintenance data processing.

FY 98 is the first year of RDT&E funds for this project.

- (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) Not Applicable.

2. (U) FY 1998 PLAN:

- (U) (\$475) Develop and integrate multi-level security capabilities on unclassified networks used by/managed by NTCSS. This capability will support the Combat Support Information for the Warfighter thrust by enabling tactical systems connected to Classified (GENSER Secret) networks to initiate queries of logistics data bases (such as NTCSS) resident on the unclassified networks, and receive detail or roll-up planning and execution data.
- (U) (\$9) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

3. (U) FY 1999 PLAN:

- (U) (\$481) Continue to incorporate state-of-the-art technologies and business process improvements into interfaces with tactical systems.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N
PROGRAM ELEMENT TITLE: Tactical Command System

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 PRESIDENT'S BUDGET:	0	498	495
(U) ADJUSTMENTS FROM FY 1998 PRESBUDG:	0	-14	-14
(U) FY 1999 PRESIDENT'S Budget Submit:	0	484	481

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1998: Reflects Congressional Undistributed General Reduction \$-13K; and revised economic assumptions \$-1K.
{total: \$-14K}

FY 1999: Reflects NWCf adjustments \$+2K; inflation adjustment -\$8K; redirected to develop and update
overarching C4ISR mission requirements. {total: \$-14K}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u>	<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>TO</u>	<u>TOTAL</u>
	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
(U) OPN (LI 2611)	32,370	78,846	73,333	41,285	35,119	38,011	36,971	CONT	CONT
(U) O&MN	36,939	40,421	41,518	44,199	43,565	44,696	43,143	CONT	CONT
(U) O&MNR	642	639	633	650	668	683	698	CONT	CONT

D. (U) SCHEDULE PROFILE: Not applicable.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604245N
PROGRAM ELEMENT TITLE: USMC H-1 UPGRADES

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO COMPLETE	TOTAL PROGRAM
H2279/ 4BW/4BN UPGRADE RDT&E ARTICLES	68,114*	83,774**	98,542	155,587 2	106,711 2	50,619	19,991	CONT	CONT

**FY98 estimate reflects \$5.6M for the 4BN Cockpit (H2419).

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION The mission of the AH-1W attack helicopter is to provide rotary wing close air support, anti-armor, armed escort, armed/visual reconnaissance and fire support coordination capabilities under day/night and adverse weather conditions. The mission of the UH-1N utility helicopter is to provide command and control and combat assault support under day/night and adverse weather conditions. Also, 4BN missions include special operations support; control, coordination, guidance, supporting fire and aeromedical evacuation. The 4BW/4BN program will replace 2-bladed rotor systems on the AH-1W and UH-1N aircraft. Fully integrated cockpits will be phased into the development after initial work on the drive system is underway. Initial work will consist of simultaneous design efforts for the 4BW and 4BN. Major modifications include: a new rotor system with semi-automatic blade fold of the new composite rotor system, a new performance matched transmission, a new 4-bladed tail rotor and drive system, a more effective stabilizer, upgraded landing gear, tail pylon structural modifications and common cockpits. This remanufacture will add 10,000 flight hours to 4BW/4BN airframes. The 4BW will increase aircraft maneuverability, speed, and payload (ordnance) capability. The fully integrated cockpits will reduce operator workload and improve situational awareness, thus increasing safety. It will provide growth potential for future weapon systems and avionics, which would increase mission effectiveness and survivability. As discrete systems have previously been added to both aircraft, pilot workload has progressively worsened. The cockpits will include integration of on-board mission planning, communications, digital fire control, self navigation, night targeting, and weapons systems in nearly identical crew stations reducing training requirements. The 4BN effort will incorporate the 4BW rotor system into the UH-1N aircraft, as well as a fully integrated cockpit common with the 4BW, maximizing commonality between the two aircraft and providing needed improvements in crew and passenger survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under Engineering and Manufacturing Development because it encompasses Engineering and Manufacturing Development of new end-items prior to a production approval decision.

*Funding in FY 1997 and prior was executed in (PE 0603266N)

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**Exhibit R-2, RDT&E Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604245N

PROJECT NUMBER: H2279

PROGRAM ELEMENT TITLE: USMC H-1 UPGRADES

PROJECT TITLE: 4BW/4BN UPGRADE

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS: (Executed in PE 0603266N)

- (U) (\$ 0) Received 4BW/4BN Milestone II decision and approval for Engineering and Manufacturing Development (E&MD)in first quarter.
- (U) (\$67,558) Began 4BW/4BN design efforts and successfully conducted 4BW/4BN Preliminary Design Review (PDR). Began design and fabrication of tooling. Began detail parts fabrication and procurement of long lead hardware. Contractor conducted a competition and selected a cockpit integrator. Began cockpit design.
- (U) (\$ 550) Began Live, Fire, Test and Evaluation (LFT&E) effort of aircraft subassemblies.
- (U) (\$ 6) Reprogrammed for various minor efforts.

2. (U) FY 1998 PLAN:

- (U) (\$83,284) Continue 4BW/4BN fabrication of tooling and procurement of long lead hardware. Conduct 4BW/4BN airframe Critical Design Review (CDR). Begin initial fabrication of 4BW/4BN aircraft components. Continue cockpit design, conduct cockpit hardware and software PDR.
- (U) (\$ 490) Continue LFT&E effort of aircraft subassemblies.

3. (U) FY 1999 PLAN:

- (U) (\$97,687) Continue fabrication of 4BW/4BN aircraft components. Complete common cockpit design, hardware and software CDR and begin avionics bench testing. Deliver initial AH-1W/UH-1N aircraft to contractor for teardown and remanufacture into 4BW/4BN. Start 4BW/4BN Structural Test Articles (STA), avionics bench and transmission bench testing. Complete 4BN engineering design. Start assembly of first 4BW EMD aircraft.
- (U) (\$ 855) Continue LFT&E effort of aircraft subassemblies.

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**Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2,Page 2 of 8)**

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604245N
PROGRAM ELEMENT TITLE: USMC H-1 UPGRADES

PROJECT NUMBER: H2279
PROJECT TITLE: 4BW/4BN UPGRADE

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997*</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	69,986	80,735	90,264
(U) Appropriated Value:		86,335	
(U) Adjustments from PRESBUDG:	-1,872	+3,039	+8,278
(U) FY 1999 President's Budget Submit:	68,114	83,774	98,542

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 reflects a decrease of -\$1,872 thousand for Small Business Innovative Research (SBIR) assessment. FY98 increase of +5,600 thousand for Congressional Add; FY98 decreases include -\$2,216 thousand for Congressional General Reductions, -\$166 thousand for contractor advisory services, -\$179 thousand for Other Economic Assumptions. FY99 increases of +\$9,500 for 4BN Common Cockpit Integration; +\$377 thousand Naval Working Capital Fund (NWCF) surcharge correction; +\$254 thousand other pricing adjustment; decreases of -\$1,737 thousand for commercial purchases inflation adjustment, -\$116 thousand for other pricing adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

*FY 1997 executed in (PE 0603266N)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604245N
PROGRAM ELEMENT TITLE: USMC H-1 UPGRADES

PROJECT NUMBER: H2279
PROJECT TITLE: 4BW/4BN UPGRADE

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
QTY			(5)	(17)	(258)	(280)			
APN-1 - Line 8					71,214	208,306	2,595,638		2,875,158

(U) RELATED RDT&E: 0604212N, ASW & Other Helo Developments
0603266N, AH-1T Comp Rotor Blade

R-1 Item No. 90

Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2,Page 4 of 8)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604245N

PROJECT NUMBER: H2279

PROGRAM ELEMENT TITLE: USMC H-1 UPGRADES

PROJECT TITLE: 4BW/4BN UPGRADE

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	1Q 4BW/4BN MSII			2Q/04 4BW/4BN MSIII
Engineering Milestones	2Q-4Q 4BW/4BN PDR	2Q-4Q 4BW/4BN CDR		
T&E Milestones				2Q/02-4Q/02 4BN TECHEVAL 1Q/03-3Q/03 4BN OPEVAL 3Q/02-1Q/03 4BW TECHEVAL 2Q/03-4Q/03 4BW OPEVAL
Contract Milestones	1Q 4BW/4BN EMD			2Q/02 4BN LRIP #1 2Q/03 4BN LRIP #2 2Q/04 4BN FRP 2Q/03 4BW LRIP 2Q/04 4BW FRP

R-1 Item No. 90

Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2,Page 5 of 8)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604245N

PROJECT NUMBER: H2279

PROGRAM ELEMENT TITLE: USMC H-1 UPGRADES

PROJECT TITLE: 4BW/4BN UPGRADE

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997*</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware Development	58,253	76,347	85,017
b. Software Development	1,003	540	522
c. Test and Evaluation	550	490	855
d. Engineering & Technical Support	4,843	2,846	3,998
e. Gov't Furnished Equipment	2,304	2,251	6,718
f. Program Management	1,155	1,300	1,432
h. Reprogramming for various minor efforts	6		
Total	68,114	83,774	98,542

*Funding in FY 1997 and prior was executed in (PE 0603266N)

R-1 Item No. 90

**Exhibit R-3, Program Element/Project Cost Breakdown
(Exhibit R-3,Page 6 of 8)**

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604245N
PROGRAM ELEMENT TITLE: USMC H-1 UPGRADES

PROJECT NUMBER: H2279
PROJECT TITLE: 4BW/4BN UPGRADE

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)
PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997* Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
<u>Major Contracts:</u>										
Bell Helicopter Ft. Worth, TX	SS CPFF	03/96	7,851	7,851	7,851	0	0	0	0	7,851
Bell Helicopter Ft. Worth, TX	SS CPAF	11/96	498,000	498,000	0	58,259	76,347	85,017	CONT	CONT
Gov't Furnished Equipment: Various	Various	Various	CONT	CONT	0	2,304	2,251	6,718	CONT	CONT
<u>In-House Support:</u>										
NAWC-AD, Patuxent Rv WX Multiple Field Activities: Tech & Engr Spt WX		10/98	CONT	CONT	729	3,231	2,328	2,393	CONT	CONT
		10/98	CONT	CONT	1,211	2,615	1,058	2,127	CONT	CONT
Support and Management										
<u>In-House Support:</u> (Travel)	Various				107	130	100	100	CONT	CONT
<u>Misc. CS Contracts:</u>	Various				1,097	1,025	1,200	1,332	CONT	CONT
Test and Evaluation:	Various				0	550	490	855	CONT	CONT

*Funding in FY 1997 and prior was executed in (PE 0603266N)

R-1 Item No. 90

Exhibit R-3, Program Element/Project Cost Breakdown
(Exhibit R-3, Page 7 of 8)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604245N
PROGRAM ELEMENT TITLE: USMC H-1 UPGRADES

PROJECT NUMBER: H2279
PROJECT TITLE: 4BW/4BN UPGRADE

GOVERNMENT FURNISHED PROPERTY

Item <u>Description</u>	Contract Method/ Fund Type <u>Vehicle</u>	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997* Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development		Not Applicable							
Support and Management		Not Applicable							
Test and Evaluation		Not Applicable							
				Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development				9,791	66,403	81,984	96,255	CONT	CONT
Subtotal Support and Management				1,204	1,155	1,300	1,432	CONT	CONT
Subtotal Test and Evaluation				0	550	490	855	CONT	CONT
Reprogramming for minor efforts					6				
Total Project				10,995	68,114	83,774	98,542	CONT	CONT

*Funding in FY 1997 and prior was executed in (PE 0603266N)

R-1 Item No. 90

**Exhibit R-3, Program Element/Project Cost Breakdown
(Exhibit R-3,Page 8 of 8)**

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROGRAM ELEMENT TITLE: Acoustic Search Sensors

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H0480 ASW Sensors & Processing *	3,455	12,450	28,630	37,358	25,304	22,417	12,242	CONT	CONT
H2000 Air Deployed Active Receiver (ADAR)	10,202	5,865	1,007	0	0	0	0	0	97,359
TOTAL	13,657	18,315	29,637	37,358	25,304	22,417	12,242	CONT	CONT

* Note: FY 1998 estimate includes \$2,000 thousand Congressional add for development of alternative shallow water sound sources. These funds will be executed under project H2420 (Advanced Ranging Source).

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

(U) (H0480) - This project provides improved air Anti-Submarine Warfare (ASW) mission effectiveness through engineering development of hardware and software associated with acoustic systems, sensors, processing, post-processing, data recording and displays for air ASW platforms. Key objectives: improved detection, classification, localization and tracking; and increased capacity and flexibility to handle multi-sensor data. Programs being funded during the period identified are the Generic Acoustic Stimulation System (GASS) which is an ocean, sensor and target-modeling system that will add shallow water and range dependent capabilities to all ASW trainers and the Advanced Extended Echo Ranging (AEER) system to provide an improved bistatic acoustic source and signal processing for harsh water environments. A future program planned for this project is the Shallow Water ASW Localization and Attack System (SWALAS) to provide improved localization and attack in regional conflict environments.

(U) (H2000) - The Air Deployed Active Receiver (ADAR) sonobuoy is an expendable air-launched acoustic receiver utilized by ASW aircraft. The ADAR sonobuoy functions as the acoustic receiver for the Improved Extended Echo Ranging (IEER) system. IEER is a mono/multistatic acoustic sensor system that utilizes an ASW aircraft, supporting acoustic source, and acoustic receiver in a coordinated ASW search and surveillance mission against conventionally powered submarines operating in shallow water environments as well as all submarines operating in deep water. The ADAR Sonobuoy will also be capable of functioning in a passive mode to detect high speed targets. The Air Common Acoustic Processing (ACAP) software programs reside in the UYS-1 (Signal processor in the P-3 and the S-3 aircraft) to provide acoustic data from sonobuoy sensors such as ADAR for display and analysis.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROGRAM ELEMENT TITLE: Acoustic Search Sensors

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H0480 ASW Sensors & Processing *	3,455	12,450	28,630	37,358	25,304	22,417	12,242	CONT	CONT

* Note: FY 1998 estimate includes \$2,000 thousand Congressional add for development of alternative shallow water sound sources. These funds will be executed under project H2420 (Advanced Ranging Source).

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION This project provides improved air Anti-Submarine Warfare (ASW) mission effectiveness through engineering development of hardware and software associated with acoustic systems, sensors, processing, post-processing, data recording and displays for air ASW platforms. Key objectives: improved detection, classification, localization and tracking; and increased capacity and flexibility to handle multi-sensor data. Programs being funded during the period identified are the Generic Acoustic Stimulation System (GASS) which is an ocean, sensor and target modeling system that will add shallow water and range dependent capabilities to all ASW trainers and the Advanced Extended Echo Ranging (AEER) system to provide an improved bistatic acoustic source and signal processing for harsh water environments. A future program planned for this project is the Shallow Water ASW Localization and Attack System (SWALAS) to provide improved localization and attack in regional conflict environments.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

(U) GASS

- (U) (\$1,109) Completed Milestone II and final source selection activities. Awarded EMD contract and initiated system design.
- (U) (\$ 963) Continued GFE environmental software development to reduce EMD risk.
- (U) (\$ 272) Provided engineering oversight of EMD contractor.
- (U) (\$ 129) Provided other engineering support and contractor support services.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H0480

PROGRAM ELEMENT TITLE: Acoustic Search Sensors

PROJECT TITLE: ASW Sensors & Processing

(U) AEER

- (U) (\$ 289) Prepared EMD solicitation and system specification.
- (U) (\$ 238) Conducted analysis of alternatives (AOA) for selection of EMD system configuration.
- (U) (\$ 455) Identified requirements for implementation of the Advanced Extended Echo Ranging (AEER) baseline in P-3C Update III AN/USQ-78A equipped aircraft.

2. (U) FY 1998 PLAN:

(U) GASS

- (U) (\$3,600) EMD contractor complete GASS system design and initiate software code and test.
- (U) (\$ 390) Continue GFE environmental software development to reduce EMD risk.
- (U) (\$ 766) Provide engineering oversight of EMD contractor.
- (U) (\$ 947) Provide other engineering support and contractor support services.

(U) AEER

- (U) (\$ 500) Complete AOA to support Milestone II.
- (U) (\$3,000) Initiate implementation of AEER baseline software in P-3C Update III.
- (U) (\$1,460) Initiate systems requirements for implementation of AEER in P-3C Update III.
- (U) (\$ 206) Provide other engineering support and contract support services.
- (U) (\$1,581) Initiate performance specification and fabrication of test article to support acceleration of non-coherent source technology enhancements.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H0480

PROGRAM ELEMENT TITLE: Acoustic Search Sensors

PROJECT TITLE: ASW Sensors & Processing

3. (U) FY 1999 PLAN:

(U) GASS

- (U) (\$10,100) EMD contractor complete preliminary design review (PDR) for each of four trainer types, procure pre-production hardware and continue code and test.
- (U) (\$ 310) Continue GFE environmental software improvements.
- (U) (\$ 850) Provide engineering oversight of EMD contractor.
- (U) (\$ 1,388) Provide other engineering support and contractor support services.

(U) AEER

- (U) (\$ 3,100) Initiate coherent source design trade-offs and system analysis.
- (U) (\$ 7,177) Continue software code and test for AEER baseline in the P-3C Update III.
- (U) (\$ 1,705) Provide other engineering support and contractor support services.
- (U) (\$ 4,000) Continue fabrication and test of prototype units for acceleration of non-coherent source technology enhancements.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H0480

PROGRAM ELEMENT TITLE: Acoustic Search Sensors PROJECT TITLE: ASW Sensors & Processing

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	3,585	10,869	29,156
(U) Appropriated Value	3,787	12,450	
(U) Adjustments from PRESBUDG:	-130	+1,581	-526
(U) FY 1999 President's Budget submit:	3,455	12,450	28,630

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 net decrease of \$130 thousand reflects -\$78 thousand for SBIR, -\$48 thousand for Federally Funded Research and Development Centers (FFRDC), and -\$4 thousand for minor pricing adjustments. The FY1998 net increase of \$1,581 thousand includes +\$2,000 thousand (Congressional add) to accelerate AEER source technologies, -\$37 thousand for Contract Advisory and Assistance Services (CAAS), and -\$382 thousand for minor pricing adjustments. The net reduction of -\$526 thousand in FY 1999 reflects +\$21 thousand for Navy Working Capital Fund (NWCF), and -\$547 thousand for minor pricing adjustments.

(U) Schedule: AEER MS-II delayed from 2Q/98 to 4Q/00 and EMD contract award from 1Q/99 to 1Q/01 to allow maturation of battery and coherent source technology. AEER SDR, PDR, CDR, TECHEVAL and OPEVAL have subsequently been delayed from 1Q/99 to 3Q/01 (SDR), 4Q/00 to 3Q/03 (PDR), 4Q/01 to 3Q/04 (CDR), 4Q/02-2Q/03 to 1Q/05-2Q/05 (TECHEVAL) and 2Q/03-3Q/03 to 3Q/05-4Q/05 (OPEVAL). The revised milestone schedules displayed in FYs 1999 through 2003 for GASS PDR, CDR and TTPRR reflect the negotiated GASS EMD contract schedule.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) - Not applicable.

(U) RELATED RDT&E:

(U) PE 0603254N (ASW Systems Development)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H0480

PROGRAM ELEMENT TITLE: Acoustic Search Sensors PROJECT TITLE: ASW Sensors & Processing

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	2Q GASS Milestone II			4Q/00 AEER MS-II 3Q/02 GASS MS-III 4Q/01 SWALAS MS-II
Engineering Milestones			1Q GASS PDR #1	3Q/00 GASS CDR #1 4Q/00 GASS PDR #2 2Q/01 GASS PDR #3/CDR #2 3Q/01 GASS PDR #4 3Q/01 AEER SDR 4Q/01 GASS CDR #3 1Q/02 GASS CDR #4 3Q/03 AEER PDR 3Q/04 AEER CDR
T&E Milestones				1Q/02-2Q/03 GASS TTPRR 1Q/05-2Q/05 AEER TECHEVAL 3Q/05-4Q/05 AEER OPEVAL
Contract Milestones	2Q GASS EMD Contract Award			1Q/01 AEER EMD Contract Award 1Q/02 SWALAS EMD Contract Award

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FY 1999 PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H0480

PROGRAM ELEMENT TITLE: Acoustic Search Sensors

PROJECT TITLE: ASW Sensors & Processing

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware Development	0	1,000	3,000
b. Software Development	1,963	7,947	16,950
c. Systems Engineering	693	1,401	4,100
d. Government Engineering Support	517	1,049	2,191
e. Program Management Support	143	698	1,801
f. Contractor Support Services	139	355	588
Total	3,455	12,450	28,630

R-1 Item No. 91

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FY 1999 PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H0480

PROGRAM ELEMENT TITLE: Acoustic Search Sensors

PROJECT TITLE: ASW Sensors & Processing

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
APLABS San Diego, CA	C/CPFF	7/93	5,469	5,469	5,469	0	0	0	0	5,469
SAIC McLean, VA	C/CPFF	6/91	7,456	7,456	4,610	963	350	320	1,213	7,456
Northrop Grumman Long Island NY	C/CPFF	2/97	45,900	45,900	0	1,000	3,600	10,100	31,200	45,900
AEER Non-Coherent Source	TBD	4/98	TBD	8,000	0	0	1,000	3,000	4,000	8,000
MISC/In House P-3 Baseline Contr	WX TBD	10/98 2/98	TBD TBD	TBD 12,000	13,871	1,210	4,447 2,000	8,821 4,000	CONT 6,000	CONT 12,000
Support and Management										
MISC/In House	WX	10/98	TBD	TBD	1,269	143	698	1,801	CONT	CONT
MISC/Contrs	C/CPFF	10/98	TBD	TBD	3,492	139	355	588	CONT	CONT
(Aggregate under \$1 million)										

Test and Evaluation Not Applicable

GOVERNMENT FURNISHED PROPERTY

PRODUCT DEVELOPMENT - NOT APPLICABLE
SUPPORT AND MANAGEMENT - NOT APPLICABLE
TEST AND EVALUATION - NOT APPLICABLE

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H0480

PROGRAM ELEMENT TITLE: Acoustic Search Sensors

PROJECT TITLE: ASW Sensors & Processing

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
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Product Development Not Applicable

Support and Management Not Applicable

Test and Evaluation Not Applicable

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	23,950	3,173	11,397	26,241	CONT	CONT
Subtotal Support and Management	4,761	282	1,053	2,389	CONT	CONT
Subtotal Test and Evaluation	0	0	0	0	CONT	CONT
Total Project	28,711	3,455	12,450	28,630	CONT	CONT

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604261N PROJECT NUMBER: H2000
PROGRAM ELEMENT TITLE: Acoustic Search Sensors PROJECT TITLE: Air Deployed Active Receiver

(U) COST: (Dollars in Thousands)

PROJECT

PROJECT NUMBER & TITLE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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H2000 Air Deployed Active Receiver (ADAR)

10,202	5,865	1,007	0	0	0	0	0	0	97,359*
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*Corrects Total Program value shown in error prior to this submit.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Air Deployed Active Receiver (ADAR) sonobuoy is an expendable air-launched acoustic receiver utilized by ASW aircraft. The ADAR sonobuoy functions as the acoustic receiver for the Improved Extended Echo Ranging (IEER) system. IEER is a mono/multistatic acoustic sensor system that utilizes an ASW aircraft, supporting acoustic source, and acoustic receiver in a coordinated ASW search and surveillance mission against conventionally powered submarines operating in shallow water environments as well as all submarines operating in deep water. The ADAR Sonobuoy will also be capable of functioning in a passive mode to detect high speed targets. The Air Common Acoustic Processing (ACAP) software programs reside in the UYS-1 (Signal processor in the P-3 and the S-3 aircraft) to provide acoustic data from sonobuoy sensors such as ADAR for display and analysis.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$3,628) Completed build and delivery of TECHEVAL and OPEVAL test units.
- (U) (\$2,901) Completed S-3B/ADAR integration test and conducted system flight test.
- (U) (\$ 570) Completed training materials and equipment for TECHEVAL/OPEVAL.
- (U) (\$1,394) Initiated TECHEVAL of the IEER system.
- (U) (\$1,708) Provided other engineering support and contractor support services.
- (U) (\$ 1) Reprogrammed to Project H1425 for Deskbook reduction.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604261N PROJECT NUMBER: H2000
PROGRAM ELEMENT TITLE: Acoustic Search Sensors PROJECT TITLE: Air Deployed Active Receiver

2. (U) FY 1998 PLAN:

- (U) (\$1,254) Provide system engineering support for completion of TECHEVAL.
- (U) (\$1,589) Complete TECHEVAL.
- (U) (\$1,165) Complete OPEVAL.
- (U) (\$ 500) Initiate Generic Acoustic Stimulator System prototype integration into S-3B Weapon System Trainer (WST) for Fleet Introduction Team (FIT) training.
- (U) (\$ 360) Complete FIT training materials.
- (U) (\$ 997) Provide other engineering support and contractor support services.

3. (U) FY 1999 PLAN:

- (U) (\$ 751) Complete Generic Acoustic Stimulator System prototype/FIT trainer integration.
- (U) (\$ 256) Provide other engineering support and contractor support services.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604261N PROJECT NUMBER: H2000
 PROGRAM ELEMENT TITLE: Acoustic Search Sensors PROJECT TITLE: Air Deployed Active Receiver

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	10,396	6,078	991
(U) Appropriated Value	10,854	5,865	
(U) Adjustments from PRESBUDG:	-194	-213	+16
(U) FY 1999 President's Budget submit:	10,202	5,865	1,007

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 net decrease of \$194 thousand includes -\$166 thousand for SBIR, -\$14 thousand for Federally Funded Research and Development Centers (FFRDC), and -\$14 thousand for minor pricing adjustments. The net decrease of \$213 thousand in FY 1998 includes -\$12 thousand for FFRDC, -\$21 thousand for Contract Advisory and Assistance Services (CAAS), and -\$180 thousand for minor pricing adjustments. The net increase of \$16 thousand in FY 1999 includes +\$31 thousand for Navy Working Capital Fund (NWCF) adjustments, and -\$15 thousand for minor pricing adjustments.

(U) Schedule: TECHEVAL delayed from 4Q/97-2Q/98 to 1Q/98-3Q/98 and OPEVAL delayed from 2Q-3Q/98 to 3Q-4Q/98 due to additional time required to complete integration and test, thus delaying MS III until 1Q/99.

(U) Technical Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) - Not applicable.

	<u>FY 1997</u>	<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>TO</u>	<u>TOTAL</u>
	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
(U) OPN (SSQ-101) (403600)	0	0	16,550	28,574	36,996	37,772	37,226	CONT	CONT

(U) RELATED RDT&E:

(U) PE 0603254N (ASW Systems Development)

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FY 1999 RDT&E,N BUDGET JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H2000

PROGRAM ELEMENT TITLE: Acoustic Search Sensors PROJECT TITLE: Air Deployed Active Receiver

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones			1Q MS-III	
Engineering Milestones				
T&E Milestones		1Q/98-3Q/98 TECHEVAL 3Q-4Q/98 OPEVAL		
Contract Milestones				

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H2000

PROGRAM ELEMENT TITLE: Acoustic Search Sensors PROJECT TITLE: Air Deployed Active Receiver

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware Development	1,924	0	0
b. Software Development	1,339	400	0
c. Systems Engineering	492	109	130
d. Development Test and Evaluation	1,866	1589	0
e. Integrated Logistics Support	0	0	0
f. Training Equipment	1,140	500	621
g. Government Engineering Support	1,765	1,105	0
h. Program Management Support	1,252	797	181
i. Contractor Support Services	423	200	75
j. Operational Test and Evaluation	0	1,165	0
k. Reprogrammed to project H1425 for Deskbook Reduction.	1		
Total	10,202	5,865	1,007

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604261N PROJECT NUMBER: H2000
 PROGRAM ELEMENT TITLE: Acoustic Search Sensors PROJECT TITLE: Air Deployed Active Receiver

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
ERAPSCO	C/CPIF	7/92	24,930	24,930	22,919	2,011	0	0	0	24,930
Fort Wayne, IN										
NAWC/AD PAX RV	WX	10/98	46,370	46,370	39,861	4,765	1,614	130	0	46,370
MISC/In House	WX	10/98	9,610	9,610	9,425	185	0	0	0	9,610
Trainer Integr	TBD	10/98	TBD	1,121	0	0	500	621	0	1,121
Support and Management										
MISC/In House	WX	10/98	5,335	5,335	2,957	1,400	797	181	0	5,335
MISC/Contrs	C/CPFF	10/98	2,508	2,508	1,958	275	200	75	0	2,508
(Less than \$2 million)										
Test and Evaluation										
Miscellaneous (Less than \$2 Million)										
	Various	10/98	5,189	5,189	869	1,566	2,754	0	0	5,189
GOVERNMENT FURNISHED PROPERTY										

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N

PROJECT NUMBER: H2000

PROGRAM ELEMENT TITLE: Acoustic Search Sensors PROJECT TITLE: Air Deployed Active Receiver

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Program</u>
Product Development	Not Applicable								
Support and Management	Not Applicable								
Test and Evaluation									
NAWC/AD WAR	WX	N/A	N/A	2,296	0	0	0	0	2,296

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	72,205	6,961	2,114	751	0	82,031
Subtotal Support and Management	4,915	1,675	997	256	0	7,843
Subtotal Test and Evaluation	3,165	1,566	2,754	0	0	7,485
Total Project	80,285	10,202	5,865	1,007	0	97,359

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604262N
PROGRAM ELEMENT TITLE: V-22

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H1425 V-22	605,641	512,139	355,142	186,838	106,188	44,502	31,758	63,708	6,889,685
TOTAL	605,641	512,139	355,142	186,838	106,188	44,502	31,758	63,708	6,889,685
RDT&E Articles	2	2							4

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element funds the development of a replacement aircraft to meet the medium lift needs of the United States Marine Corps (USMC) and the special operations needs of the United States Special Operations Command (USSOCOM).

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT (EMD) because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) ACQUISITION STRATEGY: The V-22 program is designed to provide an aircraft to meet the medium lift amphibious/vertical assault needs of the USMC and the special operations needs of the USSOCOM. The aircraft will be capable of operations from aviation and air capable ships, as well as from unimproved landing sites throughout the world. The tiltrotor aircraft combines the speed, range and fuel efficiency normally associated with turboprop aircraft with the vertical take-off/landing and hover capabilities of helicopters. The special operations aircraft (CV-22) will consist of the baseline V-22 aircraft (MV-22) configuration plus a terrain following radar, additional fuel tanks, radios and flare/chaff dispensers, radar jammer and warning receiver, and infrared countermeasures. The CV-22 will be approximately 90% common with the MV-22.

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Exhibit R-2, RDT&E Budget Item Justification
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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604262N
PROGRAM ELEMENT TITLE: V-22

PROJECT NUMBER: H1425
PROJECT TITLE: V-22

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$552,828) Continued MV-22 and CV-22 contract efforts related to the engineering and manufacturing development (EMD) program, including delivery and flight testing of EMD aircraft and government furnished equipment (GFE) integration. Completed mating of aircraft 10. Continued Fatigue Test Article (FTA) efforts. First flight of EMD aircraft 7,8 and 9. Completed aircraft 7 and 8 ferry flights to Patuxent River. Awarded maintenance trainer and operational flight trainer upgrade contracts. Continued logistics support analysis (LSA) efforts. Completed static test article (STA) test to ultimate loads. Conducted CV-22 hardware executive Preliminary Design Review (PDR).
- (U) (\$52,813) Continued in-house flight test activities, integrated test team (ITTs), integrated product team (IPTs), support equipment development, logistics and training activities, the manned flight simulator and numerous other development and test efforts at the government's in-house activities. Trained pilots for EMD testing. Conducted operational assessment (OT-IIC).

2. (U) FY 1998 PLAN:

- (U) (\$452,893) Continue MV-22 and CV-22 contract efforts related to the EMD program. Continue FTA efforts. Continue LSA and training efforts. Complete Depot level LSA. Start drop test article (DTA) testing. Start STA test to failure.
- (U) (\$59,246) Continue in-house flight test activities, ITTs, IPTs, support equipment development, logistics and training activities, the manned flight simulator and numerous other development and test efforts at the government's in-house activities. Conduct CV-22 Software PDR. Complete OT assessment (OT-IID).

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Exhibit R-2, RDT&E Budget Item Justification
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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604262N
PROGRAM ELEMENT TITLE: V-22

PROJECT NUMBER: H1425
PROJECT TITLE: V-22

3. (U) FY 1999 PLAN:

- (U) (\$309,196) Continue MV-22 and CV-22 contract efforts related to the EMD program, including flight testing of EMD aircraft and GFE integration. Continue FTA efforts. Continue training efforts. LSA complete. Complete maintenance and pilot operational evaluation (OPEVAL) training. Complete DTA testing.
- (U) (\$45,946) Continue in-house flight test activities, ITTs, IPTs, support equipment development, logistics and training activities, the manned flight simulator and numerous other development and test efforts at the government's in-house activities. Conduct CV-22 Critical Design Review (CDR). Conduct MV-22 technical evaluation (TECHEVAL). Preparation and planning for MV-22 OPEVAL.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	552,082	529,495	272,716
(U) Appropriated Value:		529,495	
(U) Adjustments from PRESBUDG:	+28,849	-17,356	+82,426
(U) FY 1999 President's Budget Submit:	605,641	512,139	355,142

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The change in FY 1997 reflects an increased reprogramming action of \$68,400 thousand to fully fund FY 1997 increment for EMD contract and to maintain program schedule; and decreases of \$39,551 thousand for Congressional Undistributed Reductions, small business innovative research (SBIR) assessment, revised economic assumptions, and below threshold reprogrammings. The FY 1998 reduction of \$17,356 thousand reflect Congressional Undistributed Reductions and revised economic assumptions. The FY 1999 increase of \$82,426 thousand reflect increases to continue Fatigue Test Article (+\$16,000K), Weapons Replaceable Assembly Test Program Sets (WRA TPS)(+\$13,000K), increase in airframe contract estimate at completion (+\$67,000K); and a decrease of \$13,574 associated with various rate and inflation adjustments.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604262N
PROGRAM ELEMENT TITLE: V-22

PROJECT NUMBER: H1425
PROJECT TITLE: V-22

(U) Schedule: The Maintenance Trainer contract was awarded 2Q97 vice 3Q97. Delays in EMD aircraft deliveries and flight test resulted in a re-plan of MV-22 TECHEVAL and OPEVAL start and completion dates.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
APN V-22 &	603,463	611,919	610,766	794,711	1,112,480	1,232,750	1,560,199	16,554,449	23,312,137 ¹
Adv Proc	55,879	60,662	54,020	72,451	82,230	172,765	109,087	1,041,675	1,695,914 ²
APN Spares	57,443	21,397	27,560	87,417	142,019	131,878	25,949	423,327	916,990
Total APN	716,785	693,978	692,346	954,579	1,336,729	1,537,393	1,695,235	18,019,451	25,925,041 ¹

¹Includes \$231,400 of FY 1989 APN funds.

²Includes \$47.145K of FY 1996 Adv Proc funds.

(U) RELATED RDT&E:

(U) PE 116404BB CV-22

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u> 3Q97	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	DAB LRIP Review			MS III 1Q01
Engineering Milestones		2Q98 CV PDR	1Q99 CV CDR	
T&E Milestones	1Q97-4Q97 OT-IIC Assess 1Q97 CV Def	3Q98-4Q98 OT-IID Assess	3Q99-4Q99 TECHEVAL	1Q00-3Q00 OPEVAL
Milestones	3Q97 LRIP 1 Def/Full Funding 2Q97 Maint Trainer contract award			

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**Exhibit R-2, RDT&E Budget Item Justification
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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604262N PROJECT NUMBER: H1425
 PROGRAM ELEMENT TITLE: V-22 PROJECT TITLE: V-22

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Prime Contractor Development	529,151	432,072	288,553
b. Contractor Engineering Support	23,677	20,821	20,643
c. Government Engineering Support	52,813	59,246	45,946
Total	605,641	512,139	355,142

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Exhibit R-3, RDT&E Budget Item Justification
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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604262N
PROGRAM ELEMENT TITLE: V-22

PROJECT NUMBER: H1425
PROJECT TITLE: V-22

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development:										
Bell-Boeing Arlington, VA	CPAF	10/92	TBD	TBD	2,249,234	521,923	418,049	280,610	CONT.	CONT.
Allison Indianapolis, IN	CPIF	12/92	TBD	TBD	154,441	7,228	8,436	4,792	CONT.	CONT.
STI Rockville, MD	T&M	10/98	TBD	TBD	13,164	2,607	2,143	2,066	CONT.	CONT.
VSS Alexandria, VA	T&M	10/98	TBD	TBD	2,192	1,984	475	1,398	CONT.	CONT.
Hughes Indianapolis, IN	CPIF	10/98	TBD	TBD	0	0	5,587	3,151	CONT.	CONT.
NAWCADPAX	WX	10/98	TBD	TBD	*	49,542	53,036	46,526	CONT.	CONT.
NAD Ch Pt	WX	10/98	TBD	TBD	*	9,601	8,832	7,677	CONT.	CONT.
NAWCADLKE	WX	10/98	TBD	TBD	*	5,577	5,974	3,906	CONT.	CONT.
NAWCWDCHL	WX	10/98	TBD	TBD	*	1,484	2,137	937	CONT.	CONT.
NAWCWDMUGU	WX	10/98	TBD	TBD	*	526	1,003	306	CONT.	CONT.
MISC Gov't	various	various	TBD	TBD	*	5,169	6,467	3,773	CONT.	CONT.

* Total FY96 & Prior amounts are not available by activity; however, they are reflected in Subtotal Production Development.

Support and Management:										
MISC Contr.	various	various	3,093	3,093	3,093	0	0	0	0	3,093

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604262N PROJECT NUMBER: H1425
PROGRAM ELEMENT TITLE: V-22 PROJECT TITLE: V-22

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

Table with 7 columns: Description, Total FY 1996 & Prior, FY 1997 Budget, FY 1998 Budget, FY 1999 Budget, To Complete, Total Program. Rows include Subtotal Production Development, Subtotal Support and Management, Subtotal Test and Evaluation, Other FY-96 and Prior Costs, and Total Project.

1/ Reflects previous V-22 funding in the following P.E.'s: 0603203N, 0603256N, 0604222A, & 0604262N.

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Date: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N

PROGRAM ELEMENT TITLE: Aircrew Systems Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0606 & W2421	Aircrew Systems Development								
TOTAL	25,596	17,366	9,454	9,246	8,994	9,196	9,450	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Aircrew Systems Development program provides engineering and manufacturing development (EMD) of Aviation Life Support Systems to protect aircrews from current and future threats including: directed energy weapons, chemical/biological/radiological agents/fallout, ballistic projectiles, temperature extremes, heat/fire, low concentration oxygen environments, high dynamic forces during emergency egress, and high "G" forces. The program also provides development for the following capabilities: head protection, inflight restraint, emergency egress and descent, escape and evasion, survival and rescue, and anthropometric sizing for small female aircrew. Acquisition initiatives include competition, the application of streamlining initiatives, use of non-developmental items (NDI), joint and tri-service developments, and the pursuit of NATO/allied cooperative ventures to expedite introduction into Navy and Marine Corps fixed and rotary wing aircraft, reduce costs, and promote commonality.

(U) SUBPROJECTS:

- (U) ESCAPE AND CRASH SAFETY: Naval Aircrew Common Ejection Seat Pre-Planned Product Improvement (NACES P³I), Advanced Crashworthy Aircrew Survival Systems (ACASS), Joint Inflatable Body and Head Restraint System (IBAHRS), Joint Cockpit Air Bag System (JCABS), Parachutes, Crashworthy Troop Seats (CWTS), and Non-NACES and Small Occupant Escape System Improvements.
- (U) LIFE SUPPORT: Passenger Anti-Exposure Survival Systems (PAESS), Extreme Cold Weather Improvement Program (ECWIP), Aircrew Modified Equipment Leading to Increased Accommodation (AMELIA), PRC-112 P³I, Aircrew Accommodation Expansion Program (AAEP), Advanced Oxygen Delivery System (AODS), Advanced Oxygen Mask (AOM), and Combat Survivor Evader Locator (CSEL).
- (U) THREAT PROTECTION: Joint Service Advanced Laser Eye Protection Visor (JALEPV) Program, Laser Eye Protection Improvement Program (LEPIP) EDU-5/P Spectacles, Chemical Biological (CB), Advanced Technology Crew Station (ATCS), Advanced Integrated Life Support Systems (AILSS), Agile Frequency LEP, Aircrew Cooling, and Navy Combat Edge (NCE).
- (U) HELMET, VISION AND DISPLAYS: Joint Night Vision System (NVS), Joint Helmet Mounted Cueing System (JHMCS), Passive Noise Reduction (PNR) Earcup, and Navy Day/Night All Weather Helmet (NDNAWH).

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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Exhibit R-2, RDT&E Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N

PROJECT NUMBER: W0606

PROGRAM ELEMENT TITLE: Aircrew Systems Development

PROJECT TITLE: Aircrew Systems Development

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

2. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$12,407) NACES P³I: Continued Phase I Development Test (DT), NACES Phase II, and initiated DT. Conducted Preliminary Design Review (PDR). Non-NACES and Small Occupant Escape System Improvements: Commenced DT. ACASS: Continued DT qualification on helo crashworthy systems. JCABS: Commenced DT. CWTS: Completed DT and approved ECP for H-53; and conducted source selection for H-1, H-3, and H-46 troop seats. Parachutes: Conducted repack extension testing and investigated vacuum pack applications for ejection seats.
- (U) (\$2,354) ECWIP: Continued DT for cold weather clothing and survival items and prepared ECP's. AMELIA: Continued DT and Operational Test (OT) of modified equipment. AAEP: Continued cockpit mapping/DT. CSEL: Supported Air Force DT and investigated non combat survival radio alternatives.
- (U) (\$2,950) LEPIP EDU-5/P Spectacles: 43 pre-production spectacles delivered for DT. Completed environmental, laser saturation, optical and ground compatibility testing AIR-1.0. Approved as an Abbreviated Acquisition Program (AAP). Joint interest from Coast Guard HQ for production buy. Established joint coordination with ONR, NSAP for contract modification to include a new USMC sun, wind and dust goggle (SWDG). JALEPV: Tailoring memo approved by AIR-1.0. AIR-1.0 approved program as an ACAT-IVM. Conceptual Design Review Mtg was held. Joint interest from the Air Force SPD at Brooks AFB initiated with limited funding. NCE: Achieved MS III.
- (U) (\$7,885) NVS: Monitored Air Force NVS DT, flight tested AN/AVS-9 DT/OT and completed ECP for AN/AVS-9. JHMCS: Awarded joint USN/USAF development contract. Continued platform integration, obtained MS II. Conducted Preliminary Design Review (PDR). PNR: Improved design and prototype earcups for DT testing, developed procurement package. NDNAWH: Monitored 6.4 effort, commenced DT.

3. (U) FY 1998 PLAN:

- (U) (\$9,484) NACES P³I: Complete Phase I CDR/System DT and submit ECP. NACES Phase II: Review integration studies and commence demonstration component and system tests. Non-NACES and Small Occupant Escape System Improvements: Continue DT on selected systems. ACASS: Continue DT/qualification on selected helo crashworthy subsystems. JCABS: Complete integration design, write SH-60 ECP. CWTS: Contract award and commence design and certification for H-1, H-3, and H-46 troop seats.
- (U) (\$2,977) ECWIP: Continue DT for cold weather clothing and survival items and prepare ECP's. AMELIA: Continue DT and OT of modified equipment and prepare ECP's. AAEP: Complete cockpit mappings and commence ECP preparation. AOM: Commence DT studies. CSEL: Support Air Force DT/OT.
- (U) (\$1,200) LEPIP EDU-5/P Spectacles: Complete DT and commence OT. MSIII approval, ECP approval and award production Lot 1. IOC approval. JALEPV: Hold PDR and commence DT. Delivery 55 T&E visors. Commence compatibility, environmental and laser saturation testing. Prepare ECP. AILSS: Monitor Army EMD for rotary wing system. Aircrew Cooling: Initiate DT studies.

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Exhibit R-2, RDT&E Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N

PROGRAM NUMBER: W0606

PROGRAM ELEMENT TITLE: Aircrew Systems Development

PROGRAM TITLE: Aircrew Systems Development

- (U) (\$3,705) NVS: Monitor and evaluate USAF panoramic NVG program and NVS Detachment system. JHMCS: Continue platform integration and software development. Finalize Critical Design Review (CDR)/commence DT. PNR: Conduct DT. NDNAWH: Continue prototype integration and test.
4. (U) FY 1999 PLAN:
- (U) (\$2,637) NACES P³I: Complete Phase I system qualification testing and aircraft integration efforts and platform ECP's. NACES P³I Phase II: Conduct DT/OT on selected candidate technologies. ACASS: Continue DT/OT of helo selected crashworthy protection subsystems. JCABS: Complete prototype installations for other SH-60 models and other rotary/fixed wing platforms. CWTS: Complete DT and prepare H-1, H-3, and H-46 platform ECP's.
 - (U) (\$2,519) ECWIP: Continue DT for cold weather clothing and survival items and prepare ECP's. AMELIA: Continue DT and OT of modified equipment and prepare ECP's. AOM: Initiate EMD DT. CSEL: Support Air Force DT. AAEP: Complete ECP preparation. AODS: Initiate DT studies.
 - (U) (\$1,045) JALEPV: Deliver pre-production visors. MSIII. Start production. Commence agile frequency protection studies.
 - (U) (\$3,253) NVS: Monitor and participate in JNVS Testing, product improvements, participate in USAF Panoramic NVG evaluation. JHMCS: Complete platform integration and software development. Commence OT. NDNAWH: MSI/II.

R-1 Item No. 93

Exhibit R-2, RDT&E Budget Item Justification
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Date: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N

PROJECT NUMBER: W0606

PROGRAM ELEMENT TITLE: Aircrew Systems Development

PROJECT TITLE: Aircrew Systems Development

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	26,083	12,111	14,126
(U) Appropriated Value		17,366	
(U) Adjustments from PRESBUDG:	-487	+5,255	-4,672
(U) FY 1999 PRESBUDG:	25,596	17,366	9,454

(U) FY 1997 decrease reflects -\$452 thousand for Small Business Innovation Research Assessment (SBIR), -\$32 thousand for FY97 Revised Economic Assumptions, and -\$3 thousand for minor program adjustments. FY 1998 increase reflects \$6 million Congressional increase for NACES P3 I. This increase is partially offset by a decrease of \$745 thousand for Congressional undistributed reductions. FY 1999 net decrease reflects -\$4,662 thousand for higher DoN priorities, -\$166 thousand for economic adjustments, -\$19 thousand for minor program adjustments, and -\$152 thousand for DBOF surcharge adjustments. These decreases are partially offset by an increase of \$327 thousand for miscellaneous rate adjustments.

(U) CHANGE SUMMARY EXPLANATION:

(U) Schedule: The following milestones have been cancelled due to program restructure and deletion of phased development.

FY 99: 2Q AILSS MSII, 3Q AILSS DT, 2Q NDNAAWH OT

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) Not Applicable.

(U) RELATED RDT&E:

(U) PE 0603216N (Aviation Survivability)

(U) PE 0604706F (Life Support Equipment, related Air Force efforts)

(U) PE 0604713A (Combat Feeding, Clothing and Equipment, related Army efforts. Coordinated through the OSD sponsored Tri-Service Life Support RDT&E Steering Committee)

(U) PE 0604384BP (Chemical Biological (CB) program)

(U) PE 06084201F (Common Avionics related Air Force efforts)

R-1 Item No. 93

Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, Page 4 of 7)

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Date: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N
PROGRAM ELEMENT TITLE: Aircrew Systems Development

PROJECT NUMBER: W0606
PROJECT TITLE: Aircrew Systems Development

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	3Q NCE MSIII 1Q JHMCS MSII	4Q JCABS SH-60 ECP 4Q LEPIP MSIII	3Q AODS MSII 2Q AOM MSII 3Q JALEPV MSIII NACES Phase I ECP	JHMCS MSIII
Engineering Milestones	3Q JHMCS PDR 4Q CWTS H-53 ECP 3Q NACES Phase I PDR 2Q LEPIP PDR	2Q LEPIP ECP 3Q AAEP ECP 3Q NACES Phase I CDR 4Q JHMCS CDR 3Q CWTS H-1,H-3 & H-46 2Q JALEPV PDR	2Q JALEPV ECP	NACES P ³ I PHASE II, ECP
T&E Milestones	2Q NCE OT COMP. 2Q NACES Phase I DT 4Q CWTS H-53 DT	3Q LEPIP DT COMP. 1Q NDNAWH DT 3Q PNR DT 3Q CWTS H-1,H-3 & H-46 DT 3Q JHMCS DT 4Q LEPIP OA COMP.	NACES P ³ I PHASE II DT/OT 3Q AOM DT 4Q JHMCS OT 4Q AODS DT NACES Phase I DT CWTS/H-1,H-3& H-46 DT 1Q JALEPV OA COMP.	CWTS/H-1, H-3 & H-46 ECP
Contract Milestones	2Q JHMCS EMD 2Q NACES P ³ I PHASE I 4Q NACES P ³ I PHASE II	4Q JALEPV DT COMP. 2Q PNR EMD 2Q CWTS/H-1,H-3 & H-46 3Q NACES PHASE II		NACES P ³ I PHASE II/III

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Exhibit R-2, RDT&E Budget Item Justification
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Date: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N

PROJECT NUMBER: W0606

PROGRAM ELEMENT TITLE: Aircrew Systems Development

PROJECT TITLE: Aircrew Systems Development

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. System Engineering	10,069	5,506	2,440
b. Developmental T&E	9,000	7,897	3,684
c. Operational T&E	610	363	450
d. ILS	5,917	3,600	2,880
e. SBIR Assessments	0	0	0
Total	25,596	17,366	9,454

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
NAWC/AD WAR WX/RX					5,972				CONT	CONT
NAWC/AD PAX WX/RX		07/98			3,350	10,521	5,326	2,600	CONT	CONT
Support and Management										
MISC (less than \$1M)										
	WX/RX	07/98			8,723	5,917	3,493	2,720	CONT	CONT
Test and Evaluation										
MISC (less than \$1M)		07/98			12,674	9,158	8,547	4,134	CONT	CONT
	WX/RX									

GOVERNMENT FURNISHED PROPERTY: NOT APPLICABLE

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, Page 6 of 7)

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Date: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N

PROJECT NUMBER: W0606

PROGRAM ELEMENT TITLE: Aircrew Systems Development

PROJECT TITLE: Aircrew Systems Development

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	9,322	10,521	5,326	2,600	CONT	CONT
Subtotal Support and Management	8,723	5,917	3,493	2,720	CONT	CONT
Subtotal Test and Evaluation	12,674	9,158	8,547	4,134	CONT	CONT
SBIR Assessments	0	0	0	0	0	0
Total Project	30,719	25,596	17,366	9,454	CONT	CONT

R-1 Item No. 93

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, Page 7 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1447
 PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Combat Sys Imp

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
K1447 Surf Combatant Combat Sys Imp	76,231	111,662	117,917	164,316	153,550	141,483	130,428	CONT.	CONT.
K1776 Surf Combatant Weapon Sys Mod	2,071	5,941	7,205	4,275	4,374	4,448	4,534	CONT.	CONT.
K1937 Surf Combatant Weapons Dev	4,235	0	6,879	7,342	977	0	0	0	196,405
K2100 Test Integration Facility	2,797	0	0	0	0	0	0	0	2,797
K2308 Smart Ship Project	0	940	560	21	22	14	10	0	1,527
TOTAL	85,334	118,543	132,561	175,954	158,923	145,945	134,972	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The AEGIS Combat System provides immediate and effective capability to counter the current and expected air, surface and sub-surface threats. Changes in the threat capability and advances in technology such as fiber optics, local area networks, and high performance computing require corresponding Weapon System and Combat System changes. This program provides the Combat System engineering and selected weapons development necessary for a continued increase in the capability of the Combat System in AEGIS cruisers and destroyers. In addition to developing and integrating improvements to the AEGIS Weapon System, this program integrates combat capabilities developed in other Navy R&D programs into the AEGIS Combat System. Modifications of AEGIS Weapon System computer programs must be made to integrate these capabilities into the AEGIS Combat System so that battle effectiveness and Combat System performance will be retained against the evolving threat. Selected Weapon and Combat System upgrades will be backfit into CG 47 Class and DDG 51 Class ships already in the Fleet, providing key warfighting capability while reducing life cycle maintenance costs. The Smart Ship Project will be incorporated into PE 0604307N under Project K2308 starting in FY 1998. This effort will address reducing shipboard manning requirements and the integration of Commercial Off-The-Shelf (COTS) equipment. The goal is to reduce life cycle costs for Navy ships.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1447
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Combat Sys Imp

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
K1447 Surf Combatant Combat Sys Imp	76,231	111,662	117,917	164,316	153,550	141,483	130,428	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides AEGIS Cruiser and Destroyer Combat System upgrades and integrates new equipments and systems to pace the threat and capture advances in technology such as fiber optics and distributed architecture. Combat Systems are upgraded in baselines. Baseline 2 (CG 52-58) consists of the Vertical Launching System, TOMAHAWK Weapon System, and Anti-Submarine Warfare upgrades. Baseline 3 (CG 59-64) includes the AN/SPY-1B radar and AN/UYQ-21 consoles. Baseline 4 (CG 65-73) integrates the AN/UYK-43/44 computers with superset computer programs developed for the DDG 51. Baseline 4 is the base Combat System for DDG 51-67. Baseline 5 was introduced in FY 1992 ships and includes the Joint Tactical Information Distribution System (JTIDS) Command and Control Processor, Tactical Data Information Link 16, Combat Direction Finding, Tactical Data Information Exchange System, AN/SLQ-32(V)3 Active Electronic Counter Countermeasures, and AEGIS Extended Range (ER) Missile. Baseline 5 was developed in three steps (phases): Phase I integrated AEGIS ER and supports the missile Initial Operational Capability; Phase II integrated system upgrades including Deceptive Electronic Countermeasures, Track Load Control algorithms, and Track Initiation Processor; Phase III integrated JTIDS and the OJ-663 color display Tactical Graphics Capability into the AEGIS Combat System. Baseline 6 will be developed in two phases. Baseline 6 Phase I is planned for the last ship in FY 1994, and Phase III is planned for the first ship in FY 1997. Baseline 6 Phase III is the designation for the computer suite resulting from consolidation of the previous Phase II baseline with variations designed to introduce Tactical Ballistic Missile Defense (TBMD) and Cooperative Engagement Capability (CEC) in in-service ships. Baseline 6 upgrades will include embarked helicopters, Fiber Optics as applied to Data Multiplexing System (DMS), implementation of affordability initiatives, the Radar Set Controller Environmental Simulator (RSCES) and Battle Force Tactical Trainer (BFTT), Advanced Display System, Evolved SEASPARROW

Missile (ESSM), Identification (ID) upgrades Phase I, Advanced TOMAHAWK Weapon Control System (ATWCS) Phase II, Fire Control System upgrades, and the Joint Maritime Command Information System (JMCIS). Baseline 7 will also be developed in two phases. Baseline 7 Phase I is planned for the last ship in FY 1998 and Phase II is planned for the last ship in FY 2002. Major Baseline 7 upgrades include but are not limited to: AN/SPY-1D(V) radar upgrade, integration of Cooperative Engagement Capability (CEC) and Tactical Ballistic Missile Defense (TBMD) capability (first forward fit implementation), advanced computer architecture, ID upgrades Phase II, Cueing Sensor, STANDARD Missile-2 Block IIIB full integration, Advanced Integrated Electronic Warfare System (AIEWS) Phase I and II, Light Airborne Multipurpose System (LAMPS) helicopter Mark III Block II, Advanced Tactical Support, integrated Naval Surface Fire Support (NSFS), and Mark 50 torpedo with Periscope Depth

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Budget Item Justification
(Exhibit R-2, Page 2 of 24)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N

PROJECT NUMBER: K1447

PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Combat Sys Imp

Attack. This project also addresses the Technology Ship Characteristic Improvement Panel (TSCIP) program for advanced computing architecture applicable to DDG 51 and other future ship classes including SC-21, CVX, and LX. Funding starts in FY 1999 for non-recurring AEGIS cruiser conversion engineering. The program will upgrade selected cruisers with Tactical Ballistic Missile Defense, land attack, and Area Air Defense Coordination (AADC) capabilities.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$16,500) Completed Baseline 6 Phase I computer program coding, debugging, and testing. Continued integration of Baseline 6 Phase 1 upgrades into the AEGIS Combat System. Continued rehosting of ACTS computer programs for BFTT, and for C&D and ID related computer programs into COTS based architecture. Conducted computer program Quality Assurance (QA).
- (U) (\$18,537) Completed consolidation of previous Baseline 6 Phase IT, Phase IIT, and Phase II into Baseline 6 Phase III. Conducted Baseline 6 Phase III System Design Review (SDR) and Preliminary Design Review (PDR). Continued RSCES Engineering Development Model (EDM) development.
- (U) (\$16,390) Completed rehost of SPY-1D(V) radar control loop code into adjunct processors including interface simulation computer programs. Began system definition for full integration of SPY-1D(V) into new construction AEGIS Combat System in Baseline 7 Phase I. Conducted system definition and In Process Review to integrate Baseline 7 Phase I upgrades into the AEGIS Combat System. Completed AEGIS Combat System Interface Simulator (ACSIS) rehost.
- (U) (\$834) Completed engineering of SM-2 Block IIIB and Block IV capability enhancements and technical assessment and feasibility studies for cueing sensor upgrades which will be integrated into Baseline 7.
- (U) (\$7,200) Continued to provide the RDT&E share of operations and maintenance of the CSED Site, Program Generation Center, Computer Program Test Site, and Land Based Test Site.
- (U) (\$16,770) Continued to provide for the participation of Navy laboratories and field activities to perform the engineering and scientific services necessary to monitor and direct the baseline efforts.

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Budget Item Justification
(Exhibit R-2, Page 3 of 24)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1447
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Combat Sys Imp

2. (U) FY 1998 PLAN:

- (U) (\$10,800) Conduct Baseline 6 Phase I QA. Complete rehosting of ACTS computer programs for BFTT, and for C&D and ID related computer programs into COTS-based architecture. Conduct Link Certification. Conduct System Qualification Test (SQT) demonstration test at the CSED Site.
- (U) (\$20,262) Conduct Baseline 6 Phase III Critical Design Review (CDR). Begin computer program coding, debugging, and testing. Complete RSCES EDM development.
- (U) (\$19,402) Complete system definition/design for full integration of SPY-1D(V) into new construction AEGIS Combat System in Baseline 7 Phase I and start system design. Conduct Baseline 7 Phase I System Design Review (SDR) for integration of upgrades into the AEGIS Combat System. Start system engineering.
- (U) (\$36,873) Develop the UYQ-70 displays, processors, and associated architectures necessary for UYQ-70 Area TBMD baselines, including necessary UYQ-70 equipment to support development of the AEGIS UYQ-70 TBMD baselines.
- (U) (\$6,114) Continue to provide the RDT&E share of operations and maintenance of the CSED Site, Program Generation Center, Computer Program Test Site, and Land Based Test Site.
- (U) (\$18,211) Continue to provide for the participation of Navy laboratories and field activities to perform the engineering and scientific services necessary to monitor and direct the baseline efforts.

3. (U) FY 1999 PLAN:

- (U) (\$20,900) Complete Baseline 6 Phase III computer program code, debugging, and testing. Start integration of Baseline 6 Phase III upgrades into the AEGIS Combat System at the CSED Site.
- (U) (\$36,384) Continue system design for full integration of SPY-1D(V) into new construction AEGIS Combat System in Baseline 7 Phase I. Conduct Baseline 7 Phase I PDR for integration of upgrades into the AEGIS Combat System.
- (U) (\$6,200) Start system definition to integrate Baseline 7 Phase II upgrades into the AEGIS Combat System.

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Budget Item Justification
(Exhibit R-2, Page 4 of 24)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1447
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Combat Sys Imp

- (U) (\$17,000) Start system definition and engineering for the AEGIS Cruiser Conversion Program to incorporate warfighting capabilities including TBMD, land attack, and AADC into Baseline 2, 3, and 4 Cruisers. This includes computer program modifications.
- (U) (\$2,947) Conduct system definition and start design of an advanced combat system with fully distributed architecture leveraging HIPER-D and other technology efforts for integration with the Navy Theater Wide program.
- (U) (\$8,000) Start system definition and engineering development for integration of the Area Air Defense Coordinator (AADC) capability into AEGIS Ships.
- (U) (\$7,200) Continue to provide the RDT&E share of operations and maintenance of the CSED Site, Program Generation Center, Computer Program Test Site, and Land Based Test Site.
- (U) (\$19,286) Continue to provide for the participation of Navy laboratories and field activities necessary to perform the engineering scientific services necessary to monitor and direct the baseline efforts.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	79,022	80,842	102,708
(U) Appropriated Value:	82,537	114,915	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget:			
a. Adjustments	-6,306	-3,253	+15,209
(U) FY 1999 PRESUDG Submit:	76,231	111,662	117,917

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1447
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Combat Sys Imp
(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 change due to Congressional Undistributed Reductions and SBIR Transfer. FY 1998 change due to undistributed reductions and economic assumptions. FY 1999 change due to an increase for CG conversions and a decrease for inflation adjustments.

(U) Schedule: Consolidation of previous Baseline 6 Phase IT, Phase IIT, and Phase II into Baseline 6 Phase III caused schedule adjustments of approximately six months. There is no impact on meeting ship schedules. Baseline 7 Phase I schedules were adjusted as well, with no impact on meeting ship schedules.

(U) Technical: NONE.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) SCN LI2122, DDG-51								
3,533,515	3,473,270	2,679,474	2,720,434	2,873,480	2,691,124	3,164,994	CONT.	CONT.
(U) OPN L15246, AEGIS Support Equipment								
31,322	20,655	83,169	85,671	65,266	71,923	68,168	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0603216C (Theater Ballistic Missile Defense)
(U) PE 0603382N (Advanced Combat System Technology)
(U) PE 0603755N (Ship Self Defense)
(U) PE 0604216C (Theater Ballistic Missile Defense)
(U) PE 0604366N (Standard Missile Improvements)

D. (U) SCHEDULE PROFILE: See attachment (1).

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

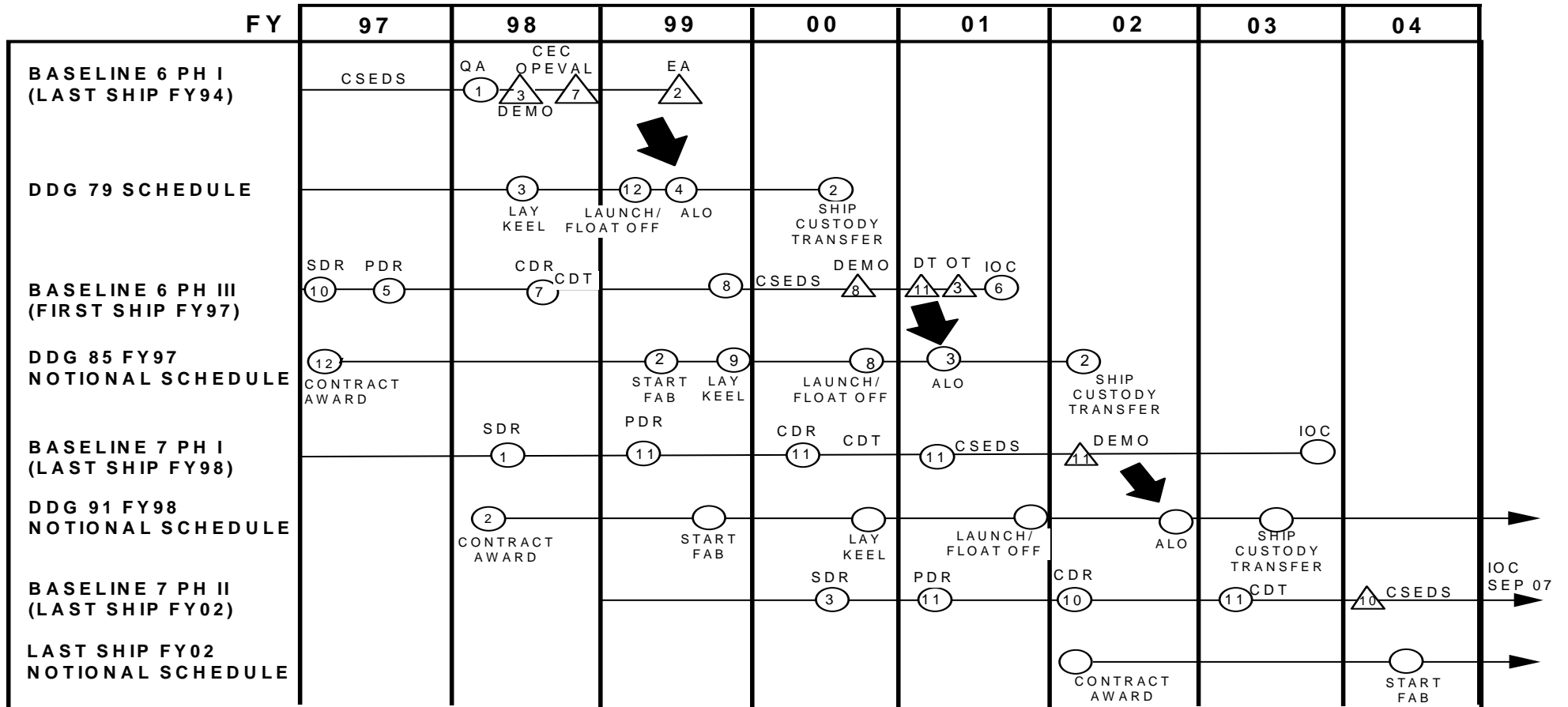
PROGRAM ELEMENT: 0604307N

PROJECT NUMBER: K1447

PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering

PROJECT TITLE: Surf Combatant Combat Sys Imp

AEGIS FORWARD FIT BASELINE DEVELOPMENT PLANNING SCHEDULE



NOTE: IOC = SHIP CUSTODY TRANSFER (SCT)

ATTACHMENT 1

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Budget Item Justification
(Exhibit R-2, Page 7 of 24)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1447
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Combat Sys Imp

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. System Engineering	63,461	97,980	93,440
b. Gov. Engineering Spt.	11,123	11,986	22,730
c. Pgm. Management Spt.	572	589	607
d. Development Test and Eval.	1,075	1,107	1,140
Total	76,231	111,662	117,917

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 8 of 24)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1447
 PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Combat Sys Imp
 B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Lockheed Martin, Moorestown, NJ	SS/CPAF	03/93	398,799	398,799	184,375	59,461	67,951	87,385	CONT.	CONT.
Lockheed Martin, Minneapolis, MN	SS/	02/98	25,500	25,500	0	0	25,500	0	0	25,500
Applied Physics Lab (APL), Baltimore, MD	SS/CPFF	02/94	24,118	24,118	12,868	2,750	4,000	10,500	CONT.	CONT.
McClellan AFB, CA	MIPR	01/94	18,664	18,664	18,664	0	0	0	0	18,664
Navy Surface Warfare Center, Dahlgren, VA	WR	10/93	39,821	39,821	21,445	6,160	5,986	9,230	CONT.	CONT.
Vitro Corp., Silver Spring, MD	C/CPAF	10/92	27,411	27,411	14,661	4,000	4,250	5,500	CONT.	CONT.
Miscellaneous			14,435	14,435	7,388	2,213	2,279	3,555	CONT.	CONT.
Support and Management										
Miscellaneous			8,379	8,379	6,611	572	589	607	CONT.	CONT.
Test and Evaluation										
Miscellaneous			6,596	6,596	3,274	1,075	1,107	1,140	CONT.	CONT.
GOVERNMENT FURNISHED PROPERTY: Not applicable.										

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5	PROGRAM ELEMENT: 0604307N	PROJECT NUMBER: K1447				
	PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering	PROJECT TITLE: Surf Combatant Combat Sys Imp				
		Total				
		<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To</u>
		<u>& Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>
						<u>Total</u>
						<u>Program</u>
Subtotal Product Development		259,401	74,584	109,966	116,170	CONT.
Subtotal Support and Management		6,611	572	589	607	CONT.
Subtotal Test and Evaluation		3,274	1,075	1,107	1,140	CONT.
Total Project		269,286	76,231	111,662	117,917	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 10 of 24)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1776
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Weapon Sys Mod

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
K1776 Surf Combatant Weapon Sys Mod	2,071	5,941	7,205	4,275	4,374	4,448	4,534	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides for modifications to the AEGIS Weapon System MK-7 to counter the threat as articulated in ONI System Threat Assessment Report, ONI TA #046-93 dated May 1993 and subsequent updates. The modifications will be introduced into CG 47 Class and DDG 51 Class ships.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$300) Continued AN/SPY-1B/D upgrade analysis support.
- (U) (\$1,258) Continued ORTS upgrade for Baselines 3, 4 and 5 design, development and engineering.
- (U) (\$513) Began AN/SPY-1B/B(V)/D Moving Target Indicator analysis, design, development, and engineering for radar enhancements.

2. (U) FY 1998 PLAN:

- (U) (\$600) Continue AN/SPY-1B/D upgrade analysis support, including signal processor overtemperature protection and Track Initiation Processor (TIP) design changes.
- (U) (\$1,239) Continue ORTS upgrade for Baselines 3,4, and 5 design, development, and engineering.
- (U) (\$1,702) Begin design and engineering for Radar Set Controller Environmental Simulator (RSCES) for AN/SPY-1D radar system.
- (U) (\$1,100) Provide the RDT&E share of operations and maintenance of the CSED Site, Program Generation Center, Computer Program Test Site, and Land Based Test Site to supplement Project K1447.

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Budget Item Justification
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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N

PROJECT NUMBER: K1776

PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Weapon Sys Mod

- (U) (\$1,300) Provide lab support to supplement Project K1447 in the integration of SPY-1D(V) radar into the AEGIS Weapon System.

3. (U) FY 1999 PLAN:

- (U) (\$100) Continue AN/SPY-1B/D upgrade analysis support. Complete TIP design changes.
- (U) (\$1,200) Continue ORTS upgrade for Baselines 3, 4, and 5 design, development, and engineering.
- (U) (\$1,100) Continue AN/SPY-1B/B(V)/D Moving Target Indicator analysis, design, development, and engineering for radar enhancement.
- (U) (\$1,800) Continue system engineering for AN/SPY-1B/D DECCM upgrades.
- (U) (\$3,005) Continue design and engineering for RCSES for AN/SPY-1D(V) radar system.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	2,114	6,123	7,325
(U) Appropriated Value:	2,204	6,123	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget:			
a. Adjustments	-133	-182	-120
(U) FY 1999 PRESBUDG Submit:	2,071	5,941	7,205

(U) CHANGE SUMMARY EXPLANATION:

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Budget Item Justification
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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1776
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Weapon Sys Mod

(U) Funding: FY 1997: Change due to SBIR transfer and minor pricing adjustments. FY 1998 change due to undistributed reductions and economic assumptions. FY 1999 change due to minor pricing and inflation adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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(U) OPN LI5246, AEGIS Support Equipment								
31,322	20,655	83,169	85,671	65,266	71,923	68,168	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: See attachment (2).

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604307N

PROJECT NUMBER: K1776

PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Weapon Sys Mod

WEAPON SYSTEM MODS PE 0604307N, PROJ. K1776

FY	96	97	98	99	00	01	02	03
AEGIS ORDALTS:								
SPY-1B/D DECCM				SYSTEM ENGINEERING DEVELOPMENT AND TESTING				
B/L 3, 4 & 5 ORTS UPGRADE	ORTS MM I UPGRADE IMP	ORTS UPGRADE B/L 3, 4 & 5						
SPY-1B/D UPGRADES	SYSTEMS ANALYSIS							
SPY-1B/D MTI		DESIGN, DEVEL, ENGIN & TESTING		DESIGN, DEVELOPMENT, ENGINEERING & TESTING				
SPY-1D RSCES			DESIGN, DEVELOPMENT, ENGINEERING & TESTING					

ATTACHMENT 2

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1776
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Weapon Sys Mod

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering	1,251	5,092	6,316
b. Government Engineering Support	817	845	884
c. Program Management Support	3	4	5
Total	2,071	5,941	7,205

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 15 of 24)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1776
 PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Weapon Sys Mod

B.(U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Martin Marietta, Morriestown, NJ	SS/CPFF	03/91	25,467	25,467	12,804	1,251	5,092	6,316	CONT.	CONT.
Miscellaneous			4,644	4,644	2,098	817	845	884	CONT.	CONT.
Support and Management										
Miscellaneous			1,068	1,068	1,056	3	4	5	CONT.	CONT.
Test and Evaluation: Not applicable.										
GOVERNMENT FURNISHED PROPERTY: Not applicable.										

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	14,902	2,068	5,937	7,200	CONT.	CONT.
Subtotal Support and Management	1,056	3	4	5	CONT.	CONT.
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	15,958	2,071	5,941	7,205	CONT.	CONT.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1937
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Weapons Dev

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
K1937 Surf Combatant Weapon Dev	4,235	0	6,879	7,342	977	0	0	0	196,405

A.(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program is required to develop selected systems and subsystems for the ARLEIGH BURKE (DDG 51) class ships. This project funds development of equipment for the AEGIS Weapon System, as opposed to the costs of integrating elements into the Combat System which is funded in Project K1447. Current funding completes the development of an upgrade to the current AN/SPY-1D radar, Engineering Development Model 4B (EDM-4B), to enhance its capability against low cross section sea skimming targets in increasingly more severe electronic countermeasures and in near-land clutter environments. The changes are in the transmitter, signal processor, and radar control computer program. Two new efforts will start in FY 1999. First, support for a Ballistic Missile Defense Organization (BMDO) Program which is developing a common, backfittable theater-wide radar upgrade signal processor to provide affordable theater-wide exoatmospheric discrimination capability. Second, integration of the AN/SPQ-9B radar into the AEGIS Weapon System to improve capability against the advanced low-altitude threat.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$3,235) Completed rehosting radar system computer program from two AN/UYK-43 computers to one AN/UYK-43 and one commercial adjunct processor, including testing of microprocessors against AEGIS benchmark requirements, testing commercial operating systems, and computer program architecture development.
- (U) (\$1,000) Conducted DT/Operational Assessment (OA) of the adjunct processor performance at the CSED Site.

2. (U) FY 1998 PLAN: Not Applicable.

3. (U) FY 1999 PLAN:

- (U) (\$2,940) Initiate expanded common signal processor design for the AN/SPY-1 Radar and include advanced AAW functionality and features. The expanded signal processor design will add AAW

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 17 of 24)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1937
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Weapons Dev
functionality to and leverage the common signal processor's TBMD functionality design currently
being pursued via TBMD funding. The advanced AAW functionality will implement adaptive digital
signal processing to improve low altitude clutter rejection performance and ECCM capabilities.

- (U) (\$3,939) Initiate the design for the installation and integration of the AN/SPQ-9B Radar (or its advanced variant) in the AEGIS Weapon System. The installation design will include remaining modification work for backfit in destroyers and cruisers.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	4,354	0	0
(U) Appropriated Value:	4,538	0	0
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget:			
a. Adjustments	-298		+6,879
(U) FY 1999 PRESBUDG Submit:	4,235	0	6,879

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 change due to Congressional undistributed reductions and minor pricing adjustments. FY 1999 change due to Theater Wide Radar Improvement and AN/SPQ-9B AEGIS integration.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 18 of 24)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5		PROGRAM ELEMENT: 0604307N					PROJECT NUMBER: K1937	
		PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering					PROJECT TITLE: Surf Combatant Weapons Dev	
FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
(U) SCN LI2122, DDG-51								
3,533,515	3,473,270	2,679,474	2,720,434	2,873,480	2,691,124	3,164,994	CONT.	CONT.

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE: Not Applicable.

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering	3,655	0	5,969
b. Government Engineering Support	580	0	910
Total	4,235	0	6,879

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K1937
 PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Surf Combatant Weapons Dev

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Martin Marietta, Morriestown, NJ	SS/CPFF	03/91	185,955	185,955	176,210	3,655	0	5,969	CONT.	CONT.
Miscellaneous Support and Management	Not Applicable									
Miscellaneous Test and Evaluation	Not Applicable									
Miscellaneous			2,060	2,060	570	580	0	910	CONT.	CONT.
					Total					
					FY 1996	FY 1997	FY 1998	FY 1999	To	Total
					<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development					176,210	3,655	0	5,969	CONT.	CONT.
Subtotal Test and Evaluation					570	580	0	910	CONT.	CONT.
Total Project					176,780	4,235	0	6,879	CONT.	CONT.

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K2308
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Smart Ship Project
(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
K2308 Smart Ship Project	0	940	560	21	22	14	10	0	1,567

A.(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Smart Ship Project (SSP) was initiated by a Chief of Naval Operations directive to examine a variety of means to reduce life cycle cost of ships, concentrating on the fact that a major portion of ship's life cycle cost is manpower. The Project is chartered to devise and implement technology and policy changes which will reduce the workload for a ship's crew. Reduced workload may result in reduced manning and therefore reduce ship life cycle costs. The technology being considered replaces human functions rather than just improving efficiency, and its application requires funding. Policy changes are focused on reducing unnecessary or redundant requirements, and do not require funding. Selected technology and policy changes will be tested in an in-service fleet ship, USS YORKTOWN (CG 48). Those changes which prove successful will be considered for implementation in both current in-service ships and future ships to maximize life cycle cost savings across all Navy ship classes. The Project will develop, procure, install, train and support test projects for demonstration in the test ship. Successful projects will be analyzed and packaged for wider application in the fleet.

(U) PROGRAM ACCOMPLISHMENTS AND PLAN:

1. (U) FY 1997 ACCOMPLISHMENTS: Not Applicable.
2. (U) FY 1998 PLAN:
 - (U) (\$461) Assess current technology and equipment available through Department of Defense and industry sources which are candidates for reducing shipboard manning requirements and individual crew member workloads. Any manning and workload reductions identified will not affect ship and system readiness and performance, crew safety, nor habitability.
 - (U) (\$235) Conduct ship and system design and engineering necessary to adapt candidate technology and equipment to adapt to shipboard environment and to integrate the equipment into existing ship systems.
 - (U) (\$244) Install and check out equipment on board designated ships and conduct at-sea testing.

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Budget Item Justification
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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K2308
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Smart Ship Project

3. (U) FY 1999 PLAN:

- (U) (\$560) Complete installation and check out of candidate technology and associated equipment on board designated ships and conduct at-sea testing.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1997 President's Budget:	0	969	5,610
(U) Appropriated Value:	0		
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget			
a. Adjustments	0	-29	-5,050
(U) FY 1999 PRESBUDG Submit:	0	940	560

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 change due to undistributed reductions and economic assumptions. FY 1999 change due to program restructure and inflation adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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Budget Item Justification
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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K2308
PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Smart Ship Project
C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN LI5246, AEGIS Support Equipment 31,322	20,655	83,169	85,671	65,266	71,923	68,168	CONT.	CONT.

(U) RELATED RDT&E: Not Applicable.

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering	0	0	0
b. Government Engineering Support	0	891	530
c. Program Management Support	0	49	30
d. Developmental Test and Evaluation	0	0	0
Total	0	940	560

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Budget Item Justification
(Exhibit R-2, Page 23 of 24)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604307N PROJECT NUMBER: K2308
 PROGRAM ELEMENT TITLE: AEGIS Combat System Engineering PROJECT TITLE: Smart Ship Project

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Contingent Contractors, NSWC/CD										
	SS/CPAF	03/98	1,047	1,047	0	0	891	530	CONT.	CONT.
Support and Management										
Misc.										
			406	406	0	0	49	30	CONT.	CONT.
Test and Evaluation										
Misc.										
			86	86	0	0	0	0	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	0	0	891	530	CONT.	CONT.
Subtotal Support and Management	0	0	49	30	CONT.	CONT.
Subtotal Test and Evaluation	0	0	0	0	CONT.	CONT.
Total Project	0	0	940	560	CONT.	CONT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

Budget Activity 5: PROGRAM ELEMENT: 0604311N
PROGRAM ELEMENT TITLE: LPD 17 Class Systems
Integration

PROJECT NUMBER: 22283
PROJECT TITLE: LPD 17 Class Systems
Integration

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
22283 LPD 17 Class Systems Integration	4,251	1,330	1,343	2,651	291	1,054	10,661	CONT.	CONT.
22425 LPD 17 Class Systems Integration		12,614							

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The 12 LPD 17 Class ships are functional replacements for 41 ships of four classes of amphibious ships. These new ships embark, transport, and land elements of Marine landing forces in an amphibious assault by helicopters, landing craft, and amphibious vehicles. Tactics, techniques, and tools for naval expeditionary warfare continue to evolve. The LPD 17 Class configuration must continue to adapt to this evolutionary process, because these ships are expected to be in service until almost 2050. The LPD 17 design includes systems configurations that reduce operating and support costs and facilitate operational performance improvements. System engineering and integration efforts beginning in FY 1997 will develop further reductions in life cycle costs and integrate performance upgrades in a rapid, affordable manner. Possible improvements include composite masts, advanced sensors, advanced computers, advanced command and control software, advanced information systems technologies, and ship based logistics concepts. Cost reduction and improved performance will be accomplished through sustained modeling and simulation efforts, continued personnel reduction efforts, system performance tradeoff evaluation, and naval expeditionary warfare systems engineering. Feedback from the operational forces for integrating system configurations will be accomplished through the Naval Expeditionary Warfare Centers in Quantico, Dahlgren, and Little Creek, Virginia. These efforts will result in well defined specifications and drawings in systems integration design packages that provide technical baselines for follow ship procurements. In addition, these efforts include the Live Fire Test & Evaluation (LFT&E) and Operational Evaluation (OPEVAL) tests required for the lead ship.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under Engineering and Manufacturing Development because it encompasses engineering and manufacturing development of new end items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

Budget Activity 5: PROGRAM ELEMENT: 0604311N
PROGRAM ELEMENT TITLE: LPD 17 Class Systems
Integration

PROJECT NUMBER: 22283
PROJECT TITLE: LPD 17 Class Systems
Integration

- (U) (\$4,251) Conducted naval expeditionary warfare systems engineering efforts for composite masts, performance modeling and simulation, and reduced personnel. Continued live fire test and operational evaluation efforts. Integrated system configuration feedback from the operational forces through the Naval Expeditionary Warfare Centers in Quantico, Dahlgren, and Little Creek, Virginia.
2. (U) FY 1998 PLANS:
- (U) (\$1,330) Continue naval expeditionary warfare systems engineering efforts. Review latest operational requirements. Continue live fire test and operational evaluation efforts. Begin update of ship specifications for 1Q/FY00 follow ship contract award.
3. (U) FY 1999 PLANS:
- (U) (\$1,343) Continue naval expeditionary warfare systems engineering efforts. Continue live fire test and operational evaluation efforts. Finalize update to the ship specifications for 1Q/F00 follow ship contract award.

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Budget Item Justification
(Exhibit R-2, Page 2 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

Budget Activity 5: PROGRAM ELEMENT: 0604311N
PROGRAM ELEMENT TITLE: LPD 17 Class Systems
Integration

PROJECT NUMBER: 22283
PROJECT TITLE: LPD 17 Class Systems
Integration

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	4,098	471	1,662
(U) Appropriated Value:	4,272	471	
(U) Adjustment to FY 1997/98 Appropriated Value/ FY 1998 President's Budget			
a. Adjustments	-21	+859	-319
(U) FY 1999 PRESBUDG Submit:	4,251	1,330	1,343

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 change due to undistributed reduction. FY 1998 change due to undistributed reductions. FY 1999 change due to funding adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not Applicable.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

Budget Activity 5: PROGRAM ELEMENT: 0604311N
PROGRAM ELEMENT TITLE: LPD 17 Class Systems
Integration

PROJECT NUMBER: 22283
PROJECT TITLE: LPD 17 Class Systems
Integration

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Millions)

FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) SCN Line 303600								
0	96	639	1,446	1,436	1,473	1,502	1,724	8,316

(U) RELATED RDT&E:
(U) PE 0604567N Ship Contract Design/Live Fire T&E

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

Budget Activity 5: PROGRAM ELEMENT: 0604311N
PROGRAM ELEMENT TITLE: LPD 17 Class Systems
Integration

PROJECT NUMBER: 22283
PROJECT TITLE: LPD 17 Class Systems
Integration

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones			2Q Program Review	4Q/02 Deliver Lead Ship 4Q/07 MS III
Engineering Milestones	1Q Initiate Detail Design	4Q Complete Detail Design	2Q Complete Systems Integr. Des. Pack.	
T&E Milestones		4Q DT-IIA	2Q OT-IC	3Q/02 DT-IIB 2Q/04 DT-IIC 4Q/03 OT-IIA
Contract Milestones	1Q Lead Ship Contract Award			1Q/00 Follow Ship Award 1Q/02 2nd Follow Ship Award

R-1 Line Item 97

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, Page 5 of 7)

UNCLASSIFIED

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

Budget Activity 5: PROGRAM ELEMENT: 0604311N
PROGRAM ELEMENT TITLE: LPD 17 Class Systems
Integration

PROJECT NUMBER: 22283
PROJECT TITLE: LPD 17 Class Systems
Integration

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering & Integration	4,001	730	543
b. Test & Evaluation	250	600	800
Total	4,251	1,330	1,343

R-1 Line Item

UNCLASSIFIED

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 6 of 7)

UNCLASSIFIED

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

Budget Activity 5: PROGRAM ELEMENT: 0604311N
 PROGRAM ELEMENT TITLE: LPD 17 Class Systems
 Integration

PROJECT NUMBER: 22283
 PROJECT TITLE: LPD 17 Class Systems
 Integration

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)
 PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	*Total FY 1996 & Prior/	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Complete	Total Program
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Product Development:

Miscellaneous	Various		0	4,001	730	543	2,401	CONT.	CONT.
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Support and Management: Not applicable.

Test and Evaluation:

Miscellaneous	Various		0	250	600	800	250	CONT.	CONT.
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*A FY 1996 Not Applicable - New P.E. established in FY 1997.

GOVERNMENT FURNISHED PROPERTY: Not applicable

	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Complete	Total Program
Subtotal Product Development	4,001	730	543	2,401	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	250	600	800	250	CONT.	CONT.
Total Project	4,251	1,330	1,343	2,651	CONT.	CONT.

R-1 Line Item

UNCLASSIFIED

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604312N

PROGRAM ELEMENT TITLE: Tri-Service Standoff Attack Missile (TSSAM)

(U) COST: (Dollars in Thousands)

PROJECT
NUMBER &
TITLE

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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A2242 Joint Air to Surface Standoff Missile (JASSM)

0	3,794	2,064	2,056	2,051	2,042	2,034	0	14,041
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(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Air to Surface Standoff Missile (JASSM) program is an FY-96 new start follow-on weapon system to the canceled Tri-Service Standoff Attack Missile (TSSAM). It is a joint Air Force/Navy Program. JASSM is a long range, conventional air-to-surface, autonomous precision guided, standoff cruise missile compatible with fighter and bomber aircraft and able to attack a variety of fixed and relocatable targets. JASSM will carry a 1,000 pound class penetrator warhead. Initial integration efforts will be on the B-52 and F-16. The F/A-18 E/F is currently designated as the Navy threshold platform for JASSM. The Navy budget covers only the cost of Navy unique testing.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$0 - Air Force funded) Continued Program Definition and Risk Reduction (PDRR) of JASSM weapons system development and hardware.
- (U) (\$0 - Air Force funded) Continued program office stand-up.
- (U) (\$0 - Air Force funded) Continued aircraft integration, ground and flight tests.

R-1 Line Item No 98

UNCLASSIFIED

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604312N
PROGRAM ELEMENT TITLE: TSSAM

PROJECT NUMBER: A2242
PROJECT TITLE: JASSM

2. (U) FY 1998 PLAN:

- (U) (\$0 - Air Force funded) Downselect to single JASSM contractor. Complete PDRR.
- (U) (\$1,900) SLAM-ER CARD development and efforts for SLAM-ER participation in JASSM Analysis of Alternatives (AOA).
- (U) (\$1,894) Carrier operability and ship suitability testing and AOA participation.

3. (U) FY 1999 PLAN:

- (U) (\$2,064) Continue carrier operability and ship suitability testing requirements.

R-1 Line Item No 98
UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604312N
PROGRAM ELEMENT TITLE: TSSAM

PROJECT NUMBER: A2242
PROJECT TITLE: JASSM

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	+9,644	+17,730
(U) Appropriated Value:			
(U) Adjustments from Presbudg:	0	-5,850	-15,666
(U) FY 1999 President's Budget Submit:	0	3,794	2,064

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: The FY 1998 net decrease of \$5,850 reflects restructure of development efforts outcome of Congressional directed Analysis of Alternatives, and \$162K for Congressional general reductions. The FY 1999 decrease of \$15,666 thousand reflects a funding reduction pending the outcome of the Analysis of Alternatives. The budget of \$2,064 continues Navy participation in carrier operability and ship suitability of JASSM. This funding level does not provide funding for any aircraft integration.
- (U) Schedule: Congressional reduction to the Air Force RDT&E budget in FY 1998 resulted in an early downselect to a single contractor (Apr 98) and delay of MS II until Nov 98.
- (U) Technical: Navy experts must assess if the JASSM design is suitable for Carrier Operability in support of a MSII decision.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) Not Applicable

(U) RELATED RDT&E:

(U) U.S. Air Force P.E. 0207325F (Joint Air to Surface Standoff Missile (JASSM))

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UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604312N
PROGRAM ELEMENT TITLE: TSSAM

PROJECT NUMBER: A2242
PROJECT TITLE: JASSM

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u> 1Q/MSII	<u>TO COMPLETE</u>
Program Milestones				
Engineering Milestones				
T&E Milestones				
Contract Milestones			1Q/EMD	

R-1 Line Item No 98
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604312N
PROGRAM ELEMENT TITLE: TSSAM

PROJECT NUMBER: A2242
PROJECT TITLE: JASSM

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Technical Support Requirements	0	3,794	2,064
b. Aircraft Integration	0	0	0
c. Ground and Flight Testing	0	0	0
Total	0	3,794	2,064

R-1 Line Item No 98

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604312N
PROGRAM ELEMENT TITLE: TSSAM

PROJECT NUMBER: A2242
PROJECT TITLE: JASSM

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
<u>Product Development</u>										
NAWC-WD	WX	Nov 97	8,757	8,757	0	0	1,193	1,564	6,000	8,757
PMA-258	PD	Dec 97	1,900	1,900	0	0	1,900	0	0	1,900
JASSM	Misc	Misc	3,384	3,384	0	0	701	500	2,183	3,384
					0	0	3,794	2,064	8,183	14,041

GOVERNMENT FURNISHED PROPERTY: Not Applicable

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	0	0	3,794	2,064	8,183	14,041
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	3,794	2,064	8,183	14,041

R-1 Line Item No 98

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q0528 ADVANCED AIRBORNE MINE COUNTERMEASURES EQUIPMENT	1,273	0	0	0	0	0	0	0	40,161
Q0529 AIRBORNE MINE HUNT SYSTEMS & Q2427	17,969	17,905	20,054	17,770	14,992	19,537	18,304	0	213,560
Q2047 AIRBORNE LASER MINE DETECTION SYSTEM (ALMDS)	11,190	0	4,913	5,874	5,860	5,833	6,780	0	130,222
TOTAL	30,432	17,905	24,967	23,644	20,852	25,370	25,084	0	383,943

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops airborne mine countermeasures systems that are required to counter known and projected mine threats. It provides a capability to locate pressure-combination and sweep resistant mines at greater coverage rates and by more rapidly deployable means. It also provides a non-acoustic mine detection and classification capability against floating and tethered mines using Light Detection and Ranging (LIDAR) techniques. Cable improvements will provide higher reliability, longer life and higher current capacity.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

R-1 Line Item 101

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Budget Item Justification
(Exhibit R-2, Page 1 of 19)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q0529 AIRBORNE MINE HUNT SYSTEMS & Q2427	17,969	17,905	20,054	17,770	14,992	19,537	18,304	0	213,560

A.(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project includes a sonar for mine detection and classification, a system for mine neutralization by explosive charge, and equipment designed to provide shallow and deep water mine hunting and minefield reconnaissance capabilities against both bottom and moored mines. There is currently no rapid airborne mine neutralization capability to support minehunting. Additionally, the Navy does not possess a capability to conduct high speed minefield reconnaissance to determine mine density and location. The Advanced Sonar is being developed to address the emergent requirement to integrate AMCM systems with an H-60 type platform. The sonar will be developed to meet the capabilities inherent with the new tow platform. This project also includes the Airborne Mine Neutralization System (AMNS) research and development effort. AMNS will provide the capability to neutralize bottom and moored mines using an airborne delivered, expendable mine neutralization device. The Shallow Water Influence Minesweep System (SWIMS) will provide a self-contained, high tow speed, shallow water influence minesweep capability. Integration of the Laser Line Scan System (LLSS) into the AN/AQS-14A Sonar will provide an interim mine identification capability until introduction of the new Advanced Minehunting Sonar.

R-1 Line Item 101

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, Page 2 of 19)

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROJECT NUMBER: Q0529

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

PROJECT TITLE: AIRBORNE MINE HUNT SYSTEMS

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1997 ACCOMPLISHMENTS:

- (U) (\$5,178) Q-20 - Completed fabrication of EMD models, qualification tests.
- (U) (\$9,018) Q-20 - Conducted initial tow tests. Completed design of side look sonar housing.
- (U) (\$1,804) Q-20 - Completed risk analysis.
- (U) (\$1,969) AMNSYS - Released RFP, conducted test planning, awarded contracts, and performed COEA type analysis.

2. (U) FY 1998 PLAN:

- (U) (\$3,000) Q-20 - Complete contractor demonstration. Accept delivery of Engineering Development Model.
- (U) (\$4,899) Q-20 - Conduct final AQS-20 Developmental Testing and transition to the Advanced Sonar system.
- (U) (\$3,000) AMNSYS - Deliver NDI prototype model.
- (U) (\$2,558) AMNSYS - Conduct fly-off testing.
- (U) (\$2,507) AMNSYS - Procure and test the test equipment, and perform data analysis.
- (U) (\$1,941) SWIMS - Award contract for design development of the demonstration system. Procure material required for fabrication.

R-1 Line Item 101

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROJECT NUMBER: Q0529

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

PROJECT TITLE: AIRBORNE MINE HUNT SYSTEMS

3. (U) FY 1999 PLAN:

- (U) (\$7,600) Advanced Sonar - Advanced Sonar fly-off.
- (U) (\$6,500) AMNSYS - Award EMD contract for integration into the helicopter.
- (U) (\$2,383) AMNSYS - Perform system integration, data analysis, TECHEVAL preparations.
- (U) (\$200) HORIZAN - Configuration Theory Tactical Decision Aid.
- (U) (\$3,371) Laser Line Scan System (LLSS) - Initiate integration of the LLSS into the AN/AQS-14A.

R-1 Line Item 101

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, Page 4 of 19)

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604373N PROJECT NUMBER: Q0529
PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES PROJECT TITLE: AIRBORNE MINE HUNT SYSTEMS

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	18,357	16,503	19,937
(U) Appropriated Value:		18,503	0
Adjustments to President's Budget:			
a. SBIR	-366	0	0
b. NWCF adjustments/General reductions/ Economic Adjustments	-22	-598	-83
c. Add: Configuration Theory Tactical Decision Aid	0	0	+200
d. Add: SWIMS Shallow Water Influence Minesweeping	0	+2,000	0
(U) FY 1999 PRESBUDG:	17,969	17,905	20,054

R-1 Line Item 101

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, Page 5 of 19)

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604373N PROJECT NUMBER: Q0529
PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES PROJECT TITLE: AIRBORNE MINE HUNT SYSTEMS

(U) CHANGE SUMMARY EXPLANATION:

(U) Schedule: AMNSYS: Milestone III from 3Q/99 to 3Q/00.
(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN 424800									
AMNSYS	0	0	0	4,284	7,759	16,605	0	0	28,648

(U) RELATED RDT&E:

(U) PE 0602315N (MCM, Mining and Special Warfare Technology)
(U) PE 0603502N (Surface and Shallow Water MCM)
(U) PE 0603555N (Sea Control and Littoral Warfare Technology Demonstration)

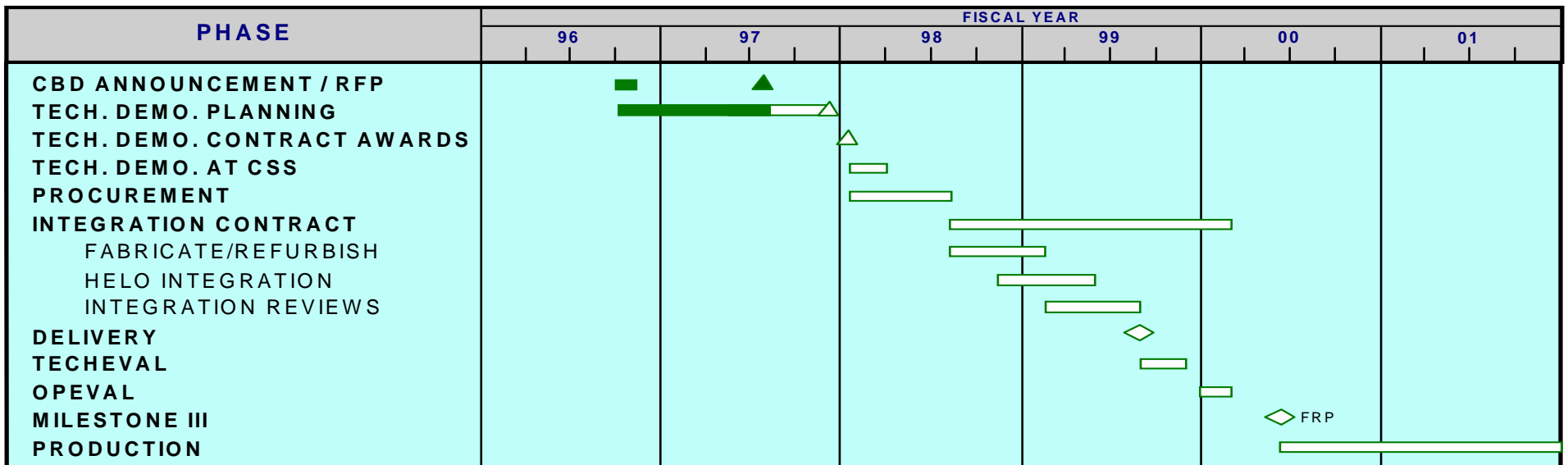
D. (U) SCHEDULE PROFILE: See attached.

R-1 Line Item 101

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AIRBORNE MINE NEUTRALIZATION SYSTEM (AMNS)



R-1 Line Item 101

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROJECT NUMBER: Q0529

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

PROJECT TITLE: AIRBORNE MINE HUNT SYSTEMS

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	12,193	8,732	5,805
b. Software Development	2,614	0	0
c. Systems Engineering	0	2,196	1,490
d. Developmental Test & Evaluation	2,000	5,502	2,144
e. Operational Test & Evaluation	0	0	8,883
f. Travel	20	20	20
g. Miscellaneous	<u>1,142</u>	<u>1,455</u>	<u>1,712</u>
Total	17,969	17,905	20,054

R-1 Line Item 101

UNCLASSIFIED

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 8 of 19)

UNCLASSIFIED

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROJECT NUMBER: Q0529

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

PROJECT TITLE: AIRBORNE MINE HUNT SYSTEMS

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government	Contract Method/ Fund Type	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Raytheon Q20	C/CPFF	7/92	55,456	55,456	44,823	9,433	1,200	0	0	55,456
TBD (AMNSYS)	C/CPFF	05/98	9,500	9,500	0	0	3,000	6,500	0	9,500
Various (AMNSYS)	C/CPFF	05/97	1,000	1,000	0	1,000	0	0	0	1,000
TBD (ADV Sonar)	C/CPIF	11/99	24,576	24,576	0	0	0	4,500	20,076	24,576
CSS, Panama City	WR	10/98	56,678	56,678	33,859	1,198	4,292	2,565	14,764	56,678
NSWC, Carderock	WR	10/98	7,874	7,874	0	0	0	1,200	6,674	7,874
Miscellaneous	WR	10/98	24,306	24,306	7,723	4,058	5,201	2,384	6,881	26,247
Support and Management										
Miscellaneous	WR VARIOUS		8,142	8,142	624	280	430	1,600	5,208	8,142
Test and Evaluation										
OPTEVFOR, VA	WR	10/99	10,000	10,000	0	0	0	0	10,000	10,000
CSS, Panama City	WR	10/97	14,087	14,087	0	2,000	3,782	1,305	7,000	14,087
GOVERNMENT FURNISHED PROPERTY: Not Applicable.										

R-1 Line Item 101

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROJECT NUMBER: Q0529

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

PROJECT TITLE: AIRBORNE MINE HUNT SYSTEMS

	Total FY 1996 & PRIOR	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	86,405	15,689	13,693	17,149	48,395	181,331
Subtotal Support and Management	624	280	430	1,600	5,208	8,142
Subtotal Test and Evaluation	<u>0</u>	<u>2,000</u>	<u>3,782</u>	<u>1,305</u>	<u>17,000</u>	<u>24,087</u>
Total Project	87,029	17,969	17,905	20,054	70,603	213,560

R-1 Line Item 101

UNCLASSIFIED

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 10 of 19)

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q2047 AIRBORNE LASER MINE DETECTION SYSTEMS	11,190	0	4,913	5,874	5,860	5,833	6,780	0	130,222

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Airborne Laser Mine Detection System (ALMDS) is a light detection and ranging (LIDAR) system for rapid detection and localization of floating and near surface tethered mines. A competitive evaluation of ALMDS candidate technologies represented by the Magic Lantern and ATD-III systems will be conducted. Data obtained from this evaluation will significantly reduce the risk associated with a follow-on ALMDS procurement decision.

R-1 Line Item 101

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, Page 11 of 19)

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROJECT NUMBER: Q2047

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

PROJECT TITLE: AIRBORNE LASER MINE DETECTION SYSTEMS

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1997 ACCOMPLISHMENTS:

- (U) (\$11,190) Conduct fly-off and perform technical evaluation.

2. (U) FY 1998 PLAN: Not Applicable.

3. (U) FY 1999 PLAN:

- (U) (\$1,000) Prepare RFP, evaluate response and award contract.
- (U) (\$1,000) Evaluate integration studies.
- (U) (\$1,913) Initiate engineering design.
- (U) (\$1,000) Prepare ECP for aircraft installation and ILS initiation.

R-1 Line Item 101

UNCLASSIFIED

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604373N PROJECT NUMBER: Q2047
PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES PROJECT TITLE: AIRBORNE LASER MINE DETECTION SYSTEMS

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	11,509	0	0
(U) Appropriated Value:	0	0	4,913
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget:			
a. SBIR	-302	0	0
b. NWCF adjustments/General reductions/ Economic Assumptions	-17	0	-87
c. Add: Airborne Laser Mine Detection System	0	0	+5,000
(U) FY 1999 PRESBUDG Submit:	11,190	0	4,913

R-1 Line Item 101

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, Page 13 of 19)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROJECT NUMBER: Q2047

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

PROJECT TITLE: AIRBORNE LASER MINE DETECTION SYSTEMS

(U) (U) CHANGE SUMMARY EXPLANATION:

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN 424800									
ALMDS	0	0	0	0	0	0	0	0	0

(U) RELATED RDT&E:

(U) PE 0602315N (MCM, Mining and Special Warfare Technology)

(U) PE 0603502N (Surface and Shallow Water MCM)

(U) PE 0603555N (Sea Control and Littoral Warfare Technology Demonstration)

D. (U) SCHEDULE PROFILE: See attached.

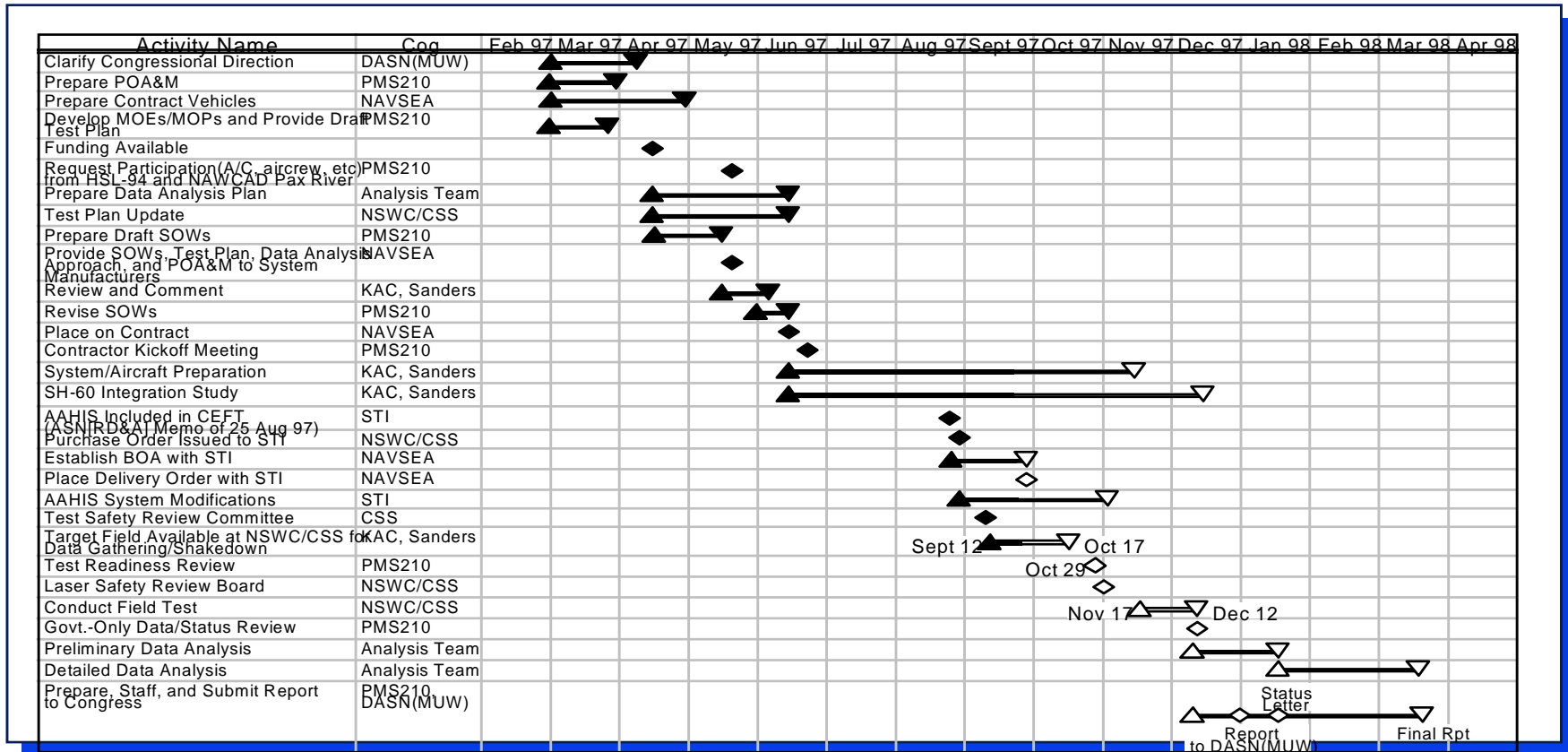
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Budget Item Justification
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H-60 CONTINGENCY PROGRAM

Activity Name	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
Flvoff	△▽					
Data Evaluation	△▽					
Evaluation of Integration Studies	△→▽					
RFP to Selectee		△				
Proposal Due		△				
Contract Award		△				
Start of NRE		△				
ECP Preparation		△→▽				
Critical Design Review				△		
System Modifications Complete					△	
Prototype Aircraft Mods				△→▽		
Contractor Tests					△→▽	
Delivery					△	
DT-Assist					△→▽	
ECP Approval/ Aircraft Mods Complete						△→▽
Capability Established						△
Funding Profile (\$K)		5000	6000	6000	6000	7000

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROJECT NUMBER: Q2047

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

PROJECT TITLE: AIRBORNE LASER MINE DETECTION SYSTEMS

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	5,648	0	2,543
b. Software Development	2,614	0	1,000
c. Systems Engineering	0	0	1,000
d. Developmental Test & Evaluation	2,609	0	0
e. Operational Test & Evaluation	0	0	0
f. Travel	20	0	20
g. Miscellaneous	299	0	350
Total	11,190	0	4,913

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 17 of 19)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604373N PROJECT NUMBER: Q2047
 PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES PROJECT TITLE: AIRBORNE LASER MINE DETECTION SYSTEMS

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
TBD	C/CPFF	06/98	15,000	15,000	0	0	0	2,000	13,000	15,000
Sikorsky	S/CPFF	06/98	5,450	5,450	0	450	0	500	4,500	5,450
Miscellaneous	WR	various	85,452	85,452	72,550	6,642	0	913	5,347	85,452
Support and Management										
CSS, Panama City	WR	10/96	8,569	8,569	6,747	322	0	750	750	8,569
NAWC AD, Pax River	WR	10/96	3,142	3,142	475	1,167	0	750	750	3,142
Test and Evaluation										
CSS, Panama City	WR	10/96	2,609	2,609	0	2,609	0	0	0	2,609
Misc.	WR	10/96	10,000	10,000	10,000	0	0	0	0	10,000

GOVERNMENT FURNISHED PROPERTY: Not Applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604373N

PROJECT NUMBER: Q2047

PROGRAM ELEMENT TITLE: AIRBORNE MINE COUNTERMEASURES

PROJECT TITLE: AIRBORNE LASER MINE DETECTION SYSTEMS

	Total FY 1996 & PRIOR	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	72,550	7,092	0	3,413	22,847	105,902
Subtotal Support and Management	7,222	1,489	0	1,500	1,500	11,711
Subtotal Test and Evaluation	10,000	2,609	0	0	0	12,609
Total Project	89,772	11,190	0	4,913	24,347	130,222

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 19 of 19)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604503N
 PROGRAM ELEMENT TITLE: Submarine System Equipment Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F0775 Submarine Support Equipment Program	11,217	0	2,606	1,024	977	681	678	CONT.	CONT.
S0219 Submarine Sonar Improvement	31,422	0	0	0	0	0	0	CONT.	CONT.
F0219 Submarine Sonar Improvement	0	47,036	37,209	30,964	21,450	21,304	22,965	CONT.	CONT.
X0742 Submarine Integrated Antenna Systems	10,225	3,620	2,878	5,437	5,551	5,662	3,200	CONT.	CONT.
X1411 Submarine Tactical Communications System	4,058	5,368	7,607	5,864	4,967	9,698	6,364	CONT.	CONT.
TOTAL	56,922	56,024	50,300	43,289	32,945	37,345	33,207	CONT.	CONT.

U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Submarine Support Equipment Program develops and improves submarine Electronic Support Measures (ESM) techniques and components, equipment, and systems that will increase submarine operational effectiveness in the increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for submarine ESM to be effective in conducting the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare and Intelligence Collection, Maritime Protection, and Joint Strike. The major efforts in this area are the Engineering and Manufacturing Development of the New SSN ESM System (formerly ASTECS), Integrated ESM Mast, ESM On Board Team Trainer, ESM software Program Trouble Report (PTR) Fixes, and de-installation of the ESM Engineering Developmental Model (EDM) from the DT/OT test platform. The ESM system is also planned for backfit on SSN 688 and SEAWOLF class submarines.

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Budget Item Justification
 (Exhibit R-2, Page 1 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604503N
PROGRAM ELEMENT TITLE: Submarine System Equipment Development

(U) The Submarine Sonar Improvement Program delivers block updates to Sonar Systems installed on SSN 688, 688I and TRIDENT Class Submarines to maintain clear acoustic, tactical and operational superiority over submarine and surface combatants in all scenarios through detection, classification, localization and contact following. Current developments are focused on supporting Littoral Warfare, Regional Sea Denial, Battle Group Support, Diesel Submarine Detection, Surveillance, and Peacetime Engagement.

(U) The Submarine Integrated Antenna Systems project develops the antennas needed to communicate in networks such as Ultra High Frequency Satellite Communications, Extremely Low Frequency, Extremely High Frequency, Super High Frequency and Global Positioning System. Hardware developments include: (a) mast-mounted systems; (b) buoyant cable systems; (c) expendable buoy systems and (d) submarine antenna distribution systems.

(U) The Submarine Tactical Communications Systems project provides attack submarines with an exterior communications system which: (a) minimizes the time required at communications depth; (b) enhances operability, reducing errors and manpower requirements; and (c) provides flexibility for low impact growth and change throughout the life of the submarine. Design efforts will provide increased antenna signal distribution and interconnection subsystems to accommodate ELF, EHF, and Mini-Demand Assigned Multiple Access and a message storage and processing subsystem.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to the production approval decision.

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Budget Item Justification
(Exhibit R-2, Page 2 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604503N
PROGRAM ELEMENT TITLE: Submarine System Equipment Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F0775 Submarine Support Equipment program	11,217	0	2,606	1,024	977	681	678	CONT.	CONT.

A.(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops and improves techniques and components, equipment, and systems that will increase submarine operational effectiveness in the increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for Submarine ESM to be effective in conducting the following mission areas: Joint Littoral Warfare; Joint Surveillance, Space and Electronic Warfare and Intelligence Collection; Maritime Protection; and Joint Strike. Specific efforts include development of the: (1) New SSN ESM system, (2) IEM, (3) ESM OBTT, (4) ESM software PTR Fixes and de-installation of the ESM EDM from the DT/OT test platform. The ESM system is also planned for backfit on SSN 688 and SEAWOLF class submarines.

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Budget Item Justification
(Exhibit R-2, Page 3 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0775

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Support
Equipment Program

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$6,697) Completed fabrication and integration, environmental and factory acceptance testing of the IEM EDM's. Began integration with host ESM system.
- (U) (\$4,520) Completed New SSN ESM system interface definition and design level detail to support Preliminary and Critical Design Reviews.

2. (U) FY 1998 PLAN:

- Project Funded under Program Element 0604558N Project F1950.

3. (U) FY 1999 PLAN:

- (\$1,906) Begin engineering development of ESM OBTT.
- (\$700) Perform ESM software PTR fixes.

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Budget Item Justification
(Exhibit R-2, Page 4 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0775

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Support
Equipment Program

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY1999</u>
(U) FY 1998 President's Budget:	11,522	0	0
(U) Appropriated Value:	12,106	0	0
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget:			
a. SBIR Transfer	-291		
b. Undistributed Reductions	-598		-46
c. Increase for ESM OBTT and ESM Software PTR Fixes			+2,652
(U) FY 1999 PRESBUDG Submit:	11,217	0	2,606

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of \$889K is a result of a (\$291K) SBIR assessment and (\$598K) undistributed reductions. The FY99 increase of \$2,606 is a result of a \$2652K ESM Development Program Shortfalls and (\$ -46K) undistributed reduction.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0775

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Support
Equipment Program

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 256000	0	0	0	14,543	15,447	19,009	21,454	7,800	78,253
(U) OPN Line 256005	0	0	0	0	960	2,599	2,602	2,700	8,861
(U) O&MN Line BA-1 Subhead 8B2B	0	0	0	700	2,759	2,820	2,882	CONT.	CONT.
(U) SCN Line 201300 (Partial)	0	26,563	19,767	0	20,025	20,483	0	713,840	800,678

(U) RELATED RDT&E:

(U) PE 0603562N (Submarine Tactical Warfare System)

(U) PE 0604558N (New SSN Combat Systems Development)

D. (U) SCHEDULE PROFILE: See attached.

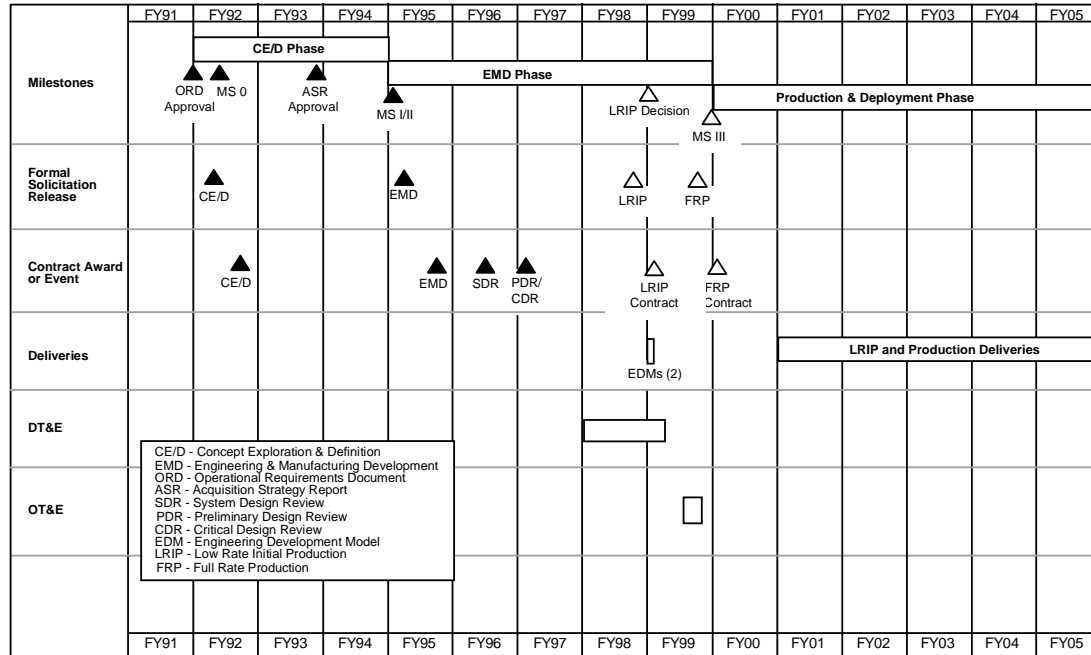
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ESM Program Schedule



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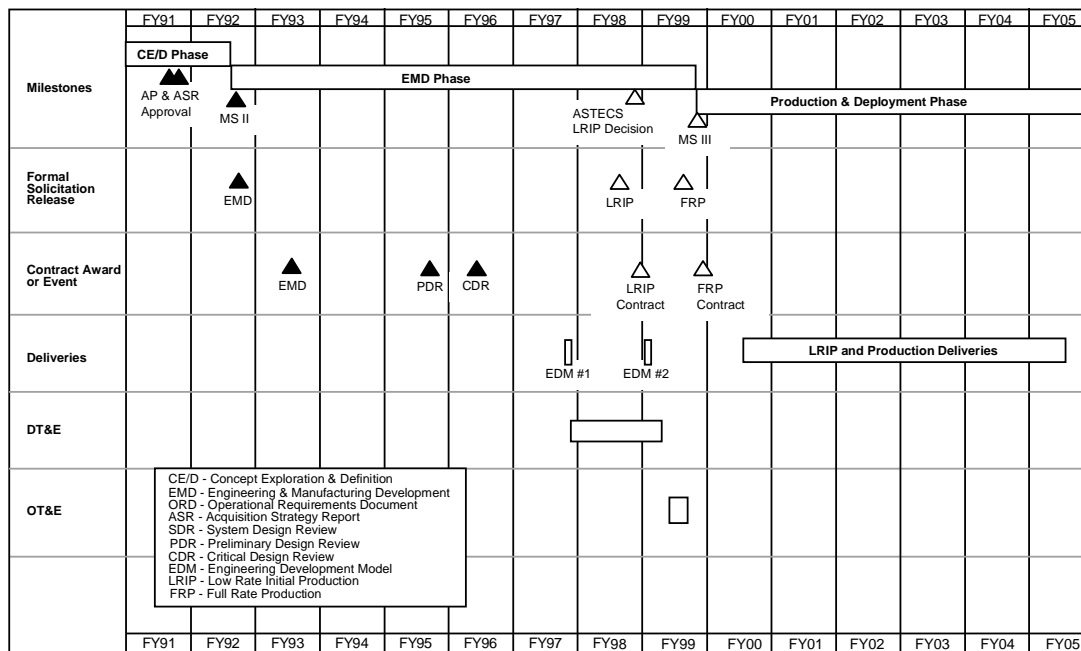
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IEM PROGRAM SCHEDULE



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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0775

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Support
Equipment Program

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Prime Hardware	7,022	0	1,280
b. Software Development	1,315	0	796
c. Engineering Support	2,399	0	530
d. Miscellaneous	481	0	0
Total	11,217	0	2,606

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RDT&E PE/Project Cost Breakdown
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0775

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Support
Equipment Program

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
IEM ADSU EMD Raytheon Goleta, CA	C/CPIF/CPAF	4/93	38,367	38,367	33,367	5,000	0	0	0	38,367
IEM/HPI Inter ST Research Newington, VA	SS/CPIF	8/94	2,879	2,879	2,879	0	0	0	0	2,879
ESM/IEM BDE System EMD Lockheed Martin Syracuse, NY	C/FFP	4/96	7,476	7,476	3,007	4,469	0	0	0	7,476
ESM OBTT/software PTR Fixes Lockheed Martin Syracuse, NY	TBD	4/99	CONT.	CONT.	0	0	0	2,606	CONT.	CONT.
Miscellaneous					15,835	1,139	0	0	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 10 of 35)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0775

PROGRAM ELEMENT TITLE: Submarine System Equipment

PROJECT TITLE: Submarine Support
Equipment Program

Contractor Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Support and Management										
Misc.					6,157	609	0	0	0	6,766
Test and Evaluation										
Misc.					0	0	0	0	0	0

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	55,088	10,608	0	2,606	CONT.	CONT.
Subtotal Support and Management	6,157	609	0	0	0	6,766
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	61,245	11,217	0	2,606	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 11 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604503N
 PROGRAM ELEMENT TITLE: Submarine System Equipment Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0219 Submarine Sonar Improvement	31,422	0	0	0	0	0	0	COMP.	COMP.
F0219 Submarine Sonar Improvement	0	47,036	37,209	30,964	21,450	21,304	22,965	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program delivers block updates to Sonar Systems installed on SSN 688, 688I and TRIDENT Class Submarines to maintain clear acoustical, tactical and operational superiority over submarine and surface combatants in all scenarios through detection, classification, localization and contact following. Current developments, detailed below, are focused on supporting Littoral Warfare, Regional Sea Denial, Battle Group Support, Diesel Submarine Detection, Surveillance, and Peacetime Engagement. OPEVAL for AN/BQQ-5E system with the TB-29 Array will complete in FY 1998; this system will provide quantum improvements in long-range detection and localization for SSN 688 and SSBN 726 Class Submarines. Engineering Change Proposal (ECP) 7001 to AN/BQQ-5E will provide Low Frequency Active Interference Rejection, Dual Towed Array Processing, and Full Spectrum Processing to SSN 688 and SSBN 726 Class Submarines. The Onboard Trainer is being developed to provide pierside and at-sea operational and team training to improve operator proficiency. The AN/BSY-1 ECP 1000, the AN/BQQ-5 Medium Frequency Active Improvement program and Improved Control Display Console Obsolete Equipment Replacement have been modified to become the basis of the Acoustics Rapid Commercial Off The Shelf Insertion (A-RCI) program. A-RCI is a multi-phased, evolutionary development effort geared toward addressing Acoustic Superiority issues through the rapid introduction of interim development products applicable to SSN 688, 688I Flight, and SSBN 726 Class Submarines. A-RCI Phases I and II introduce towed array processing improvements; A-RCI Phase III introduces spherical array processing improvements. The AN/BSY-1 High Frequency Upgrade is a stand-alone program which will be introduced as A-RCI Phase IV for SSN 688I only. Towed systems development efforts will focus on (a) tow cable improvements for shallow water towing in littoral environments; (b) hydrophone and telemetry cost and risk reduction initiatives; (c) mechanical endurance improvements; (d) sonar standardization; (e) OA-9070 handling system reliability enhancements; and (f) TB-29 () towed array development. Congressional plus-up of \$15M in FY 1999 added to accelerate Acoustic Rapid COTS Insertion/Multipurpose Processor (MPP).

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0219

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Sonar Improvement

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$21,629) Continued development of A-RCI Phases I, II and III. Conducted A-RCI Phase I Critical Design Review.
- (U) (\$6,016) Continued towed array development efforts. Continued TB-16 Multi-line Phase I development and evaluation.
- (U) (\$439) Continued OPEVAL for TB-29 and AN/BQQ-5E.
- (U) (\$828) Continued development for DTC Improvements.
- (U) (\$2,510) Obtained MS II approval and began transition of HF Upgrade Arrays Designs to production.

2. (U) FY 1998 PLAN:

- (U) (\$21,755) Conduct at-sea testing of A-RCI Phase I and CDR of Phase III.
- (U) (\$14,555) Continue research, development, training and deployment of the Multipurpose processor.
- (U) (\$2,126) Continue transition of HF Upgrade Arrays Designs to production and begin First Article Test of HF Sensor and Transmit Equipment. Begin transition of New SSN C3I developed High Frequency Processing Software to A-RCI for system integration and test.
- (U) (\$7,700) Complete TB-16 Multi-line development and evaluation, complete TB-29 OPEVAL and perform TB-29() concept development and commence Engineering Manufacturing Development.
- (U) (\$900) Continue development for Desk Top Computer Improvements.

3. (U) FY 1999 PLAN:

- (U) (\$15,684) Conduct at-sea testing of A-RCI Phases II and continue development of A-RCI Phase III.
- (U) (\$11,925) Begin system integration testing of AN/BSY-1 HF Upgrade.
- (U) (\$8,700) Continue development of TB-29() towed array.
- (U) (\$900) Continue development for DTC Improvements.

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Budget Item Justification
(Exhibit R-2, Page 13 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0219

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Sonar Improvement

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	32,125	33,545	37,512
(U) Appropriated Value:	33,562	48,545	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY98 President's Budget:			
a. Congressional Undistributed Reductions	-1,500	-1,509	
b. SBIR	-624		
c. Minor pricing adjustments	-16		-303
(U) FY 1999 PRESBUGD Submit:	31,422	47,036	37,209

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(Exhibit R-2, Page 14 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0219

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Sonar Improvement

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease of \$1,500K for Congressional Undistributed Reductions, \$624K for SBIR transfer, and \$16K for minor pricing adjustments. FY 1998 decrease of \$1509K for Congressional Undistributed Reductions. FY 1999 decrease of \$303K for minor pricing adjustments.

(U) Schedule: This submit establishes A-RCI Phase I-IV program schedule.

(U) Technical: A-RCI increases technical capabilities over programs through the use of commercial off the shelf components, open system architecture, and leveraging advanced development efforts.

C.(U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 21470	42,945	78,280	133,535	185,963	173,804	118,151	153,966	CONT.	CONT.

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Budget Item Justification
(Exhibit R-2, Page 15 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0219

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Sonar Improvement

(U) RELATED RDT&E:

(U) PE 0604524N (Submarine Combat System)

(U) PE 0604558N (New Design SSN Development)

(U) PE 0604561N (SSN-21 Development)

(U) PE 0604562N (Submarine Tactical Warfare System (Eng))

D.(U) SCHEDULE PROFILE: See attached.

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Budget Item Justification
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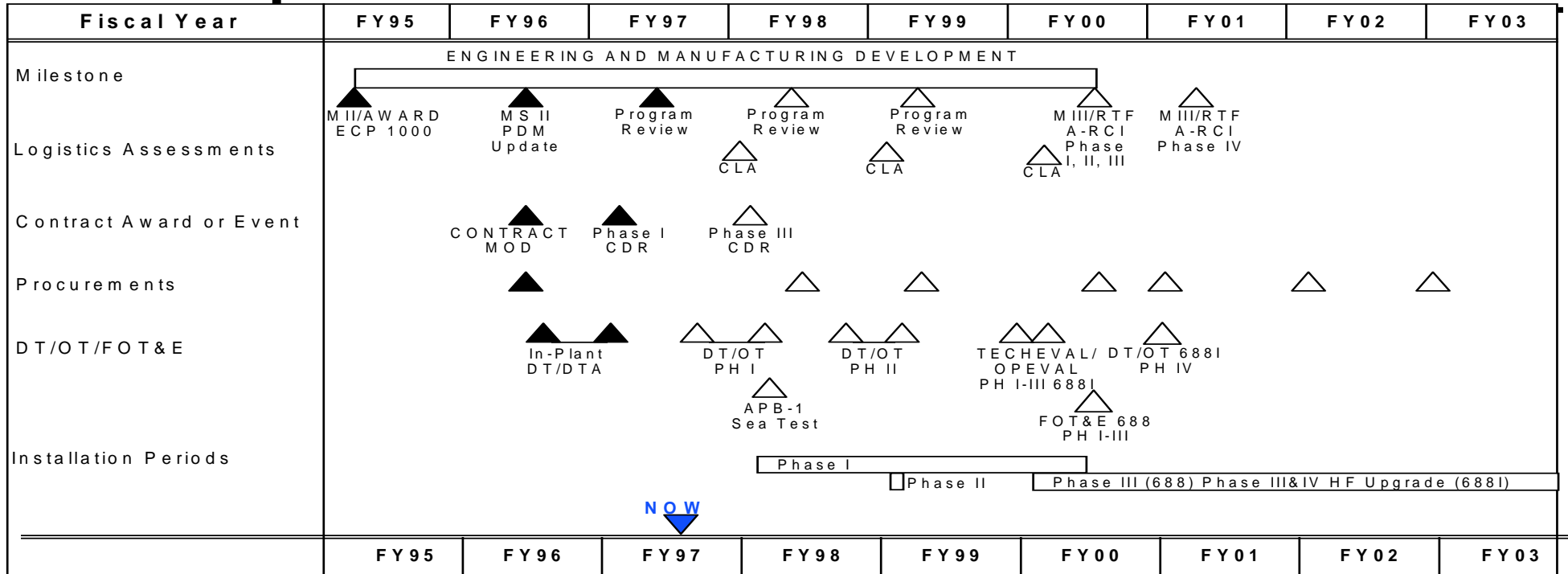
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MASTER PROGRAM SCHEDULE

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0219



NOW

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Budget Item Justification
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Master Program Schedule TB-29() Development

Program Element: 0604503N

Project Number: F0219

Fiscal Year	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04
Milestone	<div style="border: 1px solid black; width: fit-content; margin: 0 auto; padding: 2px;">ENGINEERING & MANUFACTURING DEVELOPMENT</div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> △ MII △ Program Review △ LRIP △ MII </div>							
Logistics Assessments	<div style="display: flex; justify-content: space-around;"> △ CLA △ CLA △ CLA </div>							
Contract Award or Event	<div style="display: flex; justify-content: space-around;"> △ Omnibus Award △ — △ CIT/CDR </div>							
Procurements	<div style="display: flex; justify-content: space-around;"> △ △ △ △ △ </div>							
DT/OT	<div style="display: flex; justify-content: space-around;"> △ DTI △ △ DTI OTI </div>							
Installation Periods	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> OA-9070() </div> <div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> Now ▼ TB-29() Available </div>							
	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWNDATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0219

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Sonar Improvement

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	23,573	38,960	28,082
b. Systems Engineering	5,110	5,167	5,993
c. Program Management Support	642	658	672
d. Test & Evaluation	615	760	812
e. Travel	190	150	150
f. Miscellaneous	1,292	1,341	1,500
TOTAL	31,422	47,036	37,209

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 19 of 35)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0219

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Sonar Improvement

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Digital Systems Resources Fairfax, Virginia	SS/CPFF	1/98	16,309	16,309	0	1,754	14,555	0	0	16,309
Lockheed Martin Manassas, Virginia	SS/CPAF	1/95	70,402	70,402	22,462	19,963	15,032	9,056	3,889	70,402
Lockheed Martin Manassas, Virginia	SS/CPAF	10/97	7,412	7,412	0	0	250	5,462	1,700	7,412
NUWC Newport, Rhode Island	WR	Various	CONT.		43,228	6,158	6,399	8,175	CONT.	CONT.
Misc TBD	Various C/CPIF	Various 11/97	CONT. 13,168		8,406 0	3,924 0	4,470 4,792	7,322 5,590	CONT. 2,786	CONT. 13,168

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 20 of 35)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0219

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Sonar Improvement

<u>Contractor</u> Government Performing Activity	<u>Contract</u> Method/ Fund Type Vehicle	<u>Award/</u> Oblig Date	<u>Perform</u> Activity EAC	<u>Project</u> Office EAC	<u>Total</u> FY 1996 & Prior	<u>FY 1997</u> Budget	<u>FY 1998</u> Budget	<u>FY 1999</u> Budget	<u>To</u> Complete	<u>Total</u> Program
Support and Management										
Misc	Various	Various	CONT.	CONT.	4,418	762	778	792	CONT.	CONT.
Test and Evaluation										
Misc	Various	Various	CONT.	CONT.	2,346	615	760	812	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	<u>FY 1996</u> & Prior	<u>FY 1997</u> Budget	<u>FY 1998</u> Budget	<u>FY 1999</u> Budget	<u>To</u> Complete	<u>Total</u> Program
Subtotal Product Development	74,096	30,045	45,498	35,605	CONT.	CONT.
Subtotal Support and Management	4,418	762	778	792	CONT.	CONT.
Subtotal Test and Evaluation	2,346	615	760	812	CONT.	CONT.
Total Project	80,860	31,422	47,036	37,209	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604503N PROJECT NUMBER: X0742
PROGRAM ELEMENT TITLE: Submarine System Equipment PROJECT TITLE: Submarine Integrated
Development Antenna System

(U) COST (Dollars in thousands)

PROJECTNUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0742 Submarine Integrated Antenna Systems	10,225	3,620	2,878	5,437	5,551	5,662	3,200	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Submarine Integrated Antenna System (SIAS) project provides submarines with antenna systems designed to: (a) permit greater operational flexibility through improved speed/depth performance; (b) improve reliability and availability; and (c) be compatible with existing and emerging communications systems. This project funds research and development for the communications Master Plan (Program Summary). It specifically funds the following developments: OE-538/BRC (Improved AN/BRA-34), High Speed Buoyant Cable Antennas (HSBCAs), Submarine Antenna Distribution Systems (SADS), High Data Rate Antennas (HDA), Extremely High Frequency (EHF), Super High Frequency (SHF), Phased Array Antennas (PAAs) and Global Positioning Systems (GPS).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$6,632) HDA - Awarded and managed Rapid Prototype (RP) contract and prepared for DT.
- (U) (\$1,940) SADS - Completed full functional development and conducted MS III. Completed preliminary design, conducted PDR, finalized design and began post production.
- (U) (\$600) OE-538/BRC - Completed OT-IIB and achieved MSIIA LRIP decision.
- (U) (\$1,053) Analyzed and prepared necessary changes from Antenna CSS/TADIXS Shipboard Automated Communications Control System (SACCS) compatibility.

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Budget Item Justification
(Exhibit R-2, Page 22 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X0742

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Integrated
Antenna System

2. (U) FY 1998 PLAN:

- (U)(\$1,738) HDA - Continue development, conduct developmental testing and support operational assessment.
- (U)(\$1,824) SADS - Assemble, integrate and test. Perform developmental testing in support of op-assessment and LRIP.
- (U)(\$58) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

3. (U) FY 1999 PLAN:

- (U)(\$2,878) Initiate phased array engineering to develop antenna arrays and broadband power amplifiers which support not only MILSTAR, DSCS SATCOM, and GBS but also multiple commercial SATCOM networks. This support transition of Phased Array technology from 6.3 ATD to 6.4 SIAS.

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Budget Item Justification
(Exhibit R-2, Page 23 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X0742

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Integrated
Antenna System

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	10,719	3,182	2,906
(U) Appropriated Value:	10,719	3,182	
(U) Adjustments to FY 1997/98 Appropriated Value/FY98 President's Budget	-494	+438	-28
(U) FY 1999 PRESBUDG Submit:	10,225	3,620	2,878

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease of \$296K for programmatic adjustments, \$107K for SBIR adjustment, \$34K for FFRDC adjustment, \$13K for inflation adjustment, and \$44K for minor adjustments to finance other Navy department requirements. FY 1998 increase of \$562 for programmatic adjustments, decrease of \$9K for FFRDC adjustment, \$108K for Congressional Undistributed General Reductions, and \$7K for Revised Economic Assumptions. FY 1999 \$46K is redirected to develop and update overarching C4ISR mission, decrease of \$32K to finance other Navy department requirements, an increase of \$89K as a result of NWCFC adjustments, and a decrease of \$39K for Congressional Undistributed General Reductions.

(U) Schedule: SADS version (0) aboard USS Annapolis required additional technical support through FY 96 delaying start of version (1) design into FY 1997. All milestones have been adjusted to reflect change. OE-538/BRC OT-IIB testing continued into FY 1997 requiring redesign/test prior to MS Decision. Due to test anomalies, MSIII was changed to MSIIA authorizing LRIP and deferring MSIII until FY 1999. HDR contract award was rescheduled for 4Q96 to Oct 96 due to additional offer or discussions needed to achieve full competition.

(U) Technical: Not applicable.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X0742

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Integrated
Antenna System

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	1,332	430	340
b. Systems Engineering	1,400	433	711
c. Software Development	561	153	450
d. Hardware Development	5,632	2,200	1,127
e. System Test & Evaluation	400	124	100
f. Integrated Logistic Support	500	156	50
g. Site/Platform Integration	400	124	100
CURRENT ALLOCATION	10,225	3,620	2,878

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RDT&E PE/Project Cost Breakdown
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X0742

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Integrated
Antenna System

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Raytheon Marlborough, MA	CPFF	10/96	TBD	TBD	8,256	3,300	1008	0	0	12,126
NAVUNSEAWARCEN New London, CT; Newport, Rhode Island	WX	10/95	CONT.	CONT.	5,681	4,608	879	1584	CONT.	CONT.
Misc Contracts	Various	Various	CONT.	CONT.	1,531	495	100	744	CONT.	CONT.
Misc Labs	WX	Various	CONT.	CONT.	849	90	50	100	CONT.	CONT.
Support and Management										
Misc Contracts	Various	Various	CONT.	CONT.	480	1,332	500	350	CONT.	CONT.
Test and Evaluation										
Misc. Labs						400	1083	100		

GOVERNMENT FURNISHED PROPERTY - Not applicable.

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RDT&E PE/Project Cost Breakdown
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X0742

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Integrated
Antenna System

	<u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	16,317	8,493	2,037	2,428	CONT.	CONT.
Subtotal Support and Management	480	1,332	500	350	CONT.	CONT.
Subtotal Test and Evaluation	0	400	1083	100	CONT.	CONT.
Total Project	16,797	10,225	3,620	2,878	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 28 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X1411

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Tactical
Communication System

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X1411 Submarine Tactical Communications System	4,058	5,368	7,607	5,864	4,967	9,698	6,364	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Submarine Tactical Communications System project provides attack submarines with communications systems designed to: (a) enhance data throughput through automation and integrated network management; (b) copy tactical data networks, such as Tactical Data Information Exchange System (TADIXS); (c) be interoperable with other U.S. and allied military networks; and (d) improve reliability, maintainability, and availability. This can be accomplished by providing the attack submarine with a properly integrated mix of Navy standard communication equipment covering a wide range of frequencies and modes. Included in this project is the Submarine Communications Support System (SCSS) which provides a system engineering approach for the design and evaluation of new and existing submarine radio rooms. In addition, the project provides support for the Land-Based Submarine Radio Room (LBSRR) for new systems evaluation and integration. The project includes system engineering efforts associated with demonstration of new technology which will allow the submarine to be a participant in battle group and joint operations. The new technology will increase the submarine's communications, command, and control capability. This project funds research for equipment in the OPNAV approved SCSS Program Summary. It specifically funds the development of the improved Submarine Message Buffer (SMB) and SCSS. These two efforts will develop the computer controlled radio room for submarines. Ships without SCSS capability will be limited in their interoperability with the rest of the Navy. Lastly, this program provides funds to integrate Joint Tactical Information Distribution System (JTIDS) into the SCSS and the transition to Multifunction Information Distribution System (MIDS).

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Budget Item Justification
(Exhibit R-2, Page 29 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X1411

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Tactical
Communication System

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$911) Completed DT/Operational Testing (OT) testing of improved SMB.
- (U) (\$260) Continued development of the Hi Data Rate System.
- (U) (\$1,645) Completed SCSS Phase I Integration.
- (U) (\$406) Continued Integration and developmental testing for MIDS/JTIDS.
- (U) (\$710) Systems engineering for SCSS on TRIDENT Integrated Radio Room (IRR).
- (U) (\$126) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

2. (U) FY 1998 PLAN:

- (U) (\$3,868) Begin SCSS Phase II Integration Design.
- (U) (\$1,399) Continue integration and development testing for MIDS/JTIDS.
- (U) (\$101) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

3. (U) FY 1999 PLAN:

- (U) (\$4,141) Continue SCSS Phase II integration.
- (U) (\$2,822) Continue integration and development testing for MIDS/JTIDS.
- (U) (\$644) Conduct land based testing of Phase II SCSS components.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604503N
PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT NUMBER: X1411
PROJECT TITLE: Submarine Tactical
Communication System

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	4,272	5,567	7,496
(U) Appropriated Value:			
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget:	-214	-199	+111
(U) FY 1999 PRESBUDG Submit:	4,058	5,368	7,607

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease of \$135K for programmatic adjustments, \$57K for SBIR adjustment, \$16K for FFRDC adjustment, \$5K for inflation adjustments, and \$1K for minor adjustments to finance other Navy department requirements. FY 1998 decrease of \$199K for Congressional undistributed General Reductions. FY 1999 increase of \$2070 for MIDS, decrease of \$1760 to finance other Navy requirements, \$125K for redirection to develop and update overarching C4ISR mission requirements, increase of \$46K for NWCF adjustments, and decrease of \$120K for Congressional Undistributed General Reduction.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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Budget Item Justification
(Exhibit R-2, Page 31 of 35)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604503N
PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT NUMBER: X1411
PROJECT TITLE: Submarine Tactical
Communication System

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

NUMBER TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 313000 Hardware and 313005 Installation (Partial)	28,078	42,168	64,583	65,192	66,334	65,435	74,792	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0204163N (Fleet Communications)

(U) PE 0602232N (Space & Electronic Warfare (SEW) Technology)

D. (U) SCHEDULE PROFILE: Not applicable.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X1411

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Tactical
Communication System

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	878	897	916
b. Systems Engineering	960	1,821	1,947
c. Software Development	1,388	1,310	2,683
d. Hardware Development	472	727	770
e. Test and Evaluation	360	613	1,291
CURRENT ALLOCATION	4,058	5,368	7,607

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RDT&E PE/Project Cost Breakdown
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X1411

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Tactical
Communication System

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Misc Contracts	Various	Various	CONT.	CONT.	938	345	358	409	CONT.	CONT.
NCCOSC NRaD San Diego, CA	WX	10/95	CONT.	CONT.	2,479	1,645	1,310	1,236	CONT.	CONT.
NAVUNSEAWARFCEN Newport, RI	WX	10/95	CONT.	CONT.	1,019	415	1,404	1,611	CONT.	CONT.
Misc Labs	Various	Various	CONT.	CONT.	165	410	786	2,144	CONT.	CONT.
Support and Management										
Misc Contracts	Various	Various	CONT.	CONT.	400	878	897	916	CONT.	CONT.
Test and Evaluation						360	613	1291		
Misc. Labs										

GOVERNMENT FURNISHED PROPERTY: Not applicable.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 34 of 35)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: X1411

PROGRAM ELEMENT TITLE: Submarine System Equipment
Development

PROJECT TITLE: Submarine Tactical
Communication System

	<u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	4,601	2,820	3,858	5,400	CONT.	CONT.
Subtotal Support and Management	400	878	897	916	CONT.	CONT.
Subtotal Test and Evaluation	0	360	613	1,291	CONT.	CONT.
Total Project	5,001	4,058	5,368	7,607	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROGRAM ELEMENT TITLE: Air Control (Eng)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0993 Carrier Air Traffic Control	5,731	6,528	1,260	1,826	1,866	1,897	1,940	Cont.	Cont.
W1657 Air Traffic Control (ATC) Improvements	5,609	1,244	1,893	2,236	2,440	2,497	2,566	Cont.	Cont.
W0718 Marine Air Traffic Control And Landing Systems (MATCALs)	*1,173	1,175	1,045	1,058	2,035	2,071	2,119	Cont.	Cont.
TOTAL	12,513	8,947	4,198	5,120	6,341	6,465	6,625	Cont.	Cont.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element provides for the development, integration, and testing of automated Air Traffic Control (ATC) hardware and software required to provide improved flight safety and more reliable all-weather ATC and landing capabilities ashore and afloat. Funded programs are required to upgrade or replace aging ATC and approach/landing equipment on aircraft, aircraft carriers, amphibious ships, Naval Air Stations, and Navy/Marine Corps tactical/expeditionary airfields and remote landing sites. Development of a Global Positioning System (GPS) data link is required to enable the transfer of precise positioning information between ships and aircraft.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

* Previously reflected under project X0718.

Exhibit R-2

UNCLASSIFIED

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROGRAM ELEMENT TITLE: Air Control (Eng)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0993 Carrier Air Traffic Control	5,731	6,528	1,260	1,826	1,866	1,897	1,940	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Shipboard Air Traffic Control Centers identify, marshal, and direct aircraft within 50 Nautical Miles (nm) to a ship's Automatic Carrier Landing System (ACLS) and Independent Landing Monitor (ILM). The ACLS and ILM then provide precise automatic control and verification of aircraft during their final approach and landing sequence. Due to the AN/SPN-46 radar's acquisition limitation in rain, a Moving Target Detection (MTD) capability is required. This technology is also being evaluated for use in the AN/SPN-43 search surveillance radar.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$2,233) Completed MTD development for AN/SPN-46(V) and AN/SPN-43(V).

Exhibit R-2

UNCLASSIFIED

DATE: February 1998

1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0993

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: Carrier ATC

- (U) (\$700) Provided engineering support, test & evaluation for MTD.
 - (U) (\$700) Continued Passive Point development.
 - (U) (\$2,098) Continued development effort to upgrade AN/SPN-42T systems.
2. (U) FY 1998 PLAN:
- (U) (\$2,608) Provide engineering support, test & evaluation for MTD and AN/SPN-42T systems.
 - (U) (\$708) Continue Passive Point development.
 - (U) (\$2,012) Continue development effort to upgrade AN/SPN-42T systems.
 - (U) (\$200) Complete AN/SPN-43 MTD development.
 - (U) (\$1,000) Begin development of halyard protection for AN/SPN-43.
3. (U) FY 1999 PLAN:
- (U) (\$730) Continue development effort to upgrade AN/SPN-42T systems.
 - (U) (\$400) Provide engineering support, test & evaluation for Passive Point and AN/SPN-42T systems.
 - (U) (\$130) Continue development of halyard protection for AN/SPN-43.

Exhibit R-2

UNCLASSIFIED

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604504N PROJECT NUMBER: W0993
 PROGRAM ELEMENT TITLE: Air Control (Eng) PROJECT TITLE: Carrier ATC

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	5,865	6,741	1,972
(U) Appropriated Value	6,117	0	0
(U) Adjustments from PRESBUDG:	-134	-213	-712
(U) FY 1999 President's Budget Submit:	5,731	6,528	1,260

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease of -134 thousand consists of -127 thousand for Small Business Innovation Research and -7 thousand for revised economic assumptions. FY 1998 decrease of -213 thousand consists of -13 thousand for consulting services, -101 thousand for 1.5% general reduction, -84 thousand for R&D general reduction, and -15 thousand for revised economic reductions. FY 1999 decrease of -712 thousand consists of -689 thousand program adjustment due to low expenditure rate, and -23 thousand for inflation and minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u>	<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>TO</u>	<u>TOTAL</u>
	<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
(U) OPN Automatic Carrier Landing System	7,284	11,912	10,095	20,061	18,861	18,556	18,891	Cont.	Cont.

Exhibit R-2

UNCLASSIFIED

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0993

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: Carrier ATC

(U) RELATED RDT&E:

(U) PE 0603512N (Carrier Systems Development)

(U) PE 0604512N (Shipboard Aviation Systems)

D. (U) SCHEDULE PROFILE:
S

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones		2Q-4Q 43 Halyard Protective Dev.		
Engineering Milestones	4Q PP Prototype			
T&E Milestones	1Q-2Q MTD Testing	2Q-3Q MTD Testing 1Q-2Q PPS Testing	1Q-2Q PPS Testing	Cont.
Contract Milestone				

Exhibit R-2

UNCLASSIFIED

DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0993

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: Carrier ATC

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Dev	5,023	5,685	590
b. Systems Engineering Sup	503	544	450
c. T & E Support	50	154	80
d. Project Management Sup	125	125	125
e. Travel	30	20	15
Total	5,731	6,528	1,260

Exhibit R-3

UNCLASSIFIED

DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0993

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: Carrier ATC

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Sierra Nevada	CPFF	5/93	11,174	11,174	8,939	2,235	0	0	0	11,174
Reno, NV										
Miscellaneous		Various	-	-	2,430	3,291	6,229	1,040	Cont.	Cont.
Support and Management										
Miscellaneous		Various	-	-	289	155	145	140	Cont.	Cont.
Test and Evaluation										
Miscellaneous		Various	-	-	535	50	154	80	Cont.	Cont.

GOVERNMENT FURNISHED PROPERTY : Not applicable.

Exhibit R-3

UNCLASSIFIED

DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0993

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: Carrier ATC

	<u>Total</u> <u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Actual</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Production Development	11,369	5,526	6,229	1,040	Cont.	Cont.
Subtotal Support and Management	289	155	145	140	Cont.	Cont.
Subtotal Test and Evaluation	535	50	154	80	Cont.	Cont.
Total Project	12,193	5,731	6,528	1,260	Cont.	Cont.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROGRAM ELEMENT TITLE: Air Control (Eng)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W1657 ATC Improvements	5,609	1,244	1,893	2,236	2,440	2,497	2,566	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides for engineering development, integration, adaptation, and testing of new and/or modernized real-time Air Traffic Control (ATC) systems, air navigational aids and landing systems, ATC communications systems, e.g., Fleet Area Control and Surveillance Facility (FACSFAC), and Ranges that must be modified to ensure continued interoperability with the National Airspace System (NAS).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$2,425) Continued Global Positioning System (GPS) data link/landing system efforts.
- (U) (\$330) Developed Performance Support System/Computer Based Training (PSS/CBT) framework for ATC.
- (U) (\$450) Provided in-house engineering support for GPS and PSS/CBT.
- (U) (\$2,404) Provided development engineering and contract support for Joint Precision Approach Landing System (JPALS) M/S 0 efforts, including development of an Analysis of Alternatives.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W1657

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: ATC Improvements

2. (U) FY 1998 PLAN:

- (U) (\$800) Continue GPS data link/landing efforts.
- (U) (\$285) Continue PSS/CBT efforts.
- (U) (\$159) Provide in-house engineering support for GPS and PSS/CBT efforts.

3. (U) FY 1999 PLAN:

- (U) (\$1,040) Continue GPS data link/landing efforts.
- (U) (\$500) Continue program management efforts.
- (U) (\$353) Provide in-house engineering support for GPS and PSS/CBT efforts.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	3,231	1,297	2,830
(U) Appropriated Value:	3,373	0	0
(U) Adjustments from PRESBUDG:	+2,378	-53	-937
(U) FY 1999 President's Budget Submit:	5,609	1,244	1,893

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W1657

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: ATC Improvements

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 increase of +2,378 thousand consists of a +2409 program restructuring which adds the JPALS program to W1657, -27 thousand for Small Business Innovation Research, and -4 thousand for revised economic assumptions. FY 1998 decrease of -53 thousand consists of -15 thousand for consulting services, -19 thousand for 1.5% general reduction, -16 thousand for R&D general reduction, and -3 thousand for revised economic assumptions. FY 1999 decrease of -937 thousand consists of -934 thousand for a program adjustment, +7 thousand for Navy Working Capital Fund adjustments, -19 thousand for inflation adjustments, and +9 thousand for minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) OPN National Air Space System	-	2,187	28,201	36,645	37,298	60,067	38,646	Cont.	Cont.
(U) RELATED RDT&E:	Not applicable.								

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	4Q JPALS AoA submit to AFROC			
Enginerring Milestones				
T&E Milestones	1Q-2Q Evaluate GPS prototype			Cont.
Contract Milestones				

Exhibit R-2

UNCLASSIFIED

DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W1657

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: ATC Improvements

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware	-	-	-
b. Ancillary Hardware Dev	-	-	-
c. Software Development	330	190	200
d. Systems Engineering	4,879	832	1,398
e. Training Development	85	50	50
f. ILS	55	30	70
g. T & E Support	110	67	100
d. Project Management Support	110	50	50
e. Travel	40	25	25
Total	5,609	1,244	1,893

Exhibit R-3

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604504N PROJECT NUMBER: W1657
 PROGRAM ELEMENT TITLE: Air Control (Eng) PROJECT TITLE: ATC Improvements

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NAWC Pax River	WX	10/1/98	-	-	2,269	2,633	500	1,315	Cont.	Cont.
Miscellaneous		Various	-	-	25,084	2,716	602	403	Cont.	Cont.
Support and Management										
Miscellaneous		Various	-	-	2,408	150	75	75	Cont.	Cont.
Test and Evaluation										
Miscellaneous		Various	-	-	1,961	110	67	100	Cont.	Cont.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W1657

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: ATC Improvements

	<u>Total</u> <u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Actual</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Production Development	27,353	5,349	1,102	1,718	Cont.	Cont.
Subtotal Support and Management	2,408	150	75	75	Cont.	Cont.
Subtotal Test and Evaluation	1,961	110	67	100	Cont.	Cont.
Total Project	31,722	5,609	1,244	1,893	Cont.	Cont.

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UNCLASSIFIED

DATE:February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROGRAM ELEMENT TITLE: Air Control (Eng)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0718 Marine Air Traffic Control And Landing System (MATCAL)	1,173	1,175	1,045	1,058	2,035	2,071	2,119	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Provide for continued development, integration, and testing of hardware and software to meet requirements for all-weather operation and improved flight safety of Air Traffic Control And Landing System (ATCAL) at Navy/Marine Corps expeditionary airfields. This program transferred to COMNAVAIRSYSCOM P.E. 0604504N, Project W0718 in November 1996 (FY-97).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$525K) Developed software enhancements as an eventual replacement (FY98-99) for previous versions of MATCAL Operational and Precision Approach. Functions Software (including software development documentation) is required to accommodate Air Traffic Control services for new and/or modernized Fleet aircraft.
- (U) (\$276K) Continued studies for migration of MATCAL to future architecture systems (JMCIS, CAC2S, Joint Precision Approach and Landing Systems(JPALS), AN/UYK-70, Common Air Traffic Control Console).
- (U) (\$108K) Completed study to define requirements for next-generation communication systems.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0718

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: Marine Air Traffic Control
And Landing System

- (U) (\$254K) Initiated study to incorporate automatic FAA hand-off of MATCALs Air Traffic Control tracks (hardware & software).

- (U) (\$10K) Completed study to determine supportability of new development hardware.

2. (U) FY 1998 PLAN:

- (U) (\$550K) Test and certify software improvements required to improve safety of flight and to ensure integration with TADIL B/C systems. Develop new operational software, demonstrate PC based operation software capability, and provide versions IV & V of new software.

- (U) (\$355K) Conduct studies to define requirements for Joint Precision Approach and Landing System (JPALS) to ensure interoperability and suitability for joint operations, CAC2S (for Maritime Operations), and new technology (T/R Modules) for the automatic landing system and common console.

- (U) (\$270K) Test and Evaluate First Articles of improved communication systems hardware.

3. (U) FY 1999 PLAN:

- (U) (\$340K) Conduct integration and system upgrade analysis for future Fleet Marine Force (FMF) Air Traffic Control (ATC) system. (ATNAVICS, JPALS, CEC, CAC2S): hardware and software.

- (U) (\$125K) Develop software upgrades for safety of flight and new capabilities for existing and future systems.

- (U) (\$105K) Provide A/C flight services test plan engineering support for test and evaluation of new systems and software.

- (U) (\$365K) Provide program office support for development and test of new Fleet Marine Force (FMF) Air Traffic Control system and software IV & V.

- (U) (\$110K) Conduct test and evaluation of new or upgraded hardware and software.

Exhibit R-2

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0718

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: Marine Air Traffic Control
And Landing System

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	+1,198	1,260	1,615
(U) Appropriated Value	1,173	1,175	0
(U) Adjustments from PRESBUDG:	-25	-85	-570
(U) FY 1999 PRESIDENT Budget Submit:	1,173	1,175	1,045

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease of \$25 thousand includes -\$24 thousand for SBIR transfer and -\$1 thousand for revised economic assumptions. FY 1998 decrease of \$85 thousand includes -\$47 thousand for CAAS, -\$35 thousand for general reductions, and -\$3 thousand for revised economic assumptions. FY 1999 decrease of \$570 thousand includes -\$537 thousand for program adjustments, -\$16 thousand for NWCF adjustments, -\$15 thousand for inflation adjustments, and -\$2 thousand for minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u>	<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>TO</u>	<u>TOTAL</u>
	<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
(U) OPN MATCAL\$	*1,827	9,489	10,123	9,736	10,391	10,597	10,869	Cont.	Cont.
*SPAWAR Program under Subhead 52MJ									

(U) RELATED RDT&E: Not applicable.

Exhibit R-2

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0718

PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT TITLE: Marine Air Traffic Control
And Landing System

D. (U) SCHEDULE PROFILE:

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones					
Engineering Milestones				4Q Field SW Improvements	Cont.
T&E Milestones			3Q-4Q Evaluate SW Improvements	1Q-4Q Evaluate SW Improvements	Cont.
Contract Milestones					

Exhibit R-2

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604507N

PROJECT NUMBER: V1440

PROGRAM ELEMENT TITLE: Enhanced Modular Signal
Processor

PROJECT TITLE: EMSP

(U) COST (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V1440 EMSP	20,733	2,370	1,599	1,114	1,140	1,396	1,418	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Enhanced Modular Signal Processor (EMSP) is a modular, distributed parallel state-of-the-art signal processor to provide increased performance capability for multi-platform ASW weapon systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$11,320) Migrated AN/UYS-2A operating system from MIL Spec hardware to Commercial-Off-The-Shelf (COTS) hardware with an Open System Architecture.
- (U) (\$5,000) Developed a prototype COTS-based Input Signal Conditioner (ISC) to replace current MIL Spec hardware used for sonobuoy signal processing.
- (U) (\$500) Built a prototype enclosure that provides an environment that will allow Airborne Low Frequency Sonar (ALFS) SH-60 acoustic signal processing to be performed using COTS hardware.
- (U) (\$3,913) Supported engineering design, software development, integration and test of engineering changes to SH-60 ALFS, AN/SQQ-89, P-3 Special Projects, AN/BSY-2 and DDG 993 acoustic signal processing systems.

2. (U) FY 1998 PLAN:

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

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604507N

PROJECT NUMBER: V1440

PROGRAM ELEMENT TITLE: Enhanced Modular Signal
Processor

PROJECT TITLE: EMSP

- (U) (\$2,370) Start migration of AN/SQQ-89, SH-60 ALFS, and P-3 Special Projects acoustic signal processing application software functions to COTS hardware. Work with COTS signal processor hardware vendors to foster standards that will facilitate the migration and promote use of open system architecture.

3. (U) FY 1999 PLAN:

- (U) (\$1,599) Continue migration of AN/SQQ-89, SH-60 ALFS, and P-3 Special Projects sonobuoy signal processing application software functions to COTS hardware. Work with COTS signal processor hardware vendors to foster standards that will facilitate the migration and promote use of open system architecture.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under Engineering and Manufacturing Development because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	21,740	3,462	3,224
(U) Appropriated Value:	22,718	3,462	
(U) Adjustments to FY 1997/1998 Appropriated Value/FY 1998 President's Budget:	-1,985	-1,092	-1,625
(U) FY 1999 PRESBUD Submit:	20,733	2,370	1,599

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Decrease in FY 1997 is due to Congressional Undistributed Reductions (-\$1,005K), SBIR (\$558K) and Update Below Threshold Reprogramming (-\$422K). Decrease in FY 1998 is due to Congressional R-1 Line Item 104

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

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604507N

PROJECT NUMBER: V1440

PROGRAM ELEMENT TITLE: Enhanced Modular Signal
Processor

PROJECT TITLE: EMSP

Undistributed Reductions (-\$197K), IT-21 Reduction (-\$753K), and FY 1998 N6 Offsets (-\$142K). Decrease in FY 1999 is due to EMSP Offset for NTCSS and JMCIS AFLOAT (IT-21) (\$-297K), Partial Offset for EMSP Reduction/Realignment (-\$293K), N6 PBD Adjustments (-\$200K), IT-21 Reduction (-\$800K) and minor pricing adjustments (-\$35K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 102	1,871	1,916	1,222	1,824	1,756	1,986	2,185	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0205620N (Surface ASW Combat System Integration) Provides funding for AN/SQQ-89 unique interfaces.

(U) PE 0604212N (Anti-Submarine Warfare and Other Helicopter Development) Provides funding for ALFS unique interfaces.

R-1 Line Item 104

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

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604507N

PROJECT NUMBER: V1440

PROGRAM ELEMENT TITLE: Enhanced Modular Signal
Processor

PROJECT TITLE: EMSP

D. (U) SCHEDULE PROFILE:

R-1 Line Item 104

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

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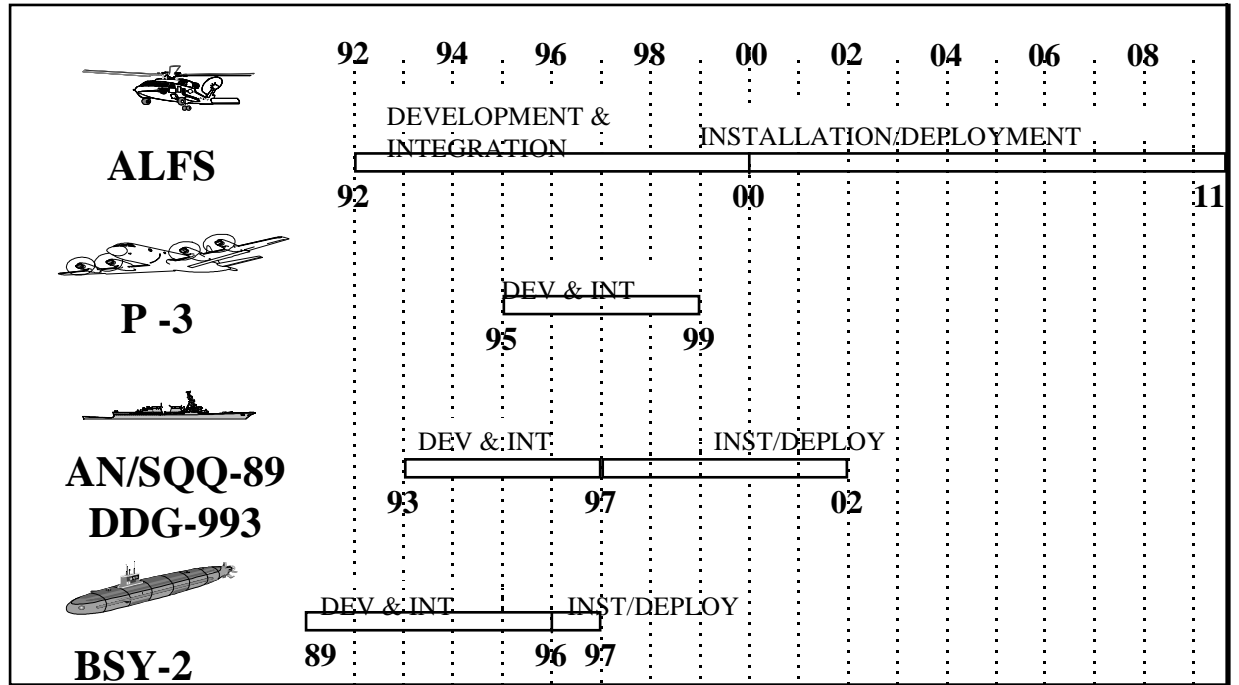
FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604507N
 PROGRAM ELEMENT TITLE: Enhanced Modular Signal
 Processor

PROJECT NUMBER: V1440
 PROJECT TITLE: EMSP



R-1 Line Item 104

Budget Item Justification
 (Exhibit R-2, page 5 of 9)

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604507N

PROJECT NUMBER: V1440

PROGRAM ELEMENT TITLE: Enhanced Modular Signal
Processor

PROJECT TITLE: EMSP

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Software Development	13,876	400	270
b. Systems Engineering	5,573	1,388	839
c. Integrated Logistics Support	812	240	160
d. Configuration Management	100	60	50
e. Project Management Support	204	100	100
f. Travel	68	70	70
g. Miscellaneous	100	112	110
TOTAL	20,733	2,370	1,599

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/Go Contract

R-1 Line Item 104

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 6 of 9)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604507N

PROJECT NUMBER: V1440

PROGRAM ELEMENT TITLE: Enhanced Modular Signal
Processor

PROJECT TITLE: EMSP

<u>Government</u> <u>Performing</u> <u>Activity</u>	<u>Method/</u> <u>Fund Type</u> <u>Vehicle</u>	<u>Award/</u> <u>Oblig</u> <u>Date</u>	<u>Perform</u> <u>Activity</u> <u>EAC</u>	<u>Project</u> <u>Office</u> <u>EAC</u>	<u>Total</u> <u>FY 1996</u> <u>&Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Product Development										
Lucent N0002494C6363/97C6361	SS/CPFF	4/94	36,000	36,000	20,814	11,276	1,084	845	CONT.	CONT.
Lockheed-Martin N00024-97-C-6368	SS/CPFF	1/97	19,029	19,029	0	5,500	0	0	CONT.	CONT.
NAWC/AD Patuxent River,MD	WR	Var.				1,006	379	400	CONT.	CONT.
NSWC/Crane	WR	Var.				1,050	175	0	CONT.	CONT.
Various						1,697	632	254	CONT.	CONT.
Support and Management		Var.				204	100	100	CONT.	CONT.
Test and Evaluation						0	0	0	0	0

GOVERNMENT FURNISHED PROPERTY

R-1 Line Item 104

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 7 of 9)

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604507N

PROJECT NUMBER: V1440

PROGRAM ELEMENT TITLE: Enhanced Modular Signal
Processor

PROJECT TITLE: EMSP

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development				0	0	0	0	0	0
Support and Management				0	0	0	0	0	0
Test and Evaluation				0	0	0	0	0	0

	<u>FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	20,814	20,529	2,270	1,499	CONT.	CONT.
Subtotal Support and Management	0	204	100	100	CONT.	CONT.
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	20,814	20,733	2,370	1,599	CONT.	CONT.

R-1 Line Item 104

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 8 of 9)

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604507N

PROJECT NUMBER: V1440

PROGRAM ELEMENT TITLE: Enhanced Modular Signal
Processor

PROJECT TITLE: EMSP

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 9 of 9)

UNCLASSIFIED

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DATE: February 1998

RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N

PROGRAM ELEMENT TITLE: Shipboard Aviation Systems

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W2232 CV Launch and Recovery Systems	9,710	8,931	8,531	9,213	9,577	10,001	7,434	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Navy unique program addresses the Engineering and Manufacturing Development (E&MD) of all systems required to recover and launch Navy/Marine Corps aircraft (fixed wing, rotary wing and Vertical/Short Take-Off and Landing (VSTOL) operating aboard aircraft carriers (CV/CVN), amphibious assault ships (LHA/LHD) and aviation facility ships. This program includes E&MD of:

- (U) The Improved Carrier Optical Landing System (ICOLS), which includes the Improved Fresnel Optical Landing System (IFLOLS) and the Long Range Line-up System (LRLS), will provide longer range, higher accuracy visual landing aids (VLA) for pilots landing on aircraft carriers.
- (U) The Integrated Shipboard Information System (ISIS) will employ existing and emerging technology to enable rapid input, collection, processing and distribution of relevant air operations information and then display this information on electronic monitors in all air operations work centers throughout the ship.
- (U) The Aviation Data Management and Control System (ADMACS) is a real-time, tactical, local area network (LAN) configuration managed for the specific support of the Air Department and the Aircraft Launch and Recovery Equipment (ALRE) data requirements on ships. It also provides connectivity among ALRE systems such as ICOLS, ISIS and Advanced Launch and Recovery Control Systems (ALRCS) and links Air Operations with other onboard tactical and support networks.
- (U) The ALRCS will introduce modern, modularized computer control systems to the catapults and arresting gear on aircraft carriers.
- (U) MORIAH will integrate standardized digital wind and meteorological (METOC) sensors to produce an affordable, LAN compatible, wind METOC suite for all classes of air capable NAVY ships.
- (U) The Virtual Imaging System for Approach and Landing (VISUAL) will provide ship's force and pilots with enhanced images of the aircraft and ship, respectively, in low visibility and night conditions.
- (U) The Shipboard Optical Landing System (SOLS) will provide advanced visual landing aids (VLA) for fixed wing, rotary wing and VSTOL aircraft, so that pilots can fly safer and more accurate approaches to all classes of ships.

Exhibit R-2

UNCLASSIFIED

DATE: February 1998

RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N

PROJECT NUMBER: W2232

PROGRAM ELEMENT TITLE: Shipboard Aviation Systems PROJECT TITLE: CV Launch & Recovery Sys

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under Engineering and Manufacturing Development because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$3,925) Awarded contract to deliver ICOLS/LRLS Engineering Development Models (EDM), performed qualification testing and delivered the first two EDMs, one of which (EDM #1) will be installed on USS CARL VINSON (CVN 70) for development testing (DT). Provided engineering and management support to program.
- (U) (\$2,870) Completed fabrication, integration and qualification testing of the ICOLS/IFLOLS. Installed the non-stabilized unit (EDM #2) at the Naval Air Test Center, Patuxent River, MD and conducted performance verification tests prior to installation of the stabilized unit (EDM #1) on USS GEORGE WASHINGTON (CVN 73). Installed EDM #2 at NAS Oceana to provide pilot familiarization training for USS GEORGE WASHINGTON (CVN 73) flight crews. DT of the unit was successfully completed and the system was certified ready for Operational Evaluation (OPEVAL). Provided pre-production support for the unit installed on USS GEORGE WASHINGTON (CVN 73). Provided engineering and management support to the program.
- (U) (\$2,315) Conducted Milestone II decision to proceed to the Engineering & Manufacturing Development (E&MD) phase of the CV/CVN Variant of the ISIS program. Continued design and integration of the ISIS EDM for installation on USS THEODORE ROOSEVELT (CVN 71) and conducted In-Process Review (IPR) with Fleet users to validate the ISIS EDM design. Provided pre-production support for the ISIS ADM installed on USS GEORGE WASHINGTON (CVN 73). Provided engineering and management support to the program.
- (U) (\$ 600) Conducted Milestone II decision to proceed to the E&MD phase of the CV/CVN Variant of the ADMACS/ISIS program. Initiated design of the ADMACS/ISIS EDM for installation on USS GEORGE WASHINGTON (CVN 73). Provided engineering and management support to the program.

2. (U) FY 1998 PLAN:

- (U) (\$ 871) Conduct Technical Evaluation (TECHEVAL) of the ICOLS/LRLS non-stabilized unit (EDM #2) at NAS Lemoore, prior to the TECHEVAL of EDM #1 on USS CARL VINSON (CVN 70). The Milestone III decision to proceed to production will then be held. Provide pre-production support for the unit installed on USS CARL VINSON (CVN 70). Provide engineering and management support to the program, particularly for the transition from the E&MD phase to the production phase.

Exhibit R-2

DATE: February 1998

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RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604512N PROJECT NUMBER: W2232
PROGRAM ELEMENT TITLE: Shipboard Aviation Systems PROJECT TITLE: CV Launch & Recovery Systems

- (U) (\$1,930) Conduct OPEVAL of the ICOLS/IFLOLS on USS GEORGE WASHINGTON (CVN 73) and prepare documentation for a Milestone III decision to proceed to production. Provide pre-production support for the unit installed on USS GEORGE WASHINGTON (CVN 73). Provide engineering and management support to the program, particularly for the transition from the E&MD phase to the production phase.
- (U) (\$2,350) Complete design and integration of the CV/CVN variant of the ISIS EDM for installation on USS THEODORE ROOSEVELT (CVN 71). Complete installation and check-out of the ISIS EDM on USS THEODORE ROOSEVELT (CVN 71) and start TECHEVAL. Provide pre-production support for the unit installed on USS THEODORE ROOSEVELT (CVN 71) and the ISIS ADM installed on USS GEORGE WASHINGTON (CVN73). Provide engineering and management support to the program.
- (U) (\$3,225) Complete design and integration of the CV/CVN variant of the ADMACS/ISIS EDM for installation on USS GEORGE WASHINGTON (CVN 73) and conduct Critical Design Review (CDR) with Fleet users to validate the ADMACS/ISIS EDM design. Start installation of the ADMACS/ISIS EDM on USS GEORGE WASHINGTON (CVN 73). Provide integration support for the various ADMACS increments under development. Provide engineering and management support to the program.
- (U) (\$ 555) Initiate design of the MORIAH wind/METOC system and complete system performance specifications. Initiate fabrication of the MORIAH EDMs. Conduct MS II decision to proceed to the E&MD phase. Provide engineering and management support to the program.

3. (U) FY 1999 PLAN:

- (U) (\$ 400) Complete outstanding DT/OT issues and conduct a Milestone III decision to proceed to production for the ICOLS/IFLOLS. Provide pre-production support for the unit installed on USS GEORGE WASHINGTON (CVN 73). Provide engineering and management support to the program, particularly for the transition from the E&MD phase to the production phase.
- (U) (\$1,000) Complete TECHEVAL of the CV/CVN variant of the ISIS EDM on USS THEODORE ROOSEVELT (CVN 71) and conduct an Operational Assessment (OA). Complete documentation for a Milestone III decision to proceed to Low Rate Initial Production (LRIP). Provide pre-production support for the unit installed on USS THEODORE ROOSEVELT (CVN 71). Provide engineering and management support to the program, particularly for the transition from the E&MD phase to the production phase.

Exhibit R-2

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DATE: February 1998

RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N

PROJECT NUMBER: W2232

PROGRAM ELEMENT TITLE: Shipboard Aviation Systems PROJECT TITLE: CV Launch & Recovery Sys

- (U) (\$2,668) Complete installation and check-out of the CV/CVN variant of the ADMACS EDM on USS GEORGE WASHINGTON (CVN 73). Conduct TECHEVAL and OPEVAL of the ADMACS/ISIS EDM on USS GEORGE WASHINGTON (CVN 73). Prepare documentation for an In-Process Review (IPR) to proceed to Full Rate Production (FRP). Provide integration support for the various ADMACS increments under development. Provide engineering and management support to the program, particularly for the transition from the E&MD phase to the production phase.
- (U) (\$1,848) Conduct Milestone II decision to proceed to the E&MD phase of the ALRCS EDM. Initiate the design and integration of the ALRCS EDM. Provide engineering and management support to the program.
- (U) (\$1,900) Conduct Milestone II decision to proceed to the E&MD phase of the LHA/LHD Variant of the ADMACS/ISIS EDM. Initiate the design and integration of the LHA/LHD variant of the ADMACS/ISIS EDM. Provide engineering and management support to the program.
- (U) (\$ 715) Complete fabrication of the MORIAH EDMs, perform qualification testing, and install on two ships for TECHEVAL. Issue production RFP and evaluate proposals. Provide engineering and management support to the program.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	6,285	9,225	10,494
(U) Appropriated Value:		9,225	
(U) Adjustments from President's Budget:	+3,425	-294	-1,963
(U) FY 1999 President's Budget:	9,710	8,931	8,531

(U) Funding: FY97 increase of \$3,425 thousand resulted from the following adjustments: An increase of \$3,015 thousand for the LRLS EDM contract award, a programmatic adjustment of \$445 thousand, and reductions of \$27 thousand for SBIR and \$8 thousand for revised economic assumptions. FY98 reflects reduction of \$294 thousand for congressional undistributed reductions. FY 99 reflects a \$2,000 thousand decrease due to delayed initiation of the VISUAL program E&MD phase from FY99 through FY00; and a decrease of \$164 thousand for revised economic assumptions and minor program adjustments. These decreases are partially offset by an increase of \$201 thousand for Navy Working Capital Fund rate and surcharge adjustments.

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DATE: February 1998

RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N

PROJECT NUMBER: W2232

PROGRAM ELEMENT TITLE: Shipboard Aviation Systems PROJECT TITLE: CV Launch & Recovery Sys

(U) CHANGE SUMMARY EXPLANATION:

Exhibit R-2

(U) Schedule: The following milestones have been changed to correct administrative errors.

ALRCS MS II 2Q/97	ALRCS MS II 2Q/99
ADMACS CDR 4Q/97	ADMACS CDR 3Q/98
VISUAL MS II 2Q/98	VISUAL MS II 2Q/00
ISIS DT 1Q/97	ISIS DT 3Q/98

(U) Milestone changes in FY97 through FY99 for CV/CVN ADMACS/ISIS were the result of delayed processing and approval of the ORD and TEMP, deferring the authorization and execution of program efforts. The LRLS system CDR is no longer required as the system was procured as COTS, therefore the CDR was deleted from the submit. The ICOLS/LRLS EDM installation on the USS CARL VINSON (CVN 70) must be done in 1Q FY98 vs 4Q FY97 as a post availability job due to work load constraints at Puget Sound Naval Shipyard, delaying DT and MS III until 2Q/98. Restoral of Consolidated Support Aircraft (CSA) funding created the VISUAL program MS II schedule slip to FY00. All other changes were made to provide additional program details.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) OPN (PE 0204216N, Aircraft Launch and Recovery Equipment)	80	4,871	23,730	26,939	20,289	12,587	10,466	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0603512N (Carrier Systems Development)

Exhibit R-2

DATE: February 1998

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RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N

PROJECT NUMBER: W2232

PROGRAM ELEMENT TITLE: Shipboard Aviation Systems PROJECT TITLE: CV Launch & Recovery Sys

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones	CV/CVN-ADMACS/ ISIS: 4Q MSII	LRLS: 2Q MSIII MORIAH: 4Q MSII	IFLOLS: 1Q MSIII CV/CVN-ADMACS/ ISIS: 2Q MSIII ALRCS: 2Q MSII LHA/LHD ADMACS/ ISIS: 2Q MSII
Engineering Milestones	CV/CVN-ISIS IPR: 4Q	CV/CVN-ADMACS/ ISIS CDR: 3Q	ALRCS CDR: 4Q LHA/LHD ADMACS/ ISIS CDR: 4Q
Test & Evaluation Milestones	IFLOLS DT (12/96 - 08/97)	LRLS DT (1/98 - 2/98) ISIS DT (4/98 - 7/98) IFLOLS OT (10/97 - 04/98)	ISIS OA (11/98) CV/CVN-ADMACS/ ISIS DT (3/99 - 7/99) CV/CVN-ADMACS/ ISIS OT - 8/99 MORIAH DT (1/99 - 8/99)
Contract Milestones		LRLS: 1Q EDM Award	

Exhibit R-2

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DATE: February 1998

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N

PROJECT NUMBER: W2232

PROGRAM ELEMENT TITLE: Shipboard Aviation Systems

PROJECT TITLE: CV Launch & Recovery Sys

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	6,718	4,285	3,348
b. Software Development	1,893	2,959	3,100
c. Integrated Logistics Support	379	838	824
d. Development Test & Evaluation	720	849	1,259
Total	9,710	8,931	8,531

Exhibit R-3

DATE: February 1998

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RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N

PROJECT NUMBER: W2232

PROGRAM ELEMENT TITLE: Shipboard Aviation Systems

PROJECT TITLE: CV Launch & Recovery Sys

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
NAWCAD-LKE	WR	10/01/97	N/A	N/A	11,208	6,495	8,731	8,331	CONT.	CONT.
Raytheon	FP	12/30/96	4,475	4,475	1,460	3,015	0	0	0	4,475
Support and Management					180	200	200	200	CONT.	CONT.
Test and Evaluation				0	0	0	0	0	0	0

GOVERNMENT FURNISHED PROPERTY: Not applicable.

DATE: February 1998

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RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N

PROJECT NUMBER: W2232

PROGRAM ELEMENT TITLE: Shipboard Aviation Systems

PROJECT TITLE: CV Launch & Recovery Sys

	FY 1996 <u>Prior</u>	FY 1997 <u>Actual</u>	FY 1998 <u>Budget</u>	FY 1999 <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Production Development	12,668	9,510	8,731	8,331	CONT.	CONT.
Subtotal Support and Management	180	200	200	200	CONT.	CONT.
Subtotal Test and Evaluation	0	0	0	0	0	
Total Project	12,848	9,710	8,931	8,531	CONT.	CONT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604516N

PROGRAM ELEMENT TITLE: Ship Survivability

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1828 Combat Readiness & Sustainability	696	722	853	865	938	959	982	CONT.	CONT.
S2054 Integrated Fire Protection/Damage Control	3,130	5,178	5,343	5,490	5,612	5,721	5,839	CONT.	CONT.
TOTAL	3,826	5,900	6,196	6,355	6,550	6,680	6,821	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports the full scale development of equipment/systems to enable continued, effective combat missions through protection from weapons effects due to hostile actions and peacetime accidents. This program also supports the engineering development of improved Personnel Protection/Damage Control/Fire Protection and Firefighting equipment, devices, and systems for rapid control/suppression of damage/fire with retention of ship mission.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

R-1 Line Item 106

Budget Item Justification
(Exhibit R-2, Page 1 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S1828
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Combat Readiness & Sustainability

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1828 Combat Readiness & Sustainability	696	722	853	865	938	959	982	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project supports the full scale engineering development of systems and components to provide protection from weapons effects for continued combat mission capability. Includes development of electrical components that support uninterrupted combat capability and damage tolerant structures.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$696) Completed engineering development of electrical fault clearing device and conducted land-based acceptance testing. Completed planning for full scale weapon effects T&E employing a blast/fragmentation warhead, shipboard generators, distribution system, and equipment loads.

2. (U) FY 1998 PLAN:

- (U) (\$334) Conduct full scale weapon effects T&E of electrical fault clearing device.
- (U) (\$388) Initiate development of damage tolerant structural fabrication techniques configurations that limit holing and flooding and prevent ship sinking from close-in underwater explosions (UNDEX), and prevent post-damage hull girder breaking due to crack growth under sea state loading. Initiate full scale weapon effects testing of alternative configurations designed to limit holing and flooding.

3. (U) FY 1999 PLAN:

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Budget Item Justification
(Exhibit R-2, Page 2 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S1828
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Combat Readiness & Sustainability

- (U) (\$363) Initiate development of a shipboard electrical fault simulation model that generates weapon-induced fault conditions for use in supporting electrical system design diagnostics and for training to restore electrical systems; identify modeling approaches.
- (U) (\$490) Continue full scale UNDEX testing of alternative configurations to limit holing and flooding.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S1828
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Combat Readiness & Sustainability

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	709	744	872
(U) Appropriated Value:	1,523	744	
(U) Adjustments to FY1997/98 Appropriated Value/ FY 1998 President's Budget			
a. Adjustments	-827	-22	-19
(U) FY 1999 PRESUDG Submit:	696	722	853

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 changes due to: -785K Near Term Mine Warfare Reprogramming; General Undistributed Reductions of -29K; -5K SBIR; -2K Revised Economic Assumptions; -6K **for other adjustments**. FY 1998 changes due Congressional undistributed reductions. FY 1999 changes due to minor pricing adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S1828
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Combat Readiness & Sustainability

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

(U) Specification changes included in new construction ship acquisition (SCN funding). Procurement information not available at this level of detail.

(U) RELATED RDT&E,N: PE 0603514N, Project S0384 (Combat Survivability Design)

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S1828
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Combat Readiness & Sustainability

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
PROGRAM MILESTONES			
Engineering Milestones		4Q Structural Configurations Evaluation Plan	4Q Shipboard Fault Simulation Modeling Approaches
T&E Milestones	4Q Electrical Fault Clearing Device Acceptance Tests	4Q Electrical Fault Clearing System T&E	4Q Structural Configuration Tests
Contracts Milestones (Not applicable)			

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Budget Item Justification
(Exhibit R-2, Page 6 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S2054
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Integrated Fire Protection/Damage Control

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S2054 Integrated Fire Protection/Damage Control	3,130	5,178	5,343	5,490	5,612	5,721	5,839	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project supports the engineering development and fleet introduction of a computer-based, total ship, damage control assessment and monitoring system that enables a rapid/coordinated response to wartime and peacetime casualties for effective recovery/restoration. In a reduced manning environment, develop the total ship tactics and doctrine for effectively fighting major ship threatening conflagrations (fire, smoke, flooding) resulting from wartime threats and peacetime accidents. This project also supports the development, testing, and evaluation of equipment and devices for protecting personnel (starting in FY 98).

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$894) Initiated firefighting experiments aboard ex-USS SHADWELL in support of developing tactics and doctrine for the water mist fire extinguishing and smoke ejection systems.
- (U) (\$300) Initiated ship-based Real Time Damage Tracking (RTDT) fire and smoke sensor system evaluation aboard the USS Rushmore and finalized specification.
- (U) (\$100) Developed specification for an interactive on-line reference implementation of Naval Ships Technical Manual (NSTM), Ch. 555, "Shipboard Firefighting", that will enable firefighting personnel to effectively formulate and implement a plan-of-attack.
- (U) (\$200) Continued development of standardized Human Computer Interface (HCI) guidelines that ensure a consistent look and feel for all Damage Control System (DCS) software applications.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S2054
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Integrated Fire Protection/Damage Control

- (U) (\$415) Completed development of the training course curriculum for DCS. Provided software support for DCS T&E ships.
 - (U) (\$375) Developed DCS communications module requirements that allows ships to transmit relief and restoration assistance requests/damage control data to accompanying ships in the battle group or shore locations. Identified offboard communication hardware integration options and DC data transmission requirements.
 - (U) (\$405) Initiated integration of combat system sensor data with DCS (pre-hit configuration management module) to enable the ship to predict the probable hit location of an anti-ship cruise missile and extent of damage so that pre-emptive actions, such as vital systems realignment, can be initiated. Identified combat system hardware integration approaches for transferring missile track and signature data to DCS. Prepared software development plan.
 - (U) (\$221) Conducted fleet evaluations aboard the ex-USS SHADWELL to identify required DCS upgrades to ensure rapid fire and smoke boundary setting and effective resource management.
 - (U) (\$220) Investigated the cause of hazardous hydrogen sulfide gas generation within the Aqueous Film Forming Foam Firefighting System; developed recommended solutions.
2. (U) FY 1998 PLAN:
- (U) (\$275) Complete RTDT Fire/Smoke Sensor evaluations aboard the USS Rushmore.
 - (U) (\$550) Complete DCS HCI guidelines and prepare DCS software development standards. Provide software support for DCS T&E ships.
 - (U) (\$1,600) Continue firefighting experiments aboard the ex-USS Shadwell in support of developing tactics and

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S2054
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Integrated Fire Protection/Damage Control

doctrine for the water mist fire extinguishing and smoke ejection systems.

- (U) (\$1,753) Continue development of the pre-hit configuration management module. Develop software requirements for a threat model that predicts impact point, a damage model that estimates damage based on threat type, and a systems model for realigning systems into more survivable configurations. Initiate software coding.
- (U) (\$300) Initiate investigation of cold water/weather and anti-exposure suits with heat retention capabilities to be utilized by DC personnel in the event of a flooding casualty.
- (U) (\$450) Initiate evaluation of conditioned firefighting clothing (Integrated Firefighter's Protective Ensemble) that will increase the time firefighters can remain on-station during extreme environments by minimizing rate of rise of body core temperature, reducing heat stress and fatigue. Commercially available microencapsulated, heat initiated phase change materials inserted into firefighter's gloves, boots, socks, anti-flash hoods, and coveralls will be evaluated for suitability.
- (U) (\$250) Initiate evaluation of personnel monitoring systems integrated with DCS that will: (1) monitor heart rate and other vital signs to indicate when it is time to remove a firefighter prior to the onset of heat stress, and (2) track personnel location.

3. (U) FY 1999 PLAN:

- (U) (\$3,413) Continue development of the pre-hit configuration module. Complete software coding. Conduct land-based T&E of selected combat system/DCS hardware integration approach; evaluate ability to track missile and predict hit point using simulated missile flight profiles and signatures. Initiate shipboard T&E to evaluate operational effectiveness.
- (U) (\$ 730) Complete firefighting experiments aboard the ex-USS Shadwell in support of developing tactics and doctrine for the water mist and smoke ejection systems.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S2054
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Integrated Fire Protection/Damage Control

- (U) (\$400) Conduct shipboard evaluations of cold water/weather and anti-exposure suits with body heat retention systems.
- (U) (\$450) Continue evaluation of conditioned firefighting clothing that increases the time firefighters can remain on-station during extreme environments.
- (U) (\$350) Continue evaluation of personnel monitoring systems that will monitor heart rate and track personnel location.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S2054
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Integrated Fire Protection/Damage Control

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	3,174	5,337	6,216
(U) Appropriated Value:	5,309	5,337	
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget			
a. Adjustments	-2,179	-159	-873
(U) FY 1999 PRESBUDG Submit:	3,130	5,178	5,343

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 changes due to: -2,000K Near Term Mine Warfare Reprogramming, -135K Congressional Undistributed Reductions, -44K SBIR Transfer. FY 1998 changes due to -147K General Reductions, -12K Economic Assumption. FY 1999 changes due to -767K **for program adjustments**, -94K Commercial Purchases Inflation Adjustment, +15 Mil & Civ Pay Rates, -27K minor pricing adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S2054
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Integrated Fire Protection/Damage Control

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line BA1/81HB/0910/HB008 0	0	5,206	12,688	4,654	11,049	3,039	TBD	TBD
(U) OPN Line 902091 (Battle Dress) 4,000	8,000	8,075	8,266	0	0	0	TBD	TBD

(U) RELATED RDT&E:

(U) PE 0603514N, Project S1565 (Fire Protection/Damage Control Systems)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S2054
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Integrated Fire Protection/Damage Control

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
PROGRAM MILESTONES			
Engineering Milestones	4Q DCS Training Curriculum Materials	2Q DCS HCI Guidelines	
	4Q Interactive Firefighting Reference Specification		
	4Q RTDT Specification		
	4Q DCS Communication Module Requirements		
	4Q DCS Pre-hit Configuration Management Module Software Development Plan	4Q Pre-hit Configuration Management Software Requirements	4Q Pre-hit Configuration Management Module Software Code

PROGRAM MILESTONES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S2054
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Integrated Fire Protection/Damage Control

T&E
Milestones

3Q Pre-Hit Module
Land-Based
Evaluations

3Q Water Mist/ Smoke
Ejection Systems
Doctrine Evaluations

4Q Cold Water/Weather
Evaluations

4Q Conditioned
Firefighting Clothing
Evaluations

4Q Personnel
Monitoring System
Evaluations

Contract
Milestones: None

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604516N PROJECT NUMBER: S2054
PROGRAM ELEMENT TITLE: Ship Survivability PROJECT TITLE: Integrated Fire Protection/Damage Control

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Engineering Assessments/ Design Studies	345	400	200
b. Test and Evaluation	1,394	3,378	4,445
c. Software Development	1,371	1,380	678
d. Travel	20	20	20
TOTAL	3,130	5,178	5,343

B.(U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands) Not Applicable

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 15 of 15)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604518N
PROGRAM ELEMENT TITLE: Combat Information Center (CIC) CONVERSION/NTDS IMPROV

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE COMPLETE	TO	TOTAL
PROGRAM									
NTDS SOFTWARE IMPROVEMENTS									
U1604	9,574	10,943	4,704	4,441	4,187	4,254	4,330	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The ACDS Block 1 program replaces the vintage Naval Tactical Data System (NTDS) operating systems and applications algorithms and implements advanced concepts for Tactical Data System upgrades for surface combatants in response to future threats, operational deficiencies and new and existing operational requirements. The increased emphasis on joint operations and littoral warfare has heightened the importance of ACDS Block 1's joint interoperability and improved littoral warfare capabilities. The program's objective is to develop integrated real time command and control systems that will increase ship's operational capabilities; promote standardization and introduce new shipboard tactical displays and support equipment; and provide integration between sensor/weapons systems which are organic to and outside the battle force. This program provides for significant Combat Direction System (CDS) improvements including implementation of the Joint Tactical Information Data System (JTIDS)/ Tactical Data Information Link Joint (TADILJ) (LINK 16) message standard to support interoperability/joint operations with U.S. Navy/Army/Air Force/Marine and NATO forces; implementation of the Aegis Tactical Executive System (ATES); and integration and interface with the Command and Control Processor (C²P), the Cooperative Engagement Capability (CEC), and Ship's Self Defense System (SSDS). This program will be an integral part of the LPD-17 and CVN-76 combat system, integrating battle management functions of all other sensor and weapon systems. In addition, the computer program is being modified to accommodate extensive use of COTS/NDI/OPEN Systems architecture hardware and firmware, and to operate in an Akcita Control Element Environment.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604518N

PROJECT NUMBER: U1604

PROGRAM ELEMENT TITLE: CIC CONVERSION/NTDS IMPROV.

PROJECT TITLE: NTDS
SOFTWARE IMPROV.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$6,618) Completed PAT and CSIT on the ACDS Block I Level 2 computer program. Delivered certified program to CVN-69 for System Integration Test (SIT), fast cruise, sea trials, participated in CEC IOC events and continued to correct priority TRs reported from the fleet.
- (U) (\$350) Completed LHD-1 system installation, on board training, and participated in the CEC IOT&E events.
- (U) (\$575) Completed crew training on the LHD-1, follow on training on the CVN69 and LHD 1 in the spring and delivery of System Operator Manuals (SOMs) and Technical Manuals.
- (U) (\$946) Continued to conduct DT/OT testing on the lead ship (CVN-69) and perform safety certification and TECHEVAL (8/97) of the Level 2 computer program.
- (U) (\$515) Began preparation of required documentation for ASN(RDA) Formal Review to achieve Milestone III.
- (U) (\$570) Continued improvements to JMCIS interface to include TBMD data, unit/land tracks, and Air Tasking Orders (ATOs) and upgrade the Geo-Server Mapping Capability to include Digital Terrain and Elevation data, Cities, and Airfields.

2. (U) FY 1998 PLAN:

- (U) (\$6,035) Complete Level 2 delivery, conduct a successful OPEVAL (2/98) and achieve Milestone III (6/98).
- (U) (\$2,010) Complete CSIT on the ACDS Block 1 Level 2 CEC Version, participate in formal CEC DT/OT events and OPEVAL testing.
- (U) (\$559) Complete development and testing of ACDS Block 1 Level 2.2 and continue to implement corrections against operational deficiencies in order to deliver to the LHD-7 CSASF in 6/98.
- (U) (\$2,339) Conduct system engineering (critical item development specification, interface control drawings), conduct a Logistic Support Analysis (LSA) and commence system development efforts for Akcita Control Element which integrates the Ship Self Defense System (SSDS). (CV(N), LPD-17,LHD and LHA)

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604518N

PROJECT NUMBER: U1604

PROGRAM ELEMENT TITLE: CIC CONVERSION/NTDS IMPROV. PROJECT TITLE: NTDS SOFTWARE IMPROV.

3. (U) FY 1999 PLAN:

(U) (\$4,704) Complete system engineering and minimal software coding of Akcita Control Element and begin software unit testing.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	9,848	11,325	9,781
(U) Appropriated Value:	10,280	11,325	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget:	-706	-382	-5,077
(U) FY 1999 PRESBUDG Submit:	9,574	10,943	4,704

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Change in FY 1997 is due to Congressional Undistributed Reductions and minor pricing adjustments. Change in FY 1998 is due to Congressional Undistributed Reductions and minor pricing adjustments. FY 1999 change due to program restructure.

(U) Schedule: Rephased to coincide with CEC installation.

(U) Technical: Not applicable.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604518N

PROJECT NUMBER: U1604

PROGRAM ELEMENT TITLE: CIC CONVERSION/NTDS IMPROV. PROJECT TITLE: NTDS SOFTWARE IMPROV.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL	
	ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM	
(U) O&M,N 0708017N/486N/46N80 Ship System Tactical		5,368	8,507	12,020	12,917	14,798	15,538	16,315	CONT.	CONT.
(U) SCN PMS-312 CVN Ship Class		0	0	0	0	45,755	0	0	0	0
(U) SCN PMS 317 LPD-17 Ship Class		0	0	8,080	17,499	17,800	18,116	18,507	8,974	88,976
(U) OPN PEO(TAD)C CEC Program Office		0	73,255	47,332	107,894	94,333	173,171	175,768	429,475	1,164,228

(U) RELATED RDT&E:

- (U) PE 0603717N (Command and Control Processor) (C2P)
- (U) PE 0205604N (Navy JTIDS)
- (U) PE 0603658N (Cooperative Engagement Capability) (CEC)
- (U) PE 0205604N (Tactical Data Links)
- (U) PE 0604231N (Navy Tactical Combat System - Afloat) (NTCS-A)
- (U) PE 0604755N (Ship Self Defense System) (SSDS)
- (U) PE 0603872C (Theater Ballistic Missile Defense)(TBMD)

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

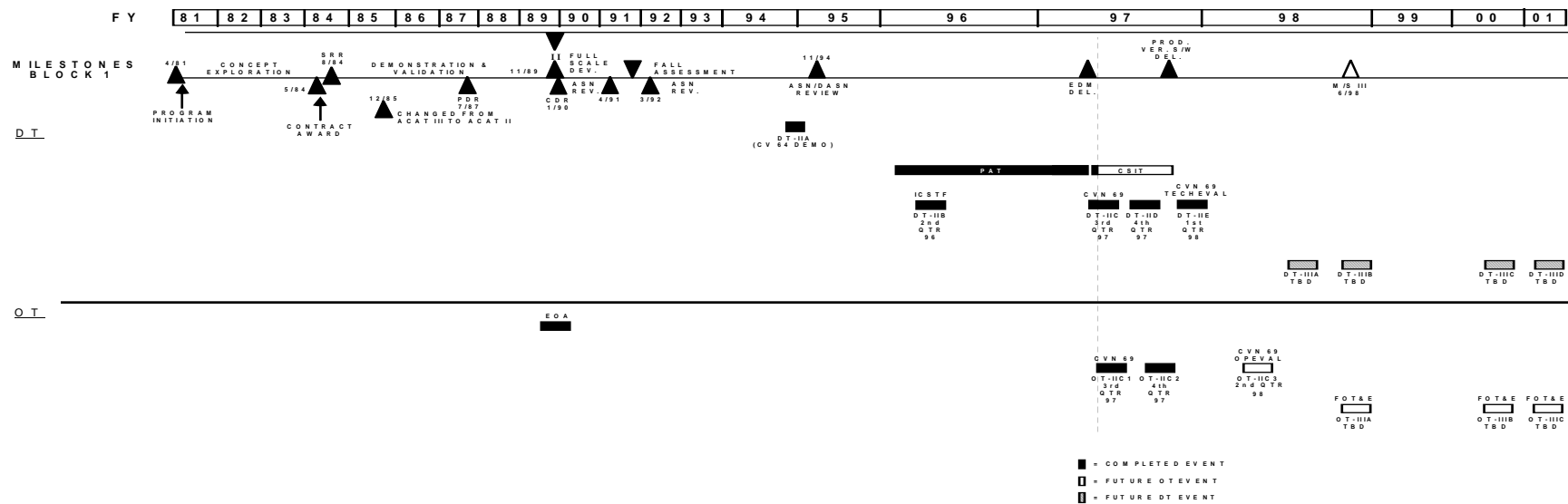
DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604518N

PROJECT NUMBER: U1604

PROGRAM ELEMENT TITLE: CIC CONVERSION/NTDS IMPROV. PROJECT TITLE: NTDS SOFTWARE IMPROV.

D. (U) SCHEDULE PROFILE:



CFS 2448-1

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN
PROGRAM ELEMENT: 0604518N
PROGRAM ELEMENT TITLE: CIC Conversion/NTDS Improvement

DATE: February 1998

BUDGET ACTIVITY: 5

PROJECT NUMBER: U1604

PROJECT TITLE: NTDS
Software Improvements

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. S/W Development and Integration	5,299	7,350	2,800
b. TDA/PAT Conduct/Training/System Engineering	1,963	1,346	873
c. Operating System License/Technical Support	209	50	0
d. Integrated Logistics Support	169	0	46
e. Configuration Management	50	0	0
f. IV&V Agent / Test Support	547	128	0
g. DT/OT Efforts	705	847	450
h. Test Facilities / HDW and Development	200	0	0
i Engineering / MSS Support	175	150	150
j. Installation Costs / ED Hardware	50	0	0
k. Travel	64	95	50
l. Miscellaneous /SBIR	143	977	335
Total	9,574	10,943	4,704

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 6 of 8)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5
Software Improvements

PROGRAM ELEMENT: 0604518N

PROJECT NUMBER: U1604

PROGRAM ELEMENT TITLE: CIC Conversion/NTDS Improvements

PROJECT TITLE: NTDS

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Actual	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development :										
Hughes Aircraft Co. San Diego, CA	C/CPAF	05/84	106,521	106,521	106,521	0	0	0	0	106,521
Hughes Aircraft Co. San Diego, CA	SS/CPFF	05/94	18,900	18,900	10,948	3,258	4,694	0	0	18,900
Hughes Aircraft Co. San Diego, CA	SS/CPAF	08/97	19,210	19,210	0	0	3,236	2,835	13,139	19,210
NCCOSC / RDTE DIV San Diego, CA	WR	Various	43,608	43,608	39,904	1,963	1,141	300	300	43,608
Miscellaneous Contractor	Various	Various	9,113	9,113	5,308	1,703	397	346	1,359	9,113
Misc Govt. Activities	Various	Various	4,161	4,161	2,125	524	300	623	589	4,161
Support and Management :										
Miscellaneous	Various	Various	1,168	1,168	293	175	150	150	400	1,168
Test and Evaluation :										
Miscellaneous	Various	Various	22,617	22,617	18,515	1,252	975	450	1,425	22,617

R-1 Line Item 107

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 7 of 8)

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604518N

PROJECT NUMBER: U1604

PROGRAM ELEMENT TITLE: CIC Conversion/NTDS Improvements

PROJECT TITLE: NTDS
Software Improvements

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ FundType Vehicle	Award/ Oblig Date	Delivery Date	Total FY1996 &Prior	FY1997 Actual	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development									
Miscellaneous	Various	Various	Various	11,756	699	50	0	0	12,505

Support and Management : Not applicable.

Test and Evaluation : Not applicable.

	FY1996 &Prior	FY1997 Actual	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Subtotal Product Development	176,562	8,147	9,818	4,104	15,387	214,018
Subtotal Support and Management	293	175	150	150	400	1,168
Subtotal Test and Evaluation	18,515	1,252	975	450	1,425	22,617
Total Project	195,370	9,574	10,943	4,704	17,212	237,803

R-1 Line Item 107

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 8 of 8)

UNCLASSIFIED

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604524N

PROJECT NUMBER: F1941

PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT TITLE: AN/BSY-2

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F1941 AN/BSY-2	17,543	17,745	11,710	6,599	3,604	0	2,113	0	1,810,484

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides systems engineering support to the AN/BSY-2 Submarine Combat Systems (SCS) and develops software fixes and enhancements designed to correct system deficiencies or anomalies identified during shipyard testing, at sea testing, IN-SERVICE trials, Acoustic Trials (Phase I and II), Weapons System Accuracy Trials (WSAT), Technical Evaluation (TECHEVAL), and Operational Evaluation (OPEVAL). It introduces Joint Maritime Command and Information Systems (JMCIS) and Advanced Capability (ADCAP) torpedo shallow water capability to the AN/BSY-2 SCS. It develops, integrates and tests the scheduled Block 2 and Block 3 system upgrades which enhance acoustic detection capabilities and combat control functions of the system and successfully supports the completion of TECHEVAL and OPEVAL events. It provides for TECHEVAL and OPEVAL test planning, asset and equipment procurements and provides direct government engineering support for the conduct of TECHEVAL and OPEVAL. This program also provides Technical Design Agent (TDA) support for the AN/BQG-5A(V)1 Standalone Wide Aperture Array system being produced by Lockheed Martin Federal Systems (LMFS). Funding is also provided for initiation of the AN/BSY-2 SCS capability improvement program.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end items prior to production approval decision.

R-1 Line Item 108

Budget Item Justification
(Exhibit R-2, Page 1 of 11)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604524N
PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT NUMBER: F1941
PROJECT TITLE: AN/BSY-2

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$10,490) Completed Block 1A2 development and test and continued Block 2/2A and Block 3 development, integration and test. Completed JMCIS test and received unrestricted certification. Continued ADCAP integration and test effort.
- (U) (\$5,883) Completed Combat System Installation Certification testing and resolved system discrepancies identified during shipyard testing, sea trials, Acoustic Trials (Phase I and II) and early TECHEVAL events.
- (U) (\$1,170) Developed, initiated and supported developmental test events and early TECHEVAL events scheduled during FY97.

2. (U) FY 1998 PLAN:

- (U) (\$14,548) Continue to provide software and engineering support to resolve system discrepancies identified during WSAT, developmental testing and early TECHEVAL events. Completed integration, test and acceptance of the AN/BSY-2 Block 2/2A Upgrade. Continue development, test and integration of the AN/BSY-2 Block 3 upgrade.
- (U) (\$1,657) Continue to develop, initiate and support developmental test events and early TECHEVAL events.
- (U) (\$1,540) Continue to provide TDA support for AN/BQG-5A(V)1 Standalone Wide Aperture Array development effort.

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Budget Item Justification
(Exhibit R-2, Page 2 of 11)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604524N

PROJECT NUMBER: F1941

PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT TITLE: AN/BSY-2

3. (U) FY 1999 PLAN:

- (U) (\$10,021) Continue to provide software and engineering support to resolve system discrepancies identified during developmental testing, early TECHEVAL test events and fleet operations. Complete Block 3 integration, test and acceptance. Initiate Block 4 development and integration effort.
- (U) (\$300) Continue to provide TDA support for the AN/BQG-5A(V)1 Standalone Wide Aperture Array development effort.
- (U) (\$1,389) Continue TECHEVAL and OPEVAL test planning efforts and conduct of developmental testing and early TECHEVAL events. Complete procurement of TECH/OPEVAL assets and related test equipment to conduct TECH/OPEVAL.

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Budget Item Justification
(Exhibit R-2, Page 3 of 11)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604524N

PROJECT NUMBER: F1941

PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT TITLE: AN/BSY-2

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	17,828	23,701	18,584
(U) Appropriated Value:	18,952	23,701	0
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget			
a. General reductions/adjustments	-1,409	-956	-10
b. Navigation Data Distribution and Display	0	0	-3,000
c. Enhanced Modular Signal Processor	0	0	-1,864
d. AN/BSY-2 Restructure	0	0	-2,000
e. FY98 Cut: TECHEVAL/OPEVAL Delay	0	-5,000	0
(U) FY 1999 PRESBUDG Submit:	17,543	17,745	11,710

R-1 Line Item 108

Budget Item Justification
(Exhibit R-2, Page 4 of 11)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604524N

PROJECT NUMBER: F1941

PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT TITLE: AN/BSY-2

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 - The funding decrease of \$1,409 represents general budget reductions and adjustments. FY 1998 - The funding decrease of \$956 is for general budget reductions and adjustments and the decrease of \$5,000 is a Congressional reduction. FY 1999 - The \$10 decrease is for general budget reductions and adjustments; the \$3,000 decrease is for the Navigation Data Distribution and Display System; the \$1,864 decrease is for delay in the Enhanced Modular Signal Processor replacement effort until FY 2003 and the \$2,000 decrease is for the AN/BSY-2 Restructure.

(U) Schedule: FY 1997 - Acoustic Trials and WSAT have been extended due to rescheduling of the Seawolf (SSN21) delivery. FY 1998 - Commencement of some TECHEVAL events has slipped from FY 1998 to FY 2000. FY 1999 - Commencement of OPEVAL has slipped from FY 1999 to FY 2000.

(U) Technical: Not applicable.

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Budget Item Justification
(Exhibit R-2, Page 5 of 11)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604524N

PROJECT NUMBER: F1941

PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT TITLE: AN/BSY-2

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0205632N (Mk 48 ADCAP)

(U) PE 0204229N (TOMAHAWK & TMPC)

(U) PE 0604601N (Mine Development)

(U) PE 0604503N (Submarine System Equipment Development)

(U) PE 0604507N (Enhanced Modular Signal Processor)

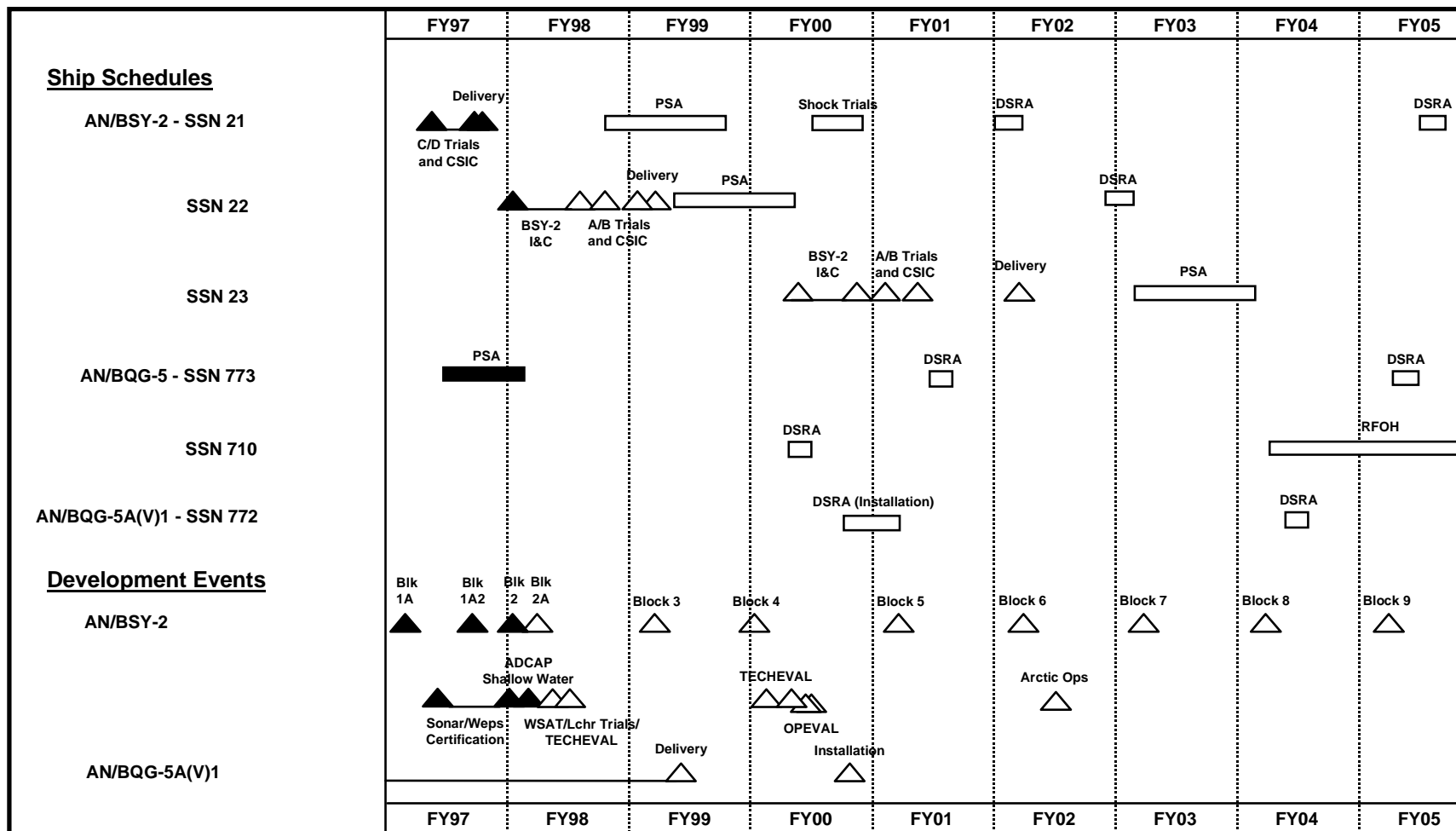
D. (U) SCHEDULE PROFILE: See attached.

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Budget Item Justification
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Budget Item Justification
(Exhibit R-2, Page 7 of 11)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604524N

PROJECT NUMBER: F1941

PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT TITLE: AN/BSY-2

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Software Development/Systems Engineering	8,323	11,102	8,951
b. Technical Design Agent (TDA)/ Engineering Support	5,780	4,786	1,170
c. Program Management Support	2,085	0	0
d. Developmental/Operational Test Evaluation Effort	1,170	1,657	1,389
e. Travel	185	200	200
Totals	17,543	17,745	11,710

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 8 of 11)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604524N

PROJECT NUMBER: F1941

PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT TITLE: AN/BSY-2

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
LMC, Syracuse, NY	C/FPI	12/87	1,206,787	1,206,787	1,206,787	0	0	0	0	1,206,787
LMC, Syracuse, NY	C/AF	12/95	31,503	31,503	3,565	4,582	11,102	8,951	3,303	31,503
Raytheon,										
Portsmouth,RI	C/FPI	2/91	22,318	22,318	22,318	0	0	0	0	22,318
AT&T, Greensboro,	NCC/FPI	2/91	39,912	39,912	39,912	0	0	0	0	39,912
IBM Manassas, VA	FFP	3/86	16,800	16,800	16,800	0	0	0	0	16,800
NUWC Newport, RI	WR	11/96	300,048	300,048	286,174	8,315	4,068	995	496	300,048
NSWC Crane, IN	WR	11/96	15,650	15,650	15,650	0	0	0	0	15,650
NTSC Orlando, FL	WR	11/96	5,257	5,257	5,257	0	0	0	0	5,257
Miscellaneous	Various	Various	35,464	35,464	34,464	0	200	200	600	35,464
Support and Management										
EG&G,										
Rockville MD	C/CPAF	10/87	77,003	77,003	74,748	2,255	0	0	0	77,003
NUWC, Newport RI	WR/RC	11/96	36,196	36,196	34,165	1,051	718	175	87	36,196
MITRE, McLean VA	MIPR	11/96	7,264	7,264	7,094	170	0	0	0	7,264

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 9 of 11)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604524N

PROJECT NUMBER: F1941

PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT TITLE: AN/BSY-2

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Test and Evaluation										
NUWC, Newport, RI	WR/RC	11/96	12,546	12,546	500	1,170	1,657	1,389	7,830	12,546

GOVERNMENT FURNISHED PROPERTY

Product Development

Miscellaneous	Various	Various	3,236	3,236	3,236	0	0	0	0	3,236
Support and Management			0	0	0	0	0	0	0	

Test and Evaluation

Miscellaneous	Various	Various	500	500	500	0	0	0	0	500
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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 10 of 11)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604524N

PROJECT NUMBER: F1941

PROGRAM ELEMENT TITLE: Submarine Combat System

PROJECT TITLE: AN/BSY-2

	<u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Actuals</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	1,634,163	12,897	15,370	10,146	4,399	1,676,975
Subtotal Support and Management	116,007	3,476	718	175	87	120,463
Subtotal Test and Evaluation	1,000	1,170	1,657	1,389	7,830	13,046
Total Project	1,751,170	17,543	17,745	11,710	12,316	1,810,484

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 11 of 11)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604528N

PROGRAM ELEMENT TITLE: SWATH Oceanographic Ship

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
22457 SWATH Oceanographic Ship	0	45,000	0	0	0	0	0	0	45,000
TOTAL	0	45,000	0	0	0	0	0	0	45,000

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports innovative development and construction of one prototype Small Waterplane Area Twin Hull (SWATH) general purpose oceanographic research vessel. Its mission is to conduct general purpose oceanographic research in coastal and deep ocean areas. Congress originally appropriated in the FY97 DoD Appropriation Act \$45 million of Shipbuilding and Conversion, Navy (SCN) funds for the SWATH AGOR as a "plus-up" to the President's budget to replace the R/V MOANA WAVE, a Navy owned ship operated by the University of Hawaii. Congress transferred the funds to FY98 RDTE in the FY 1998 DoD Appropriation Act. The SWATH AGOR will be the first Navy-owned oceanographic research SWATH. The industry design team will use new SWATH technologies which have not been proven in the design of an oceanographic SWATH ship of the size and range being considered (up to 2000+ long tons). The ship will be a developmental effort in that it will incorporate many new untried and unproven design concepts. If successful in developing this vessel, the Navy will be able to utilize the state-of-the-art concepts in developing a future larger upscale generation of oceanographic vessels. The technology developed for the SWATH AGOR will have applications for other Navy Missions, such as Surface Combatants, mine countermeasure ships and SIGINT surveillance ships, planned for future development. This program is a streamline acquisition program which plans to minimize applicable regulations by taking advantage of Section 845 of the National Defense Act for FY94, as amended by Section 804 of the National Defense Act for FY97.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

R-1 Line Item 109

Budget Item Justification
(Exhibit R-2, Page 1 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604528N

PROJECT NUMBER: 22457

PROGRAM ELEMENT TITLE: SWATH Oceanographic Ship

PROJECT TITLE: SWATH Oceanographic Ship

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS: Not Applicable.

2. (U) FY 1998 PLAN:

- (U) (\$1,000) Commence Phase I -Ship Definitization. Joint Industry-Government WIPTs will optimize desired ship capabilities within a specific cost cap; essentially as a pure Cost as an Independent Variable (CAIV) effort. Work required during Phase I will include finalization of ship requirements, performance and ship spec development, integrated management plan, logistic support concept, Test and Evaluation Plan, life cycle cost estimates, and a Phase II budget breakdown. At the end of Phase I the ship will be detailed in sufficient detail to exercise a firm fixed price option for Phase II.
- (U) (\$40,500) Commence Phase II - Detail Design and Construction. During this phase, detail design will be completed. Model test may be performed, if necessary, to validate the ship's capabilities and predicted performance. The Industry Team will proceed with procurement, construction, equipment, test and ship trials, mission, demonstrations, fitting out, post-shakedown availability, and ship delivery.
- (U) (\$3,500) - Program Technical and Management Support

3. (U) FY 1999 PLAN: Not Applicable.

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Budget Item Justification
(Exhibit R-2, Page 2 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604528N

PROJECT NUMBER: 22457

PROGRAM ELEMENT TITLE: SWATH Oceanographic Ship

PROJECT TITLE: SWATH Oceanographic Ship

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Appropriated Value		45,000	
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget			
(U) FY 1999 PRESBUDG Submit:		45,000	

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: FY 98 adjustments from FY 98 President's Budget include 45,000K transfer from FY97 SCN to FY98 RDTE
- (U) Schedule: Not applicable.
- (U) Technical: Not applicable.

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Budget Item Justification
(Exhibit R-2, Page 3 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604528N

PROJECT NUMBER: 22457

PROGRAM ELEMENT TITLE: SWATH Oceanographic Ship

PROJECT TITLE: SWATH Oceanographic Ship

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones	Not applicable	Phase I Trades/Concept Cost Estimate Develop Performance Specifications Finalize Requirements Document Major Decision II (MDII) Approval to enter Phase II	
Engineering Milestones		Commence Phase II Contract/Detail Design/Start Construction	Continue Phase II Construction of AGOR SWATH

R-1 Line Item 109

Budget Item Justification
(Exhibit R-2, Page 4 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604528N

PROJECT NUMBER: 22457

PROGRAM ELEMENT TITLE: SWATH Oceanographic Ship

PROJECT TITLE: SWATH Oceanographic Ship

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
T&E Milestones		TBD	TBD
Contract Milestones		Establish desired operational capabilities Major Decision I (MDI) - approve development strategy Develop Source Selection Plan Issue Request for Proposal (RFP) Source Selection Shipyard Selection	

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Budget Item Justification
(Exhibit R-2, Page 5 of 7)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604528N

PROJECT NUMBER: 22457

PROGRAM ELEMENT TITLE: SWATH Oceanographic Ship

PROJECT TITLE: SWATH Oceanographic Ship

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Design Development	0	1,000	0
b. AGOR SWATH Construction	0	40,500	0
c. Program Technical and Management Support	0	3,500	0
TOTAL	0	45,000	0

R-1 Line Item 109

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 6 of 7)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604528N

PROJECT NUMBER: 22457

PROGRAM ELEMENT TITLE: SWATH Oceanographic Ship

PROJECT TITLE: SWATH Oceanographic Ship

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
PRODUCT DEVELOPMENT										
TBD	C/FFP	2/98	TBD	1,000	0	0	1,000	0	0	1,000
TBD	C/FFP	6/98	TBD	40,500	0	0	40,500	0	0	40,500
SUPPORT AND MANAGEMENT										
TBD	TBD	CONT	TBD	3,500	0	0	3,500	0	0	3,500
TEST AND EVALUATION										
Not applicable.										

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	0	0	41,500	0	0	41,500
Subtotal Support and Management	0	0	3,500	0	0	3,500
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	45,000	0	0	45,000

R-1 Line Item 109

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 7 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604558N
 PROGRAM ELEMENT TITLE: New Design SSN Development

(A) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F1947 New Design SSN HM&E	265,454	204,056	146,360	138,635	133,865	96,764	114,007	272,700	1,867,066
F1950 New Design SSN Combat System Development	96,959	92,050	72,456	67,414	67,991	57,695	52,022	125,659	902,435
F2429 Enhanced Sonar Dome Demonstration/Validation	0	3,881	0	0	0	0	0	0	3,881
F2430 Advanced Submarine Tactical Electronic Combat Sys/Integrated Mast	0	7,762	0	0	0	0	0	0	7,762
TOTAL	362,413	307,749	218,816	206,049	201,856	154,459	166,029	398,359	2,781,144

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: A principal challenge to the U.S. Navy is to maintain the submarine fleet essential to defend American interests. The New Attack Submarine (New SSN) is being designed to counter the potential threats of the next century in a multi-mission capable submarine that has the ability to provide covert, sustained presence in denied waters. The primary goal of the program is to develop an affordable yet capable submarine by evaluating a broad range of system and technology alternatives, and examining cost reduction, producibility improvement, and technical risk reduction. This Program Element (PE) provides the technology, prototype components, and systems engineering needed to design and construct the New SSN and build in its Command, Control, Communications, and Intelligence (C³I) System. This PE directly supports the following New SSN missions: (1) covert strike warfare; (2) anti-submarine warfare; (3) covert intelligence collection/surveillance, indication and warning, and electronic warfare; (4) anti-surface ship warfare; (5) special warfare; (6) mine warfare; and (7) battle group support.

(U) Project F2429: Plus up continues a FY97 special congressional interest item that includes B.F. Goodrich, Electric Boat and Naval Surface Weapons Center as participants. The line funds investigation into new manufacturing processes for a sub bow dome.

(U) Project F2430: The congressional plus-up for ASTECS and Integrated ESM Mast (IEM) restored several highly desirable elements of the ASTECS/IEM programs to improve platform performance. These items were eliminated due to fiscal constraints. Improvements included enhancements to ship's radar intercept, emitter identification, and signal intercept capabilities.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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Budget Item Justification
(Exhibit R-2, page 1 of 21)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1947

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN HM&E

(U) COST (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F1947 New Design SSN HM&E	265,454	204,056	146,360	138,635	133,865	96,764	114,007	272,700	1,867,066

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project encompasses all the Hull, Mechanical and Electrical (HM&E) development efforts for the New SSN. The traditional distinct phasing of the design process has been replaced with a continuous concurrent engineering process called Integrated Product and Process Development (IPPD). This serves to maintain the focus of multi-discipline teams consisting of Government, shipbuilder and suppliers. This process is essential to achieve balanced New SSN platform capability, affordability, and flexibility in a low rate production environment. The thrust of these efforts will be to develop and apply multiple, advanced HM&E system technologies which are integrated into the design of the New SSN. The IPPD approach to technology innovation and ship integration will enable advances in military capability, while proactively controlling development and acquisition costs, impacts on ship weight and volume, and mitigating technical risks. New technologies are being transitioned from industry and Government research and development programs where doing so offers substantial performance and/or affordability payoffs. Leveraging and capitalizing on existing technologies and vendor bases for components from SSN 688I, TRIDENT, and SEAWOLF helps minimize both cost and risk. Varying degrees of re-engineering of existing systems is required to adapt them to the new submarine's requirements. HM&E development will support a FY 1998 lead ship construction contract award.

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Budget Item Justification
(Exhibit R-2, page 2 of 21)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1947

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN HM&E

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$230,806) Continued design, manufacturing, and qualification testing of prototype technologies and components such as: main propulsion unit; ship service turbine generator; weapons stowage, handling and launch system; thrust bearing; electromagnetic signature reduction; emergency diesel generator; non-Chloro Fluoro Carbon (CFC) air conditioning unit; gas discharge system; special hull treatments; interior communications systems; thin line towed array handling system; bow dome; integrated low pressure electrolyzer system; ship control system; hydraulic actuators and valves; and, reverse osmosis desalination unit. Completed design and tested scaled prototype propulsor on large scale vehicle. Continued survivability (shock) qualification testing and analyses of various components. Continued system verification studies, tests, and analyses in support of ship design including signature, hydrodynamics, materials, and survivability analyses and tests using a multitude of large and small scale test vehicles.
- (U) (\$9,059) Continued effectiveness analyses and evaluations relating to force effectiveness. Conducted analysis in support of force effectiveness assessment and component performance tradeoffs. Maintained cost reducing approach to New SSN construction through use of IPPD's concurrent engineering and design/build philosophy. Continued coordination of New SSN specification at the shipbuilder. Continued cost estimating and validation of cost reduction ideas for New SSN overall design development. Continued environmental compliance and pollution prevention efforts, achieving both SECDEF and SECNAV awards for Acquisition Program Pollution Prevention.
- (U) (\$21,425) Continued development of logistic support concept for Commercial-Off-The-Shelf (COTS) configuration items, conducted Reliability, Maintainability, and Availability (RM&A) modeling analyses of New SSN systems, concept definition and development of an Onboard Team Trainer, development of HM&E trainers, operation and support cost research, and prototyping of a digital data environment that supports the Joint Continuous Acquisition Life Cycle Support (JCALS) concepts. Prepared test plans, vulnerability report, test index and Master Plan for Ship Testing (MPST). Continued data evaluation for Test and Evaluation Master Plan (TEMP). Prepared test plans and schedules for developmental testing, acoustics, shock launcher trials. Conducted Live Fire Test and Evaluation (LFT&E) modeling and analysis.
- (U) (\$4,164) Provided IPPD, Design/Build team program support at shipyards, Navy laboratories and in-house. Performed engineering evaluations of ship integration assessments of ship design and systems development issues including structures fabrication process streamlining, confirmation of component acoustic performance requirements, and software development and integration across multiple ship systems.

2. (U) FY 1998 PLAN:

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1947

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN HM&E

- (U) (\$177,064) Continue design, manufacturing, and qualification testing of prototype systems and components such as: main propulsion unit; ship service turbine generator; weapons stowage, handling and launch systems; thrust bearing; electromagnetic signature reduction; emergency diesel generator; non-CFC air conditioning unit; gas discharge system; special hull treatments; thin line towed array handling system; integrated low pressure electrolyzer system; ship control system; hydraulic actuators and valves; and, reverse osmosis desalination unit. Complete testing of next design configuration scaled prototype propulsor on large scale vehicle and initiate design and manufacture of full scale propulsor. Continue shock qualification testing and analyses of various components. Continue system verification studies, tests, and analyses in support of ship design including signature, hydrodynamics, materials and survivability analyses and tests using a multitude of large and small scale test vehicles. Provide IPPD (Design/Build) team support at shipyards, Navy laboratories and in-house. Support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues.
- (U) (\$8,062) Continue effectiveness analyses and evaluations relating to force effectiveness. Conduct analysis in support of force effectiveness assessment and component performance tradeoffs. Maintain cost reducing approach to New SSN construction through use of IPPD's concurrent engineering and design/build philosophy. Continue coordination of New SSN specification. Continue cost estimating and validation of cost reduction concepts for New SSN overall design development. Continue environmental compliance and pollution prevention efforts.
- (U) (\$12,547) Continue development of logistic support concept for COTS configuration items, conduct RM&A modeling analyses of New SSN systems, continue development of an onboard team trainer and HM&E trainers, and continue prototyping digital data environment that supports the JCALS concepts.
- (U) (\$6,383) Continue the development of the TEMP, Vulnerability Report(VAR)and Non-Propulsion Test Index(NPTI), provide IPPD support to Commander Operational Test and Evaluation Force(COTF)operational assessments. Prepare test plans and schedules associated with developmental testing, shock, acoustic and launchers trials testing, weapons accuracy testing and technical evaluation. Conduct engineering evaluation of test results, LFT&E modeling and analysis. Continue development of the total ship test plan in support of Developmental Test/Operational Test (DT/OT), DT/OT-IIA-IIIF.

3. (U) FY 1999 PLAN:

- (U) (\$120,582) Continue design, manufacturing, and qualification testing of prototype technologies and components such as: main propulsion unit; ship service turbine generator; weapons stowage, handling and launch systems; thrust bearing; electromagnetic signature reduction; special hull treatments; integrated low pressure electrolyzer system; ship control system; and, reverse osmosis desalination unit. Continue design and manufacture of full scale propulsor. Continue shock qualification testing and analyses of various components. Continue system

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1947

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN HM&E

verification studies, tests, and analyses in support of ship design including signature, hydrodynamics, materials, and survivability analyses and tests. Provide IPPD (Design/Build) team support at shipyards, Navy laboratories and in-house. Support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues.

- (U)(\$7,812) Continue effectiveness analyses and evaluations relating to force effectiveness. Conduct analysis in support of force effectiveness assessment and component performance tradeoffs. Maintain cost reducing approach to New SSN construction through use of IPPD's concurrent engineering and design/build philosophy. Continue coordination of New SSN specification at the shipbuilder. Continue cost estimating and validation of cost reduction ideas for New SSN overall design development. Continue environmental compliance and pollution prevention efforts.
- (U)(\$11,454) Continue development of: COTS support concepts, RM&A modeling analyses, development of trainers and prototyping a digital data environment that supports the Continuous Acquisition Life Cycle Support virtual enterprise concept. Prepare test plans associated with developmental testing. Conduct engineering evaluation of test results. Conduct LFT&E modeling and analysis. Develop Sea Trial Plan for Shipbuilder and Post Shipbuilder Sea Trials.
- (U)(\$6,512) Continue the development of the TEMP, VAR and NPTI. Plan and coordinate second shipbuilder T&E efforts. Provide IPPD support to COTF operational assessments. Prepare test plans, schedules and support associated with developmental testing, conduct Combat Control Off-hull Test Series, Shock, Acoustic and Launchers Trials Testing, Weapons Accuracy Testing and Tech Eval. Conduct engineering evaluation of test results. LFT&E modeling and analysis. Continue development of the total ship test plan in support of DT/OT-IIA-IIF.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	271,930	215,280	144,015
(U) Appropriated Value	284,187	215,280	0
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget			
a. FY 1997 SBIR transfer	-5,536	0	0
b. Undistributed Reductions/Adjustments	-13,197	-6,270	597
c. *Delay SEAWOLF Shock Testing	0	-3,999	0
d. New SSN Tech Insertion	0	0	4,000

*This action does not reflect pending re-programming

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Budget Item Justification
(Exhibit R-2, page 5 of 21)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5	PROGRAM ELEMENT: 0604558N	PROJECT NUMBER: F1947		
	PROGRAM ELEMENT TITLE: New Design SSN Development	PROJECT TITLE: New Design SSN HM&E		
e. Contract Advisory and Assistance Services	0	-955	0	agreements of FY98 (+2M) and FY99 (+2M)
f. Commerical Purchases Inflation Adjustments	0	0	-2,575	
g. Military and Civilian Pay Rates	0	0	323	
(U) FY 1999 PRESBUDG Submit:	265,454	204,056	146,360	

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1997 decrease of \$18,733K is attributed to SBIR transfer(-\$5,536K)and undistributed reductions, (-\$13,197K). The FY 1998 decrease of \$11,224K is attributed to Undistributed Adjustments (-\$6,270K) and Delay SEAWOLF Shock Testing(-\$3,999K) and Contract Advisory and Assistance Services (-\$955K). The FY 1999 increase of \$2,345K is attributed to Undistributed Adjustments (\$597K) and New SSN Tech Insertion (\$4,000K), Commercial Purchase Inflation adjustment (-\$2,575K), and Military and Civilian Pay Rates (\$323K).

(U) Schedule: Not applicable

(U) Technical: Not applicable.

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Budget Item Justification
(Exhibit R-2, page 6 of 21)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1947

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN HM&E

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) SCN Line 201300 PE: 0204281N	289,882	2,495,044	2,002,901	747,443	1,715,443	2,049,185	1,012,584	50,037,700	62,041,500
(U) SCN Line 201310 PE: 0204281N	485,822	0	0	0	0	0	0	0	589,217
(U) O&M,N Line BA-3 Subhead: 3B4K	0	0	303	312	321	331	341	331	1,942
(U) O&M,N Line BA-3 Subhead 3B1K	0	0	0	4,594	3,580	4,596	5,613	8,336	26,719
(U) OPN Line Item 1320 BA-1	0	0	0	0	0	14,085	0	0	14,085
(U) OPN Line Item 2762 BA-2	0	0	0	0	0	7,245	0	0	7,245
(U) OPN Line Item 5661 BA-4	0	0	0	0	0	5,915	2,718	0	8,633

(U) RELATED RDT&E:

(U) PE 0603561N (Advanced Submarine System Development)

(U) PE 0603570N (Advanced Nuclear Power Systems)

(U) PE 0604567N (Ship Contract Design/Live Fire T&E)

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Budget Item Justification
(Exhibit R-2, page 7 of 21)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

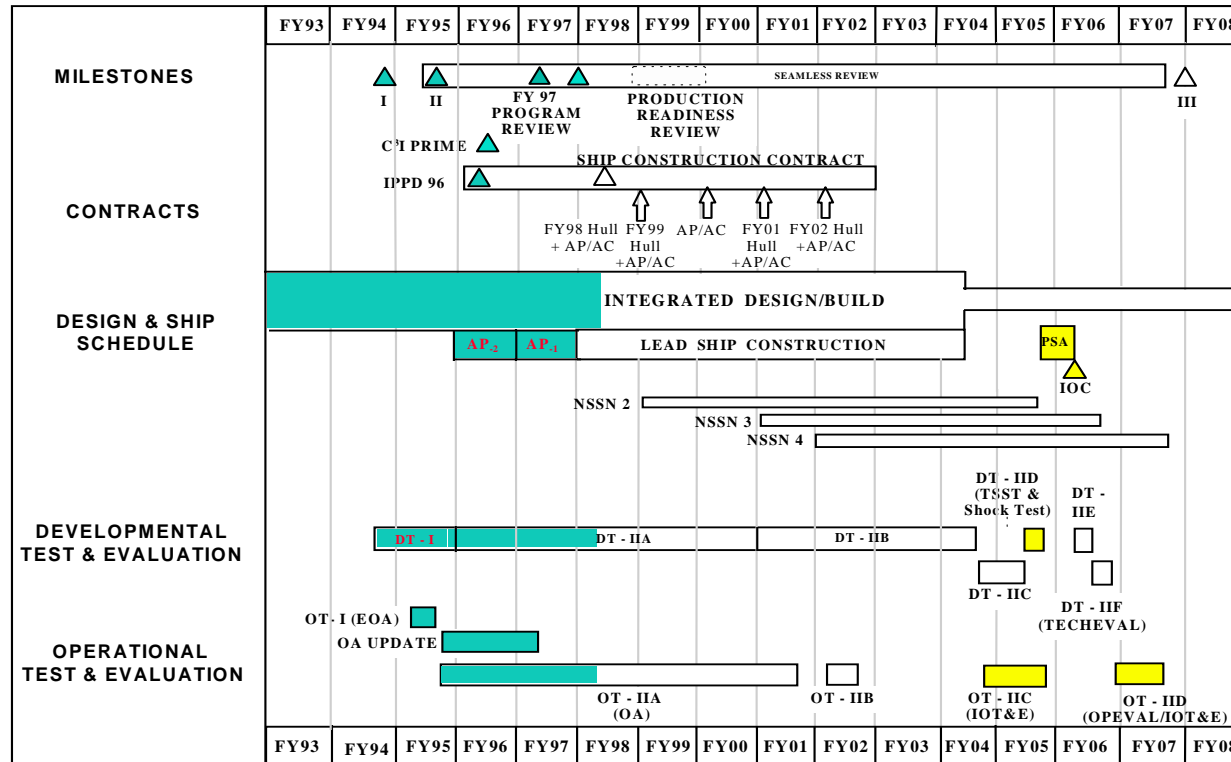
PROJECT NUMBER: F1947

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN HM&E

D. (U) SCHEDULE PROFILE:

Program Schedule



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Budget Item Justification
(Exhibit R-2, page 8 of 21)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1947

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN HM&E

A. (U) PROJECT COST BREAKDOWN: (\$ in Thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Design/Management Support	1,180	185	192
b. On-Site Design/Build Team Support	3,075	1,023	1,033
c. Mission Effectiveness	272	283	292
d. Subsafe/Safety	1,590	15	33
e. Environmental	5,641	5,477	4,799
f. Technical Specification Support	1,470	130	289
g. Cost Analysis	358	379	445
h. New SSN Ship & Module	28,252	6,213	4,000
i. Signature Reduction/Analysis	23,572	17,850	19,063
j. Survivability Engineering Development	14,914	17,240	18,368
k. Structural Engineering R&D	4,579	2,786	500
l. Main Propulsion Unit Development	26,324	2,699	11,854
m. Propulsion System Engineering Development	27,847	26,850	20,801
n. Electrical System Engineering Development	31,979	42,580	7,086
o. Auxiliary System Engineering			

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 9 of 21)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5	PROGRAM ELEMENT: 0604558N	PROJECT NUMBER: F1947	
	PROGRAM ELEMENT TITLE: New Design SSN Development	PROJECT TITLE: New Design SSN HM&E	
Development	28,291	19,483	7,613
p. Materials/Coatings Engineering R&D	9,346	7,183	3,795
q. Weapons Launcher System Engineering R&D	13,394	15,719	11,134
r. Logistics	16,240	12,987	11,632
s. Infrastructure, Sponsor & Program	4,164	3,597	3,676
t. T&E	5,185	5,665	5,845
u. CFE Electronics Engineering Development	17,781	15,712	13,910
Total	265,454	204,056	146,360

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 10 of 21)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1947

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN HM&E

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in Thousands)

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NSWC Carderock, MD	WR	VARIOUS	571,475	571,475	129,277	65,739	43,704	39,660	293,095	571,475
NSWC Carderock, MD	RC	VARIOUS	3,269	3,269	1,807	1,462	0	0	0	3,269
NAWC,ORLANDO, FL	WR	VARIOUS	35,818	35,818	677	1,005	6,548	6,897	20,691	35,818
NUWC, Newport, RI	WR	VARIOUS	73,635	73,635	36,668	9,386	8,015	8,311	11,255	73,635
FISC, Norfolk, VA	RC	VARIOUS	4,504	4,504	2,254	2,250	0	0	0	4,504
SUPSHIP, Groton,CT	PD	VARIOUS	111,480	111,480	29,115	31,400	22,434	9,093	19,438	111,480
SPAWAR/ Applied Research Lab/PENN State University	SS/CPFF	1/94	10,711	10,711	5,551	1,950	1,620	855	735	10,711
EB Corp., Groton, CT	SS/CPFF	1/95	190,193	190,193	63,009	55,990	40,524	12,978	17,692	190,193
EB Corp., Groton, CT	SS/CPFF	5/95	262,331	262,331	51,166	43,701	60,650	47,714	59,100	262,331
EG&G INC. Newport News Shipbuilding, Newport News, VA	C/CPAF	12/96	26,603	26,603	0	9,749	5,394	4,405	7,055	26,603
MISCELLANEOUS	SS/CPFF	2/93	15,785	15,785	13,554	1,057	420	267	487	15,785
MISCELLANEOUS	VARIOUS	VARIOUS	206,691	206,691	143,804	31,680	3,285	4,364	23,558	206,691
Support and Management										
MISCELLANEOUS	VARIOUS	VARIOUS	60,308	60,308	13,873	6,901	7,238	7,452	24,844	60,308
Test and Evaluation										
MISCELLANEOUS	VARIOUS	VARIOUS	294,263	294,263	4,470	3,184	4,224	4,364	278,021	294,263

GOVERNMENT FURNISHED PROPERTY: Not applicable.

Total
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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 11 of 21)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1947

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN HM&E

	<u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	476,882	255,369	192,594	134,544	453,106	1,512,495
Subtotal Support and Management	13,873	6,901	7,238	7,452	24,844	60,308
Subtotal Test and Evaluation	4,470	3,184	4,224	4,364	278,021	294,263
Total Project	495,225	265,454	204,056	146,360	755,971	1,867,066

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 12 of 21)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1950

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN Combat System Development

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F1950 New Design SSN Combat System Development	96,959	92,050	72,456	67,414	67,991	57,695	52,022	125,659	902,435

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project encompasses the top level systems development and overall integration into the ship of the New SSN C³I System (formerly referred to as Combat Systems), which includes multiple subsystems. The traditional distinct phasing of the ship design process has been replaced with a continuous concurrent engineering process called IPPD. This serves to maintain the focus of multi-discipline teams consisting of the Government, shipbuilder and suppliers. This process, which includes the C³I System efforts, is essential to achieve the maximum cost reduction possible in a low rate production environment. The scope of the system is expanded from Sonar and Combat Control subsystems to include Electronics Support Measures(ESM), Exterior Communications, Submarine Regional Warfare System, Navigation, Total Ship Monitoring, Imaging, Tactical Acoustic Communications, Radar, Architecture including Navigation Data Distribution and Display (ND³) function, Interior Communications, Tactical Support Devices, Fiber Optic Cable Subsystem, and Special Purpose Subsystems, such as Battle Force Team Trainer and others. The Research, Development, Test and Evaluation funds identified encompass New SSN specific development efforts (not programmed in other program lines) including electronic integration as well as physical integration into the platform of the aforementioned subsystems.

(U) New SSN is using an acquisition and implementation approach based on an Open System, COTS Non-Developmental Items and subsystems; leveraging on-going subsystems developments; and developing new subsystems when needed to satisfy New SSN requirements. The recurring cost of future C³I Systems are being reduced to meet the program's affordability goals and satisfy operational requirements. Subsystems must be developed or modified to: (1) reduce the shipbuilding and construction recurring costs through the use of COTS components; (2) use advanced computer technologies to evolve to an open system design; (3) enhance capabilities to support expanded operational requirements, reduced manning, and reduced shipboard component footprint.

(U) To meet the collective future threat, the submarine force must operate as effectively in littoral regions as it traditionally has in open ocean. Close coordination with surface battle groups and airborne units is essential to mission accomplishment. To support the New SSN mission, the following functional capabilities are provided or supported by the New SSN C³I System: (1) Passive and Active detection of multiple contacts, including early warning threat determination through processing and analysis of sensor data; (2) classification of sensor data for the purpose of identifying contacts;

(3) localization (tracking) of contacts through target motion analysis; (4) preset, launch, and control of weapons and countermeasures; (5) improved communication and connectivity with other battle group elements, airborne units, and special operations forces; (6) incorporation of Vertical Launch System to enhance strike warfare; and (7) more effective covert surveillance through video imaging with onboard digital enhancement capabilities, and improved electronic warfare analysis capabilities.

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Budget Item Justification
(Exhibit R-2, page 13 of 21)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1950

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN Combat System Development

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$15,687) System level development activities continued in the following areas: structurally integrated enclosure (SIE) interface development; development of C³I System design data to support integration into the platform; and conduct system engineering functions such as requirements management, interface control, test and evaluation planning; C³I Subsystem integration planning.
- (U) (\$59,958) Continued Sonar, Combat Control and Architecture (S/CC/A) Subsystem development: continued detailed hardware design, software transition and development, development of logistics support, prepared for system integration and test, initiate procurement of test hardware and non-propulsion electronics systems integration. Incorporated development of ND³ functions into the Architecture and Combat Control subsystems development. Implemented an Integrated Development Plan for more common submarine combat system development with Acoustic Rapid COTS Insertion (A-RCI), AN/BQG-5A and CCS-MK2. Completed multi-purpose processor (MPP) software development for the New SSN C³I Sonar Subsystem and the Navy's A-RCI effort. The MPP software was developed and tested under the A-RCI program and incorporated into the New SSN C³I System as a non-developmental item to minimize development risk to the New SSN C³I System program.
- (U) (\$21,314) Continued development efforts to support unique requirements for other subsystems. Finalized ESM subsystem and Imaging interface definition with C³I subsystems. Completed design level detail to support Preliminary and Critical Design Reviews.

2. (U) FY 1998 PLAN:

- (U) (\$9,380) Continue system level development activities in the following areas: SIE electronics integration; development of C³I System test and evaluation procedures to support integration testing and installation/test into the platform; and conduct system engineering functions such as requirements management, interface control and test and evaluation planning to support formal DT and OT events.
- (U) (\$76,167) Continue S/CC/A subsystem development: continue detailed hardware/software development and integration, logistics support, preparation for integration and test and procurement of test hardware and non-propulsion electronics intra-subsystem integration.
- (U) (\$6,503) Continue development efforts to support unique requirements for other subsystems. Perform integration testing and problem resolution for the ESM and Imaging subsystems at contractor's facility.

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Budget Item Justification
(Exhibit R-2, page 14 of 21)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1950

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN Combat System Development

3. (U) FY 1999 PLAN:

- (U) (\$9,488) System level development activities continue in the following areas: SIE electronics integration; development and validation of C³I System test and evaluation procedures to support integration testing and installation/test into the platform; and conduct system engineering functions such as requirements management, interface control, test and evaluation planning to support formal DT/OT; C³I Subsystem integration planning.
- (U) (\$58,144) Continue S/CC/A subsystem development; complete hardware and software development; complete final critical design review; continue logistics support and the procurement of test hardware and non-propulsion electronics intra-subsystem integration. Continue intersubsystem integration.
- (U) (\$4,824) Continue development efforts to support unique requirements for other subsystems. Perform ESM and Imaging subsystem Engineering Development Model integration testing.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	100,254	95,796	66,348
(U) Appropriated Value:	105,113	95,796	0
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget:			
a. Undistributed Reductions/ Adjustments	-4,859	-3,746	-626
b. *FY97 Cut: C ³ I Contract Savings Estimate	-7,000	0	0
c. FY97 Add: COTS MPP	+7,000	0	0
d. ND ³	0	0	+4,734
e. New SSN - C ³ I System Engineering and Integration	0	0	+2,000
f. FY 1997 SBIR Transfer	-1,997	0	0
g. FY 97 Supp'l - Revised Economic Assumptions	-123	0	0
h. March 1997 Update BTRs	-175	0	0
i. FY 1997 Actual Update of FY99 OSD/OMB Budget	-1,000	0	0

*an additional \$4,700K was cut during the Appropriation Reviews for GAO "prior year savings"

R-1 Line Item 110

Budget Item Justification
(Exhibit R-2, page 15 of 21)

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604558N PROJECT NUMBER: F1950
 PROGRAM ELEMENT TITLE: New Design SSN Development PROJECT TITLE: New Design SSN Combat System Development

(U) FY 1999 PRESBU DG Submit: 96,959 92,050 72,456

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1997 decrease of \$8,154K is attributable to, C³I contract savings (-\$7,000K), COTS MPP (+\$7,000K), SBIR transfer (-\$1,997K), revised economic assumptions (-\$123K), March 1997 Update BTRs (-\$175K) and, FY 1997 Actual Update of FY99 OSD/OMB Budget (-\$1,000K). FY 1998 decrease of \$3,746K is attributable to undistributed reductions. The FY 1999 increase of \$6,108K includes undistributed adjustments (-\$626K). Also, additional resources were programmed to FY 1999 to address identified system engineering and integration efforts for the C3I System (+\$2,000K) and ND³ (+\$4,734K).

(U) Schedule: Not applicable.

(U) Technical: The ND³ functionality had previously been provided by the submarine Navigation Sensor System Interface, a backfit program that was canceled as a result of budget constraints. This function is now provided as an integral portion of the C³I architecture and fully funded within this Project, F1950.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) SCN Line 201300 PE: 0204281N	289,882	2,495,044	2,002,901	747,443	1,715,443	2,049,185	1,012,584	50,037,700	62,041,500
(U) SCN Line 201310 PE: 0204281N	485,822	0	0	0	0	0	0	0	589,217
(U) O&M,N Line BA-1 Subhead: 852B				700	2,759	2,882	2,882	Cont.	Cont.
(U) O&M,N Line BA-3 Subhead: 3B4K	0	0	303	313	322	332	341	331	1,942
(U) O&M,N Line BA-3 Subhead 3B1K	0	0	0	4,594	3,580	4,596	5,613	8,336	26,719
(U) OPN Line Item 1320 BA-1	0	0	0	0	0	14,085	0	0	14,085

R-1 Line Item 110

Budget Item Justification
(Exhibit R-2, page 16 of 21)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1950

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN Combat System Development

(U) OPN Line Item 2762 BA-2	0	0	0	0	0	7,245	0	0	7,245
(U) OPN Line Item 5661 BA-4	0	0	0	0	0	5,915	2,718	0	8,633

U) RELATED RDT&E:

- (U) PE 0603504N (Advanced Submarine Combat Systems Development)
- (U) PE 0603561N (Advanced Submarine System Development)
- (U) PE 0603562N (Submarine Tactical Warfare Systems)
- (U) PE 0603570N (Advanced Nuclear Power Systems)
- (U) PE 0604503N (Submarine System Equipment Development)
- (U) PE 0604567N (Ship Contract Design/Live Fire T&E)
- (U) PE 0604574N (Navy Tactical Computer Resources)
- (U) PE 0604777N (Navigation/ID Systems)

R-1 Line Item 110

Budget Item Justification
(Exhibit R-2, page 17 of 21)

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

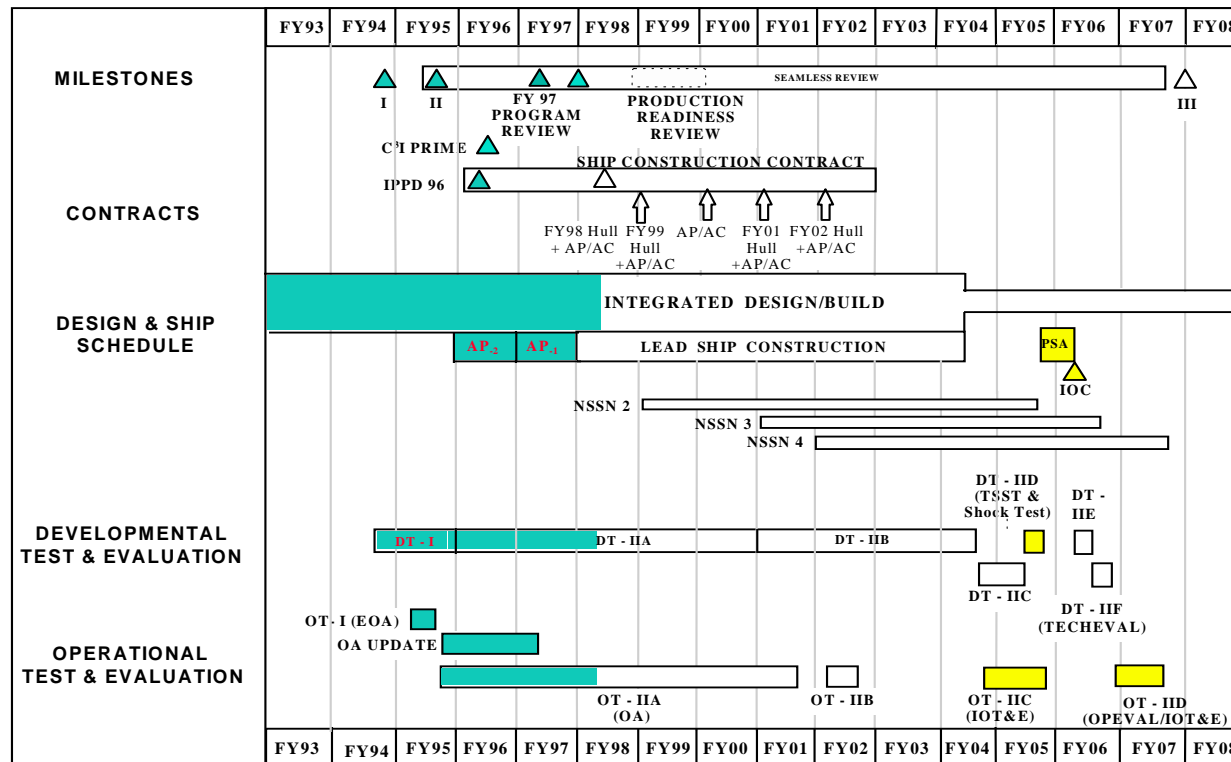
PROJECT NUMBER: F1950

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN Combat System Development

D. (U) SCHEDULE PROFILE:

Program Schedule



R-1 Line Item 110

Budget Item Justification
(Exhibit R-2, page 18 of 21)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1950

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN Combat
System Development

A. (U) PROJECT COST BREAKDOWN: (\$ in Thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. S/CC/A/ND ³	59,958	76,167	58,144
b. SYSTEM LEVEL	15,687	9,380	9,488
c. EXTERIOR COMMS	2,639	789	573
d. IMAGING	2,365	3,467	1,328
e. NAVIGATION	1,757	111	116
f. ESM	14,553	2,136	2,807
Total	96,959	92,050	72,456

R-1 Line Item 110

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 19 of 21)

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1950

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN Combat System Development

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in Thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Lockheed SS/CPFF/CPIF Martin St. Paul, MN		9/94	24,928	24,928	14,793	2,037	1,082	1,106	5,910	24,928
Digital SS/CPFF Systems Resources, Fairfax, VA		3/94	43,203	43,203	36,203	7,000	0	0	0	43,203
EB Corp., SS/CPFF Groton, CT		10/94	31,261	31,261	14,238	3,042	2,603	1,800	9,578	31,261
NUWC, VARIOUS Newport, RI		VARIOUS	215,961	215,961	88,474	17,069	13,215	13,699	83,504	215,961
Kollmorgen C/CPIF Northampton, MA		1/95	22,032	22,032	14,000	1,665	3,606	2,761	0	22,032
Lockheed/ C/FFP Martin, Syracuse, NY		7/95	35,850	35,850	21,876	13,075	374	500	25	35,850
Lockheed/ C/CPAF Martin, Manassas, VA		4/96	212,128	212,128	17,329	42,421	55,945	38,078	58,355	212,128
TBD VARIOUS		VARIOUS	69,118	69,118	0	0	5,112	5,210	48,842	59,164
Miscellaneous VARIOUS		VARIOUS	168,665	168,665	50,256	4,447	2,588	1,138	110,236	168,665
Support and Management										
EG&G, C/CPFF Rockville, MD		6/94	5,568	5,568	3,644	1,924	0	0	0	5,568
EG&G, C/CPAF Rockville, MD		12/96	22,377	22,377	0	766	5,354	5,471	10,786	22,377
EG&G, C/CPAF Rockville, MD		11/96	1,410	1,410	0	1,410	0	0	0	1,410
Miscellaneous VARIOUS		VARIOUS	57,350	57,350	9,376	1,913	1,596	1,270	43,195	57,350

R-1 Line Item 110

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 20 of 21)

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604558N

PROJECT NUMBER: F1950

PROGRAM ELEMENT TITLE: New Design SSN Development

PROJECT TITLE: New Design SSN Combat
System Development

Test and Evaluation

Miscellaneous	VARIOUS	VARIOUS	2,538	2,538	0	190	575	1,423	350	2,538
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GOVERNMENT FURNISHED PROPERTY: Not applicable.

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	257,169	90,756	84,525	64,292	316,450	813,192
Subtotal Support and Management	13,020	6,013	6,950	6,741	53,981	86,705
Subtotal Test and Evaluation	0	190	575	1,423	350	2,538
Total Project	270,189	96,959	92,050	72,456	370,781	902,435

R-1 Line Item 110

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 21 of 21)

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604561N

PROJECT NUMBER: F1946

PROGRAM ELEMENT TITLE: SSN 21 Development

PROJECT TITLE: SSN 21 Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F1946 SSN 21 Development	70,687	50,307	27,456	69,266	8,046	27,937	2,742	0	1,731,019

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The SEAWOLF submarine will be a multi-mission ship that will introduce unprecedented performance capabilities. It will be the quietest, most heavily-armed attack submarine the Navy has ever built. The design of the SEAWOLF is based on an extensive research and development program and will incorporate technological advancements to provide: order of magnitude improvement in ship quieting; improved acoustic sensors; more capable combat systems; greater weapon capacity and capability; quieter launch; weapon launch at high ship speed; advanced reactor; improved performance machinery program; an advanced propulsor; increased operating depth; improved ship control; and enhanced survivability.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: The following information is intended to highlight major Research and Development (R&D) efforts and does not include all SEAWOLF R&D efforts.

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$6,000) Addressed emerging acoustic issues.
- (U) (\$13,165) Continued development of Advanced Special Hull Treatment including system qualification and inspection. Commenced planning for FY98 trial installation on SSN21 Post Shakedown Availability (PSA). Completed ongoing research, test and redesign program for Mold-in-Place/Special Hull Treatment repair. Financed with dollars budgeted in support of Target Strength, Ship Control, EM and Launcher trials.
- (U) (\$26,646) Commenced pre-PSA trials, e.g., acoustic trials, weapons/sonar certification. Continued FSST planning and environmental assessments. Continued deficiency assessment and resolution in acoustic silencing including propulsor. Conducted component shock test qualification efforts.
- (U) (\$11,078) Developed and finalized software configuration for non propulsion electronics (i.e. ship control, Weapons, Stowage and Handling System (WSHS), Exterior Communications System, monitoring including final certification and test.

R-1 Line Item 111

Budget Item Justification
(Exhibit R-2, Page 1 of 8)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604561N

PROJECT NUMBER: F1946

PROGRAM ELEMENT TITLE: SSN 21 Development

PROJECT TITLE: SSN 21 Development

- (U) (\$13,798) Conducted emergent research, test and redesign program for wide aperture array. Completed emergent research, test and redesign program for titanium alloy forgings based on concerns raised over brittle fracture of weapons launch system hull closures. Continued Integrated Product Team execution of Risk Management Plans in all high risk areas. Continued Improved Performance Machinery Program (IPMP) development.

2. (U) FY 1998 PLAN:

- (U) (\$18,450) Commence PSA installation of ASHT on SSN21.
- (U) (\$19,619) Complete analysis of pre-PSA acoustic trial data. Remaining required funding for FSST. Start Operational Test (OT) planning. Continue deficiency assessment and resolution in acoustic silencing including propulsor.
- (U) (\$5,876) Continue submarine technology developments and risk management efforts.
- (U) (\$6,362) Complete development, certification and final software configuration of Non-Propulsion Electronics (NPE) systems (ship control, WSHS, etc.) and weapons launch.

3. (U) FY 1999 PLAN:

- (U) (\$20,751) Commence post-PSA trials, e.g., acoustic trials, and weapons/sonar certification. Continue Operational Test (OT) planning only. Re-engineering and design to correct acoustic deficiencies including propulsor. Complete post-PSA analysis of ASHT installation on SSN21.
- (U) (\$3,719) Re-engineering and correction of deficiencies in NPE systems including ship control, WSHS, ECS, etc.
- (U) (\$2,986) Continue risk management efforts in all high risk areas.

R-1 Line Item 111

Budget Item Justification
(Exhibit R-2, Page 2 of 8)

UNCLASSIFIED

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604561N

PROJECT NUMBER: F1946

PROGRAM ELEMENT TITLE: SSN 21 Development

PROJECT TITLE: SSN 21 Development

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	87,506	49,542	27,731
(U) Appropriated Value:	91,931	49,542	0
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget			
a. SBIR	-1,302	0	0
b. DD1002 Update BTRs	-1,449	0	0
c. Delay SEAWOLF Shock Testing	0	3,999	0
d. Actual Update of OSD/OMB Budget	-81	0	0
e. SSN21 Mini Performance Trial	0	-1,200	0
f. FY97 AEGIS/TBMD/CEC Reprogramming	-13,879	0	0
g. Undistributed reductions	-4,533	-2,034	-275
(U) FY 1999 PRESBUDG Submit	70,687	50,307	27,456

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 97 decrease of \$21,244K is a result of SBIR (-\$1,302K), FY 1997 AEGIS/TBMD/CEC Reprogramming (-\$13,879K), and for Other undistributed marks (-\$6,063K). The FY98 net increase of \$765K is a result of Performance, Launcher & EM Trials (+\$3,999K), SSN21 Mini Performance Trial (-\$1,200K) and for Undistributed reductions (-\$2,034K). The FY99 net decrease of \$275K is a result of Undistributed reductions.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

R-1 Line Item 111

Budget Item Justification
(Exhibit R-2, Page 3 of 8)

UNCLASSIFIED

UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604561N

PROJECT NUMBER: F1946

PROGRAM ELEMENT TITLE: SSN 21 Development

PROJECT TITLE: SSN 21 Development

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) SCN #201200	656,523	153,362	23,116	8,340	2,759	14,488	12,966	0	8,122,700
(U) MILCON P-398	0	0	0	0	0	0	0	0	27,300
(U) OPN #094900, #051000	50,848	6,292	23,412	28,947	11,363	1,527	197	0	303,656
(U) OPN #098000, #144500	0	0	0	0	0	0	0	0	2,236

(U) RELATED RDT&E:

- (U) PE 0603570N (Advanced Nuclear Power Systems)
- (U) PE 0604524N (Submarine Combat Systems)
- (U) PE 0604567N (Ship Contract Design/Live Fire T&E)

R-1 Line Item 111

Budget Item Justification
(Exhibit R-2, Page 4 of 8)

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

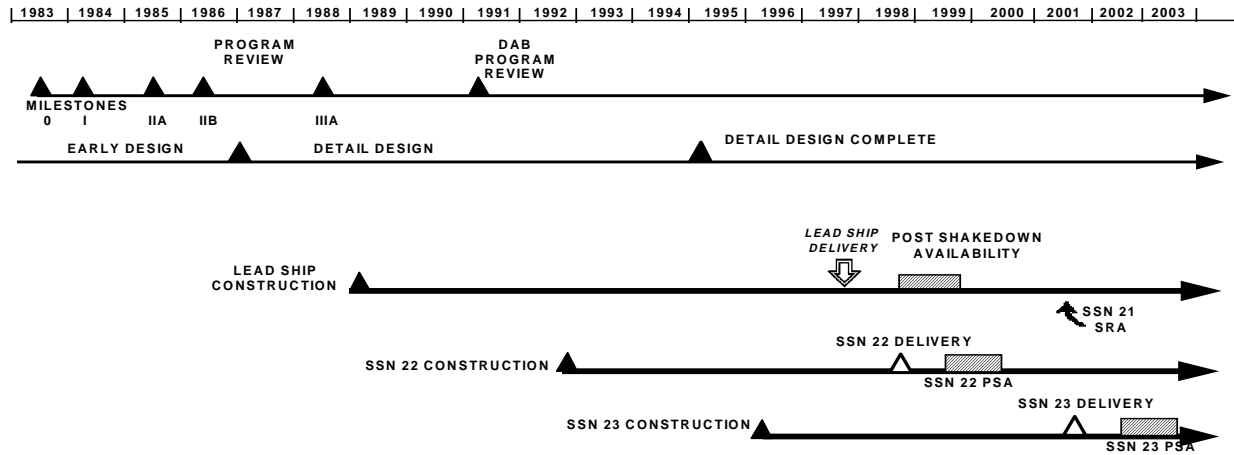
BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604561N
PROGRAM ELEMENT TITLE: SSN 21 Development

PROJECT NUMBER: F1946
PROJECT TITLE: SSN 21 Development

D. (U) SCHEDULE PROFILE:

PLANNING SCHEDULE PROGRAM



**SEAWOLF PROGRAM
LAST YEAR IN A FOURTEEN YEAR PROCESS
TOWARD LEAD SHIP DELIVERY**

R-1 Line Item 111

Budget Item Justification
(Exhibit R-2, Page 5 of 8)

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604561N

PROJECT NUMBER: F1946

PROGRAM ELEMENT TITLE: SSN 21 Development

PROJECT TITLE: SSN 21 Development

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Submarine Silencing	10,621	10,104	4,270
b. Advanced Ship Control	6,127	5,438	3,500
c. Improved Performance Machinery Program	1,574	600	0
d. Shock	1,955	0	0
e. Propulsor	1,906	995	526
f. Target Strength Reduction	13,165	18,450	1,000
g. Weapons, Stowage & Handling	4,951	924	219
h. Advanced Submarine Technology	12,224	5,276	2,986
i. Test & Evaluation	18,164	8,520	14,955
Total	70,687	50,307	27,456

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
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Product Development

R-1 Line Item 111

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 6 of 8)

UNCLASSIFIED

UNCLASSIFIED

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604561N PROJECT NUMBER: F1946
 PROGRAM ELEMENT TITLE: SSN 21 Development PROJECT TITLE: SSN 21 Development

General Dynamics										
Groton CT	SS/CPFF	7/83	352,500	352,500	317,582	18,491	11,790	1,843	2,794	352,500
Newport News Shipbuilding										
Newport News VA	SS/CPFF	4/87	115,604	115,604	111,748	2,288	801	767	0	115,604
NSWC										
Carderock MD	WR/RC	Various	314,238	314,238	291,454	12,532	7,027	2,330	895	314,238
NUWC										
Newport RI	WR	Various	60,244	60,244	37,428	4,025	4,532	7,192	7,067	60,244
Miscellaneous	Various	Various	463,136	463,136	449,943	9,843	567	1,267	1,516	463,136
Support and Management										
Miscellaneous	Various	Various	45,330	45,330	34,195	4,970	4,023	2,142	0	45,330

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
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Test and Evaluation

General Dynamics										
Groton CT	SS/CPFF	7/83	99,801	99,801	66,845	1,650	3,683	0	27,623	99,801
NSWC										
Carderock MD	WR	Various	104,790	104,790	63,760	12,302	15,135	1,656	11,937	104,790
Miscellaneous	Various	Various	175,376	175,376	101,623	4,586	2,749	10,259	56,159	175,376

GOVERNMENT FURNISHED PROPERTY Not applicable

R-1 Line Item 111

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 7 of 8)

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604561N

PROJECT NUMBER: F1946

PROGRAM ELEMENT TITLE: SSN 21 Development

PROJECT TITLE: SSN 21 Development

	<u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	1,208,155	47,179	24,717	13,399	12,272	1,305,722
Subtotal Support and Management	34,195	4,970	4,023	2,142	0	45,330
Subtotal Test and Evaluation	232,228	18,538	21,567	11,915	95,719	379,967
Total	1,474,578	70,687	50,307	27,456	107,991	1,731,019

R-1 Line Item 111

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 8 of 8)

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604562N

PROGRAM ELEMENT TITLE: Submarine Tactical Warfare System

(U) COST: (Dollars in Thousands)

PROJECT NUMBER	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0236/F0236 SSN Combat System Improvement	21,460	43,066	28,573	18,043	1,906	1,148	6,567	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops software upgrades to integrate improved weapons capabilities within submarine Combat Control System (CCS) MK1, MK2, and AN/BSY-1 (Combat Control) and, as a part of the Obsolete Equipment Replacement (OER), the program develops improvements to hardware which has become increasingly difficult and not economical to maintain. The thrust of the CCS Improvement program is the fleet introduction of CCS MK2 Program D0 and the development of CCS MK2 Program D0 Blocks 1 and 2. CCS MK2 converged multiple submarine combat system developments into a single effort to minimize submarine life cycle costs, i.e., SSN 688, SSN 688I and SSBN 726 Classes. CCS MK2 Program D0 provides a modular software architecture, introduces Tomahawk Block 3 and Harpoon Block 1C capabilities, introduces Advanced Capability (ADCAP) on TRIDENT, and replaces obsolete equipment. CCS MK2 Program D0 Block 1 integrates CCS MK2 into AN/BSY-1 systems, replaces additional obsolete equipment, incorporates a direct interface to the Global Positioning System, incorporates Joint Maritime Command Information System (JMCIS) into CCS MK2, and implements Advanced Tomahawk Weapon Control System (ATWCS), ADCAP torpedo improvements and several other miscellaneous enhancements. CCS MK2 Program D0 Block 2 incorporates into submarine CCS anticipated upgrades to ADCAP, Tomahawk and Harpoon, and implements additional OER. AN/BSG-1 (formerly known as Tomahawk Land Attack Missile - Nuclear (TLAM-N) Portable Launching System (PLS)) provides SSN Submarines with a stand alone TLAM-N Missile launching capability.

R-1 Line Item 112

Budget Item Justification
(Exhibit R-2, Page 1 of 8)

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604562N

PROJECT NUMBER: S0236/F0236

PROGRAM ELEMENT TITLE: Submarine Tactical Warfare System

PROJECT TITLE: SSN Combat System Improvement

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$17,799) Continued development of CCS MK2 Program D0 Block 1C.
- (U) (\$3,661) Obtained Milestone II and awarded contract for AN/BSG-1.

2. (U) FY 1998 PLAN:

- (U) (\$28,299) Commence System Design Certification Testing (SDCT) for CCS MK2 Program D0 Block 1C.
- (U) (\$14,767) Continue development of AN/BSG-1.

3. (U) FY 1999 PLAN:

- (U) (\$21,713) Complete SDCT and begin Development Test (DT) for CCS MK2 Program D0 Block 1C.
- (U) (\$6,860) Continue development of AN/BSG-1.

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Budget Item Justification
(Exhibit R-2, Page 2 of 8)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604562N

PROJECT NUMBER: S0236/F0236

PROGRAM ELEMENT TITLE: Submarine Tactical Warfare System

PROJECT TITLE: SSN Combat System Improvement

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	21,837	45,663	32,376
(U) Appropriated Value:	22,899	45,663	
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget:			
a. FY97 SBIR Transfer	-350		
b. Congressional Undistributed Reductions	-1,089	-1,597	
c. TLAM/N Contract Savings			-4,398
d. TLAM PORTABLE LAUNCH SYS (AN/BSG-1)		-1,000	+1,000
e. Minor Pricing Adjustments			-405
(U) FY 1999 PRESBUDG Budget Submit:	21,460	43,066	28,573

U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: FY 1997 adjustments are due to SBIR transfer (-350K), and Congressional Undistributed Reductions (-1,089K). FY 98 adjustments are due to Congressional Undistributed Reductions (-1,597K) and AN/BSG-1 (-1,000K). FY 99 adjustments are due to TLAM-N contract cost savings (-4,398K), AN/BSG-1 (+1,000K) and minor pricing adjustments (-405K).
- (U) Schedule: The development and testing schedules for CCS MK2 Program D0 Block 1C were adjusted due to changes in technical content described below. The CDR and SDCT milestones moved to accommodate commonality with the NSSN Combat Control program. TOMAHAWK Block IV capability has been deferred allowing for shortened and consolidated test events. The net result is a single Milestone III for all variants of CCS MK2 Block 1C by May 2000.
- (U) Technical: The CCS MK2 Program D0 Block 1C program has been adjusted to maximize foreground software commonality with the NSSN Combat Control program. Due to changes in the TOMAHAWK Baseline Improvement Program (TBIP), OPNAV has directed TOMAHAWK Block IV missile capability be deferred and accomplished as an Engineering Change to the existing program baseline.

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Budget Item Justification
(Exhibit R-2, Page 3 of 8)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604562N

PROJECT NUMBER: S0236/F0236

PROGRAM ELEMENT TITLE: Submarine Tactical Warfare System

PROJECT TITLE: SSN Combat System Improvement

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 54200	14,125	18,964	17,460	32,074	36,852	56,305	54,010	CONT.	CONT.

(U) RELATED RDT&E:

- (U) PE 0204229N (Tomahawk & Tomahawk Missile Planning Center)
- (U) PE 0205632N (MK 48 ADCAP)
- (U) PE 0603504N (Advanced Submarine Combat Systems Dev.)
- (U) PE 0604503N (Submarine System Equipment Dev.)
- (U) PE 0604707N (Submarine Electronic Warfare Architecture/Eng. Support)

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604562N

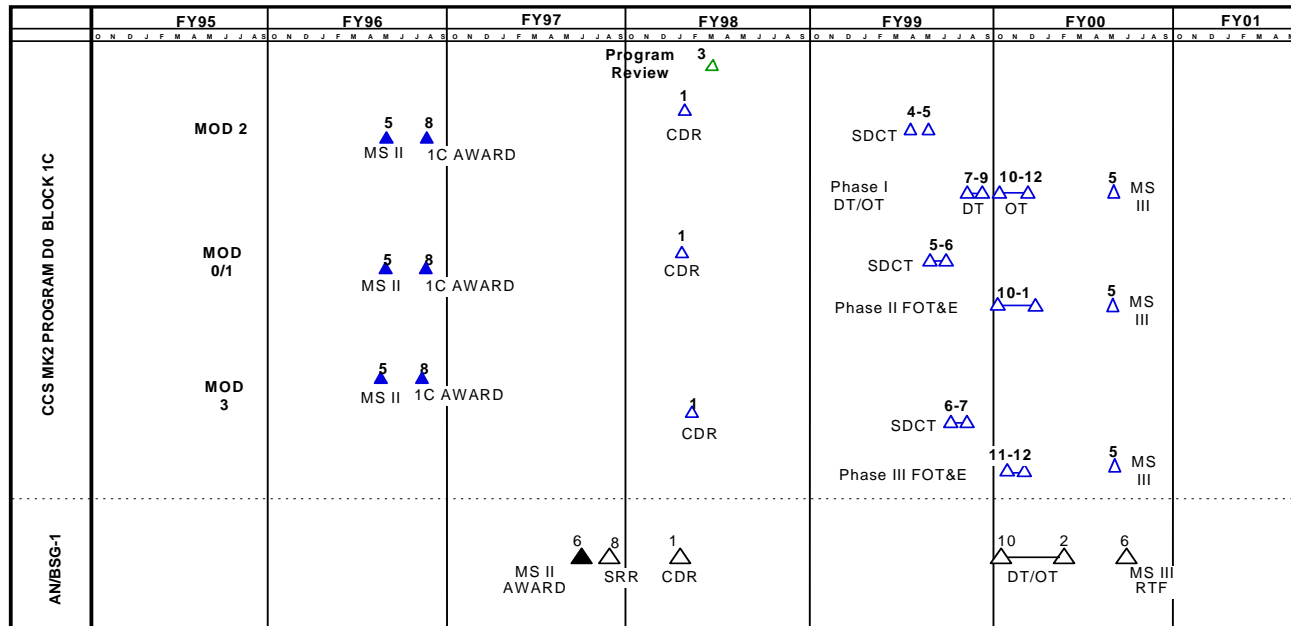
PROJECT NUMBER: S0236/F0236

PROGRAM ELEMENT TITLE: Submarine Tactical Warfare System

PROJECT TITLE: SSN Combat System Improvement

D. (U) SCHEDULE PROFILE:

COMBAT CONTROL DEVELOPMENT SCHEDULE



LEGEND: ▲ SCHEDULED COMPLETION ▲ COMPLETED

PE: 0604562N: Proj S0236

09/17/97

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Budget Item Justification
(Exhibit R-2, Page 5 of 8)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604562N PROJECT NUMBER: S0236/F0236
PROGRAM ELEMENT TITLE: Submarine Tactical Warfare System PROJECT TITLE: SSN Combat System Improvement

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	6,872	12,702	3,528
b. Software Development	6,055	16,306	6,150
c. Government Engineering Support/ Systems Engineering	7,700	10,471	5,943
d. Independent Software Nuclear Safety Analysis	0	936	814
e. Test and Evaluation	111	473	9,819
f. Program Management Support	460	1,600	1,102
g. Miscellaneous	262	578	1,217
Total	21,460	43,066	28,573

R-1 Line Item 112

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 6 of 8)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604562N PROJECT NUMBER: S0236/F0236
 PROGRAM ELEMENT TITLE: Submarine Tactical Warfare System PROJECT TITLE: SSN Combat System Improvement

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing <u>Activity</u>	Contract Method/ Fund Type <u>Vehicle</u>	Award/ Oblig Date	Perform Activity <u>EAC</u>	Project Office <u>EAC</u>	Total FY 1996 & Prior	FY 1997 <u>Budget</u>	FY 1998 <u>Budget</u>	FY 1999 <u>Budget</u>	To <u>Complete</u>	Total <u>Program</u>
Product Development Raytheon Portsmouth, RI	SS/FPI	Jun 94	18,916	18,916	18,916	0	0	0	0	18,916
Raytheon Portsmouth, RI	C/CPIF	Jun 96	40,333	40,333	7,243	5,545	16,700	6,190	4,655	40,333
Raytheon Portsmouth, RI	C/CPIF	Jun 97	12,446	12,446	0	1,905	8,700	1,350	491	12,446
NUWC Newport, RI	WR	Oct 96	N/A	N/A	35,127	7,700	10,471	5,943	CONT.	CONT.
Cruise Missile Project Washington, DC	PD	Dec 96	N/A	N/A	2,958	150	3,564	2,167	CONT.	CONT.
Various	TBD	TBD	N/A	N/A	218,390	5,589	2,031	2,002	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 7 of 8)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604562N PROJECT NUMBER: S0236/F0236
 PROGRAM ELEMENT TITLE: Submarine Tactical Warfare System PROJECT TITLE: SSN Combat System Improvement

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity Support and Management	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
EG&G Rockville, MD	C/CPFF	Sep 94	9,000	9,000	4,141	460	1,600	1,102	CONT.	CONT.
Test and Evaluation										
Various	TBD	TBD	N/A	N/A	3,037	111	0	9,819	CONT.	CONT.
GOVERNMENT FURNISHED PROPERTY: Not applicable.										
Subtotal Product Development					282,634	20,889	41,466	17,652	CONT.	CONT.
Subtotal Support and Management					4,141	460	1,600	1,102	CONT.	CONT.
Subtotal Test and Evaluation					3,037	111	0	9,819	CONT.	CONT.
Total Project					289,812	21,460	43,066	28,573	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 8 of 8)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1803 Ship Contract Design	208	50,009	85,228	152,757	240,155	238,202	251,383	CONT.	CONT.
S2197 Ship Specifications	2,407	2,228	1,276	1,289	1,263	1,373	3,975	CONT.	CONT.
S2198 Live Fire Test and Evaluation	113	3,457	8,673	7,505	1,486	4,120	3,277	CONT.	CONT.
S2301 Carrier Contract Design	0	33,822	38,468	50,610	64,306	61,078	49,405	CONT.	CONT.
S2302 Carrier Live Fire Test and Evaluation	0	0	0	20,334	13,567	0	0	CONT.	33,901
TOTAL	2,728	89,516	133,645	232,495	320,777	304,773	308,040	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element (PE) directly supports the Navy's Shipbuilding Plan by providing for the development of all post Feasibility Study (usually after Milestone I) engineering, programmatic and acquisition documentation, including ship specifications and contractual documents, associated with the acquisition of Navy ships. This line also supports Live Fire Test and Evaluation for new ship designs.

Contract Design has traditionally been the engineering development of the technical and contractual definition of the ship design (including ship specifications and drawings) to a level of detail sufficient for prospective shipbuilders to make a sound estimate of the construction cost and schedule. Additionally, the contract design package developed under this PE has provided the technical baseline from which the Navy selects the shipbuilder who then develops the detail design package required to support the construction and eventual delivery of the ship. This PE also supports the development of design methodologies which facilitate and optimize the transition from ship design documents to efficient production of new ships and ship conversions, and supports engineering planning and ship affordability studies.

(U) Under Acquisition Reform for new design ships and submarines, traditional distinct phasing of the design process has been replaced with a continuous concurrent engineering Integrated Product and Process Development (IPPD) process extending through and after contract award. This serves to maintain the focus of multi-discipline teams consisting of the government, shipbuilder, system programs, and suppliers. Government/Industry Integrated Product Team(s) (IPTs) will utilize the IPPD

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Budget Item Justification
(Exhibit R-2, Page 1 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

process to develop the design in an Integrated Product and Data Environment (IPDE). The design approach is part of an acquisition strategy that is based on commercial practices and incorporates a phased technical definition. This may involve continuing efforts (where Milestone I has not occurred) in those cases where IPTs would be disrupted after Feasibility Study conclusion.

(U) For the Future Carrier (CVX), Government/Industry Integrated Product Team(s) will utilize the IPPD process to develop industry sea-based tactical aviation platform design(s) to a level of detail sufficient for prospective shipbuilders to produce the most effective, affordable product achievable in the most efficient manner. This PE also supports Live Fire Test and Evaluation (LFT&E) for the Future Carrier (CVX) program.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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Budget Item Justification
(Exhibit R-2, Page 2 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S1803

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

PROJECT TITLE: Ship Contract Design

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1803 Ship Contract Design	208	50,009	85,228	157,757	240,155	238,202	251,383	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports the development of all technical, programmatic, and contractual documentation required after feasibility studies for the acquisition of the ships in the Navy's Shipbuilding Program. The major effort is the engineering development of the technical and contractual definition of the ship design (e.g., ship specifications and drawings), with sufficient details for the prospective shipbuilder to make a sound estimate of construction cost and schedule. It also serves as the contractual technical definition from which the selected builder develops the shipbuilding detail design and testing package required to build and deliver the ship.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$ 208) Commenced AOE SLEP Contract Design.

2. (U) FY 1998 PLAN:

- (U) (\$25,000) DD 21 industry team design studies. Multiple contracts will be awarded to industry teams structured to enable the contractors to investigate the complex technical issues of the program, perform trade-off studies, develop the planning for the management, engineering and production of the system.
- (U) (\$8,500) Begin design and engineering development of a computational plant architecture testbed leading to the ships information system for the DD 21 family of ships. This system will provide survivable, common open architecture for HM&E, combat systems, C4I and administrative elements and will be designed with the flexibility to be incorporated into future surface ships.
- (U) (\$4,500) DD 21 system engineering development of a technical assessment model that will be used to review the technical feasibility of the industry proposals in Phase I of the acquisition strategy. Begin development of the Smart Product Model which constitutes the complete representation of the ship's requirements, design and capabilities at each stage of the life cycle.
- (U) (\$5,689) Begin implementation of the engineering development team responsible for participation, oversight and monitoring of the industry team effort for DD 21. Begin implementation of the DD 21 source selection and evaluation team that will be used to transition to Phase II of the acquisition strategy.

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Budget Item Justification
(Exhibit R-2, Page 3 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S1803

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design PROJECT TITLE: Ship Contract Design

- (U) (\$2,500) Begin DD 21 technology transition and integration efforts for candidate systems which may be incorporated into the lead ship by the industry teams. Review development schedules and timelines to ensure that technical risk is properly managed.
- (U) (\$3,820) Initiate top down functional analysis to determine crew workload in order to address DD 21 manning goals.

4. (U) FY 1999 PLAN:

- (U) (\$ 3,000) Commence CG Conversion Contract Design.
- (U) (\$50,000) Initial system design for DD 21. Two industry teams will begin development of the system functional baseline, comment on and validate the performance specification, develop and validate cost estimates, and develop a detailed engineering and production plan necessary to design and deliver the lead ship.
- (U) (\$9,500) Continue design and engineering development, and begin demonstration and testing to support the design effort for the computational plant architecture leading to the ships information system for DD 21.
- (U) (\$4,733) Continue implementation of the engineering development team responsible for the participation, oversight and monitoring of the industry effort for DD 21.
- (U) (\$ 2,495) Continue DD 21 technology transition and integration efforts for candidate systems which may be incorporated into the lead ship by the industry teams. Review development schedules and timelines to ensure that technical risk is properly managed.
- (U) (\$8,500) Continue top down functional analysis to determine crew workload in order to address DD 21 manning goals.
- (U) (\$7,000) DD 21 system engineering development of a technical assessment model that will be used to review the technical feasibility of the industry proposals in Phase I of the acquisition strategy. Continue development of the Smart Product Model which constitutes the complete representation of the ship's requirements, design and capabilities at each stage of the life cycle.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	3,958	51,720	80,941
(U) Appropriated Value:	3,958	51,720	
(U) Adjustments to FY 1997/98 Appropriated Value/			

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N PROJECT NUMBER: S1803
PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design PROJECT TITLE: Ship Contract Design

FY 1998 President's Budget:

a. Adjustments	-3,750	-1,711	+4,287
(U) FY 1999 PRESBUDG Submit:	208	50,009	85,228

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease due to general/adjustments and funding realignment (-\$3,750)
FY 1998 decrease due to R&D/gen. reductions and revised economic assumptions (-\$1,711)
FY 1999 changes due to CG Mod (+3,000), general adjustments and revised economic assumptions (+1,287)

(U) Schedule: The current SCN Plan is as follows:

CG MOD	FY 2001
CVN 77	FY 2001
DD 21	FY 2004
ADC (X)	FY 2002
LHA/LH(X)	FY 2005
Command Ship	FY 2005
CV(X)	FY 2006

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0603564N (Ship Preliminary Design/Feasibility Studies)

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S1803

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design PROJECT TITLE: Ship Contract Design

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones		2nd Qtr DD 21 MS I	
Engineering Milestones	See Individual Ship Acquisition Program Documentation.		
T&E Milestones	See Individual Ship Acquisition Program Documentation.		
Contract Milestones		DD21 Industry Team Studies	

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S1803

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

PROJECT TITLE: Ship Contract Design

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering Development	158	12,309	20,578
b. Program Management Support	50	1,550	2,250
c. Travel	0	150	400
d. Technology Assessments/Integration	0	2,500	2,500
e. Industry Team Design Studies	0	25,000	50,000
f. Computational Plant Architecture	0	8,500	9,500
Total	208	50,009	85,228

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RDT&E,N PE/Project Cost Breakdown
(Exhibit R-3, Page 7 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S1803

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design PROJECT TITLE: Ship Contract Design

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
JJMA	C	3/95	Cont.	Cont.	1,500	100	1,300	2,450	Cont.	Cont.
Arlington, Va.										
AME	C	3/95	Cont.	Cont.	2,570	0	0	1,000	Cont.	Cont.
Arlington, Va.										
CD-NSWC	WR	A.N.	Cont.	Cont.	500	0	2,660	3,000	Cont.	Cont.
Carderock, MD.										
NAVAIR	WR	A.N.	Cont.	Cont.	700	0	3,331	3,500	Cont.	Cont.
Arlington, VA.										
SPAWAR	PD	Var.	Cont.	Cont.	0	0	90	90	Cont.	Cont.
Arlington, VA.										
DD-NSWC	WR	A.N.	Cont.	Cont.	380	0	8,489	11,633	Cont.	Cont.
Dahlgren, VA.										
NRL	WR	A.N.	Cont.	Cont.	0	0	670	670	Cont.	Cont.
Washington, DC.										
Competitive	C	3/98	TBD	TBD	0	0	25,000	50,000	TBD	TBD

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RDT&E,N PE/Project Cost Breakdown
(Exhibit R-3, Page 8 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S1803

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design PROJECT TITLE: Ship Contract Design

Government Performing Activity	Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
NCCOSC/NRAD San Diego, CA.	WR	A.N.	Cont.	Cont.	50	0	889	900	Cont.	Cont.
APL/JHU Laurel, MD.	C	10/97	Cont.	Cont.	0	0	940	940	Cont.	Cont.
Techmatics Fairfax, VA	C	10/97	Cont.	Cont.	0	0	1,800	1,125	Cont.	Cont.
Vitro Silver Spring,MD	C	10/97	Cont.	Cont.	0	0	890	890	Cont.	Cont.
NSWC/CR Crane, IN	WR	10/97	Cont.	Cont.	0	0	665	665	Cont.	Cont.
NSWC/PHD Port Hueneme, CA	WR	10/97	Cont.	Cont.	0	0	370	370	Cont.	Cont.
Misc. TBD	Var.	Var.	Cont.	Cont.	0	58	1,365	5,745	Cont.	Cont.
Support and Management Misc. TBD	Var.	Var.	Cont.	Cont.	180	50	1,550	2,250	Cont.	Cont.

Test and Evaluation - None.

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RDT&E,N PE/Project Cost Breakdown
(Exhibit R-3, Page 9 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S1803

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

PROJECT TITLE: Ship Contract Design

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
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Product Development

None

Support and Management

None

Test and Evaluation

None

	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	9,044	158	48,459	82,978	Cont.	Cont.
Subtotal Support and Management	180	50	1,550	2,250	Cont.	Cont.
Subtotal Test and Evaluation	0	0	0	0	Cont.	Cont.
Total Project	9,224	208	50,009	85,228	Cont.	Cont.

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RDT&E,N PE/Project Cost Breakdown
(Exhibit R-3, Page 10 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2197

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

PROJECT TITLE: Ship Specifications

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S2197 Ship Specifications	2,407	2,228	1,276	1,289	1,263	1,373	3,975	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project funds the development, implementation and integration of computer-aided design/computer-aided manufacturing (CAD/CAM) systems to improve the transition from the Navy's Contract Design to the shipbuilder's detail design and production. This project also funds development, improvement and update of NAVSEA cognizant acquisition specifications including integration of Federal and Military Specifications, Handbooks General Specifications for Ships of the U.S. Navy and COTS equipment/systems into a Performance Based, bidable ship contract design acquisition package. These documents are required to reflect the latest technologies (e.g. open systems architecture for information and power systems), manufacturing techniques, environmental requirements, hazardous material reduction, safety and legal/Congressional requirements.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$ 300) Continued to develop, improve and update NAVSEA cognizant acquisition specifications. Continue development of Specification data base and Open Systems Architecture.
- (U) (\$2,107) Continued development of CAD II analysis programs, program integration and development of CAD II ship design systems and modeling techniques for application on DD 21 and AOE(X).

2. (U) FY 1998 PLAN:

- U) (\$ 500) Continue to develop, improve and update NAVSEA cognizant acquisition specifications. Continue development of Specification data base and Open Systems Architecture.
- (U) (\$ 928) Continue development of CAD II analysis programs and program integration. Continue development of CAD II ship design systems and modeling techniques for application on DD 21 and AOE(X).

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Budget Item Justification
(Exhibit R-2, Page 11 of 30)

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2197

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design PROJECT TITLE: Ship Specifications

- (U) (\$ 800) Commence development of Performance Based Ship Acquisition Specification Program.

3. (U) FY 1999 PLAN:

- (U) (\$ 500) Continue to develop, improve and update NAVSEA cognizant acquisition specifications. Continue development of Specification data base and Open Systems Architecture.
- (U) (\$ 776) Continue development of Performance Based Ship Acquisition Specification Program.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	2,758	2,296	1,293
(U) Appropriated Value:			
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget			
a. Adjustments	-351	-68	-17
(U) FY 1999 PRESBUDG Submit	2,407	2,228	1,276

(U) CHANGE SUMMARY EXPLANATION:

Funding: Decrease in FY 1997 due to general reductions (-\$351K). Decrease in FY 1998 due to General Reductions (\$-63K) and Economic Assumption (-\$5K). FY 1999 decrease due to Commercial Purchase Inflation (-\$17K).

(U) Schedule: The current SCN Plan is as follows:

CG MOD	FY 2001
CVN 77	FY 2001
DD 21	FY 2004
LHA/LH(X)	FY 2005
Command Ship	FY 2005
CV(X)	FY 2006

R-1 Line Item 113

Budget Item Justification
(Exhibit R-2, Page 12 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2197

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

PROJECT TITLE: Ship Specifications

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0603564N (Ship Preliminary Design/Feasibility Studies)

R-1 Line Item 113

Budget Item Justification
(Exhibit R-2, Page 13 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2197

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

PROJECT TITLE: Ship Specifications

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones	See Individual Ship Acquisition Program Documentation.		
Engineering Milestones	See Individual Ship Acquisition Program Documentation.		
T&E Milestones	See Individual Ship Acquisition Program Documentation.		
Contract Milestones	See Individual Ship Acquisition Program Documentation.		

R-1 Line Item 113

Budget Item Justification
(Exhibit R-2, Page 14 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2197

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

PROJECT TITLE: Ship Specifications

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. CAD Systems Engineering	1,607	428	0
b. CAD Software Development	500	500	0
c. Specification Improvements	300	500	500
d. Performance Based Specifications	0	800	776
Total	2,407	2,228	1,276

R-1 Line Item 113

RDT&E PE/ Project Cost Breakdown
(Exhibit R-3, Page 15 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2197

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

PROJECT TITLE: Ship Specifications

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
SPCC Mechanicsburg, Pa.	WR	A.N.	Cont.	Cont.	1,270	590	700	0	Cont.	Cont.
JJMA Arlington, Va.	C	2/95	Cont.	Cont.	596	308	300	500	Cont.	Cont.
CD-NSWC Carderock, MD.	WR	A.N.	Cont.	Cont.	589	564	500	0	Cont.	Cont.
PSNSY Pudget Sound,WA	WR	A.N.	Cont.	Cont.	0	120	0	0	Cont.	Cont.
AME Arlington, Va.	C	2/95	Cont.	Cont.	100	686	500	500	Cont.	Cont.
Misc.	Var.	A.N.	Cont.	Cont.	49	139	228	276	Cont.	Cont.

Support and Management
None

Test and Evaluation
None

GOVERNMENT FURNISHED PROPERTY
None

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development									
None									

R-1 Line Item 113

RDT&E PE/ Project Cost Breakdown
(Exhibit R-3, Page 16 of 30)

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UNCLASSIFIED

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2197

PROGRAM ELEMENT TITLE: Ship Contract Design/Live Fire T&E Design

PROJECT TITLE: Ship Specifications

Support and Management
None
Test and Evaluation
None

	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	2,604	2,407	2,228	1,276	Cont.	Cont.
Subtotal Support and Management	0	0	0	0	Cont.	Cont.
Subtotal Test and Evaluation	0	0	0	0	Cont.	Cont.
C. Total Project	2,604	2,407	2,228	1,276	Cont.	Cont.

R-1 Line Item 113

RDT&E PE/ Project Cost Breakdown
(Exhibit R-3, Page 17 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2198

PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT TITLE: Live Fire Test and Evaluation

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S2198 Live Fire Test & Evaluation	113	3,457	8,673	7,505	1,486	4,120	3,277	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project specifically responds to the Congressionally mandated Live Fire Test and Evaluation (LFT&E) legislation which requires realistic survivability testing be conducted under all major acquisition programs before production approval is granted. Evaluations concerning the vulnerability and lethality of ships against known threat systems will be coucted using analytical prediction techniques and model testing.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$ 113) Supported LPD 17 Live Fire Test and Evaluation

2. (U) FY 1998 PLAN:

- (U) (\$ 3,457) Commence DD 21 Live Fire Test and Evaluation.

3. (U) FY 1999 PLAN:

- (U) (\$ 8,673) Continue DD 21 Live Fire Test and Evaluation.

R-1 Line Item 113

Budget Item Justification
(Exhibit R-2, Page 18 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N
PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT NUMBER: S2198
PROJECT TITLE: Live Fire Test and Evaluation

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	88	3,831	8,826
(U) Appropriated Value	88	3,831	
(U) Adjustments to FY 1997/98 Appropriated Value/:			
FY 1998 President's Budget			
a. Adjustments	+25	-374	-153
(U) FY 1999 PRESBUDG Submit	113	3,457	8,673

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Funding increase in FY 1997 is due to general adjustments (25K).
Decrease in FY 1998 due to General reductions of (-\$374K).
FY 1999 decrease due to general adjustments and revised economic assumption (-\$153K).

(U) Schedule: The current SCN Plan is as follows:

CG MOD	FY 2001
CVN 77	FY 2001
DD 21	FY 2004
LHA/LH(X)	FY 2005
Command Ship	FY 2005
CV(X)	FY 2006

(U) Technical: Not applicable

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0603564N (Ship Preliminary Design/Feasibility Studies)

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program			
Milestones	See Individual Ship Acquisition Program Documentation.		

R-1 Line Item 113

Budget Item Justification
(Exhibit R-2, Page 19 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N
PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT NUMBER: S2198
PROJECT TITLE: Live Fire Test and Evaluation

Engineering
Milestones See Individual Ship Acquisition Program Documentation.

T&E
Milestones See Individual Ship Acquisition Program Documentation.

Contract
Milestones See Individual Ship Acquisition Program Documentation.

R-1 Line Item 113

Budget Item Justification
(Exhibit R-2, Page 20 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N
PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT NUMBER: S2198
PROJECT TITLE: Live Fire Test and Evaluation

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Develop LFT&E Test Models	113	1,400	3,067
b. Threat Analysis Development	0	1,026	2,106
c. Test Procedure Development	0	831	3,000
d. Program Support	0	200	500
Total	113	3,457	8,673

R-1 Line Item 113

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 21 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2198

PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT TITLE: Live Fire Test and Evaluation

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Test and Evaluation										
Misc.	Var.	A.N.	Cont.	Cont.	0	113	3,257	8,173	Cont.	Cont.
Support and Management										
TBD					0	0	200	500	Cont.	Cont.
Product Development										
None										

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
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GOVERNMENT FURNISHED PROPERTY

None

Product Development
None

Support and Management
None

Test and Evaluation
None

Total	FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 22 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5	PROGRAM ELEMENT: 0604567N	PROJECT NUMBER: S2198				
	PROGRAM ELEMENT TITLE: Ship Contract Design/ Live Fire T&E	PROJECT TITLE: Live Fire Test and Evaluation				
Subtotal Test and Evaluation	0	113	3,257	8,173	Cont.	Cont.
Subtotal Support and Management	0	0	200	500	Cont.	Cont.
Subtotal Product Development	0	0	0	0	Cont.	Cont.
Total Project	0	113	3,457	8,673	Cont.	Cont.

Live Fire Test and Evaluation
(U) COST (Dollars in thousands)

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 23 of 30)

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UNCLASSIFIED

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE:

February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2301

PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT TITLE: Carrier Contract Design

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S2301 Carrier Contract Design	0	33,822	38,468	50,610	64,306	61,078	49,405	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project encompasses the design efforts for the CVN 77 and CVX Contract Design. The traditional distinct phasing of the design process for aircraft carriers has been replaced with a continuous concurrent engineering Integrated Product and Process Development (IPPD) process extending through and after contract award. This serves to maintain the focus of multi-discipline teams consisting of the government, shipbuilder, aviation programs, and suppliers. Government/Industry Integrated Product Team(s) (IPTs) will utilize the IPPD process to develop the design in an Integrated Product and Data Environment (IPDE). The design approach is part of an acquisition strategy that is based on commercial practices and incorporates a phased technical definition.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLAN: Not applicable.
2. (U) FY 1998 PLAN:
 - (U) (\$33,822) Commence CVN 77 Contract Design.
3. (U) FY 1999 PLAN:
 - (U) (\$38,468) Continue CVN 77 Contract Design.

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Budget Item Justification
(Exhibit R-2, Page 24 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N
PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT NUMBER: S2301
PROJECT TITLE: Carrier Contract Design

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 98 President's Budget:	0	17,866	34,844
(U) Appropriated Value	0	17,866	N/A
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget:			
a. Adjustments	0	+15,956	+3624
(U) FY 1999 PRESBUDG Submit	0	33,822	38,468

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Increase in FY 1998 due to Gen. R&D Reductions, revised Economic Assumptions and realignment of funds (+\$15,956)
Increase in FY 1999 due to Flag Board (+\$4,200K), Program Adjustment (-\$4,149).

(U) Schedule: CVN 77 is scheduled for FY 2001.

(U) Technical: Not applicable

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E: (U) PE 0603512N (Carrier Systems Development)
(U) PE 0603564N (Ship Feasibility Studies)

D. (U) SCHEDULE PROFILE:

	<u>FY1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones	See Individual Ship Acquisition Program Documentation.		
Engineering Milestones	See Individual Ship Acquisition Program Documentation.		

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Budget Item Justification
(Exhibit R-2, Page 25 of 30)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N
PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT NUMBER: S2301
PROJECT TITLE: Carrier Contract Design

T&E

Milestones See Individual Ship Acquisition Program Documentation.

Contract

Milestones See Individual Ship Acquisition Program Documentation

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE:

February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2301

PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT TITLE: Carrier Contract Design

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Trade-off Analysis/ Integration Assessments	0	20,322	19,770
b. Design and Integrate Selected Changes	0	12,400	15,747
d. Prepare Contract Package	0	1,100	2,951
Total	0	33,822	38,468

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 27 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N

PROJECT NUMBER: S2301

PROGRAM ELEMENT TITLE: Ship Contract Design/
Live Fire T&E

PROJECT TITLE: Carrier Contract Design

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 1996 & Prior Budget	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete
Advanced Marine Enterprises									
AME	Contr.	Oct 97	Cont.	Cont.	0	1,371	1,401	Cont.	Cont.
Naval Surface Warfare Center, Carderock Division									
NSWC/CD	WR	Oct 97	Cont.	Cont.	0	160	164	Cont.	Cont.
Naval Surface Warfare Center, Dahlgren Division									
NSWC/DD	WR	Jan 98	Cont.	Cont.	0	438	448	Cont.	Cont.
NEWPORT NEWS SHIPBUILDING									
NNS	WR	Oct 97	Cont.	Cont.	0	15,000	19,452	Cont.	Cont.
Naval Air Warfare Center, Aircraft Division									
NAWC	WR	Oct 97	Cont.	Cont.	0	1,549	1,583	Cont.	Cont.
Naval Surface Warfare Center, Port Hueneme Division									
NSWC/PHD	WR	Feb 98	Cont.	Cont.	0	251	257	Cont.	Cont.
Naval Nuclear Propulsion Program									
SEA08	Misc.	Jan 98	Cont.	Cont.	0	10,000	10,000	Cont.	Cont.
Noesis, Inc.									
NOESIS	Contr.	Feb 98	Cont.	Cont.	0	200	204	Cont.	Cont.
Peat Marwick, LLP.									
KPMG	WR	Feb 98	Cont.	Cont.	0	370	378	Cont.	Cont.
NAVAL SEA SYSTEMS COMMAND DETACHMENT, (PERA CV)									
PERA(CV)	WR	Jan 98	Cont.	Cont.	0	200	204	Cont.	Cont.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 28 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N
 PROGRAM ELEMENT TITLE: Ship Contract Design/
 Live Fire T&E

PROJECT NUMBER: S2301
 PROJECT TITLE: Carrier Contract Design

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development (cont'd)									
JOHN J. McMullen ASSOCIATES									
JJMA	Contr.	Dec 97	Cont.	Cont.	0	1,779	1,818	Cont.	Cont.
M. Rosenblatt & Son, Inc.									
MRS	Contr.	Oct 97	Cont.	Cont.	0	236	241	Cont.	Cont.
Lockheed Martin Corporation									
LOCKHEED	Contr.	Jan 98	Cont.	Cont.	0	512	523	Cont.	Cont.
RAND									
RAND	WR	Feb 98	Cont.	Cont.	0	500	511	Cont.	Cont.
MISCELLANEOUS									
Misc.	Misc.	Jan 98	Cont.	Cont.	0	535	547	Cont.	Cont.
Total					0	33,101	37,731	Cont.	Cont.
Support and Management									
Contractor									
Various	PR	Jan 98	Cont.	Cont.	0	721	737	Cont.	Cont.
Test and Evaluation			Not Applicable						

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RDT&E PE/Project Cost Breakdown
 (Exhibit R-3, Page 29 of 30)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604567N
 PROGRAM ELEMENT TITLE: Ship Contract Design/
 Live Fire T&E

PROJECT NUMBER: S2301
 PROJECT TITLE: Carrier Contract Design

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type <u>Vehicle</u>	Award/ Oblig Date	Delivery Date	Total FY 1997 <u>Budget</u>	FY 1998 <u>Budget</u>	FY 1999 <u>Budget</u>	To <u>Complete</u>	Total <u>Program</u>
Product Development			Not Applicable					
Support and Management			Not Applicable					
Test and Evaluation			Not Applicable					
Total								
				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To</u>	<u>Total</u>
				<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development				0	33,101	37,731	Cont.	Cont.
Subtotal Support and Management				0	721	737	Cont.	Cont.
Subtotal Test and Evaluation				0	0	0	0	0
Total Project				0	33,822	38,468	Cont.	Cont.

R-1 Line Item 113

RDT&E PE/Project Cost Breakdown
 (Exhibit R-3, Page 30 of 30)

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604574N
 PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT NUMBER& TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1353 Standard Hardware	25,372	31,392	2,062	2,371	2,441	3,217	3,052	CONT.	CONT.
W0845 Advanced Mission Computer (AMC)	1,094	1,125	5,014	9,803	15,596	6,464	5,764	CONT.	CONT.
X2265 Naval Warfare Tactical Data Base	1,034	1,345	1,173	1,267	1,296	1,392	1,445	CONT.	CONT.
TOTAL	27,500	33,862	8,249	13,441	19,333	11,073	10,261	CONT.	CONT.
RDT&E Articles		2	23	16					41

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Project S1353, Standard Hardware: This project provides Planning and support for development and modification of the Navy's high performance embedded computer resources to meet Open Systems Architecture standards via the Computer Open Systems Implementation Program (COSIP), specifically, development of the AN/UYQ-70 display suite, assessment of Open Architecture display components, the Mass Memory Storage Device (MMSD), and other standard peripherals.

(U) Project W0845, Advanced Mission Computer (AMC): This project provides for airborne digital computer requirements with a standard commercial open design that will permit rapid technology infusion through pre-planned product improvements. The focus of the open systems AMC development is to provide existing platforms with Higher Order Language (HOL) and high speed bus architecture. The AMC also includes (1) the integration of commercially based processors, (2) development of input/output and other special function modules (voice recognition), (3) development of a backplane based on the commercial (open system) industry standards, (4) support of the additional design, test and qualification necessary to meet multi-user requirements and bring other programs' non-development item/commercial off-the-shelf (NDI/COTS) modules and designs into the open systems AMC family. The lead user is the F/A-18 E/F. Potential users include SH-60R, V-22, AH-1W, EA-6B, and F/A-18C/D.

UNCLASSIFIED

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604574N
PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

(U) Project X2265, The Naval Warfare Tactical Database (NWTDB) is an information management infrastructure project to solve data interoperability problems and implement DOD data architecture and standards in Navy. NWTDB is the data architecture component of Copernicus. NWTDB has developed management and engineering processes to define and translate information needs to automated systems, and to manage changes resulting from new operational requirements or technology advances. Database integration, data standardization, and configuration management are supported by reverse engineering database structures and definitions into a common format to facilitate data interoperability problem identification and resolution. The management and engineering processes, and authoritative database structures are documented in the NWTDB Standards Manual which is distributed to Navy C⁴ISR and combat system architects, system developers, reference database producers, other services and agencies, and selected foreign governments. The Data Analysis and Reconciliation Tool (DART), a Microsoft Windows based application, is being evolved to support the full information management life cycle; i.e. linking databases and transfer formats to operational information requirements. DART supports systems documentation, configuration management, DOD standard data element generation, and requirements traceability. In August 1996, DASN C⁴I recommended the NWTDB process and DART tool to ASD C³I as a practical approach to solve data interoperability problems and support database integration, especially for the Global Command and Control System. NWTDB management process received OSD Award in 1993. Management responsibilities are defined in OPNAVINST 9410.6 of 13Jul93, "NWTDB Requirements for Tactical Naval Warfare Systems" which implements DoD Directive 4630.5 of 12 Nov 92, "Compatibility, Interoperability and Integration of Tactical Command, Control, Communication and Intelligence (C³I) Systems", and DoD Directive 8320.1 of 26 Sep 91, "DoD Data Administration". OPNAVINST 9410.6 also specifies that Navy system developers and database producers will transition to NWTDB data standards and structures by the year 2000.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: These programs are funded under ENGINEERING & MANUFACTURING DEVELOPMENT because they encompass engineering and manufacturing development of new end-items prior to production approval decision.

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Exhibit R-2, RDT&E Budget Item Justification
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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: S1353

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Standard Hardware

(U) COST (Dollars in thousands)

PROJECT NUMBER& TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1353 Standard Hardware	25,372	31,392	2,062	2,371	2,441	3,217	3,052	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Planning and support for development and modification of the Navy's high performance embedded computer resources to meet Open Systems Architecture standards via the Computer Open Systems Implementation Program (COSIP), specifically, development of the AN/UYQ-70 display suite to include adaptation to submarine and Marine Corps applications, assessment of Open Architecture display components, and virtual prototyping of legacy systems to open systems, commercial hardware.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$656) Updated the COSIP Computer Resources Information Base (CRIB) through assessment and certification of new candidate technologies, including distributed operating and network systems for AEGIS, Ship Defense, and other related activities.
- (U) (\$24,332) Via the COSIP CRIB, investigated technology infusion into the AN/UYQ-70(V). This includes intensive study and testing of flat panel technology and its adaptation to the Navy's tactical display needs. Develop AN/UYQ-70 variant for the New Attack Submarine Program.
- (U) (\$384) Via COSIP, investigated requirements for common, ruggedized shipboard racks and enclosures.

2. (U) FY 1998 PLAN:

- (U) (\$461) Continue expansion of COSIP CRIB to increase viability of COTS technology into tactical systems via additional testing of commercial products.
- (U) (\$875) Using COSIP CRIB tools and data, continue investigating technology infusion into the AN/UYQ-70(V) to embrace wider range of Navy surface applications using new COTS technology.

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: S1353

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Standard Hardware

- (U) (\$460) Continue efforts to develop shipboard racks/enclosures and common tactical data systems.
 - (U) (\$16,981) Adapt AN/UYQ-70 for submarine applications
 - (U) (\$5,822) Initiate virtual prototyping of legacy systems.
 - (U) (\$6,793) Adapt AN/UYQ-70 for Marine Corps applications.
3. (U) FY 1999 PLAN:
- (U) (\$537) Continue increasing CRIB database by incorporating additional testing data of commercial technology.
 - (U) (\$1,000) Using COSIP CRIB tools and data, continue to investigate technology infusion into the AN/UYQ-70(V) to meet Navy emerging subsurface and airborne tactical display/processor requirements.
 - (U) (\$525) Continue Information Technology Electronic Commerce (ITEC) support.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
FY 1998 President's Budget:	26,540	2,224	2,157
Appropriated Value:	27,690	32,274	0
Adjustments to FY 1997/1998 Appropriated Value/FY 1998 Presidents Budget:			
a) Undistributed Reductions	-2,138	-1,332	-95
(U) FY 1999 President's Budget Submit:	25,372	31,392	2,062

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: S1353

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Standard Hardware

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 97 decrease of \$2,318K results from a SBIR assessment (-\$628K), Undistributed Reductions (-\$1,150K), FY 97-16 MPN (-\$100K), FY 97 Revised Economic Assumption (-\$32), and BTR (-\$408).

FY98 and FY99 decrease are the result of Undistributed Reductions.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) Not applicable.

(U) RELATED RDT&E:

(U) PE 0603270N (ELECTRONIC WARFARE ADVANCED TECHNOLOGY)

(U) PE 0603382N (ADV COMBAT SYSTEM TECHNOLOGY)

(U) PE 0603502N (SHALLOW WATER MCM)

(U) PE 0603755N (COOPERATIVE ENGAGEMENT)

(U) PE 0604307N (AEGIS WEAPON SYSTEM MODS)

(U) PE 0604366N (STANDARD MISSILE IMPROVEMENTS)

(U) PE 0604372N (NEW THREAT UPGRADE)

(U) PE 0604755N (SHIP SELF DEFENSE)

D. (U) SCHEDULE PROFILE: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification
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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: S1353

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Standard Hardware

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	22,657	20,000	0
b. Software Development	440	7,500	550
c. Government Engineering Support	2,200	3,767	1,437
d. Travel	75	125	75
Total	25,372	31,392	2,062

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Exhibit R-3, RDT&E Program Element/Project Change Breakdown
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: S1353

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Standard Hardware

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Loral/St. Paul	Various	Various	204,280	204,280	161,623	22,657	20,000	0	0	204,280
Misc	Various	Various	Cont.	Cont.	50,000	440	7,500	550	Cont.	Cont.
Support and Management										
Misc	Various	Various	Cont.	Cont.	6,390	75	125	75	Cont.	Cont.
Test and Evaluation:										
Misc	Various	Various	Cont.	Cont.	8,394	250	767	229	Cont.	Cont.
NSWC Dahlgren	Various	Various	Cont.	Cont.	7,933	950	1,500	604	Cont.	Cont.
NUWC Newport	Various	Various	Cont.	Cont.	8,313	1,000	1,500	604	Cont.	Cont.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	211,623	23,097	27,500	550	Cont.	Cont.
Subtotal Support and Management	6,390	75	125	75	Cont.	Cont.
Subtotal Test and Evaluation	24,640	2,200	3,767	1,437	Cont.	Cont.
Total Project	242,653	25,372	31,392	2,062	Cont.	Cont.

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Exhibit R-3, RDT&E Program Element/Project Change Breakdown
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: W0845

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Advanced Mission Computer

(U) COST (Dollars in thousands)

PROJECT NUMBER& TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0845 AMC	1,094	1,125	5,014	9,803	15,596	6,464	5,764	CONT.	CONT.
RDT&E Articles		2	23	16					41

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Advanced Mission Computer (AMC) project provides for airborne digital computer requirements with a standard commercial open design that will permit rapid technology infusion through pre-planned product improvements. The focus of the open systems AMC development is to provide existing platforms with Higher Order Language (HOL) and high speed bus architecture. The AMC also includes (1) the integration of commercially based processors, (2) development of input/output and other special function modules (voice recognition), (3) development of a backplane based on the commercial (open system) industry standards, (4) support of the additional design, test and qualification necessary to meet multi-user requirements and bring other programs' non-development item/commercial off-the-shelf (NDI/COTS) modules and designs into the open systems AMC family. The lead user is the F/A-18 E/F. Potential users include SH-60R, V-22, AH-1W, EA-6B, and F/A-18C/D.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$439) Performed requirements definition to develop an AMC system consisting of commercial off-the-shelf (COTS)/Open Systems mission processors, high speed bus architecture, and a HOL Operational Flight Program (OFP) for the F/A-18 E/F.
- (U) (\$655) Developed acquisition strategy and prepared the Request For Proposal (RFP).

2. (U) FY 1998 PLAN:

- (U) (\$362) Award contract and perform Preliminary Design Review (PDR).
- (U) (\$663) Achieve Milestone II and support negotiation leading to contract award and develop acquisition documentation.

(U) (\$100) Coordinate engineering manufacturing and development (EMD) integration efforts with F/A-18 E/F. An additional \$141 thousand is

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: W0845

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Advanced Mission Computer

3. (U) FY 1999 PLAN:

- (U) (\$4,110) Complete Critical Design Review (CDR) and continue development and integration of open systems AMC for F/A-18 E/F.
- (U) (\$904) Begin hardware prototype/integration.

B. (U) PROGRAM CHANGE SUMMARY

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	1,118	1,184	1,446
(U) Appropriated Value:	1,189	--	--
(U) Adjustments from PRESBUD:	-24	-59	3,568
(U) FY 1999 President's Budget Submit:	1,094	1,125	5,014

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 reflects reductions of \$14 thousand for the Small Business Innovative Research (SBIR) assessment , \$1 thousand for revised economic adjustments, \$9 thousand for minor program adjustments. FY 1998 reflects a reduction of \$59 thousand for congressional undistributed reductions. FY 1999 reflects an increase of \$3,850 thousand to accelerate development and integration of the AMC for the F/A-18E/F, an increase of \$21 thousand for Navy Working Capital Funds (NWCF) rate increases, a reduction of \$204 thousand for low prior year expenditures, a reduction of \$88 thousand for Commercial Purchases Inflation and a reduction of \$11 thousand for minor pricing adjustments.

(U) Schedule: FY 1998 reflects a change in PDR from 2Q 1998 to 3Q 1998. This is a result of Phase 0 Requirements Definition. FY 1999 reflects a change in CDR from 4Q 1998 to 1Q 1999. This is a result of Phase 0 Requirements Definition.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands): Not applicable.

(U) RELATED RDT&E:

(U) PE 0204136N F-18 Squadrons

(U) PE 0604215N Standards Development

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: W0845

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Advanced Mission
Computer

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones		2Q MS II (3/98)		
Engineering Milestones		3Q PDR (6/98)	1Q CDR (11/98)	
T&E Milestones				
Contract Milestones		2Q EMD AWD II (3/98)		

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: W0845

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Advanced Mission Computer

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Program Planning	100	48	200
b. Technical Program Mgmt Support	50	21	168
c. Prime Eqpmt/E&MD Prime Contract	367	982	4,035
d. System T&E/OT&E	18	10	100
e. System Engineering	335	25	415
f. Travel	18	0	0
g. Contract Services	206	39	96
Total	1,094	1,125	5,014

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604574N PROJECT NUMBER: W0845
 PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources PROJECT TITLE: Advanced Mission Computer

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Boeing		03-98	TBD	TBD	692	367	982	4,035	CONT.	CONT.
Miscellaneous		12-98	TBD	TBD	19,212	503	94	783	CONT.	CONT.
Support and Management										
Miscellaneous		12-98	TBD	TBD	1,147	206	39	96	CONT.	CONT.
Test and Evaluation										
Miscellaneous		02-99	TBD	TBD	150	18	10	100	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	Total FY 1996 & Prior*	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	19,904	870	1,076	4,818	CONT.	CONT.
Subtotal Support and Management	1,147	206	39	96	CONT.	CONT.
Subtotal Test and Evaluation	150	18	10	100	CONT.	CONT.
Total Project	21,201	1,094	1,125	5,014	CONT.	CONT.

*FY 96 & prior year funding includes program information for AN/AYK-14 development which is completed.

C (U) FUNDING PROFILE: Not Applicable.

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: X2265

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Naval Warfare
Tactical Data Base

(U) COST (Dollars in thousands)

PROJECT NUMBER& TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2265 Naval Warfare Tactical Data Base	1,034	1,345	1,173	1,267	1,296	1,392	1,445	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Naval Warfare Tactical Database (NWTDB) is an information management infrastructure project to solve data interoperability problems and implement DOD data architecture and standards in Navy. NWTDB is the data architecture component of Copernicus. NWTDB has developed management and engineering processes to define and translate information needs to automated systems, and to manage changes resulting from new operational requirements or technology advances. Database integration, data standardization, and configuration management are supported by reverse engineering database structures and definitions into a common format to facilitate data interoperability problem identification and resolution. The management and engineering processes, and authoritative database structures are documented in the NWTDB Standards Manual which is distributed to Navy C⁴ISR and combat system architects, system developers, reference database producers, other services and agencies, and selected foreign governments. The Data Analysis and Reconciliation Tool (DART), a Microsoft Windows based application, is being evolved to support the full information management life cycle; i.e. linking databases and transfer formats to operational information requirements. DART supports systems documentation, configuration management, DOD standard data element generation, and requirements traceability. In August 1996, DASN C⁴I recommended the NWTDB process and DART tool to ASD C³I as a practical approach to solve data interoperability problems and support database integration, especially for the Global Command and Control System. NWTDB management process received OSD Award in 1993. Management responsibilities are defined in OPNAVINST 9410.6 of 13Jul93, "NWTDB Requirements for Tactical Naval Warfare Systems" which implements DoD Directive 4630.5 of 12 Nov 92, "Compatibility, Interoperability and Integration of Tactical Command, Control, Communication and Intelligence (C³I) Systems", and DoD Directive 8320.1 of 26 Sep 91, "DoD Data Administration". OPNAVINST 9410.6 also specifies that Navy system developers and database producers will transition to NWTDB data standards and structures by the year 2000.

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: X2265

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Naval Warfare
Tactical Data Base

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$ 99) Developed final NWTDB Standards Manual Version Three for C⁴ISR and combat system architects and system developers.
- (U) (\$ 70) Incorporated Universal Joint Task List in DART 1.09.
- (U) (\$105) Tested DART 1.09 and finalize build.
- (U) (\$100) Developed DART 1.09 User's Guide for system architects, system developers, and data administrators.
- (U) (\$ 36) Analyzed JMCIS Afloat and MIDB 2.0 differences supported by DART.
- (U) (\$ 35) Registered Surface Ship Combat Systems database in NWTDB.
- (U) (\$105) Developed NWTDB Capstone Model for Navy C⁴I Process.
- (U) (\$246) Developed DART 2.0 Applications:
 - Rehosted for platform independence and client/server applications to supports IT-21 and JMCIS 98 environment.
 - Developed USMTF screens and comparison to database data elements.
 - Revised Universal Joint Task List screens
 - Developed Universal Navy Task List screens.
 - Created a port to client/server.
- (U) (\$100) Developed draft DART 2.0 User's Guide.
- (U) (\$100) Technical support to implement DOD data architecture and standards process, including the CIO mission and the High Level Architecture and Modeling and Simulation Resource Repository interface planning.
- (U) (\$ 38) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C⁴ISR) implementation guidance. Develop and update Naval C⁴ISR mission to incorporate an overarching operational, systems, technical and I information architecture. Conduct associate C⁴ISR analyses and studies.

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: X2265

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Naval Warfare
Tactical Data Base

2. (U) FY 1998 PLAN:

- (U) (\$ 50) Develop TADIL screens and comparison to database data elements.
- (U) (\$ 50) Test DART 2.0 and finalize build.
- (U) (\$ 50) Finalize DART 2.0 User's Guide for system architects, system developers, and data administrators.
- (U) (\$200) Continue to register core Naval Tactical Systems (emphasis on combat ID system databases) and changes to the NWTDB Standards Manual Version Three, including incorporation of IW links and nodes effort funded by OSD in FY97.
- (U) (\$150) Develop Operational Requirements Models to support definition of information exchange requirements:
 - Amphibious
 - Strike
 - Undersea
 - Surface
 - Air
 - C2/IW
 - Integrated Naval C⁴I
- (U) (\$100) Develop NWTDB Standards Manual - Version Four.
- (U) (\$294) Develop DART 3.0 Client/Server applications including on-line registration, configuration management, and security features via internet to support IT-21 implementation, and interface to the Modeling and Simulation Resource Repository System.
- (U) (\$100) Develop year 2000 problem identification aids in DART.
- (U) (\$100) Develop draft DART 3.0 User's Guide for operational users, systems architects, system developers, and data administrators.
- (U) (\$ 75) Test DART 3.0 and finalize build.
- (U) (\$ 50) Develop to support the CIO mission a data requirements to mission measure of performance matrices.
- (U) (\$101) Technical support to implement DOD architecture and data standards process, including coordination with NATO GROUP 5.

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Exhibit R-2, RDT&E Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: X2265

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Naval Warfare
Tactical Data Base

- (U) (\$ 25) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C⁴ISR) implementation guidance. Develop and update Naval C⁴ISR mission to incorporate and overarching operational, systems, technical and information architecture. Conduct associated C⁴ISR analyses and studies.
3. (U) FY 1999 PLAN:
- (U) (\$ 90) Develop final DART 3.0 User's Guide.
 - (U) (\$180) Continue to register Naval tactical systems (emphasis on mission planning databases)and changes to the NWTDB Standards Manual - Version Four.
 - (U) (\$197) Develop DART 3.1 configuration management and metadata warehousing features to support data fusion/pull.
 - (U) (\$ 41) Expand TADIL screens and comparison to USMTF and database elements.
 - (U) (\$ 70) Test DART 3.1 and finalize build.
 - (U) (\$ 90) Develop DART 3.1 User's Guide.
 - (U) (\$170) Collect data and prototype in DART a capability linking systems data requirements to mission traceability to support CIO assessment.
 - (U) (\$100) Develop NWTDB Standards Manual - Version Five as an on-line publication.
 - (U) (\$135) Expand Naval C⁴I Engineering Data Models for combat ID and mission planning.
 - (U) (\$100) Technical Support to implement DOD architecture and data standards process, including coordination with NATO GROUP 5.

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604574N

PROJECT NUMBER: X2265

PROGRAM ELEMENT TITLE: Navy Tactical Computer Resources

PROJECT TITLE: Naval Warfare
Tactical Data Base

B. (U) PROGRAM CHANGE SUMMARY

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	1,303	1,386	1,423
(U) Appropriated Value:			
(U) Adjustments from FY 1998 PRESBUDG:	-269	-41	-250
(U) FY 1999 President's BUDGET SUBMIT:	1,034	1,345	1,173

**Comparability transfer: FY-96 funded under X1976.

Program broken out into S2265 during PR-97 to provide visibility. Program transferred to SPAWARSSYSCOM and project number changed to X2265 during Navy review of FY 98 Budget Submission.

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997: -\$22K Reduction is FY 1997 SBIR transfer; -\$205K reflects funding change due to minor adjustments to finance other department requirements; -\$1K minor Navy adjustments, -\$41K reduction for Congressional undistributed adjustments.

FY 1998: -\$41K Reduction for Congressional undistributed adjustments.

FY 1999: -\$142K Reduction is NWTDB offset for NTCSS and JMCIS; -\$20K redirected to develop and update overarching C⁴ISR mission requirements; -88K reduction to fund higher priorities.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E: Not applicable.

V. (U) SCHEDULE PROFILE: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604601N

PROGRAM ELEMENT TITLE: Mine Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q0267 Mine Improvements	2,371	2,270	15	852	2,007	6,862	15,069	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This non-acquisition project is the only R&D program for mine systems, and is the sole support for the capability to maintain the effectiveness of mines facing new threat targets and increasing emphasis on major regional conflicts and littoral warfare in shallow water. Project tasks are grouped into several areas: 1a) Threat Modeling/Analysis, which collects, analyzes, and develops digital models of data on current priority threat target characteristics to support computer simulations of the "one-on-one" encounter between a mine and its target; 1b) Target Detection and Response, which uses target models to develop optimal mine designs, settings, and firing algorithms; 1c) Mine Warfare Modeling/Analysis, which uses models of the targets and the mines to support computer simulation of the "many-on-many" encounter between a minefield and all the targets and mine countermeasures; 2a) Components/Subsystems, which develops upgrades of mine components to maintain effectiveness against current threat targets using proven state-of-the-art technology; and 2b) Advanced Power Sources, which develops improved batteries without hazardous heavy metals. Typical Mine Improvements efforts include: obtaining, analyzing, and modeling threat target signatures and damage susceptibility data; determining optimal mine settings/algorithms; updating minefield planning models and the databases supporting them; and improving the performance of mine subsystems such as sensors or batteries. Initiate development of a Littoral Sea Mine (LSM).

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Budget Item Justification
(Exhibit R-2, Page 1 of 4)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604601N

PROJECT NUMBER: Q0267

PROGRAM ELEMENT TITLE: Mine Development

PROJECT TITLE: Mine Improvements

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1,216) Completed the preliminary design of the ACV algorithm. Began the development of an algorithm that specifically addresses Diesel-Electric/Mini-Subs (DE/MS). Continued to develop and generate actuation and damage operational data for fleet minefield planning for high priority targets. Completed the development of a shallow water array for magnetic and pressure signatures.
- (U) (\$1,155) Completed the development of MK-132 mine battery using the AA lithium cell. Began the development of a larger lithium cell for use in standard mine warfare system power supplies; evaluated the improved safety and performance potential of lithium cell technologies. Continued the development of the improved pressure sensor and test set. Continued to conduct system analyses for LSM.

2. (U) FY 1998 PLAN:

- (U) (\$1,170) Complete the development of the ACV algorithm and publish a final report. Continue the development of the DE/MS algorithm and begin initial investigation of an algorithm specifically addressing remote control of mines code firmware for the fast patrol algorithm. Continue to develop and generate actuation and damage operational data for fleet minefield planning for high priority targets.
- (U) (\$1,100) Continue development of a larger lithium cell. Complete preliminary designs of batteries using those cells. Complete development of MK-130 Mine battery using the AA lithium cell. Complete the development of the improved pressure sensor and test set. Complete the system analyses for LSM.

3. (U) FY 1999 PLAN: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604601N

PROJECT NUMBER: Q0267

PROGRAM ELEMENT TITLE: Mine Development PROJECT TITLE: Mine Improvements

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	2,381	2,815	3,650
(U) Appropriated Value:	2,505	2,815	
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget:			
a. NWCF Adjustment, General Reductions and funding realignments	-134	-545	-3,635
(U) FY 1999 PRESBUDG Submit:	2,371	2,270	15

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY97 reflects minor NWCF/general adjustments (-134). FY98 changes due to various pricing adjustments and general reductions (-545). FY99 (-\$3,650) funding realignments and general adjustment (+\$15).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604601N

PROJECT NUMBER: Q0267

PROGRAM ELEMENT TITLE: Mine Development PROJECT TITLE: Mine Improvements

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. System Testing	250	350	0
b. System Engineering Development	783	975	0
c. SW Support	781	600	0
d. Logistics	240	150	0
e. Program Management	290	175	15
f. Travel	20	20	0
g. SBIR	<u>7</u>	<u>0</u>	<u>0</u>
TOTAL	2,371	2,270	15

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands) Not applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N

PROGRAM ELEMENT TITLE: Unguided Conventional Air-launched Weapons

(U) COST: (Dollars in Thousands)

PROJECT NUMBER TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
A2183 SLAM ER	30,333	28,020	5,183	1,626	2,951	3,103	4,681	CONT.	CONT.
TOTAL	30,333	28,020	5,183	1,626	2,951	3,103	4,681	CONT.	CONT.
RDT&E ARTICLES	19	4							

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) A2183/STANDOFF LAND ATTACK MISSILE - EXPANDED RESPONSE Description: This program funds the development of SLAM Expanded Response (ER) designed to maintain baseline SLAM capability while improving performance in the areas of launch and control aircraft survivability, immunity to countermeasures, probability of kill against hardened targets and improved user interfaces for both mission planning and launch aircraft integration. The SLAM ER consists of both hardware and software upgrades to the missile. SLAM ER incorporates many non-development items i.e., the Embedded Global Positioning System/Inertial Navigation System (GPS/INS) (EGI), modified Tomahawk wings and warhead, and the existing advanced mode of the AWW-13 data link pod. The Automatic Target Acquisition (ATA) tracker is being integrated into the SLAM ER missile to enhance its capability to attack and kill low thermal contrast, and small targets in cluttered urban scenes, and in poor weather. The ATA capability will also reduce the overall number of Standoff Outside Area Defense (SOAD) missiles needed by increasing the Probability of Kill for part of the target set. In addition, ATA increases pilot and aircraft survivability by minimizing the time that the pilot needs to fly with his head down to control the weapon. To accommodate future U.S. Air Force and Navy aircraft integration, SLAM ER will incorporate a MIL-STD-1760 interface.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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Exhibit R-2, RDT&E Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N

PROGRAM ELEMENT TITLE: Unguided Conventional
Air-launched Weapons

PROJECT NUMBER: A2183
PROJECT TITLE: SLAM ER

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLAN:

- (U) (\$18,096) Continued Engineering & Manufacturing Development (E&MD) efforts. Delivered SLAM ER flight test missiles and supported testing.
- (U) (\$ 1,051) Continued F/A-18 aircraft integration, flight clearance and software efforts.
- (U) (\$ 1,300) Continued Osprey Jaywalker efforts.
- (U) (\$ 4,383) Performed Flight Readiness Review and started Missile Flight Test and Evaluation and completed Assistant Secretary of the Navy (Research, Development and Acquisition (ASN(RD&A)) Program Review for Low Rate Initial Production (LRIP) I.
- (U) (\$ 2,500) Continued Warhead development and testing.
- (U) (\$ 3,003) Continued Systems Engineering, government and contractor support.

2. (U) FY 1998 PLAN:

- (U) (\$ 8,888) Continue E&MD efforts. Provide SLAM ER missile support.
- (U) (\$ 860) Complete F/A-18 aircraft OFP-13C SLAM ER integration and flight clearance and develop the F/A-18 OFP-15C Automatic Target Acquisition (ATA) software.
- (U) (\$ 1,000) Continue Osprey Jaywalker efforts.
- (U) (\$12,377) Continue Missile Flight Test and Evaluation and complete ASN(RD&A) Program Review for LRIP II.
- (U) (\$ 2,600) Complete Warhead development and continue testing.
- (U) (\$ 2,295) Continue Systems Engineering, government and contractor support.

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Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, page 2 of 8)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N
PROGRAM ELEMENT TITLE: Unguided Conventional
Air-launched Weapons

PROJECT NUMBER: A2183
PROJECT TITLE: SLAM ER

3. (U) FY 1999 PLAN:

- (U)(\$ 1,500) Complete E&MD efforts.
- (U) (\$ 500) Complete Osprey Jaywalker efforts.
- (U) (\$ 1,451) Continue Missile Flight Test and Evaluation.
- (U) (\$ 1,732) Complete System Engineering, Government and Contractor support.

(U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998/1999 President's Budget:	30,991	28,890	5,167
(U) Appropriated Value	32,322		
(U) Adjustments from Pres. Budget:	-658	-870	16
(U) FY 1999 OSD/OMB Budget Submit:	30,333	28,020	5,183

(U) CHANGE SUMMARY EXPLANATION:

(U)Funding: The FY97 decrease of -\$658 thousand reflects an adjustment of -\$616 thousand for Small Business Innovation Research, and -\$42 thousand for revised economic assumptions. The FY98 decrease of -\$870 thousand reflects Congressional undistributed reductions. The FY99 net increase of \$16 thousand is a result of Navy Working Capital Fund (NWCF) rate adjustments.

(U) Schedule: FY98: SLAM ER Automatic Target Acquisition (ATA) software requires a modification to the F/A-18 OFP-15C software to load the target photo into the missile. FY99: Osprey Jaywalker efforts will complete in FY 1999 due to the closeout of the contract, which is scheduled to occur in FY 1999 rather than in FY 1998.

(U) Technical: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, page 3 of 8)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N
 PROGRAM ELEMENT TITLE: Unguided Conventional
 Air-launched Weapons

PROJECT NUMBER: A2183
 PROJECT TITLE: SLAM ER

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
WPN									
WPN Line 18									
SLAM-ER	40,178	30,016	39,506	35,582	28,024	28,441	29,218	246,563	477,528

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	2Q FRR 2Q LRIP (I)	2Q LRIP (II)	2Q MSIII	
Engineering Milestones				
T&E Milestones	1Q/97-3Q/98 CC 1Q/97-2Q/98 DT-IIC 2Q DT-1 MSL FIRE	2Q/3Q DT-IID 2Q/98-1Q/99 OT-IIA 2Q OTRR	1Q OPEVAL	
Contract Milestones			2Q FRP	

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Exhibit R-2, RDT&E Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N

PROJECT NUMBER: A2183

PROGRAM ELEMENT TITLE: Unguided Conventional
Air-launched Weapons

PROJECT TITLE: SLAM ER

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. E&MD	18,096	8,888	1,500
b. F/A-18 Software Development	1,051	860	0
c. Osprey Jaywalker CCM/Sep	1,300	1,000	500
d. Test and Evaluation	4,383	12,377	1,451
e. Warhead Development	2,500	2,600	0
f. Systems Engineering	1,150	1,700	1,397
g. Government Field Support	1,526	288	119
h. Advisory & Assistance Services	229	207	140
i. Travel	98	100	76
Total	30,333	28,020	5,183

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, page 5 of 8)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N
 PROGRAM ELEMENT TITLE: Unguided Conventional
 Air-launched Weapons

PROJECT NUMBER: A2183
 PROJECT TITLE: SLAM ER

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Comp</u>	<u>Total Program</u>
Product Development:										
McDonnell Douglas St. Louis, MO	SS/CPIF	09/94	124,942	124,942	96,458	18,096	8,888	1,500	cont.	cont.
China Lake, CA	WR	11/97	22,292	22,292	13,695	3,650	4,300	647	cont.	cont.
OSP	PD	10/97	10,150	10,150	7,350	1,300	1,000	500	cont.	cont.
Miscellaneous	WX	11/97	14,543	14,543	9,675	2,675	1,248	945	cont.	cont.
Support and Management:										
Miscellaneous		07/98	903	903	327	229	207	140	cont.	cont.
Test and Evaluation:										
Pt. Mugu, CA	WX	11/97	20,803	20,803	2,592	4,383	12,377	1,451	cont.	cont.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
 (Exhibit R-3, page 6 of 8)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N
PROGRAM ELEMENT TITLE: Unguided Conventional
Air-launched Weapons

PROJECT NUMBER: A2183
PROJECT TITLE: SLAM ER

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	127,178	25,721	15,436	3,592	cont.	cont.
Subtotal Support and Management	327	229	207	140	cont.	cont.
Subtotal Test and Evaluation	2,592	4,383	12,377	1,451	cont.	cont.
Total Project	130,097	30,333	28,020	5,183	cont.	cont.

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, page 7 of 8)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N

PROGRAM ELEMENT TITLE: Unguided Conventional
Air-launched Weapons

PROJECT NUMBER: A2183
PROJECT TITLE: SLAM ER

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, page 8 of 8)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604610N

PROGRAM ELEMENT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V2234 LIGHTWEIGHT TORPEDO DEVELOPMENT	11,517	18,615	8,106	9,292	8,732	7,962	2,753	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The funding is to design, integrate and test the Lightweight Hybrid Torpedo (LHT) by taking advantage of current USN investments in torpedo hardware and torpedo technology. The torpedo will be comprised of components and software from the MK 46 Torpedo, MK 50 Torpedo, and MK 48 ADCAP Torpedo. The Lightweight Hybrid Torpedo will incorporate improvements in the shallow water, littoral warfare counter-countermeasure environments.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$4,845) Continued LHT Engineering and Manufacturing Development Contract (Required for Contract cost growth and material commitments).
- (U) (\$534) Continued development and production of Ancillary Hardware, including Fleet Exercise Section(FES) and Automatic Test Equipment (ATE), to support LHT.
- (U) (\$2,293) Continued development of tactical and signal processing software.
- (U) (\$1,125) Conducted simulation efforts in support of tactical software development.
- (U) (\$2,720) Performed Lightweight torpedo system engineering efforts.

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Budget Item Justification
(Exhibit R-2, page 1 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604610N PROJECT NUMBER: V2234
PROGRAM ELEMENT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT PROJECT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT

2. (U) FY 1998 PLAN:

- (U) (\$2,364) Continue LHT Engineering and Manufacturing Development Contract.
- (U) (\$5,309) Continue development and production of Ancillary Hardware, including Fleet Exercise Section (FES) and Automatic Test Equipment (ATE), to support LHT.
- (U) (\$4,505) Development of tactical and signal processing software continues.
- (U) (\$1,511) Continue simulation efforts in support of tactical software development.
- (U) (\$4,926) Continue Lightweight torpedo system engineering efforts.

3. (U) FY 1999 PLAN:

- (U) (\$544) Continue LHT Engineering and Manufacturing Development Contract.
- (U) (\$1,220) Continue development and production of Ancillary Hardware (Complete development of Fleet Exercise Section (FES)) and Automatic Test Equipment (ATE) to support LHT.
- (U) (\$1,772) Continue development of tactical and signal processing software.
- (U) (\$2,343) Continue simulation and initiate in-water test program.
- (U) (\$2,227) Continue Lightweight torpedo system engineering efforts.

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Budget Item Justification
(Exhibit R-2, page 2 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604610N PROJECT NUMBER: V2234
 PROGRAM ELEMENT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT PROJECT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT

B. (U) PROGRAM CHANGE SUMMARY: (\$ in thousands)

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	10,832	17,290	8,129
(U) Appropriated Value:	15,019	19,302	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY1998 President's Budget:	-3,502	-687	-23
(U) FY 1999 PRESBUDG Submit:	11,517	18,615	8,106

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 97: Changes due to minor pricing adjustments(+703), SBIR (-233), Congressional undistributed adjustments (-548), and E&MD Contract Savings (-3,657).
 FY 98: Changes due to Congressional undistributed adjustments (-687).
 FY 99: Changes due to minor pricing adjustments (-23).

(U) Schedule: The LHT program has been restructured. The restructure includes: shift of LHT IOC to FY03 vice FY01; shift in the testing program to FY99-FY02 from FY98-FY01, with continuation of the RDT&E E&MD contract to completion as originally planned; shift in LRIP to FY00/FY01, vice FY99/FY00; and shift in full rate production to FY02 vice FY01.

(U) Technical:

FY 98: The administrative realignment of MK50 funding into LHT, provides for the continuing development of shallow water software algorithms which are directly related to the development and initial capability of the LHT.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (\$ in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
WPN/321500	0	0	0	16,233	27,248	30,701	36,822	380,940	491,944

(U) RELATED RDT&E:

RDT&E/0604355	0	8,733	0	0	0	0	0	0	8,733
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D. (U) SCHEDULE PROFILE: See Attached

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Budget Item Justification
(Exhibit R-2, page 3 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604610N

PROJECT NUMBER: V2234

PROGRAM ELEMENT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT

PROJECT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT

	FY97	FY98	FY99	FY00	FY01	FY02	FY03
<p><u>Development & Upgrades</u> Lightweight Hybrid</p> <p>MK 50 P 3 I (BUG I/II)</p> <p><u>Hardware Procurement</u> Lightweight Hybrid</p>	<p>▲ OT1B</p>	<p>▲ PDR</p> <p style="margin-left: 20px;">▲ CDR</p>	<p>ENGINEERING TESTS ▲————▲ (55 RUNS)</p>	<p>TECHEVAL ▲————▲</p> <p>(45 RUNS)</p>	<p>OPEVAL ▲——▲</p> <p>(30 RUNS)</p>	<p>▲ HYBRID IOC</p>	
		<p>▲——▲</p> <p>EDM (21 UNITS) DELIVERIES</p>	<p>▲</p> <p>LRIP I AWARD</p>	<p>▲</p> <p>LRIP II AWARD</p>	<p>▲</p> <p>MS III</p> <p>▲</p> <p>FRP AWARD</p>		

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Budget Item Justification
 (Exhibit R-2, page 4 of 7)

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FY 1998/1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604610N

PROGRAM ELEMENT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	4,845	2,364	544
b. Ancillary Hardware Development	534	5,309	1,220
c. Software Development	2,293	4,505	1,772
d. System, Test & Evaluation	1,125	1,511	2,343
e. Systems Engineering	2,174	4,167	1,880
f. Program Management Support	546	759	347
Total	11,517	18,615	8,106

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 5 of 7)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604610N PROJECT NUMBER: V2234
 PROGRAM ELEMENT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT PROJECT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING: (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NUWC	WR	OCT 97	CONT.	CONT.	20,636	5,726	14,617	6,891	CONT.	CONT.
Alliant Contract	C/CPAF	JUN 96	17,532	17,532	8,979	4,845	2,364	544	800	17,532
Various	VAR	VAR	CONT.	CONT.	1,536	468	581	106	CONT.	CONT.
Support and Management										
ARL/PSU	C/CPFF	JAN 98	CONT.	CONT.	3,533	0	265	150	CONT.	CONT.
Various	VAR	VAR	CONT.	CONT.	907	431	724	347	CONT.	CONT.
Test and Evaluation										
COMOPTEVFOR	VAR	OCT 97	CONT.	CONT.	33	47	64	68	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY:

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development									
Alliant Contract	C/FP	MAR 96	JUL 97	2,797	0	0	0	0	2,797
Support and Management									
				0	0	0	0	0	0
Test and Evaluation									
				0	0	0	0	0	0

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 6 of 7)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604610N

PROJECT NUMBER: V2234

PROGRAM ELEMENT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT PROJECT TITLE: LIGHTWEIGHT TORPEDO DEVELOPMENT

C. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	33,948	11,039	17,562	7,541	CONT.	CONT.
Subtotal Support and Management	4,440	431	989	497	CONT.	CONT.
Subtotal Test and Evaluation	33	47	64	68	CONT.	CONT.
Total Project	38,421	11,517	18,615	8,106	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 7 of 7)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1998			
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604612M Marine Corps Mine/Countermeasures Systems				PROJECT C2106		
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C2106 ADVANCED COUNTERMEASURES SYSTEMS (ACS)	3813	912	3855	7119	5633	4543	1927	Continuing	Continuing	
Quantity of RDT&E Articles										
<p>A. (U) <u>Mission Description and Budget Item Justification:</u></p> <p>(U) The ACS program is a “tool box” approach, using a variety of systems, each of which center on a particular aspect of the neutralization of blast-hardened and complex-fused mines, and unexploded munitions. This includes current and future threat explosives that defeat the effectiveness of current minefield breaching systems. The Primary goals of this package are to achieve very high neutralization percentages against the targeted threat; joint applicability for use with primary assault platforms to include land and amphibious assaults. The ACS program researches and develops follow on minefield clearing and assault breaching capabilities that will neutralize current and future blast-hardened and complex-fused mines. ACS will alleviate a critical deficiency in clearing minefields during amphibious operations. Current breaching assets are 1950s technology that do not meet breaching mission requirements.</p> <p>(U) <u>Justification for Budget Activity:</u> This program is funded under Engineering and Manufacturing Development because of the need to research and test new and emerging technologies which will meet required mission criteria prior to production approval decisions.</p> <p>(U) <u>FY 1997 Accomplishments:</u></p> <ul style="list-style-type: none"> • (U) \$ 2392 Explosive Standoff Minefield Breacher (ESMB): Funded the Marine Corps portion of the Program Definition and Risk Reduction (PDRR) phase of the FY 1997 contract. This included development of a prototype system. This concluded Marine Corps participation in the joint Army led program. • (U) \$ 1000 Expeditionary Mine Clearance Systems: Forward financed the development and testing of remoting the D-8 bulldozer with modified mine plow and conduct live fire testing. Remanufacture full width mine plows for developmental testing and design certification. • (U) \$ 421 Contractor Support: Provided management support analysis of contractor results using a management support contractor. Continued to provide support in preparation of milestone documentation and contract deliverables. <p>(U)Total \$ 3,813</p>										
Project C2106			Page 118 - 1 of 118 - 3 Pages				Exhibit R-2			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development		February 1998
PE NUMBER AND TITLE 0604612M Marine Corps Mine/Countermeasures Systems		PROJECT C2106
(U) FY 1998 Planned Program:		
• (U) \$	0	Expeditionary Mine Clearance Systems: Complete operational testing on full width mine plows. This effort financed with \$1M of FY97 funds.
• (U) \$	517	Expeditionary Mine Clearance Systems: Remanufacture one Flail unit for testing. Funding includes contractor test support and test equipment.
• (U) \$	44	Advanced Mine Detector Program: Fund Program Determination and Risk Reduction (PDRR).
• (U) \$	100	Ground Marking System (GMS): Perform Engineering Analysis of the British developed Pathfinder system. The Pathfinder was evaluated under the Foreign Comparative Test Program in FY 1995.
• (U) \$	225	Contractor Support: Update all program documentation , and provide management support using a support contract.
• (U) \$	26	SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f)(1).
(U)Total \$	912	
(U) FY 1999 Planned Program:		
• (U) \$	2398	Expeditionary Mine Clearance Systems: Complete evaluation of the remanufactured Flail system. Remanufacture and test the remaining Flail systems. Test systems. Funding includes contractor support and all test equipment and material.
• (U) \$	75	Advanced Mine Detector: Transition to engineering and manufacturing development.
• (U) \$	500	Ground Marking System: Remanufacture existing Pathfinder system for testing. Manufacture mounting brackets for additional vehicles. Conduct testing. Complete testing.
• (U) \$	52	Magnetic Countermine Systems (MACS): Fund for laboratory salaries, hardware and testing for Program Determination and Risk Reduction (PDRR) phase.
• (U) \$	600	Shaped Charge Munitions (SCM): Test and evaluate non-developmental item SCM's in live mine testing.
• (U) \$	230	Contractor Support: Update all program documentation for and provide management support using a support contract.
(U)Total \$	3,855	
Project C2106	Page 118 - 2 of 118 - 3 Pages	Exhibit R-2

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1998				
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604612M Marine Corps Mine/Countermeasures Systems			PROJECT C2106				
B. (U) <u>Project Change Summary</u>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>					
(U) Previous President's Budget				3880	950	3907					
(U) Adjustments to Previous President's Budget				-67	-38	-52					
(U) Current Budget Submit				3813	912	3855					
(U) Change Summary Explanation:											
<p>(U) Funding: The FY 1997 and FY 1998 decrease reflects the Small Business Innovation Research assessment and revised economic adjustments. The FY 1999 adjustment due to Commercial Purchases Inflation adjustment.</p> <p>(U) Schedule: Not applicable</p> <p>(U) Technical: Not applicable</p>											
C. (U) <u>Other Program Funding Summary</u>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total
(APPN, BLI #, NOMEN)										<u>Compl</u>	<u>Cost</u>
(U) PMC, BLI# 637100, Advanced Mine/Countermeasures Systems			0	0	0	0	0	0	1,150	CONT	CONT
(U) Related RDT&E											
(U) PE 0602131M (Marine Corps Landing Force Technology)											
(U) PE 0603612M (Marine Corps Mine Countermeasures)											
(U) PE 0603640M (Marine Corps Advanced Technology Demonstrations)											
D. (U) <u>Schedule Profile</u>: Not applicable.											
Project C2106			Page 118 - 3 of 118 - 3 Pages						Exhibit R-2		

UNCLASSIFIED

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N

PROGRAM ELEMENT TITLE: Joint Direct Attack Munition (JDAM)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E2137 JDAM RDT&E articles		30,047	12,003	11,738	11,699	15,204	2,407	2,428	0	168,730
Guided Test Vehicles	114									

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: JDAM is a joint acquisition program combining Department of Navy and Air Force requirements to upgrade existing General Purpose Bomb capabilities in adverse weather and at medium to high altitude releases. The Air Force is the executive service. The Navy's participation in JDAM involves joint development of JDAM components and support of Navy-Marine Corps unique requirements such as aircraft integration on the F/A-18. JDAM will provide an accurate (defined as not more than 13 meters) adverse weather capability. The program will incorporate commonality with the Joint Standoff Weapon where feasible. The JDAM Product Improvement Program (PIP) will field improvements to the JDAM system with initial emphasis on attaining precision (3 meters or less) accuracy through non-seeker and seeker initiatives.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT (E&MD) because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$10,900) Completed Developmental Testing (DT-IIA) and continued test engineering support, initiated test phases: DT-IIB/Operational Testing (OT-IIA); DT-III A; OT-IIB (Operational Evaluation (OPEVAL) 11C Overlay Control Store (OCS)); and planning efforts for OT-III (Follow-on Test & Evaluation (FOT&E) Operational Flight Program (OFP) 13C).
- (U) (\$ 5,721) Continued OFP software development for flight testing, and JDAM Mission Planning Module (MPM) development for Tactical Air Mission Planning System (TAMPS).
- (U) (\$ 1,624) Procured JDAM Test Assets (Guided Test Vehicles (GTVs)).

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N

PROJECT NUMBER: E2137

PROGRAM ELEMENT TITLE: Joint Direct Attack Munition (JDAM) PROJECT TITLE: JDAM

- (U) (\$ 8,996) Performed systems engineering, Integrated Logistics Support (ILS) and program support for the JDAM E&MD Phase II contract and Initial Operating Capability (IOC); and prepared for and supported the Low Rate Initial Production (LRIP) decision; and supported the AV-8B integration effort.
- (U) (\$ 2,806) Continued systems engineering, ILS, program support, and testing for Joint Programmable Fuze (JPF) E&MD program.

2. (U) FY 1998 PLAN:

- (U) (\$ 354) Complete DT-IIIA testing, OT-IIB (OPEVAL 11C OCS) testing, and conduct DT-IIIB/OT-III (DT/FOT&E OFP 13C) testing.
- (U) (\$ 885) Continue OFP software activities supporting flight testing, and JDAM MPM development for TAMPS.
- (U) (\$ 860) Continue to incrementally fund JDAM Test Assets (GTVs) procured in FY96 and FY97.
- (U) (\$ 5,573) Perform systems engineering, ILS and program support for the JDAM E&MD Phase II, Milestone (MS) III decision, fleet deployment IOC, and perform systems engineering support for the Product Improvement Program (PIP) development program.
- (U) (\$ 3,305) Continue support of the JDAM integration effort on the AV-8B.
- (U) (\$ 1,026) Continue systems engineering, ILS, program support, and testing for JPF E&MD program.

3. (U) FY 1999 PLAN:

- (U) (\$ 255) Complete JDAM MPM software development.
- (U) (\$ 6,376) Perform systems engineering, ILS and program support in preparation for fleet introduction IOC of the JDAM weapons system including the JPF program, and continue systems engineering efforts supporting the PIP program.
- (U) (\$ 5,107) Continue support of the JDAM integration effort on the AV-8B.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N

PROJECT NUMBER: E2137

PROGRAM ELEMENT TITLE: Joint Direct Attack Munition PROJECT TITLE: JDAM

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
FY 1998 President's Budget Submit:	33,461	12,714	11,853
Appropriated Value:	35,130		
Adjustments from PRESBUDG:	-3,414	-711	-115
FY 1999 President's Budget Submit:	30,047	12,003	11,738

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 reduction of -\$3,414 million reflects decreases of -\$2,833 million for various reprogramming for higher Navy priorities, -\$539 thousand reduction for the Small Business Innovative Research (SBIR) transfer, and -\$42 thousand reduction for various minor adjustments. The FY98 reduction of -\$711 thousand reflects undistributed Congressional adjustments. The FY99 decrease of -\$115 thousand reflects a -\$207 inflation adjustment and a \$92 thousand increase for minor program adjustments.

(U) Schedule: The rephasing/reallocating of test requirements and organizational participation has resulted in the following changes: DT-IIB 1Q 97/4Q 97 now 4Q 96/4Q 97; OT-IIA 2Q 97/4Q 97 now 3Q 97/4Q 97; DT-IIIA 3Q 97/2Q 98 now 2Q 97/1Q 98; OT-IIIA 3Q 97/2Q 98 replaced by DT-IIIB 1Q 98/2Q 98; and OT-IIIB 3Q 98/3Q 98 now OT-III 2Q 98/3Q 98.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u>	<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>TO</u>	<u>TOTAL</u>
	<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
PAN&MC/B.A-1 - Ammunition - JDAM	-	28,610	41,363	36,036	30,060	30,615	65,998	480,211	712,893
PAAF/B.A-1 - Ammunition-JDAM									
USAF (3011) Weapons Procurement	23,010	54,645	53,157	127,999	246,016	216,298	210,009	427,814	1,358,948

RELATED RDT&E:

Air Force PE 0604618F Joint Direct Attack Munitions (JDAM).

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FY 1998/99 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N

PROJECT NUMBER: E2137

PROGRAM ELEMENT TITLE: Joint Direct Attack Munitions

PROJECT TITLE: JDAM

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	3Q LRIP	3Q MS-III		
Engineering Milestones				
T&E Milestones	DT-IIB 4Q 96/4Q 97 DT-IIIA 2Q 97/1Q 98 OT-IIA 3Q 97/4Q 97 OT-IIB 4Q 97/1Q 98	DT-IIIB 1Q 98/2Q 98 OT-III 2Q 98/3Q 98		
Contract Milestones				

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DATE: February 1998

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N

PROJECT NUMBER: E2137

PROGRAM ELEMENT TITLE: Joint Direct Attack Munition PROJECT TITLE: JDAM

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	FY 1997 <u>Actual</u>	FY 1998 <u>Estimate</u>	FY 1999 <u>Estimate</u>
a. System Engineering	3,378	1,832	3,196
b. A/C Integration/Certification	868	3,374	5,151
c. OFP S/W Development	4,283	617	151
d. TAMPS S/W Development	1,438	267	104
e. Development Test & Evaluation	6,249	71	0
f. Operational Test & Evaluation	4,499	128	0
g. Test Asset Hardware	1,624	860	0
h. Integrated Logistics Support (ILS)	1,295	549	754
i. Training	968	809	311
j. Travel	175	130	89
k. Contractor Engineering Support	2,988	2,645	1,810
l. Joint Programmable Fuze (JPF)	2,282	721	172
TOTAL	30,047	12,003	11,738

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Exhibit R-3 RDT&E,N Program Element/Project Cost Breakdown
(Exhibit R-2 page 5 of 8 pages)

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DATE: February 1998

FY 1998 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N

PROJECT NUMBER: E2137

PROGRAM ELEMENT TITLE: Joint Direct Attack Munition PROJECT TITLE: JDAM

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Contract Government Method/ Performing Fund Type Activity Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Total Office FY 1996 EAC & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
<u>Product Development</u>								
Contract Costs (\$1.0M or more):								
OFFP Software Dev. BOA 10/98 McDonnell Douglas Aircraft		13,251	13,251 10,407	2,584	260	0	0	13,251
JDAM (Software Dev) CPAF 10/99 (TAMPS) Texas Instruments		8,224	8,224 4,449	460	65	45	3,205	8,224
Less than \$1.0M (Aggregate Total)		3,363	3,363 1,981	1,382	0	0	0	3,363
In-house Support:								
NAWC, CL JDAM DEV. WX 10/99		90,162	90,162 35,943	8,502	7,610	9,794	28,313	90,162
<u>Support and Management:</u>								
Less than \$1.0M (Aggregate Total):		14,854	14,854 6,797	3,163	2,775	1,899	220	14,854

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Exhibit R-3 RDT&E,N Program Element/Project Cost Breakdown
(Exhibit R-2 page 6 of 8 pages)

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DATE: February 1998

FY 1998/99 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N

PROJECT NUMBER: E2137

PROGRAM ELEMENT TITLE: Joint Direct Attack Munition

PROJECT TITLE: JDAM

(U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

<u>Contractor/ Contract</u>	<u>Method/</u>	<u>Award/</u>	<u>Perform</u>	<u>Project</u>	<u>Total</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To</u>	<u>Total</u>
<u>Performing</u>	<u>Fund Type</u>	<u>Oblig</u>	<u>Activity</u>	<u>Office</u>	<u>FY 1996</u>	<u>Actual</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>	<u>Program</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>& Prior</u>					

PERFORMING ORGANIZATIONS (Continued)

Test and Evaluation:

Contract Costs (\$1.0M or more):

F/A-18 A/C BOA	10/97		6,216	6,216	6,214	2	0	0	0	6,216
(McDonnell Douglas, St.Louis, MO)										

In-house Support:

JDAM TEST										
NAWC-PAX	WX	10/98	4,523	4,523	3,764	658	101	0	0	4,523
NAWC-CL	WX	10/98	13,910	13,910	1,906	11,672	332	0	0	13,910

GOVERNMENT FURNISHED PROPERTY

<u>Item</u>	<u>Contract</u>	<u>Method/</u>	<u>Award/</u>	<u>Total</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To</u>	<u>Total</u>
<u>Description</u>	<u>Fund Type</u>	<u>Vehicle</u>	<u>Oblig</u>	<u>Delivery</u>	<u>& Prior</u>	<u>Actual</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>	<u>Program</u>
			<u>Date</u>	<u>Date</u>						
Product Development										
Support and Management										
Test and Evaluation:										
Test Assets	CPAF		10/95	Oct 97 -	11,743	1,624	860	0	0	14,227
	MIPR		10/97	Mar 98						

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Exhibit R-3 RDT&E,N Program Element/Project Cost Breakdown
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DATE: February 1998

FY 1998/99 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N

PROJECT NUMBER: E2137

PROGRAM ELEMENT TITLE: Joint Direct Attack Munition PROJECT TITLE: JDAM

	<u>FY 1996 & Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	52,780	12,928	7,935	9,839	31,518	115,000
Subtotal Support and Management	6,797	3,163	2,775	1,899	220	14,854
Subtotal Test and Evaluation	23,627	13,956	1,293	0	0	38,876
Total Project	83,204	30,047	12,003	11,738	31,738	168,730

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Exhibit R-3 RDT&E,N Program Element/Project Cost Breakdown

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604654N

PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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Q1829 Explosive Ordnance Disposal Procedures

	5,609	6,416	7,037	7,160	7,313	7,441	7,585	CONT.	CONT.
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A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This is a Joint Service Program. DOD assigned development responsibility for Explosive Ordnance Disposal (EOD) procedures and equipment to the Navy in support of the Joint Services. This program provides for the technical development, validation, preparation, joint service verification and approval of EOD render-safe procedures for all known domestic and foreign conventional and nuclear ordnance. This program also provides for the implementation of the DOD/DOE/FBI Memorandum of Understanding for response to Improvised Nuclear Devices (INDs). The program also provides for the acquisition of high priority foreign mines. The analysis and exploitation of these mines will provide for the development of MCM and unique EOD procedures. This project develops procedures in accordance with CNO approved NAPDD 426-852.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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Budget Item Justification
(Exhibit R-2, Page 1 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604654N

PROJECT NUMBER: Q1829

PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development

PROJECT TITLE: Explosive Ordnance Disposal Procedures

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$4,599) Obtained foreign ordnance and developed EOD render-safe procedures for new sophisticated domestic and foreign ordnance.
- (U) (\$1,010) Developed IND countermeasures procedures and participated in exercises and joint working groups.

2. (U) FY 1998 PLAN:

- (U) (\$4,865) Continue to obtain foreign ordnance and develop EOD render-safe procedures for new sophisticated domestic and foreign ordnance.
- (U) (\$1,067) Continue to develop IND countermeasures procedures and participate in exercises and joint working groups.
- (U) (\$484) Obtain high priority foreign mines for analysis and exploitation to provide for the development of Mine Countermeasures procedures.

Exhibit R-2

R-1 Line Item 121

Budget Item Justification
(Exhibit R-2, Page 2 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604654N PROJECT NUMBER: Q1829
PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development PROJECT TITLE: Explosive Ordnance Disposal Procedures

3. (U) FY 1999 PLAN:

- (U) (\$5,243) Obtain foreign ordnance and develop EOD render-safe procedures for new sophisticated domestic and foreign ordnance.
- (U) (\$1,040) Develop IND countermeasures procedures and participate in exercises and joint working groups.
- (U) (\$754) Obtain high priority foreign mines for analysis and exploitation to provide for the development of Mine Countermeasures procedures.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	5,609	6,613	6,975
(U) Appropriated Value:	7,346	6,613	
(U) Adjustments to FY97/98 Appropriated Value/FY 1998 President's Budget:			
a. Funding realignment and NWCF general adjustments	-1,737	-197	+62
(U) FY 1999 PRESBUDG Submit:	5,609	6,416	7,037

R-1 Line Item 121

Budget Item Justification
(Exhibit R-2, Page 3 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604654N PROJECT NUMBER: Q1829
PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development PROJECT TITLE: Explosive Ordnance Disposal Procedures

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Adjustments in FY 97 are due to NCWF/General adjustments (\$-1,737). FY 98 decreases are due to general adjustment of -\$197. FY 99 increase of \$+62 is due to minor adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E: All conventional ordnance related developments, both domestic and foreign, manufactured or improvised.

D. (U) SCHEDULE PROFILE: Not applicable.

R-1 Line Item 121

Budget Item Justification
(Exhibit R-2, Page 4 of 7)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604654N

PROJECT NUMBER: Q1829

PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development

PROJECT TITLE: Explosive Ordnance Disposal Procedures

A. (U) PROJECT COST BREAKDOWN: (\$in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. RSP Development	4,599	4,865	5,243
b. IND Countermeasures	1,010	1,067	1,040
c. Foreign Mine Acquisition	0	484	754
Total	5,609	6,416	7,037

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RDT&E,N PE/PROJECT COST BREAKDOWN
(Exhibit R-3, Page 5 of 7)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604654N PROJECT NUMBER: Q1829
 PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development PROJECT TITLE: Explosive Ordnance Disposal Procedures

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION:

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NAVEODTD	IH WR	10/96	CONT.	CONT.	135,067	5,315	6,416	7,037	CONT.	CONT.
MISC	WR/MP	1/96	640	640	346	294	0	0	0	640

Support and Management Not applicable.
 Test and Evaluation Not applicable.

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development Not applicable.									
Support and Management Not applicable.									
Test and Evaluation Not applicable.									

R-1 Line Item 121

RDT&E,N PE/PROJECT COST BREAKDOWN
 (Exhibit R-3, Page 6 of 7)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604654N

PROJECT NUMBER: Q1829

PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development
PROJECT TITLE: Explosive Ordnance Disposal Procedures

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	135,413	5,609	6,416	7,037	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	135,413	5,609	6,416	7,037	CONT.	CONT.

R-1 Line Item 121

RDT&E,N PE/PROJECT COST BREAKDOWN
(Exhibit R-3, Page 7 of 7)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: January 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604703N PROJECT NUMBER: L1822
PROGRAM ELEMENT TITLE: Manpower, Personnel, Training, Simulation, and Human Factors PROJECT TITLE: Manpower, Personnel, Training, Simulation, and Human Factors

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
L1822 Manpower, Personnel, Training, Simulation, and Human Factors	754	992	1,235	1,232	1,256	1,277	1,302	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program applies advanced technologies to operational requirements in manpower, personnel, training, simulation, and human factors, and transitions into operation those projects demonstrated in advanced development. Enabling technologies include adaptive testing, mathematical optimization, statistical and econometric forecasting, computer-based simulation, and decision support systems.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under RDT&E OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLANS:

- (U) (\$60K) Completed development and validation of the Brig Training Assessment Model and transition to operational use.
- (U) (\$94K) Completed validation of the Quality of Life Predictive Model and transition to an operational system.
- (U) (\$147K) Completed conversion of demonstration Medical Manpower Allocation Model to an All-Navy model for implementation.
- (U) (\$148K) Continued development of the rate forecasting models for Military Personnel Navy Appropriation.
- (U) (\$305K) Begin development of Navy Training Quota Management System which will develop "booking profiles" for each class from history and match current bookings against the profile. Project will allow schools to project ahead whether a class is over or underfilling to either add or cancel a class. Additionally , Navy will be able to compare each user's current bookings with the profile, determine that a particular user is not using its quota share, and reallocate the quotas to other users.

Exhibit R-2, RDT&E Budget Justification Sheet

R-1 Item No - 122

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: January 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604703N PROJECT NUMBER: L1822
PROGRAM ELEMENT TITLE: Manpower, Personnel, Training, Simulation, and Human Factors PROJECT TITLE: Manpower, Personnel, Training, Simulation, and Human Factors

2. (U) FY 1998 PLANS:

- (U) (\$145K) Complete validation and transition of the All-Navy Medical Manpower Allocation Model.
- (U) (\$272K) Complete development of the rate forecasting models for Military Personnel Navy Appropriation. Begin development of interfaces between the planning models and budget calculation and execution models.
- (U) (\$340K) Continue development of Navy Training Quota Management System which will develop "booking profiles" for each class from history and match current bookings against the profile.
- (U) (\$235K) Begin transition of the proof of concept prototype model developed under the successful 6.3 Assignment Policy Management System (APMS) subproject. APMS capabilities will be integrated into the development of the Job Advertisement and Selection System (JASS) within the Military Assignment, Selection, and Transfer (MAST) System and provide a tool to execute new policy initiatives such as the Home Basing policy. A redesign of the APMS model and monitoring subsystem to conform to the JASS and MAST standards and the development of seamless interfaces is required to effectively integrate APMS within JASS.

3. (U) FY 1999 PLANS:

- (U) (\$350K) Complete development and validation of Navy Training Quota Management System.
- (U) (\$357K) Continue development of the Assignment Policy Management System (APMS).
- (U) (\$350K) Begin transition of successful products of the 6.3 Distribution 2000 Prototyping Project to demonstrate that technologies/models developed will work across a range of officer and enlisted detailing communities.
- (U) (\$178K) Begin transition of the models developed under the successful 6.3 Decision Aids for Strength Control subproject and integrate them into an operational system. This subproject will address the problems in managing the enlisted strength planning system and the budget development and execution system as an integrated system.

B. (U) PROGRAM CHANGE SUMMARY:

Exhibit R-2, RDT&E Budget Justification Sheet

R-1 Item No - 122

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: January 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604703N PROJECT NUMBER: L1822
PROGRAM ELEMENT TITLE: Manpower, Personnel, Training, Simulation, and Human Factors PROJECT TITLE: Manpower, Personnel, Training, Simulation, and Human Factors

	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	1,022	1,252
(U) Adjustments from FY 1998 PRESBUDG:	-30	-17
(U) FY 1999 President's Budget Submission:	992	1,235

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 funding adjustment of -\$30 is the result of an R&D and a General reduction (-\$28), and an Economic Assumption adjustment (-\$2). In FY 1999, -\$17 is the result of inflation adjustment for Commercial Purchases (-\$22), and a correction (+\$5) to a DBOF Surcharge.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

- (U) PE 0601152N, In-House Independent Lab Research
- (U) PE 0601153N, Defense Research Sciences
- (U) PE 0602233N, Mission Support Technology
- (U) PE 0602722A, Personnel and Training
- (U) PE 0603707N, Manpower, Personnel and Training Advanced Technology Development
- (U) PE 0603731A, Manpower and Personnel
- (U) PE 0603704F, Manpower and Personnel Systems Technology

D. (U) SCHEDULE PROFILE: Not applicable.

Exhibit R-2, RDT&E Budget Justification Sheet

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROGRAM ELEMENT TITLE: Navy Energy Program (ENG)

A. (U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0371	1,903	2,873	5,544	2,592	2,631	2,735	2,755	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Develop energy-efficient systems and practices for ships, facilities, and aircraft. Resulting energy efficiency gains contribute to fleet sustainability, combat capability (e.g., greater range, time on station), and reduced operating costs. Efforts include fuel use optimization aids for aircraft; anti-fouling paints, air conditioning and lighting for ships; and adaptation of renewable/alternative energy technologies to Navy facility needs. Provide test and evaluation support to the companion PE 0603724N Project R0829. Annual savings of \$130M were achieved in FY 1995 and, as currently funded, \$155M is projected for FY 2000 compared to FY 1985 cost.

(U) This program, and the companion PE 0603724N Navy Energy Program (ADV), support the achievement of Executive Department, DoD, and Navy Energy Management Goals; and also address the Office of the Secretary of Defense (OSD), the Secretary of the Navy, and the Chief of Naval Operations direction to make up-front investment in technologies that reduce future cost of operation and ownership of the fleet and supporting infrastructure. Navy is TRISERVICE lead for the implementation of renewable/alternative energy systems across DoD.

(U) Joint Mission Areas/Warfare Areas (JMA/WA): This program directly supports the following JMA's: Strike, Littoral Warfare, Sea and Air Superiority, Strategic Mobility, Readiness, and Support and Infrastructure.

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Budget Item Justification
(Exhibit R-2, page 1 of 6)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROJECT NUMBER: R0371

PROGRAM ELEMENT TITLE: Navy Energy Program (ENG)

PROJECT TITLE: Energy Conservation (ENG)

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$500) Aircraft: Developed Flight Optimization Routines for Energy Management (FOREM) software for P-3C and AV-8B; continued fleet requested enhancements of FOREM software and began conversion to WINDOWS format. Defined airframe to computer interfaces required to automate P-3 Flight Performance Advisory System (FPAS) sensor inputs (e.g. fuel flow, external winds and temperature, MACH NO. and altitude). Identified a means to transfer FOREM generated flight plans to the F/A-18 and P-3 FPAS systems. Provided palmtop portable computers running FOREM to Marine Corps squadrons for in-the-field flight planning.
- (U) (\$903) Ships: Installed stern flap on DD-963/CG-47 test ship for powering trials. Supported endurance test of CV/CVN modified air conditioning plant (R114 replacement program), monitoring efficiency. Continued advanced easy release and ablative copper/cobioicide anti-fouling coating ship trials; belly stripe and hull patch performance demonstrations; and life cycle management studies.
- (U) (\$500) Facilities: Tested and evaluated advanced solar photovoltaic (PV) systems incorporating thin film receptors and ganged, parallel, processors/controllers. Continued test and evaluation of solar/wind and solar/fuel cell hybrid power systems. Evaluated hydrogen storage technologies for PV/fuel cell power systems (joint with NASA).

2. (U) FY 1998 PLAN:

- (U) (\$538) Aircraft: WINDOWS version of FOREM will be developed and tested for P-3 aircraft and distributed to fleet. Develop airframe to computer interfaces required to automate P-3 FPAS sensor inputs (e.g. fuel flow, external winds and temperature, MACH NO. and altitude). Develop a means to transfer FOREM generated flight plans to the F/A-18 and P-3 FPAS systems. Provide palmtop portable computers running FOREM to transport type aircraft

R-1 Line Item 123

Budget Item Justification
(Exhibit R-2, page 2 of 6)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROJECT NUMBER: R0371

PROGRAM ELEMENT TITLE: Navy Energy Program (ENG)

PROJECT TITLE: Energy Conservation (ENG)

(C-2, C-9, KC-130, UC-12) for on-board real-time updates for fuel state, weather changes, engine out performance. Develop laptop FOREM system for E-6A TACAMO aircraft.

- (U) (\$905) Ships: Conduct pre-installation powering trials for TAO-187 hydrodynamic mods. Optimize air conditioning impeller/compressor design for new 125 ton air conditioning plant to avoid efficiency losses in R114 replacement program. Life cycle management procedures development for advanced hull coatings. Conduct full hull trial of advanced ablative copper/cobiocide paint.
- (U) (\$1,430) Facilities: Test and evaluate hydrogen storage techniques and operational scale PV/Fuel Cell hybrid power system. Initiate development of renewable/alternative energy power systems including large remote PV/hybrid stand alone, medium to large PV grid support systems, and high efficiency, low emission systems.

3. (U) FY 1999 PLAN:

- (U) (\$759) Aircraft: Complete conversion of FOREM software to WINDOWS format. Examine cost effectiveness of FPAS systems for additional aircraft with newly available Global Positioning Satellite system computer assets (e.g. C-9, KC-130, C-2, E-2). Extend FOREM to additional aircraft such as MV-22.
- (U) (\$1,215) Ships: Install and conduct powering trials for TAO-187 hydrodynamic mods and DDG-51 stern flap retrofit. Monitor ship trials of easy release and ablative copper/cobiocide hull coatings. Assist fleet introduction of hull inspection/cleaning remotely operated vehicle. Test and evaluate high efficiency air conditioning plants, supporting both R114 replacement program and development efforts for new construction.
- (U) (\$3,570) Facilities: Continue development of renewable/alternative energy power systems for DOD facility applications. Navy is Lead Service for DOD implementation of these systems which include: PV hybrid systems (PV/diesel, PV/wind, PV fuel cell, etc.) for stand alone remote, and grid support applications; geothermal primary power systems; and PV peak shaving systems. Complete development of high efficiency, low emission power system.

B. (U) PROGRAM CHANGE SUMMARY

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	1,903	2,088	2,535

R-1 Line Item 123

Budget Item Justification
(Exhibit R-2, page 3 of 6)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604710N PROJECT NUMBER: R0371
PROGRAM ELEMENT TITLE: Navy Energy Program (ENG) PROJECT TITLE: Energy Conservation (ENG)

(U) Appropriated Value:	-	2,088	-
(U) Adjustments from FY 1998 PRESBUDG:	0	+785	+3,009
(U) FY 1999 President's Budget Request:	1,903	2,873	5,544

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 adjustment is due to Congressional Undistributed reductions (-81), economic assumptions (-7) and an increase to accelerate a high payoff task (+873). FY 1999 adjustment is due to Navy Working Capital Fund (NWCF) surcharge correction (-22), other NWCF adjustments (+57), an increase to complete high payoff task begun in FY 1998 (+3,000) and other minor adjustments (-26).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

- (U) PE 0601153N (Defense Research Sciences)
- (U) PE 0602121N (Surface Ship and Submarine HM&E Technology)
- (U) PE 0602122N (Aircraft Technology)
- (U) PE 0602234N (Materials, Electronics, and Computer Technology)
- (U) PE 0603508N (Ship and Submarine HM&E Advanced Technology)
- (U) PE 0603712N (Environmental Quality and Logistics Advanced Technology)

R-1 Line Item 123

Budget Item Justification
(Exhibit R-2, page 4 of 6)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROJECT NUMBER: R0371

PROGRAM ELEMENT TITLE: Navy Energy Program (ENG)

PROJECT TITLE: Energy Conservation (ENG)

(U) PE 0603721N (Environmental Protection)

(U) PE 0603724N (Navy Energy Program (ADV))

D. (U) SCHEDULE PROFILE: Not applicable.

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Budget Item Justification
(Exhibit R-2, page 5 of 6)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROJECT NUMBER: R0371

PROGRAM ELEMENT TITLE: Navy Energy Program (ENG)

PROJECT TITLE: Energy Conservation (ENG)

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Engineering Development & Testing	1,903	2,873	5,544

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION: Not applicable.

R-1 Line Item 123

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 6 of 6)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N
 PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & Title	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	To Complete	Total Program
X2134 BGPHERS-ST	3,040	2,063	2,518	960	720	733	746	Cont.	Cont.
X2135 CHBDL-ST	2,159	2,319	3,252	1,542	1,551	1,583	1,617	Cont.	Cont.
Total	5,199	4,382	5,770	2,502	2,271	2,316	2,363	Cont.	Cont.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Battle Group Passive Horizon Extension System - Surface Terminal (BGPHERS-ST) extends the Battle Group's line-of-sight radio horizon by using remote receivers in the ES-3A's sensor payload, and sends this information via the Common High Bandwidth Data Link - Surface Terminal (CHBDL-ST) to the surface ships.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHEP-ST

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & Title	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	To Complete	Total Program
X2134 BGPHEP-ST	3,040	2,063	2,518	960	720	733	746	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Battle Group Passive Horizon Extension System Surface Terminal (BGPHEP-ST) extends the Battle Group's line-of-sight radio horizon by using remote receivers in the ES-3A's sensor payload, via the Common High Bandwidth Data Link Shipboard Terminal (CHBDL-ST). BGPHEP-ST will be located in LHD, LHA, CV/CVN, LCC, and AGF Ships Signal Exploitation Space (SSES). The BGPHEP-ST 5-position, 6-rack cryptologic control, analysis and reporting center uses Navy-standard DTC/TAC-N series workstations and integral local intercept receivers. The design down sizes and corrects deficiencies from the 14-rack AN/SLQ-50 (XN-1) model tested on USS EISENHOWER (CVN-69) during FY87 (factory verification completion in fall 1989). Development will proceed in two stages, first reducing risk by demonstrating operation with the ship's local receivers (the Ship's Signals Exploitation Equipment (SSEE) Upgrade)), then (timed to meet CHBDL-ST development) adding control and use of the remote airborne payload (RS-6BN).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$500) Completed rehost of software to TAC-N computer and definition of software interfaces to host the ship's C⁴I system.
- (U) (\$400) Continued P³I development effort to access other ES-3A PME, including special signals.
- (U) (\$500) Continued P³I development effort to access other USAF U-2S PME, including special signals.

R -1 Line Item 124

Budget Item Justification
(Exhibit R-2, Page 2 of 17 Pages)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHERS-ST

- (U) (\$170) Initiated USAF U-2S interoperability test with rehosted TAC-N configuration.
 - (U) (\$1,000) Initiated the development of EPR-157/EPR-208 functional capabilities into existing BGPHERS-ST hardware.
 - (U) (\$418) Completed rehost of software to TAC-N computer and definition of software interfaces to host the ship's C⁴I system.
 - (U) (\$ 52) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors, and Reconnaissance (C⁴ISR) implementation guidance. Developed and updated the Naval C⁴ISR mission to incorporate overarching operational systems, technical and information architectures. Conduct associated C⁴ISR analyses and studies.
2. (U) FY 1998 PLAN:
- (U) (\$245) Initiate development effort to access EP-3E Joint Signals Avionics Family (JSAF) Low Band Subsystem Sensor (LBSS).
 - (U) (\$500) Complete USAF U-2S interoperability test with rehosted TAC-N configuration.
 - (U) (\$500) Complete P³I development effort to access other ES-3A PME, including special signals.
 - (U) (\$479) Continue P³I development effort to access other USAF U-2S PME, including special signals.
 - (U) (\$300) Complete the development of EPR-157/EPR-208 functional capabilities into existing BGPHERS-ST hardware.
 - (U) (\$ 39) Continue development and update of Naval C⁴ISR implementation guidance. Develop and update the Naval C⁴ISR mission to incorporate overarching operational systems, technical and information architectures. Conduct associated C⁴ISR analyses and studies.

R -1 Line Item 124

Budget Item Justification
(Exhibit R-2, Page 3 of 17 Pages)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHEP-ST

3. (U) FY 1999 PLAN:

- (U) (\$448) Continue P³I development effort to access other USAF U-2S PME, including special signals.
- (U) (\$490) Initiate development design engineering of BGPHEP-ST on the LCC/AGF class.
- (U) (\$590) Initiate development effort to rehost software to TAC-(N+1) computer and definition of software enhancements to host ship's C⁴I system.
- (U) (\$700) Continue P³I development effort to access EP-3E JSAF LBSS.
- (U) (\$290) Initiate P3I development effort to USAF U-2S JSAF PME.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	2,723	2,127	2,608
(U) Adjustments from FY 1998 PRESBUDG:	+317	-64	-90
(U) FY 1999 President's Budget Submit:	3,040	2,063	2,518

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1997: -\$60K for SBIR transfer, +\$399K BTR to complete rehost to TAC-4 computers, -\$3K for inflation adjustment, and -\$19K for miscellaneous adjustments.

(U) FY 1998: -\$59K for Congressional undistributed general reductions and -\$5K for an inflation adjustment.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
 PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHEs-ST

(U) FY 1999: -\$42K redirected to develop and update overarching C⁴ISR mission requirements, -\$4K for NCWF adjustment, and -\$44K for an inflation adjustment for commercial purchases.

(U) Schedule: Current schedule unchanged.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	To Complete	Total Program
OPN Line 2434	37,147	45,537	73,542	75,945	49,074	34,046	32,714	Cont.	Cont.
O&M,N 4B7N	1,352	1,559	1,751	1,710	1,934	1,988	2,039	Cont.	Cont.

(U) RELATED RDT&E: PE 0305885G, Project 05500, BGPHEs-ST.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHE-S

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones		IOC 2Q	
Engineering Milestones	P ³ I Development	P ³ I Development	P ³ I Development
T&E Milestones	JTF-EX-97-02	Interoperability Testing	Interoperability Testing
Contract Milestones	Award Prod Contract 1Q		

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHEs-ST

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	140	190	240
b. Systems Engineering	150	800	1,305
c. Hardware and Software Development	1,650	400	675
d. System Test & Evaluation	1,050	673	298
e. Integrated Logistic Support	50	0	0
Total:	3,040	2,063	2,518

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
 PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHEs-ST

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development:									
E-Systems Inc., Melpar Div Falls Church, VA	CPFF BOA	1/96	23,154	23,154	1,800	1,200	1,980	Cont.	Cont.
Support and Management					190	190	240	Cont.	Cont.
Test and Evaluation					1,050	673	298	Cont.	Cont.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHEs-ST

GOVERNMENT FURNISHED PROPERTY: N/A

	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	1,800	1,200	1,980	Cont.	Cont.
Subtotal Support and Management	190	190	240	Cont.	Cont.
Subtotal Test and Evaluation	1,050	673	298	Cont.	Cont.
Total Project	3,040	2,063	2,518	Cont.	Cont.

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Budget Item Justification
(Exhibit R-3, Page 9 of 17 Pages)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & Title	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	To Complete	Total Program
X2135 CHBDL-ST	2,159	2,319	3,252	1,542	1,551	1,583	1,617	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Common High Bandwidth Data Link-Ship Terminal (CHBDL-ST) equipment will provide a common high bandwidth data link shipboard terminal for the receipt of signal and imagery intelligence data from remote airborne sensors and the transmission of link and sensor control data to airborne platforms. Signal intelligence data is received from the Battle Group Passive Horizon Extension System (BGPHEs) Airborne Component (AC) and delivered to the BGPHEs Shipboard Terminal. Imagery intelligence data is received from various tactical airborne reconnaissance systems and delivered to the Joint Service Imagery Processing System - Navy (JSIPS-N).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$297) Completed Physical and Functional Configuration Audits. This effort was funded by \$300K of FY 96 carryover funding.
- (U) (\$200) Completed rehost to TAC 4 computers, complete design for Solid State Power Amplifier, new embedded COMSEC, and spectrum analyzer.
- (U) (\$500) Incorporated design changes from DT/OT.
- (U) (\$332) Updated supporting documentation for production.

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Budget Item Justification
(Exhibit R-2, Page 10 of 17 Pages)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

- (U) (\$315) Continued Test and Evaluation with other systems such as Joint Services Imagery Processing System (JSIPS) and Tier II+ Unmanned Air Vehicle (UAV).
 - (U) (\$463) Completed rehost to TAC-4 computers, complete design for solid state power amplifier, new embedded COMSEC, and spectrum analyzer.
 - (U) (\$ 52) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors, and Reconnaissance (C⁴ISR) implementation guidance. Developed and updated the Naval C⁴ISR mission to incorporate overarching operational systems, technical and information architectures. Conduct associated C⁴ISR analyses and studies.
2. (U) FY 1998 PLAN:
- (U) (\$825) Initiate development of Dual Simultaneous Link Capability. This effort will be forward funded by an additional \$300K of FY 97 carryover funding.
 - (U) (\$290) Initiate development efforts for wideband encryption (KG-135) enhancements.
 - (U) (\$500) Continue Test and Evaluation with other systems such as Joint Services Imagery Processing System (JSIPS) ATARS, GUARDRAIL, U-2 ASARS II Improvement Program (AIP), and High Altitude Endurance (HAE) UAVs.
 - (U) (\$660) Initiate development efforts for ship-to-ship data connectivity.
 - (U) (\$ 44) Continue development and update of Naval C⁴ISR implementation guidance. Develop and update the Naval C⁴ISR mission to incorporate overarching operational systems, technical and information architectures. Conduct associated C⁴ISR analyses and studies.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

3. (U) FY 1999 PLAN:

- (U) (\$200) Flight test of dual simultaneous link capability.
- (U) (\$450) Initiate development efforts for interoperability with other emerging sensor systems.
- (U) (\$575) Continue development efforts for ship-to-ship data connectivity.
- (U) (\$750) Initiate multi-queing capability development.
- (U) (\$740) Complete development of wideband encryption (KG-135) enhancements.
- (U) (\$537) Continue Test and Evaluation with other systems such as Joint Services Imagery Processing System (JSIPS) ATARS, GUARDRAIL, U-2 AIP, and HAE UAVs.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	1,851	2,404	3,367
(U) Adjustments from FY 1998 PRESBUDG:	+308	-85	-115
(U) FY 1999 President's Budget Submit:	2,159	2,319	3,252

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Budget Item Justification
(Exhibit R-2, Page 12 of 17 Pages)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
 PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1997: -\$35K for SBIR transfer, -\$23K for FFRDC reduction, +\$469K BTR to complete rehost to TAC-4 computers, complete design for solid state power amplifier, embedded COMSEC and spectrum analyzer, -\$2K for economic assumptions, -\$37K for NCWF adjustments and -\$64K for miscellaneous adjustments.

(U) FY 1998: -\$66K for Congressional undistributed general reductions, -\$14K for Contract Advisory reductions, and -\$5K for Economic Assumptions.

(U) FY 1999: -\$54K redirected to develop and update overarching C⁴ISR mission requirements, -\$7K for NCWF adjustment, -\$57K for the Commercial Purchases Inflation adjustment, and +\$3K for the increase for Military and Civilian Pay Rates.

(U) Schedule: Current schedule unchanged.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	To Complete	Total Program
OPN Line 2434	37,147	45,537	73,542	75,945	49,074	34,046	32,714	Cont.	Cont.
O&M,N	590	985	1,121	1,197	1,215	1,246	1,274	Cont.	Cont.

(U) RELATED RDT&E: PE 0603261N Project A2174 Joint Service Imagery Processing Systems - Navy (JSIPS-N).

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
 PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999
Program Milestones	1Q FCA 1Q PCA	IOC 2Q	
Engineering Milestones	TAC-4 Rehost		-Wideband Encryption Interface -Dual Simultaneous Link
T&E Milestones	JIF-EX-97-02 JSIPS-N Test	-Guardrail Interoperability -JSIPS-N DT/OT	-Guardrail/UAV/ U-25 AIP Interoperatibility Tests

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	250	215	260
b. Systems Engineering	545	1,150	1,350
c. Hardware & Software Development	715	454	905
d. System Test & Evaluation	395	500	737
e. Integrated Logistic Support	254		
f. Site/Platform Integration			
Total:	2,159	2,319	3,252

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
 PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development		10/93	20,502	20,502	20,502				0	20,502
Loral Salt Lake City, UT	FFP	W/Options								
Loral	Various	Various	TBD	TBD		1,260	1,604	2,255	Cont.	Cont.
Support and Management						504	215	260	Cont.	Cont.
Test & Evaluation						395	500	737	Cont.	Cont.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

GOVERNMENT FURNISHED PROPERTY: N/A

	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	1,260	1,604	2,255	Cont.	Cont.
Subtotal Support and Management	504	215	260	Cont.	Cont.
Subtotal Test and Evaluation	395	500	737	Cont.	Cont.
Total Project	2,159	2,319	3,252	Cont.	Cont.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROGRAM ELEMENT TITLE: Joint Standoff Weapon System

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E2068 JSOW RDT&E Articles	82,267 31	77,977 6	73,022 9	52,883 8	36,463 8	17,619 0	1,050 0	0	787,956

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Standoff Weapon (JSOW) is an air-to-ground weapon designed to attack a variety of targets during day, night and adverse weather conditions. JSOW will enhance aircraft survivability as compared to current interdiction weapon systems by providing the capability for launch aircraft to standoff outside the range of most target area surface-to-air threat systems. The JSOW launch-and-leave capability will allow several target kills per aircraft sortie.

(U) The JSOW program will first develop a baseline weapon for use against fixed area targets. The JSOW Baseline (AGM-154A) variant will include a kinematically efficient airframe, an integrated Inertial/Global Positioning System (INS/GPS) navigation capability, and a BLU-97/B submunition payload. This weapon will be designed upfront for pre-planned product improvements. The JSOW AGM-154A Low Rate Initial Production contract option for 100 units was awarded in February 1997. The JSOW Unitary (AGM-154C) variant will add a terminal seeker, a man-in-the-loop data link, and a unitary warhead to enable the attack of blast/frag sensitive or moving point targets. The JSOW Unitary will provide increased accuracy and lethality, and the capability for aimpoint selection, target discrimination, and bomb impact assessment. The JSOW/BLU-108 (AGM-154B) variant incorporates the Sensor Fuze Weapon submunition (BLU-108) into the baseline vehicle. The JSOW/BLU-108 variant will provide a standoff delivery capability against massed armor and land combat vehicles.

(U) Through adherence to international standards for weapons interfaces and minimized weight and dimension considerations, JSOW will be compatible with Air Force and NATO aircraft. JSOW is a joint Navy/Air Force program.

(U)JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT (EMD) because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: Joint Standoff Weapon System

PROJECT TITLE: JSOW

1. (U) FY 1997 ACCOMPLISHMENTS:

(U) BASELINE:

- (U) (\$14,812) Completed E&MD efforts.
- (U) (\$ 3,228) Completed systems engineering technical efforts, completed developmental testing (DT-IIC), and conducted Production Readiness Review (PRR).
- (U) (\$ 2,622) Conducted and completed operational testing (OT-IIB) testing.
- (U) (\$ 3,857) Completed F/A-18 integration efforts.

(U) UNITARY:

- (U) (\$40,241) Continued E&MD efforts.
- (U) (\$ 5,751) Continued systems engineering technical efforts.
- (U) (\$ 1,020) Continued F/A-18 Integration efforts.

(U) BLU-108:

- (U) (\$ 5,382) Continued E&MD efforts.
- (U) (\$ 1,673) Began procuring Government Furnished Equipment (GFE) assets.
- (U) (\$ 2,232) Continued systems engineering technical efforts, conducted Critical Design Review (CDR), and commenced DT&E planning.
- (U) (\$ 159) Continued F/A-18 integration efforts.
- (U) (\$ 1,290) Continued Sensor Fuze Weapon efforts.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: Joint Standoff Weapon System

PROJECT TITLE: JSOW

2. (U) FY 1998 PLAN:

(U) UNITARY:

- (U) (\$60,360) Continue E&MD efforts.
- (U) (\$ 7,692) Continue systems engineering technical efforts, Mission Planning System integration, safety approvals and DT&E planning.
- (U) (\$ 1,665) Continue F/A-18 integration efforts.

(U) BLU-108:

- (U) (\$ 4,097) Continue E&MD efforts.
- (U) (\$ 3,463) Continue systems engineering technical efforts and start DT&E.
- (U) (\$ 700) Continue Sensor Fuze Weapon efforts.

3. (U) FY 1999 PLAN:

(U) UNITARY:

- (U) (\$55,936) Continue E&MD efforts.
- (U) (\$ 5,130) Continue systems engineering technical efforts, Mission Planning System integration, safety approvals, test and evaluation planning and conduct Critical Process Review #2.
- (U) (\$2,449) Begin Developmental Testing & Evaluation (DT&E).
- (U) (\$1,716) Continue F/A-18 integration efforts.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: Joint Standoff Weapon System

PROJECT TITLE: JSOW

(U) BLU-108:

- (U) (\$ 5,018) Complete E&MD efforts.
- (U) (\$ 2,173) Complete systems engineering technical efforts and complete IOT&E.
- (U) (\$ 600) Complete Sensor Fuze Weapon efforts.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	86,266	71,526	78,828
(U) Appropriated Value:	86,266		
(U) Adjustments from PRESBUDG:	-3,999	+6,451	-5,806
(U) FY 1999 President's Budget Submit:	82,267	77,977	73,022

(U) CHANGE SUMMARY EXPLANATION:

(U) The net FY 97 decrease of \$3,999 thousand is due to the Small Business Innovative Research decrease of \$1,706 thousand; a decrease of \$2,188 thousand for general reductions; a deduction of \$105 revised economics recission and an increase of \$1,600 thousand for a reprogramming for Sensor Fuze Weapon effort. The net FY-98 increase of \$6,451 is due to \$9,000 thousand acceleration of Unitary; a decrease of \$2,391 for general reductions and a decrease of \$158 thousand for Economic Assumptions. The net FY-99 decrease of \$5,806 thousand is the result of a restructuring of unitary development efforts; a decrease of \$1,096 thousand for deflation adjustments which were partially offset by an increase of \$289 thousand for the Navy Working Capital Fund.

(U) Schedule: The JSOW Unitary: FY-97 Critical Process Review #1 (CPR) was completed 4Q/97. DT-IIB and OT-IIA were combined and renamed System Flight Test to be consist with the Selected Acquisition Report (SAR) and changed from 3Q/99-1Q/00 to 2Q/99-4Q/00. The JSOW BLU-108 Critical Design Review occurred in 3Q/97 vice 1Q/97 due to required environmental lid seal design improvements. JSOW BLU-108 FY-98 IOT&E was redesignated as a combined DT/OT test phase and rescheduled from 1Q/98-1Q/99 to 2Q/01-4Q/01 to allow more time for Air Force Systems to mature.

(U) Technical: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: Joint Standoff Weapon System

PROJECT TITLE: JSOW

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1996</u> <u>& PRIOR</u>	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
USN WPN, PE: 223000										
<u>BASELINE</u>										
\$s	25,198	77,918*	62,027**	108,691	134,487	110,214	112,582	123,881	1,268,638	2,023,636
Qty's	0	100	135	328	564	501	524	584	6064	8800
<u>BLU-108</u>										
\$s	0	3,100	0	16,516	75,606	91,751	112,831	94,765	49,074	443,643
Qty's	0	0	0	0	188	251	335	282	144	1200
<u>UNITARY</u>										
\$s	0	0	0	0	8,518	112,247	129,788	146,352	3,457,778	3,854,683
Qty's	0	0	0	0	0	118	167	209	7306	7800
USAF WP, APPN: 3020 PE: 27324F										
<u>BASELINE</u>										
\$s	0	0	19,113	23,197	29,318	36,753	15,472	15,639	496,439	635,931
Qty's	0	0	45	77	121	171	65	53	2468	3000
<u>BLU-108</u>										
\$s	0	0	0	14,030	56,092	71,878	73,995	103,926	784,605	1,104,526
Qty's	0	0	0	23	142	206	225	314	2090	3000

*Includes a FY97 Congressional plus-up of \$15.574M to be executed with the FY98 procurement.

** Includes a FY98 Congressional plus-up of \$5,000M to be executed with the FY98 procurement.

(U)RELATED RDT&E: (U) PE: 0604727F (USAF RDT&E,F BLU-108)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: JOINT STANDOFF WEAPON PROGRAM

PROJECT TITLE: JSOW

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				
Baseline			1Q MS-III	
Unitary				4Q/02 MS-III
BLU-108				1Q/01 MS-III
Engineering Milestones				
Baseline	1Q PRR			
Unitary	4Q CPR #1		2Q CPR #3	4Q/00 #3
BLU-108	3Q CDR			

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: Joint Standoff Weapon System

PROJECT TITLE: JSOW

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
T&E Milestones				
Baseline	OT-IIB 2Q-4Q/97			
Unitary			SYSTEM FLIGHT TEST DT-11B/OT-IIA 2Q/99-4Q/00	OT-IIB 1Q-3Q/01
BLU-108		COMBINED DT&E/IOT&E 2Q/98-3Q/98		
Contract Milestones				
Baseline	2Q LRIP (OPTION)	4Q LRIP (FIRST DELIVERY)		
Unitary				1Q/00 ST/STE
BLU-108			2Q/99 LRIP (OPTION)	

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: Joint Standoff Weapon

PROJECT TITLE: JSOW

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	63,112	65,342	61,821
b. Systems Engineering	7,382	6,608	4,045
c. Integrated Logistics Support	658	654	685
d. Training Development	236	184	298
e. F/A-18 Integration	5,036	1,665	1,716
f. Developmental Test and Evaluation	1,457	2,318	2,449
g. Operational Test and Evaluation	2,622	0	0
h. Government Engineering Support	617	492	737
i. Program Management Support	811	514	1,071
j. Travel	336	200	200
Total	82,267	77,977	73,022

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: Joint Standoff Weapon

PROJECT TITLE: JSOW

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Contract	Method/	Award/	Perform	Project	Total	FY 1997	FY 1998	FY 1999	To	Total
Government	Fund Type	Oblig	Activity	Office	FY 1996	Actual	Budget	Budget	Complete	Program
Performing	Vehicle	Date	EAC	EAC	& Prior					
Product Development										
Major Contracts:										
DEM/VAL	C/CPIF	10/88	22,101	22,101	22,101	0	0	0	0	22,101
PRE-MS-I	C/CPIF	10/88	3,275	3,275	3,275	0	0	0	0	3,275
PRE-E&MD	C/CPIF	10/88	3,143	3,143	3,143	0	0	0	0	3,143
TI B/L E&MD	C/CPIF	10/92	243,776	243,786	228,964	14,812	0	0	0	243,776
TI UNITARY										
PRE-E&MD	C/CPIF	10/94	6,316	6,316	6,316	0	0	0	0	6,316
TI UNITARY										
E&MD	C/CPIF	08/95	269,256	269,256	29,600	40,241	60,360	55,936	83,119	269,256
TI BLU-108										
PRE-E&MD	C/CPIF	01/94	474	474	474	0	0	0	0	474
TI BLU-108										
E&MD	C/CPIF	06/95	17,176	17,176	2,679	5,382	4,097	5,018	0	17,176
MTECHNOLGY										
BLU-108/SMART RACK										
	C/CPIF	10/95	4,585	4,585	4,585	0	0	0	0	4,585
MCDONNELL DOUGLAS										
F/A-18 INTEGRATION										
	C/CPIF	10/95	20,041	20,041	10,507	4,063	1,324	1,373	2,774	20,041
TEXTRON (GFE)										
BLU-108	C/CPFF	10/96	1,673	1,673	0	1,673	0	0	0	1,673
Misc Contracts:		10/96	4,840	4,840	2,084	1,004	885	867	0	4,840
(< \$1M)										

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: Joint Standoff Weapon

PROJECT TITLE: JSOW

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
<u>In-House Support:</u>										
NAWCAD, PAX	WX	10/94	1,000	1,000	1,000	0	0	0	0	1,000
NAWC WD, CL	WX	10/98	113,515	113,515	87,364	6,911	7,456	5,028	6,489	113,515
PMA-265, CL	WX	10/98	16,020	16,020	13,679	973	331	343	694	16,020

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Support and Management										
<u>In-House Support:</u>										
Misc Contracts:		10/98	23,577	23,577	13,392	1,764	1,206	2,008	5,207	23,577
Test and Evaluation										
<u>In-House Support:</u>										
NAWCWD, CL	WX	10/98	28,082	28,082	15,876	2,822	2,318	2,449	4,617	28,082
OPTEVFOR	PD	10/98	9,106	9,106	1,369	2,622	0	0	5,115	9,106

GOVERNMENT FURNISHED PROPERTY. Not Applicable.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: 14 Jan 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N

PROJECT NUMBER: E2068

PROGRAM ELEMENT TITLE: Joint Standoff Weapon

PROJECT TITLE: JSOW

	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	415,771	75,059	74,453	68,565	93,076	727,191
Subtotal Support and Management	13,392	1,764	1,206	2,008	5,207	23,577
Subtotal Test and Evaluation	17,245	5,444	2,318	2,449	9,732	37,188
Total Project	446,408	82,267	77,977	73,022	108,015	787,956

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown
(Exhibit R-3, Page 11 of 11 pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROGRAM ELEMENT TITLE: Ship Self Defense

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U0166 SPS IMPROVEMENT PROG	19,558	8,492	2,670	511	0	0	0	0	70,487
U0167 5" RAM MISSILE	18,792	13,649	4,241	7,597	7,791	7,944	8,116	CONT.	CONT.
U0172 CIWS PHALANX	4,652	0	0	0	0	0	0	0	146,332
U0173 NATO SEASPARROW	44,750	47,085	32,687	13,130	4,624	4,832	4,971	CONT.	CONT.
U0665 IRST	7,240	0	0	0	0	0	0	0	47,723
U0954 SHIPBOARD EW IMPR.	8,141	2,652	2,012	2,663	0	0	0	0	185,526
U2178 QRCC	25,596	46,190	26,808	24,339	13,352	13,584	13,851	CONT.	CONT.
U2190 NULKA	6,022	9,912	2,316	1,443	1,104	556	1,092	CONT.	CONT.
U2309 AIEWS	0	26,110	40,875	53,170	34,906	35,355	45,508	CONT.	CONT.
U2348 MULTI-FUNCTION RADAR	0	0	35,573	71,660	78,529	88,371	74,675	CONT.	CONT.
U2349 SSD LAUNCHER	0	0	0	0	7,325	11,861	14,819	CONT.	CONT.
U2442 IRST DEVELOPMENT	0	3,881	983	0	0	0	0	0	4,864
TOTAL	134,751	157,971	148,165	174,513	147,631	162,503	163,032	CONT.	CONT.

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Budget Item Justification
(Exhibit R-2, Page 1 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROGRAM ELEMENT TITLE: Ship Self Defense

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element consolidates currently ongoing and planned programmatic efforts related to Ship Self Defense (SSD). The consolidation facilitates effective planning and management of these efforts, exploiting the synergistic relationship inherent in each. These projects are directed by a single program manager in Program Executive Office for Theater Air Defense. Analysis and demonstration have established that surface SSD based on single-sensor detection, point-to-point control architecture performs marginally against current and projected Anti-Ship Cruise Missile (ASCM) threats. The supersonic seaskimming ASCM reduces the effective battle space to the horizon and the available reaction timeline to less than 30 seconds, from first opportunity to detect until the ASCM impacts its target ship. Against such a threat, multi-sensor integration is required for effective detection; parallel processing is essential to reduce reaction time to acceptable levels and to provide vital coordination/integration of hardkill and softkill assets; and improvements in terminal gun system effectiveness and in missile kinematics, control and homing accuracy are required for successful hardkill engagement. These SSD projects address and coordinate the detect, control, and engage functions necessary to meet the rigorous SSD requirements within a development structure dedicated to systems engineering.

(U) DETECTION: Improved coordinated sensor performance to increase the probability of detecting low altitude, low observable targets is to be achieved through the synergism gained from the integration of dissimilar sensor sources. Multi-sensor integration is being addressed through the efforts of Quick Reaction Combat Capability (QRCC) (U2178), while sensor improvements are addressed through the SPS Improvements (U0166), Infrared Search and Track (U0665), Shipboard Electronic Warfare Improvements (U0954) and Advanced Integrated Electronic Warfare System (U2309) projects. These improvements to both active and passive detection capabilities are complementary to the ship signature reduction technology also being pursued through project U0954. The Multi-Function Radar (U2348) will provide designated ships with an affordable, high performance radar system for ship defense well into the next century.

(U) CONTROL: Multi-sensor integration, parallel processing and the coordination of hardkill/softkill capabilities in an automated response to the ASCM threat are the cornerstones of Ship Self Defense System (SSDS) being developed through QRCC (U2178) efforts. In addition, that project provides for the central system engineering management of SSD developments, including efforts required to integrate SSDS with the Advanced Combat Direction System (CDS) for those ships having a CDS.

(U) ENGAGEMENT: Both missile and terminal gun system improvements necessary to meet their requirements are being addressed via NATO Seasparrow Missile System (NSSMS) (U0173), 5" Rolling Airframe Missile (RAM) (U0167), and CIWS PHALANX (U0172). Missile improvements are to include improved kinematic performance plus advanced seeker and low elevation fuzing/warhead capabilities. Gun system improvements address system detection, rate-of-fire, number of rounds on target, first round accuracy, and reliability and maintenance. Project U2349, the Ship Defense Launcher System, will provide designated ships not having a Vertical Launch System (VLS) with an affordable, light weight means of employing the Evolved SeaSparrow Missile (ESSM).

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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Budget Item Justification
(Exhibit R-2, Page 2 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U0166
PROJECT TITLE: SPS Improvement Program

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U0166 SPS IMPROVEMENT PROGRAM	19,558	8,492	2,670	511	0	0	0	0	70,487

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops and tests performance and reliability upgrades for search radar equipment to meet the evolving threat.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$200) Continued radar analysis/trade-off studies and implementation of functional and performance allocations among elements comprising integrated Ship Self Defense System (SSDS), including system interface adaptations and preparation/conduct of associated tests and demonstrations.
- (U) (\$9,284) Continued funding ongoing AN/SPQ-9B Radar development contract. Conduct First Article Testing (FAT) on two production proof kits. Support integration into MK 86 system at Land Based Test Site (LBTS).
- (U) (\$2,438) Initiated First Article Testing (FAT) at contractor site and MK 86 integration testing at Naval Surface Warfare Center, Port Hueneme Division (NSWC/PHD).
- (U) (\$169) Continued Digital Sidelobe Cancellation development as a product improvement to the AN/SPQ-9B Radar.
- (U) (\$7,467) Develop EDM AN/SPS-48 solid state transmitter.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0166

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: SPS Improvement Program

2. (U) FY 1998 PLAN:

- (U) (\$200) Continue radar analysis/trade-off studies and implementation of functional and performance allocations among elements comprising integrated SSDS, including system interface adaptations and preparation/conduct of associated tests and demonstrations.
- (U) (\$2,241) Complete contractor PPK development. Conduct developmental testing at NSWC Port Hueneme and aboard DD-963 class ship. Commence Operational Testing (OT).
- (U) (\$1,199) Complete FAT at contractor site and MK 86 integration testing at NSWC Port Hueneme Division.
- (U) (\$4,852) Develop SPQ-9B Lightweight Antenna.

3. (U) FY 1999 PLAN:

- (U) (\$200) Continue radar analysis/trade-off studies and implementation of functional and performance allocations among elements comprising integrated SSDS, including system interface adaptations and preparation/conduct of associated tests and demonstrations.
- (U) (\$2,470) Complete OT IIC on DD-963 class ship.

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Budget Item Justification
(Exhibit R-2, Page 4 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0166

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: SPS Improvement Program

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	20,994	3,756	2,747
(U) Appropriated Value	21,892	8,756	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget	-2,334	-264	-77
 (U) FY 1999 PRESBUDG Submit:	 19,558	 8,492	 2,670

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 change is due to Congressional undistributed reductions, minor pricing adjustments, and minor reprogrammings.
 FY 1998 and 1999 decreases are due to Congressional undistributed reductions and minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
	ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
(U) OPN 14UK / LINE 511000/05/06 (Gun Fire Control Equipment)	10,156	9,529	20,203	18,250	22,825	28,095	36,366	9,200	154,624

(U) RELATED RDT&E: Not applicable.

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Budget Item Justification
(Exhibit R-2, Page 5 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0166

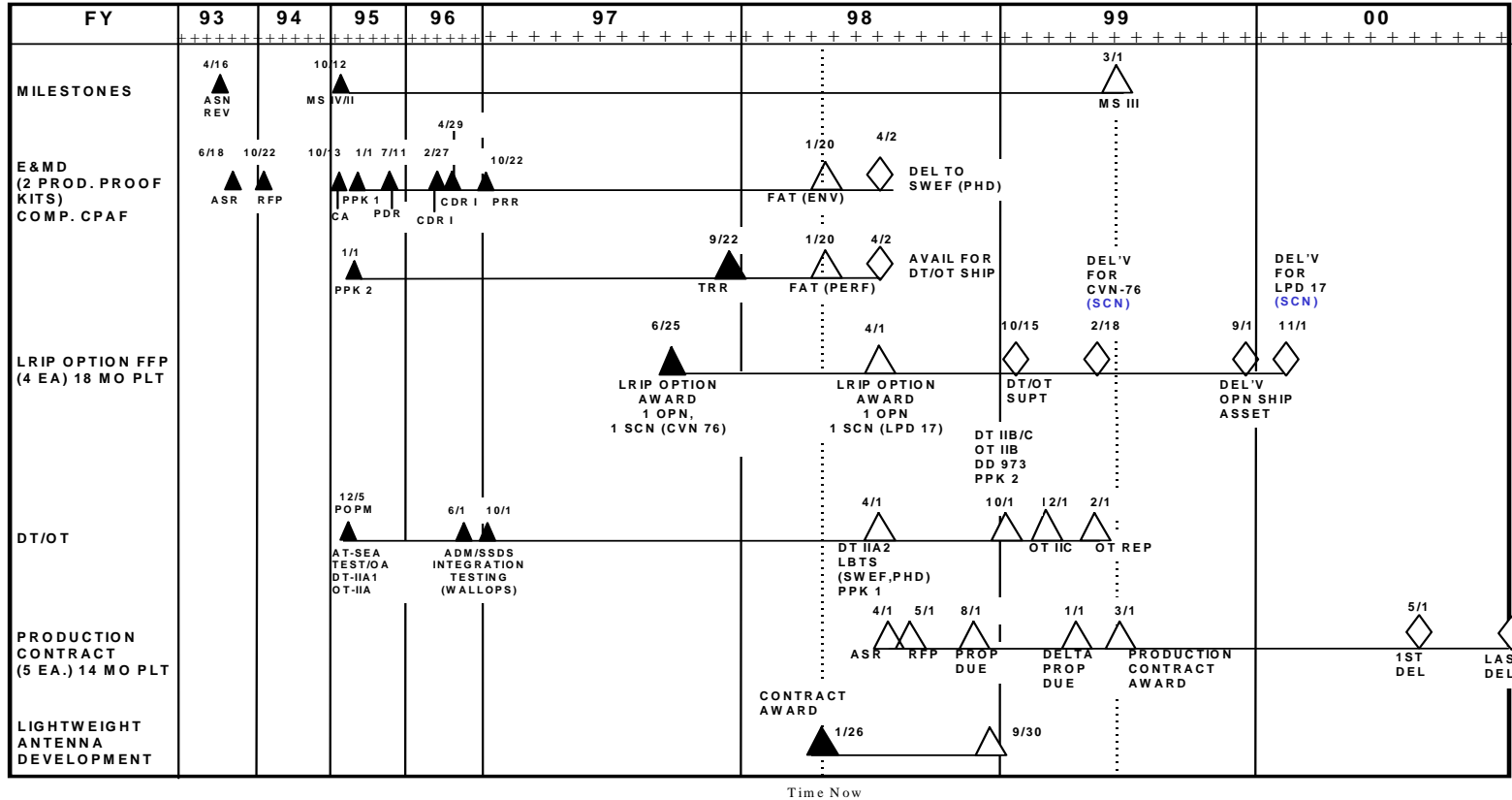
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: SPS Improvement Program

D. (U) SCHEDULE PROFILE:

28 JANUARY 1998

AN/SPQ-9B RADAR PROGRAM SCHEDULE



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Budget Item Justification
(Exhibit R-2, Page 6 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U0166
PROJECT TITLE: SPS Improvement Program

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. System Development Contract	15,660	5,652	0
b. Contractor Engineering Support	750	50	100
c. Government Engineering Support	2,606	915	747
d. Test and Evaluation	0	1,845	1,793
e. Miscellaneous	542	30	30
Total	19,558	8,492	2,670

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 7 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0166

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: SPS Improvement Program

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig. Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>FY1996 & Prior</u>	<u>FY1997 Budget</u>	<u>FY1998 Budget</u>	<u>FY1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Norden Systems Melville, NY	CPAF	10/94	34,065	34,065	19,129	9,284	5,652	0	0	34,065
NRL Washington, DC	WR/RC	Various	8,168	8,168	7,468	700	0	0	0	8,168
NAVSURFWARCENDIV Port Hueneme, CA	WR	Various	6,443	6,443	5,377	1,066	0	0	0	6,443
Miscellaneous (NSWC/CD, JHU/APL)	PD/WR	Various	6,327	6,327	3,205	1,048	915	747	431	6,327
ITT/G Van Nuys, CA	FFP	11/97	7,000	7,000	0	7,000	0	0	0	7,000
Support and Management										
Miscellaneous (EG&G, Techmatics)	CPFF	Various	2,545	2,545	1,995	260	80	130	80	2,545
Test and Evaluation										
Miscellaneous (NSWC/PHD)	WR/RC	Various	2,983	2,983	1,823	0	400	760	0	2,983
NRL Washington, DC	WR	Various	2,678	2,678	0	200	1,445	1,033	0	2,678

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 8 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0166

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: SPS Improvement Program

GOVERNMENT FURNISHED PROPERTY

<u>Item Description</u>	<u>Contract Method/ FundType Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>FY1996 & Prior</u>	<u>FY1997 Budget</u>	<u>FY1998 Budget</u>	<u>FY1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development									
Transmitter (Air Force)	MIPR	1/95	3/95	259	0	0	0	0	259

Support and Management - Not applicable.

Test and Evaluation - Not applicable.

	<u>FY1996 & Prior</u>	<u>FY1997 Budget</u>	<u>FY1998 Budget</u>	<u>FY1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	35,438	19,098	6,567	747	431	62,281
Subtotal Support and Management	1,995	260	80	130	80	2,545
Subtotal Test and Evaluation	1,823	200	1,845	1,793	0	5,661
Total Project	39,256	19,558	8,492	2,670	511	70,487

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 9 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0167

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: 5" Rolling Airframe Missile

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U0167 5" ROLLING AIRFRAME MISSILE	18,792	13,649	4,241	7,597	7,791	7,944	8,116	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this program is to develop a surface-to-air self-defense system utilizing a dual mode, passive Radio Frequency/Infrared 5" Rolling Airframe Missile. The baseline system provided a self-defense capability against active radar-guided anti-ship missiles and was developed on an equal cost share basis with the Government of the Federal Republic of Germany. This effort will provide a capability against passive anti-ship missiles, very low altitude missiles, and maneuvering missiles through the incorporation of an infrared all-the-way mode seeker and improved fuze. This system is designed to counter anti-ship cruise missile raids and provide for ship survivability with accurate terminal guidance, proven lethality, and no shipboard post launch dependence.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1,500) Conducted Government Electromagnetic Environmental Effects (E3) testing.
- (U) (\$5,100) Continued algorithm development.
- (U) (\$2,800) Conducted government and contractor simulations.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 10 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0167

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: 5" Rolling Airframe Missile

- (U) (\$1,000) Documentation/Evaluation of test results.
 - (U) (\$1,500) Completed Electronics Design.
 - (U) (\$1,500) Completed Seeker Design.
 - (U) (\$1,492) Continued to support development of system interface adaptations as necessary to provide effective SSD integration.
 - (U) (\$1,700) Completed EM flight tests.
 - (U) (\$1,000) Conducted Aircraft Captive Carry Seeker testing.
 - (U) (\$1,200) Prepared for Technical/Operational Evaluation (TECH/OPEVAL) Testing.
2. (U) FY 1998 PLAN:
- (U) (\$6,700) Conduct DT/OT-IIB.
 - (U) (\$1,700) Conduct Tech Eval (DT-IIC).
 - (U) (\$1,900) Conduct OPEVAL (OT-IIC).
 - (U) (\$1,200) Conduct contractor and government simulation efforts.
 - (U) (\$800) Documentation/Evaluation of test results.
 - (U) (\$1,349) Continue to support development of system interface adaptations as necessary to provide effective SSD integration.
3. (U) FY 1999 PLAN:
- (U) (\$3,750) Conduct OT-IIIA (FOT&E).
 - (U) (\$491) Continue to support development of system interface adaptations as necessary to provide effective SSD integration.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 11 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0167

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: 5" Rolling Airframe Missile

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	19,170	14,136	4,616
(U) Appropriated Value	20,016		
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget	-1,224	-487	-405
 (U) FY 1999 PRESBUDG Submit:	 18,792	 13,649	 4,241

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Change in FY 1997 is due to Congressional Undistributed reductions. Change in FY 1998 is due to Contract Advisory and Assistance Services (CAAS) and pricing adjustments. Change in FY 1999 is due to pricing and inflation adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN LINE 523800 (RAM):	44,656	66,517	59,760	42,945	20,181	44,268	43,646	CONT.	CONT.
(U) WPN LINE 224200 (RAM):	46,858	40,999	44,766	46,438	45,294	78,353	74,118	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

R-1 Line Item 126

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 12 of 62)

UNCLASSIFIED

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

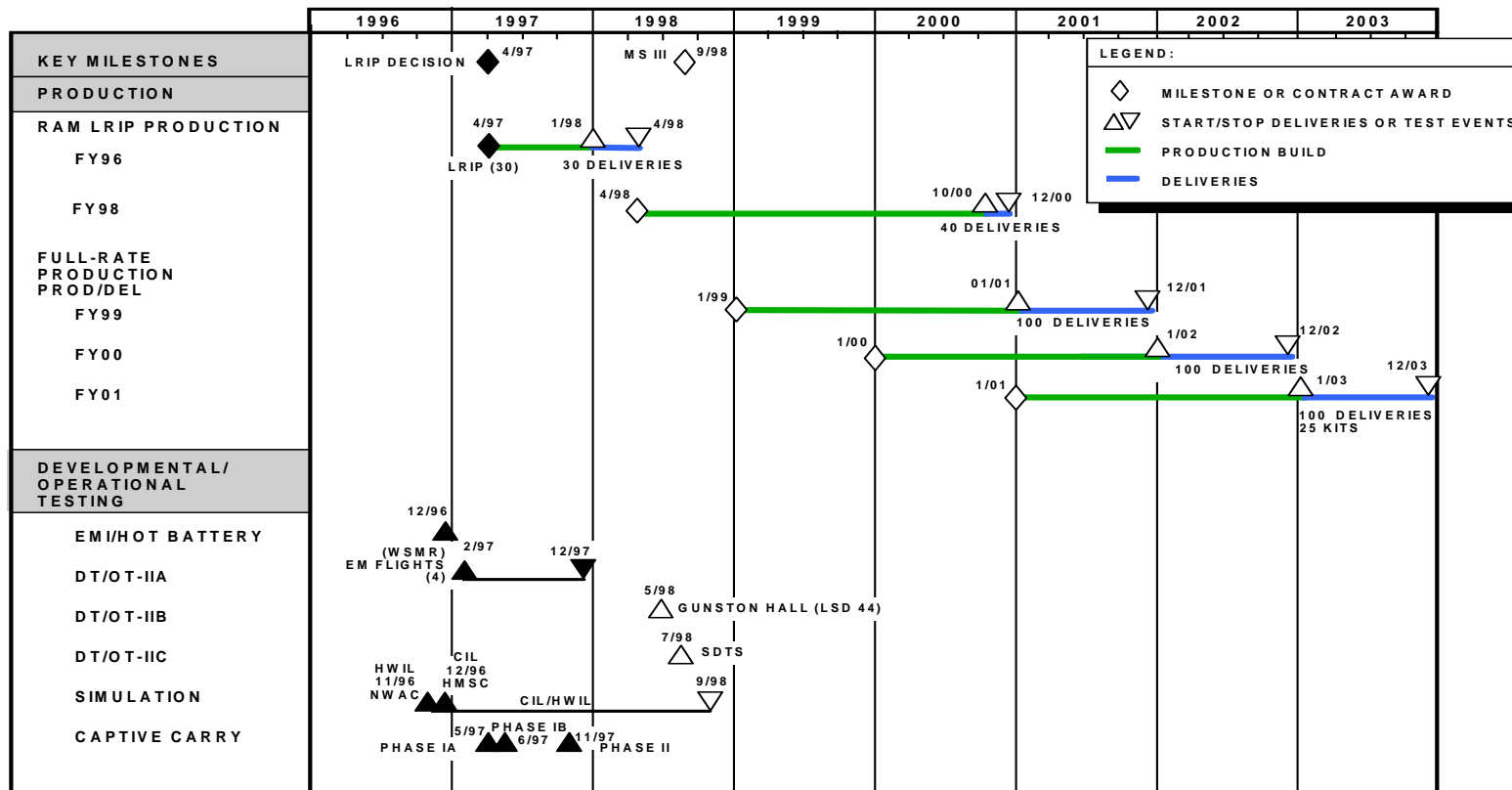
BUDGET ACTIVITY 5: PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U0167
PROJECT TITLE: 5" Rolling Airframe Missile

D. (U) SCHEDULE PROFILE:



RAM PROGRAM PLAN BLOCK I DEVELOPMENT/PRODUCTION (CY)



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R-1 Line Item 126

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 13 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY 5: PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U0167
PROJECT TITLE: 5" Rolling Airframe Missile

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	9,941	834	0
b. Ancillary Hardware Development	1,143	950	350
c. Developmental Test and Evaluation	1,686	175	0
d. Operational Test and Evaluation	1,591	8,630	2,083
e. Contractor Engineering Support	320	521	50
f. Government Engineering Support	2,732	980	1,087
g. Travel	235	210	180
h. Miscellaneous	1,144	1,349	491
Total	18,792	13,649	4,241

R-1 Line Item 126

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 14 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0167

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: 5" Rolling Airframe Missile

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ FundType Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 & Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	Budget To Complete	Total Program
Product Development :										
HMSC - 89C5339 Tuscon, AZ	SS/CPFF	09/89	19,630	19,630	19,630	0	0	0	0	19,630
HMSC - 94C5435 Tuscon, AZ	SS/CPAF	06/94	CONT.	CONT.	28,486	9,634	834	0	CONT.	CONT.
JHU/APL Laurel, MD	SS/CPFF	12/94	CONT.	CONT.	2,775	1,143	950	350	CONT.	CONT.
NAVAIRWARCEN / WD China Lake, CA	WR	Various	CONT.	CONT.	12,236	2,184	780	681	CONT.	CONT.
Miscellaneous	Various	Various	CONT.	CONT.	208,302	2,234	1,759	1,077	CONT.	CONT.
Support and Management :										
Miscellaneous	Various	Various	CONT.	CONT.	2,824	320	521	50	CONT.	CONT.
Test and Evaluation :										
HMSC - 94C5435 Tuscon, AZ	SS/CPAF	10/96	CONT.	CONT.	0	1,056	5,570	1,483	CONT.	CONT.
NAVAIRWARCEN / WD Pt. Mugu, CA	WR	01/95	CONT.	CONT.	512	230	0	600	CONT.	CONT.
NAVSURFWARCEN/PHD Port Hueneme, CA	WR	12/97	CONT.	CONT.	0	0	2,280	0	CONT.	CONT.
Miscellaneous	Various	Various	CONT.	CONT.	397	1,991	955	0	CONT.	CONT.

R-1 Line Item 126

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 15 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0167

PROGRAM ELEMENT TITLE:Ship Self Defense

PROJECT TITLE: 5" Rolling Airframe Missile

GOVERNMENT FURNISHED PROPERTY

Item <u>Description</u>	Contract Method/ FundType <u>Vehicle</u>	Award/ Oblig Date	Delivery Date	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	Budget To Complete	Total Program
Product Development : Not applicable.									
Support and Management : Not applicable.									
Test and Evaluation									
HMSC - 94C5435	SS/CPAF	12/95	12/96	3,687	0	0	0	0	3,687

	FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	Budget To Complete	Total Program
Subtotal Product Development	271,429	15,195	4,323	2,108	CONT.	CONT.
Subtotal Support and Management	2,824	320	521	50	CONT.	CONT.
Subtotal Test and Evaluation	4,596	3,277	8,805	2,083	CONT.	CONT.
Total Project	278,849	18,792	13,649	4,241	CONT.	CONT.

R-1 Line Item 126

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 16 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROGRAM ELEMENT TITLE: Ship Self Defense

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U0173 NATO SeaSparrow	44,750	47,085	32,687	13,130	4,624	4,832	4,971	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program encompasses three (3) primary efforts to enhance ship self defense:

1. (U) EVOLVED SEASPARROW MISSILE (ESSM): A cooperative effort among 10 NATO SeaSparrow Nations, including the U.S. to improve the capability of the SeaSparrow Missile to counter the low altitude, highly maneuverable Anti-Ship Cruise Missile (ASCM) threat. The program consists of evolving the SeaSparrow Missile through development of a new rocket motor with tail control, thrust vector control and ordnance (warhead) upgrade as well as modifications to the MK41 VLS to fire from a single cell 4 ESSM (QuadPack), and modifications to NATO SEASPARROW Surface Missile System (NSSMS) to provide ESSM capability.
2. (U) The MK91 NATO SEASPARROW Guided Missile Fire Control System (GMFCS) Rearchitecture Program integrates NSSMS into the Ship Self Defense System (SSDS) Architecture to provide an additional layer of ship missile defense. This effort consists of combining the Firing Officer Console and Radar Set Console functionality into a single Advanced Display System Console (AN/UYQ 70); modifying the Signal Data Processor and eliminating the MK157 Computer Signal Data Converter, and System Evaluation and Trainer (SEAT) which cannot accommodate further upgrade; and redistributing this functionality within SSDS compatible microprocessors. This approach will eliminate the analog, point-to-point architecture, limited input-output channel and computer processing reserve deficiencies resident in the existing MK57 NSSMS, as well as allow for full exploitation of the capabilities of the future ESSM and provide significant reductions (50%) in NSSMS cost of ownership and manning.
3. (U) Improvements to the Self Defense Surface Missile System (SDSMS), SWY-1 NSSMS to sustain effective capability. The focus of this effort is primarily on modifications to operational computer programs to support integration on multiple ship classes to support battle group operation.

R-1 Line Item 126

Budget Item Justification
(Exhibit R-2, Page 17 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0173

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NATO SeaSparrow

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

(a) (U) ESSM [\$38,423]

- (U) (\$17,047) Provided incremental funding to continue ESSM EMD efforts at Hughes including the S-Band capability for AEGIS ESSM Uplink. Conducted CDR, delivered test assets to support the first major development test event (DT-IIA).
- (U) (\$1,675) Provided incremental funding for continuation of ESSM Warhead development. Finalize warhead qualification tests and deliver assets for warhead arena and vulnerability testing.
- (U) (\$11,476) Continued MK41 VLS ESSM QuadPack development effort at United Defense, Lockheed Martin and Government Labs. Deliver first Canisters for Packaging, Handling, Storage and Transportation Qualification.
- (U) (\$8,225) Continued ESSM Integration (Integrated Product Team participation) and government lab/engineering efforts associated with EMD. Supported CDR, conducted first major Development Test event (DT-IIA) and conduct Insensitive Munitions (IM) testing.

(b) (U) MK91 Rearchitecture [\$6,086]

- (U) (\$5,331) Continued effort on EMD Contract with Raytheon to modify NSSMS MK91 to integrate with SSDS Architecture.
- (U) (\$755) Initiated integration engineering efforts to support NSSMS MK91 SSDS Software Test. Preliminary Design Review (PDR) conducted in Nov 1996, to kick-off software development which led to formal qualification testing in Sept 1997. Began installation of modified equipment on the Self Defense Test Ship in Sept 1997.

(c) (U) OTHER SDSMS (SWY-1/2/3) [\$241]

- (U) (\$241) Continued parallel development effort to support modifications to Mk23 TAS hardware to support installation of TAS radar in SSDS configured ships.

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Budget Item Justification
(Exhibit R-2, Page 18 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0173

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NATO SeaSparrow

2. (U) FY 1998 PLAN:

(a) (U) ESSM [\$38,853]

- (U) (\$18,158) Incremental funding to continue ESSM EMD efforts at Hughes, including the S-Band capability for AEGIS ESSM uplink. Continue DT-IIA testing, deliver production representative missiles to support at sea development test and operational assessment (DT-IIB/OT-IIA).
- (U) (\$715) Incremental funding for continuation of ESSM Warhead development. Continue live fire threat/vulnerability testing.
- (U) (\$11,500) Continue MK41 VLS ESSM Quad Pack development effort at United Defense, Lockheed Martin and government labs. Conduct land based firings and testing associated with launcher environment.
- (U) (\$8,480) Continue ESSM integrated product team efforts and government lab/engineering efforts associated with EMD. Conduct DT-IIB/OT-IIA for ESSM.

(b) (U) MK91 Rearchitecture [\$6,039]

- (U) (\$6,039) Complete effort on EMD Contract to Raytheon to modify MK91 to integrate with SSDS Architecture. Complete formal software qualification testing in Mar 1998. Commence Self Defense Test Ship installation of hardware in Jan 1998, and software in Mar 1998.

(c) (U) OTHER SDSMS (SWY-1/2/3) (\$2,193)

- (U) (\$2,193) Modify computer programs to address deficiencies identified in Software Qualification Tests. Continue efforts associated with support of SSDS Configuration.

3. (U) FY 1999 PLAN:

(a) (U) ESSM [\$30,428]

- (U) (\$17,767) Incremental funding to continue ESSM EMD efforts at Hughes, including the S-Band capability for AEGIS ESSM uplink. Conduct DT-IIIE/OT-IIB in Self Defense Test Ship (SDTS); conduct TECHEVAL/OPEVAL on LHD Class ships. Achieve Milestone III decision.
- (U) (\$6,460) Continue MK41 ESSM Quad Pack development effort at United Defense, Lockheed Martin and government labs. Conduct system integration testing and land base missile firings.

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Budget Item Justification
(Exhibit R-2, Page 19 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0173

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NATO SeaSparrow

3. (U) FY-99 Plan (Cont'd):

- (U) (\$6,201) Continue ESSM integrated product team participation and government lab engineering efforts associated with EMD. Support development and operational tests.

(b) (U) MK91 Rearchitecture [0]

(c) (U) OTHER SDSMS (SWY-1/2/3 [\$2,259])

- (U) (\$2,259) Continue efforts associated with support of SSDS Configuration.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	45,437	48,687	14,233
(U) Appropriated Value:	47,475	48,687	
(U) Adjustments to FY 1997/1998 Appropriated Value/ FY 1998 President's Budget	-3,311	-1,602	18,454
(U) FY 1999 PRESBUDG Submit:	44,750	47,085	32,687

(U) ADJUSTMENTS TO APPROPRIATED VALUE:

(U) FY 1997/1998 changes due to Congressional Undistributed Reductions and minor pricing adjustments. FY1999 change due to program restructure and pricing adjustments.

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Budget Item Justification
(Exhibit R-2, Page 20 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0173

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NATO SeaSparrow

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
• (U) 1. WPN BA-2 Other Missiles, Sparrow Mods (230400) / Evolved SeaSparrow Missile (ESSM) (230700)	2,478	10,277	35,672	55,663	59,174	69,446	69,821	CONT.	CONT.
• (U) 2. OPN BA-4 NATO SEASPARROW (523700, 523705)	4,614	12,511	5,156	5,758	5,661	5,924	6,117	CONT.	CONT.

(U) RELATED RDT&E:

- (U) PE 0603609N (Conventional Munitions)
- (U) PE 0604307N (AEGIS Combat System Engineering)
- (U) PE 0604755N (U2178 Quick Reaction Combat Capability-QRCC)

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Budget Item Justification
(Exhibit R-2, Page 21 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0173

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NATO SeaSparrow

D. (U) SCHEDULE PROFILE: (ESSM / NATO SEASPARROW Rearchitecture)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones			4Q LRIP PMR	4Q MS III
Engineering Milestones	1Q SRR 2Q SDR 4Q PDR	4Q CDR		
T&E Milestones		3Q DT-IIA	3Q DT-IIB 3Q DT-IIC 3Q OT-IIA	1Q DT-IIE 1Q OT-IIB 2Q DT-IIF 3Q OT-IIC
Contract Milestones				1Q LRIP CA (Allied) 2Q LRIP OA (US)

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Budget Item Justification
(Exhibit R-2, Page 22 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0173

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NATO Seasparrow

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories

a. Primary Hardware Development

FY 1997

23,138

FY 1998

23,627

FY 1999

17,767

b. Ancillary Hardware Development

8,508

8,390

7,219

c. Software Development

975

1,256

817

d. System Engineering

4,932

4,799

2,887

e. Development Test and Evaluation

2,885

4,463

1,581

f. Integrated Logistics Support

755

727

224

g. Engineering Support

765

621

352

h. Program Management Support

498

410

244

i. Program Management Personnel

575

1,395

1,023

j. Travel

320

325

330

k. Miscellaneous/Other

1,399

1,072

243

Total

44,750

47,085

32,687

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 23 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0173

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NATO Seasparrow

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ FundType Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development										
(a) SDSM ENHANCEMENTS:										
Raytheon - Wayland, MA	SS/CP	06/95	TBD	TBD	13,857	5,331	5,469	0	0	24,657
Hughes - Fullerton, CA	SS/CPFF	06/95	TBD	TBD	3,538	0	0	0	0	3,538
Vitro - Rockville, MD	SS/CPFF	03/95	TBD	TBD	2,346	0	278	0	0	2,624
Miscellaneous	SS/CPFF	Various	TBD	TBD	18,523	200	1,151	817	CONT.	CONT.
(b) ESSM/QUAD PACK:										
Hughes - Tuscon, AZ	LC/CPAF	06/95	TBD	TBD	50,519	17,047	18,158	17,767	CONT.	CONT.
Lockheed-Martin/ UNDEF/ Baltimore MD/Minn, MN	LC/CPAF	06/95	TBD	TBD	17,641	9,076	7,239	6,460	CONT.	CONT.
Raytheon/ED - Wayland, MA	SS/CPFF	06/95	TBD	TBD	3,737	0	0	0	0	3,737
TDW (German Company)	LC/CP	08/95	TBD	TBD	3,126	872	0	0	0	3,998
NSWC Dahlgren Contracted with a German Contractor to Manufacture Warhead										
Miscellaneous	SS/CPFF	Various	CONT.	CONT.	3,707	1,261	2,224	759	CONT	CONT

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 24 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U0173
PROJECT TITLE: NATO Seasparrow

Contractor/ Government Performing Activity	Contract Method/ FundType Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Comple	Total Program
Support and Management										
(a) SDSM ENHANCEMENTS:										
Miscellaneous	SS/CPFF	11/93	3,769	3,769	3,769	0	0	0	0	3,769
(b) ESSM/QUAD PACK:										
Miscellaneous	Various	Various	CONT.	CONT.	87	82	70	70	CONT.	CONT.

Test and Evaluation : Not applicable.

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ FundType Vehicle	Award/ Oblig Date	Delivery Date	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development									
(a) SDSM ENHANCEMENTS:									
Miscellaneous	WR	Various	Various	1,694	396	309	0	0	2,403
(b) ESSM/QUAD PACK:									
NAWC-CL / NSWC-DD	WR	Various	Various	9,888	4,774	4,079	2,260	CONT.	CONT.
NSWC/PHD	WR	Various	Various	1,375	1,070	1,521	1,645	CONT.	CONT.
Miscellaneous	WR	Various	Various	738	440	442	351	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 25 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U0173
PROJECT TITLE: NATO Seasparrow

<u>Item Description</u>	<u>Contract Method/ FundType Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY1996 &Prior</u>	<u>FY1997 Budget</u>	<u>FY1998 Budget</u>	<u>FY1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Support and Management									
(a) SDSM ENHANCEMENTS:									
Miscellaneous	WR/PD	Various	Various	2,052	240	455	113	CONT.	CONT.
(b) ESSM/QUAD PACK:									
NSPO/Various	PD	Various	Various	2,061	1,076	1,227	707	CONT.	CONT.
Miscellaneous	Various	Various	Various	249	0	0	157	CONT.	CONT.
Test and Evaluation									
(a) SDSM ENHANCEMENTS:									
Miscellaneous	WR	Various	Various	1,376	160	550	796	CONT.	CONT.
(b) ESSM/QUAD PACK:									
Miscellaneous	WR	Various	Various	2,125	2,725	3,913	785	CONT.	CONT.
				<u>FY1996 &Prior</u>	<u>FY1997 Budget</u>	<u>FY1998 Budget</u>	<u>FY1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development				130,689	40,467	40,870	30,059	CONT.	CONT.
Subtotal Support and Management				8,218	1,398	1,752	1,047	CONT.	CONT.
Subtotal Test and Evaluation				3,501	2,885	4,463	1,581	CONT.	CONT.
Total Project				142,408	44,750	47,085	32,687	CONT.	CONT.

R-1 Line Item 126

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 26 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROGRAM ELEMENT TITLE: Ship Self Defense

(U) COST: (Dollars in Thousands)

PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U0954 Shipboard EW Improvements	8,141	2,652	2,012	2,663	0	0	0	0	185,526

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Shipboard Electronic Warfare (EW) Improvements Program major efforts are: **OUTLAW BANDIT** Ship Signature management includes development of Radar Cross Section (RCS) reduction treatments for FFG-7, DD 963, CG 47 class ships and also covers RCS measurement and control techniques.

Advanced Integrated Electronic Warfare System (AIEWS) is the next generation EW system and will be an integral part of the ship combat system (AEGIS and SSDS). It will be developed using a two phased approach. Increment 1 will introduce advanced Electronic Support (ES), consisting of precision Electronic Support Measures (ESM), Specific Emitter identification (SEI) and special receiver, increased processing throughput, open architecture, Standard Combat systems work station with new Human Machine Interface (HMI), decoy integration and EMI improvements. Increment 2 will introduce advanced Electronic Attack (EA) which will include both RF and IR capabilities. This development will support both backfit and forward fit.

Note: Funding for AIEWS is transferred to Project U2309 commencing in FY 1998.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$5,823) AIEWS -Continued AIEWS Increment 1 development by consolidating AIEWS BAA results into RFP for EMD contract award
- (U) (\$2,318) OUTLAW BANDIT - Continued signature measurement tests. Continued P3I and signature improvements, including RAM improvement program.

2. (U) FY 1998 PLANS:

- (U) (\$2,652) OUTLAW BANDIT - Refine RCS prediction tool. Continue fire control system RCS reduction development. Conduct airborne measurement radar tests. Improve material measurement arch. Continue RAM improvements. Conduct future threat survivability study.

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Budget Item Justification
(Exhibit R-2, Page 27 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0954

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Shipboard EW Improvements

3. (U) FY 1999 PLAN:

- (U) (\$2,012) OUTLAW BANDIT - Continue signature measurement tests. Continue systems engineering improvements, including T&E cost reduction initiative. Continue P3I and signature/RAM improvement program.

B.. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	8,657	2,819	3,067
(U) Appropriated Value:	9,094	2,819	
(U) Adjustments to FY1997/98 Appropriated Value/ FY1998 President's Budget	-953	-167	-1,055
(U) FY1999 President's Budget Submit:	8,141	2,652	2,012

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding; Decrease in FY1997 is due to undistributed Congressional reduction and minor pricing adjustments. FY1998 is due to General Reductions. FY1999 adjustment due to program restructure and minor pricing adjustments.
- (U) Schedule: Not applicable.
- (U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY:

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) OPN Line Item 2346 (C3 Countermeasures)	506	6,404	6,080	9,266	5,950	5,730	9,345	CONT.	CONT.
(U) RELATED RDT&E: None									

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0954

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Shipboard EW Improvements

D. (U) SCHEDULE PROFILE:



OUTLAW BANDIT SCHEDULE

*Theater
Air
Defense*

ACAT LEVEL: III

DESCRIPTION:

OUTLAW BANDIT IS A SHIP SIGNATURE REDUCTION PROGRAM, APPLYING RADAR ABSORBENT MATERIAL (RAM) TO SELECTED AREAS OF A SHIP'S EQUIPMENT, SUPERSTRUCTURE, AND WEAPON SYSTEMS. PCMS ENHANCES SHIP SURVIVABILITY WHEN USED IN CONJUNCTION WITH AN/SLQ-32 AND DECOYS.

MAJOR PROGRAM INTERFACES: PEO SC-AP

SHIPS: DESIGNATED DD 963, CORT AND NON-CORT, FLIGHTS 3 AND 4 FFG AND CG 47 CLASSES

SCHEDULE:

	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
TESTING	DT-IV ▲ (ONGOING)	DT-III (DD) ▲ (ONGOING)	DT-III (CG) ▲				→	
DEPLOYMENT	▲ FFG, DD, CG (ONGOING)							→

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R-1 Line Item 126

Budget Item Justification
(Exhibit R-2, Page 29 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0954

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Shipboard EW Improvements

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Major SW Contracts	1,476	0	0
b. System Engineering	1,910	879	350
c. Program Spt/Review/Meetings-In/House Spt	1,416	0	0
d. Test & Evaluation	150	250	200
e. Contractor Eng. Spt	332	400	400
f. Program Mgmt Spt	400	400	400
g. Logistic Spt	947	100	100
h. Pre Planned Prod. Imprvmt	358	390	350
i. Software Development/Documentation	200	100	100
j. RCS Radar Improvement	200	0	0
k. Travel	82	30	30
l. Misc	670	103	82
Total:	8,141	2,652	2,012

R-1 Line Item 126

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 30 of 62)

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FY1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U0954

PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT TITLE: Shipboard EW Improvements

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ FundType Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development										
ADCAP/NMSO	SS/CPFF	12/86	18,916	18,916	18,916	0	0	0	0	18,916
PHASE E/NMSO	C/CPFF	05/92	13,329	13,329	13,329	0	0	0	0	13,329
AIEWS/NMSO	C/CPFF	03/95	11,000	11,000	11,000	0	0	0	0	11,000
DSR SW DEV	C/CPFF	03/95	5,305	5,305	3,829	1,476	0	0	0	5,305
HUGHES/LOCKHEED										
AIEWS-BAA	C/CPFF	12/95	1,498	1,498	1,498	0	0	0	0	1,498
PHASE E/AIEWS										
NRL	WR/RCP	12/94	25,012	25,012	23,825	1,187	0	0	0	25,012
NSWC/DD-AIEWS	WR/RCP	12/96	9,740	9,740	8,120	1,620	0	0	0	9,740
NSWC/PHD/NAWC/ CRANE/NWAD										
	WR/RCP	01/95	22,002	22,002	20,759	786	0	0	0	22,002
OUTLAW BANDIT										
NRL	WR	10/94	CONT.	CONT.	15,846	350	300	200	CONT.	CONT.
NSWC/DD/NSWC/CD										
NSWC/PHD/NCCOSC	WR/RCP	01/95	CONT.	CONT.	21,704	1,088	1,169	700	CONT.	CONT.
SPCC	WR	10/94	CONT.	CONT.	1,389	0	0	0	CONT.	CONT.
TRAVEL	WR	10/94	CONT.	CONT.	918	82	30	30	CONT.	CONT.
MISC	VAR	VAR	CONT.	CONT.	1,249	670	103	82	CONT.	CONT.

R-1 Line Item 126

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 31 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U0954
PROJECT TITLE: Shipboard EW Improvements

Contractor/ Government Performing Activity	Method/ FundType Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total PROG
Support and Management										
ADCAP/PHASE E										
AIEWS/OUTLAW BANDIT										
NMSO/NAVSEA/APL)										
	PD/PR	10/94	CONT.	CONT.	19,713	732	800	800	CONT.	CONT.
Test and Evaluation										
ADCAP/PHASE E/OUTLAW 01/95										
		10/94	CONT.	CONT.	7,963	150	250	200	CONT.	CONT.

Government Furnished Property: Not applicable.

	FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Subtotal Product Development	142,382	7,259	1,602	1,012	1,713	153,968
Subtotal Support and Management	19,713	732	800	800	800	22,845
Subtotal Test and Evaluation	7,963	150	250	200	150	8,713
Total Project	170,058	8,141	2,652	2,012	2,663	185,526

R-1 Line Item 126

RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 32 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROGRAM ELEMENT TITLE: Ship Self Defense

(U) COST (Dollars in thousands)

PROJECT

NUMBER & FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL	
TITLE	ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
U2178 Quick Reaction Combat Capability (QRCC)	25,596	46,190	26,808	24,339	13,352	13,584	13,851	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The QRCC project implements an evolutionary acquisition of improved ship self defense capabilities against anti-ship cruise missiles for selected ships by integrating existing and programmed anti-air warfare stand-alone systems. It provides an automated quick reaction and multi-target engagement capability emphasizing performance in the littoral environment. Integration focuses on coordinating existing sensor information, providing threat identification and evaluation, assessing defensive readiness, and recommending an optimized defensive tactical response to counter single and multiple anti-ship cruise missile attacks. Subsequent modifications and upgrades will optimize the Ship Self Defense System and provide enhanced self defense capabilities while allowing for insertion of advanced technologies during Engineering and Manufacturing Development and Production and Deployment Phases. System design emphasizes use of nondevelopmental items, commercial standards, Next Generation Computer Resources, computer program reuse, and open architecture. QRCC replaces manual control of several different ship self defense systems with a single integrated capability under the computer aided control of ship operators. Improvements to current system performance for short range anti-air ship self defense will implement the Ship Self Defense System (SSDS), incorporate multi-sensor integration of existing sensors, improve ship defense local command and control functions by automation of the detect through engagement sequence under the control of flexible embedded doctrine, integrate and coordinate weapon systems, and provide hardkill/softkill integration. The current focus of this project is the development of the SSDS which leverages recent critical experiments, the Rapid Anti-Ship Missile Integrated Defense System (RAIDS) program efforts, and the SSDS demonstration on USS WHIDBEY ISLAND (LSD 41) in June 1993. System architecture centers on a distributed processing concept which uses a fiber optic local area network (LAN), LAN access units, Advanced Display System workstation, and software to integrate existing sensors and weapons. The initial effort will focus on the LSD 41 class of ships to integrate existing LSD 41 class sensors, the Rolling Airframe Missile (RAM), Phalanx Close-in Weapon System (CIWS), and Electronic Countermeasures System (AN/SLQ-32). Other ship systems such as ship support, navigation, and Identification Friend or Foe will also be integrated into the system via the LAN. The distributed architecture allows the incremental evolution and implementation of follow-on modification to the SSDS which will integrate other ship self defense elements, such as the NATO Seasparrow missile system, AN/SPQ-9 radar, and other sensors, as well as the RAM, CIWS, and AN/SLQ-32 installations on other ship classes. Ships with the Advanced Combat Direction System (ACDS) will also have those systems integrated with SSDS to optimize the use of offboard track data in ship self defense and to transmit SSDS track data to other ships.

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Budget Item Justification
(Exhibit R-2, Page 33 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2178

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Quick Reaction Combat Capability

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1997 ACCOMPLISHMENTS:

- (U) (\$8,100) Completed DT and conduct OT on LSD-41 class ship.
- (U) (\$14,617) Continued E&MD of SSDS MK 1 for follow-on class ships.
- (U) (\$750) Supported programmatic documentation changes.
- (U) (\$2,129) Supported logistics requirements due to ship class adaptations.

2. FY 1998 PLAN:

- (U) (\$21,381) Prepare critical item development specifications and interface control drawings, conduct logistic support analysis, and commence software coding of SSDS MK1 for follow-on class ships. (CV(N), LPD-17, LHD, and LHA)
- (U) (\$1,325) Prepare updated documentation for SSDS integration with RAM BLK 1.
- (U) (\$4,078) Conduct FOT&E on Self Defense Test Ship (SDTS) in conjunction with RAM BLK 1 testing.
- (U) (\$3,881) Establish Wallops Island Ship Defense Test Facility.
- (U) (\$9,703) Integrate QRCC with Naval systems.
- (U) (\$5,822) Integrate QRCC with the Ship Self Defense Test Ship.

3. FY 1999 PLAN:

- (U) (\$16,424) Complete software coding for LPD-17 and CV(N) ship classes and conduct software unit testing.
- (U) (\$4,572) Integrate hardware and software for LPD-17 and CV(N) ship classes.
- (U) (\$5,812) Commence ILS documentation (training, technical manuals) for LPD-17 and CV(N) ship classes.

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Budget Item Justification
(Exhibit R-2, Page 34 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2178

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Quick Reaction Combat Capability

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	26,246	27,710	28,326
(U) Appropriated Value	29,480	47,710	
(U) Adjustments to FY 1997 Appropriated Value / 1998 President's Budget.	-3,884	-1,520	-1518
(U) FY 1999 President's Budget:	25,596	46,190	26,808

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Decrease in FY 1997 is due to reductions for Near Term Mine Warfare Plan, Congressional Undistributed general reductions and minor pricing adjustments. Decrease in FY 1998 is due to Congressional Undistributed general reductions and minor pricing adjustments. Decrease in FY 1999 is due to Ship Self Defense ILS reduction and pricing adjustments .

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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Budget Item Justification
(Exhibit R-2, Page 35 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2178

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Quick Reaction Combat Capability

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 523900, 523905, 523906 (MK 1)	18,013	17,468,229,944	57,876	60,479	64,205	63,464	CONT.	CONT.	
(U) O&MN 14D90 WPN Maint. QRCC	4,161	5,278	7,003	6,430	6,296	6,414	6,487	CONT.	CONT.
(U) SCN CV(N) ship class SSDS MK1	0	0	0	0	34,030	0	0	0	34,030
(U) SCN LPD-17 ship class SSDS MK 1	0	0	9,998	20,357	20,714	21,109	21,479	10,824	104,481

(U) RELATED RDT&E: PE 0603755N (Ship Self Defense)
PE 0604518N (Advanced Combat Direction System Block 1)

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Budget Item Justification
(Exhibit R-2, Page 36 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2178

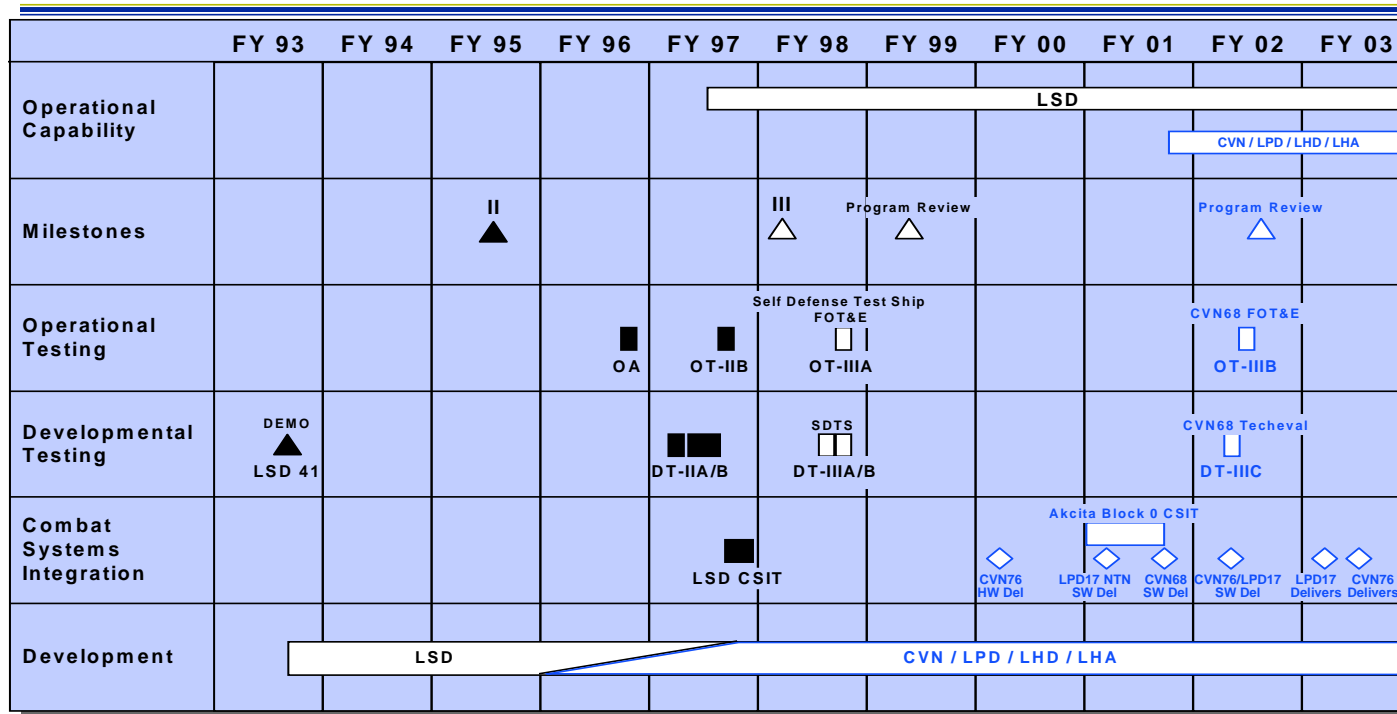
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Quick Reaction Combat Capability

D. (U) SCHEDULE PROFILE:



SSDS PROGRAM STRUCTURE



SSDS-2

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Budget Item Justification
(Exhibit R-2, Page 37 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2178

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Quick Reaction Combat Capability

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	0	0	0
b. Software Development	10,852	16,206	15,576
c. Systems Engineering	3,636	17,029	5,807
d. Training Development	800	800	889
e. Integrated Logistics Support	400	400	289
f. Configuration Management	198	200	187
g. Install	0	0	0
h. Test & Evaluation	5,614	7,505	479
i. Government Engineering Support	2,978	2,700	2,413
j. Program Management Support	348	600	405
k. Documentation	600	600	604
l. Travel	170	150	159
Total	25,596	46,190	26,808

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RDT&E PE/Cost Breakdown
(Exhibit R-3, Page 38 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2178
PROJECT TITLE: Quick Reaction Combat Capability

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ FundType Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development										
Hughes San Diego, CA	SS/CPAF	10/95	39,641	39,641	26,880	10,852	1,909	0	0	39,641
Hughes Tucson, AZ	SS/FP	10/94	17,740	17,740	17,740	0	0	0	0	17,740
Hughes San Diego, CA	SS/CPAF	8/97	CONT.	CONT.	0	0	15,127	20,061	CONT.	CONT.
NAVSURFWARCENDIV Port Hueneme, CA	WR	Various	CONT.	CONT.	3,896	50	0	225	CONT.	CONT.
NAVSURFWARCENDIV Dahlgren, VA	WR	Various	CONT.	CONT.	4,312	2,753	5,582	300	CONT.	CONT.
JHU/APL Laurel, MD	SS/FP	10/93	CONT.	CONT.	13,125	2,614	5,452	500	CONT.	CONT.
Raytheon Maynard, MA	SS/FP	6/95	4,000	4,000	4,000	0	3,512	0	0	7,512
NRL Washington DC	WR	Various	CONT.	CONT.	502	120	100	75	CONT.	CONT.
NWAD Corona, CA	WR	Various	CONT.	CONT.	865	982	125	0	CONT.	CONT.

R-1 Line Item 126

RDT&E PE/Cost Breakdown
(Exhibit R-3, Page 39 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2178
PROJECT TITLE: Quick Reaction Combat Capability

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ FundType Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY1996 &Prior</u>	<u>FY1997 Budget</u>	<u>FY1998 Budget</u>	<u>FY1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development (Cont.)										
NAVSURFWARCENDIV										
Dam Neck , VA	WR	Various	CONT.	CONT.	0	0	0	50	CONT.	CONT.
NWAD-AD										
St. Inigoes, MD	WR	Various	4,056	4,056	3,236	820	0	0	0	4,056
MISC.										
Various	Various	Various	CONT.	CONT.	2,153	1,960	6,278	5,042	CONT	CONT.
Support and Management										
MISC.										
Various	Various	Various	CONT.	CONT.	2,799	348	600	405	CONT.	CONT.
Test and Evaluation										
NAVSURFWARCENDIV										
Port Hueneme, CA	WR	Various	CONT.	CONT.	3,880	1,867	6,622	0	CONT.	CONT.
NAVSURFWARCENDIV										
Dahlgren, VA	WR	Various	CONT.	CONT.	7,080	3,230	0	0	CONT.	CONT.
MISC.										
Various	Various	Various	CONT.	CONT.	566	0	883	0	CONT.	CONT.

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RDT&E PE/Cost Breakdown
(Exhibit R-3, Page 40 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2178
PROJECT TITLE: Quick Reaction Combat Capability

GOVERNMENT FURNISHED PROPERTY

<u>Item Description</u>	<u>Contract Method/ FundType Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY1996 &Prior</u>	<u>FY1997 Budget</u>	<u>FY1998 Budget</u>	<u>FY1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development									
HARDWARE - ADS Equipment, LAUs, Fiber Optic Cables									
Unisys									
St. Paul, MN	SS/FP	1/94	4/95	3,863	0	0	0	0	3,863
HARDWARE - Command Table									
NRaD									
San Diego, CA	WR	Various	CONT.	474	0	0	150	0	474
		<u>FY1996 &Prior</u>	<u>FY1997 Budget</u>	<u>FY1998 Budget</u>	<u>FY1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>		
Subtotal Product Development		81,046	20,151	38,085	26,403	CONT.	CONT.		
Subtotal Support and Management		2,799	348	600	405	CONT.	CONT.		
Subtotal Test and Evaluation		11,526	5,097	7,505	0	CONT.	CONT.		
Total Project		95,371	25,596	46,190	26,808	CONT.	CONT.		

R-1 Line Item 126

RDT&E PE/Cost Breakdown
(Exhibit R-3, Page 41 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2190

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NULKA Decoy

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U2190 NULKA Decoy	6,022	9,912	2,316	1,443	1,104	556	1,092	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Offboard Active Decoy (NULKA) is a joint cooperative program between the United States and Australia to develop an active offboard decoy which utilizes a broadband radio frequency repeater mounted atop a hovering rocket. The Decoy is designed to counter a wide variety of present and future radar guided Anti-Ship Missile (ASM) threats by radiating a large radar cross section signal while flying a shiplike trajectory. The United States developed the Electronic Payload and Fire Control System. Currently the United States is modifying the payload to incorporate cost savings improvements and improve reliability. The Fire Control System components are being consolidated and modified. The MK 36 Decoy Launching System (DLS) is being modified to support NULKA Launches. Australia developed the hovering rocket, launcher, and launcher interface unit.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$5,658) Conducted DT testing. Continued research and development of payload improvements required to counter the next generation threat and to improve EMC capability. Continued integration of NULKA with SSDS.
- (U) (\$364) Forward financing of FY 1998 requirements due to low execution rates.

2. (U) FY 1998 PLAN:

- (U) (\$9,912) Complete SSDS integration. Conduct DT/OT testing required to achieve a Milestone III decision for the NULKA System. Continue development of payload improvements and EMC upgrade.

3. (U) FY 1999 PLAN:

- (U) (\$2,316) Complete EMC upgrade and conduct FOT&E of EMC improvements.

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Budget Item Justification
(Exhibit R-2, Page 42 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2190

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NULKA Decoy

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	6,111	8,233	8,314
(U) Appropriated Value:	6,377	10,233	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget:	-355	-321	-5,998
(U) FY 1999 PRESBUDG Submit:	6,022	9,912	2,316

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Decreases in FY 1997 and FY 1998 are due to Congressional Undistributed Reductions and minor pricing adjustments. FY 1999 decrease is due to transfer of funds to a classified program.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM		
(U) OPN Line 553000 (Anti-ship Missile Decoy System)	23,562	17,917	21,504	22,653	20,255	19,802	18,819	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

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Budget Item Justification
(Exhibit R-2, Page 43 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

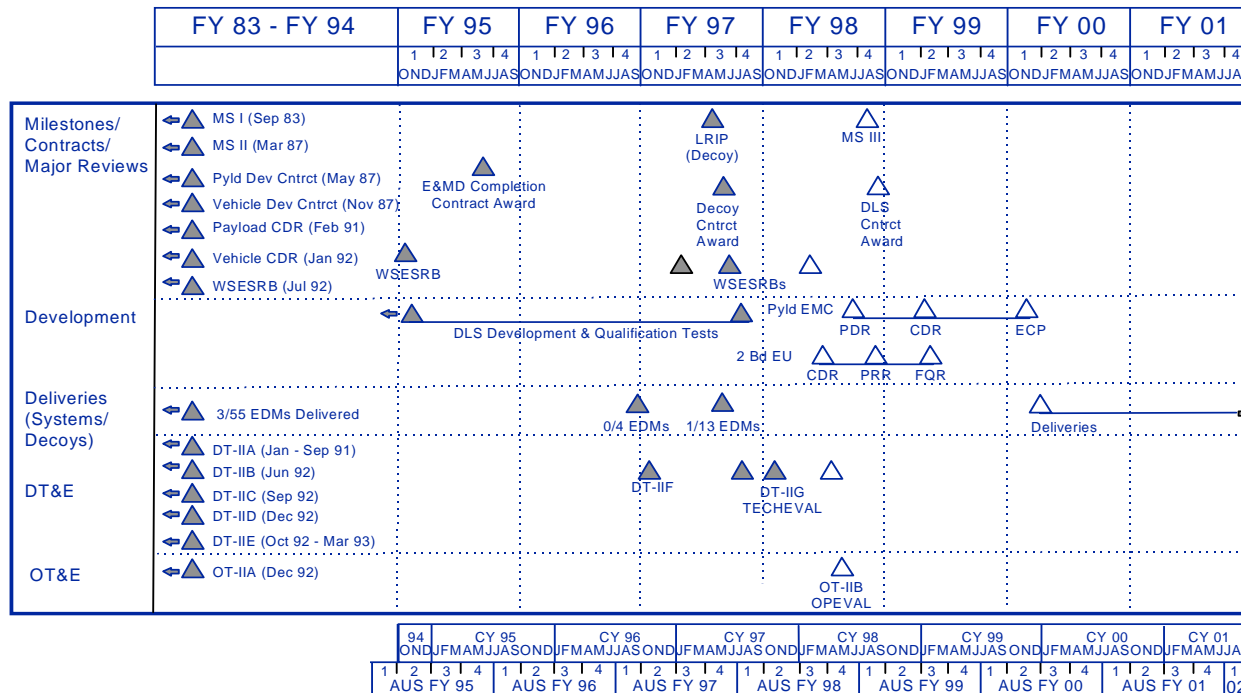
PROJECT NUMBER: U2190

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NULKA Decoy

D. (U) SCHEDULE PROFILE:

OVERALL NULKA SCHEDULE



12 Nov 97

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2190
PROJECT TITLE: NULKA Decoy

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Design and analysis	2,907	7,170	569
b. Hardware Fabrication and Procurement	1,101	1,853	1,512
c. Demonstration Test and Evaluation	479	400	0
d. Operational Test and Evaluation	1,300	185	0
e. Program Management Support	175	175	175
f. Travel	60	129	60
Total	6,022	9,912	2,316

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 45 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2190

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: NULKA Decoy

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ FundType Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development										
NAVSURFWARCENDIV Crane, IN	WR	Various	CONT.	CONT.	970	350	300	400	CONT.	CONT.
NAVSURFWARCENDIV Indian Head, MD	WR/RC	Various	CONT.	CONT.	1,125	350	422	150	CONT.	CONT.
NAVSURFWARCENDIV Dahlgren, VA	WR	Various	CONT.	CONT.	1,491	1,117	1,500	464	CONT.	CONT.
NAVSURFWARCENDIV Port Hueneme , CA	WR	Various	657	657	0	0	657	0	0	657
NRL Washington, DC	WR	Various	CONT.	CONT.	540	700	400	567	CONT.	CONT.
Sippican Boston, MA	SS/CPFF	09/96	CONT.	CONT.	1,300	1,300	892	500	CONT.	CONT.
BAEA, Australia	SS/CPFF	05/96	4,356	4,356	1,460	1,180	1,716	0	0	4,356
NAVSUP Washington, DC	PD	Various	3,000	3,000	0	0	3,000	0	0	3,000
Support and Management										
Techmatics Arlington, VA	CC/CPFF	06/96	CONT.	CONT.	456	175	175	175	CONT.	CONT.
Miscellaneous	Various	Various	CONT.	CONT.	225	750	665	60	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 46 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2190
PROJECT TITLE: NULKA Decoy

Contractor/ Government Performing Activity	Contract Method/ FundType Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Test and Evaluation: OPTEVFOR	WR	11/07/96	100	100	0	100	0	0	0	100
NAVSURFWARCENDIV Pt. Mugu, CA	WR	04/01/98	185	185	0	0	185	0	0	185

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Subtotal Product Development	6,886	4,997	8,887	2,081	CONT.	CONT.
Subtotal Support and Management	681	925	840	235	CONT.	CONT.
Subtotal Test and Evaluation	0	100	185	0	0	285
Total Project	7,567	6,022	9,912	2,316	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 47 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U2309 Advanced Integrated Electronic Warfare System (AIEWS)	0	26,110	40,875	53,170	34,906	35,355	45,508	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Advanced Integrated Electronic Warfare System (AIEWS) is the next generation EW system which will be an integral part of the ship combat system (AEGIS and ISDS). AIEWS will be developed using a two phased approach. Increment 1 will introduce advanced Electronic Support (ES) consisting of precision Electronic Support Measures (ESM), Specific Emitter Identification (SEI) and special receiver, increased processing throughput, open architecture, a standard combat system workstation with new Human Machine Interface (HMI), decoy integration, and EMI improvements. Increment 2 will introduce both RF and IR advanced Electronic Attack (EA) capabilities. This development will support both backfit and forward fit. Note: FY 1997 and prior funding for AIEWS is contained in U0954.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS: Not applicable.

2. (U) FY 1998 PLANS:

- (U) (\$25,317) Initiate AIEWS Increment 1 EMD to include receiver, SEI, precision ESM and integration efforts for both AEGIS and ISDS Combat Systems; implementation of risk reduction efforts and advanced technology demonstrations.
- (U) (\$793) Initiate development of Increment 1 logistics efforts to include electronic technical documentation, embedded training foundation, and perform manpower personnel and training analysis.

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Budget Item Justification
(Exhibit R-2, Page 48 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2309

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Advanced Integrated Electronic Warfare

3. (U) FY 1999 PLANS:

- (U) (\$39,225) Continue Increment 1 EMD.
- (U) (\$900) Continue development of Increment 1 logistics efforts.
- (U) (\$750) Initiate Increment 2 electronic attack trade study to optimize and ensure compatibility of onboard (RF/IR) countermeasures with offboard (RF/IR) countermeasures.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	0	26,929	41,487
(U) Appropriated Value:	0	26,929	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget		-819	-612
(U) FY 1999 PRESBUDG Submit:	0	26,110	40,875

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: FY 1998 and FY1999 decreases are due to undistributed Congressional reductions and minor pricing adjustments.
- (U) Schedule: Not applicable.
- (U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY:

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 231300 (AIEWS)	0	0	0	0	27,492	52,552	44,009	CONT.	CONT.
(U) RELATED RDT&E: Not applicable.									

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Budget Item Justification
(Exhibit R-2, Page 49 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998






BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604755N
 PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2309
 PROJECT TITLE: Advanced Integrated Electronic Warfare System (AIEWS)

D. (U) SCHEDULE PROFILE:

AIEWS PROGRAM SCHEDULE

6 Nov 1997

	FY96	FY97	FY98	FY99	FY00	FY01
INCREMENT 1	STUDIES		MS II	EMD		
	 BAA Contract Award	 BAA Results	 Contract Award			
INCREMENT 2	 Risk Reduction Efforts					 Increment 2 Risk Reduction Efforts

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Budget Item Justification
 (Exhibit R-2, Page 50 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2309
PROJECT TITLE: Advanced Integrated Electronic Warfare System (AIEWS)

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware Development	0	11,884	21,354
b. Software Development	0	10,100	14,425
c. Systems Engineering	0	1,202	1,700
d. Government Engineering Support	0	1,241	1,180
e. Test & Evaluation	0	0	500
f. Contractor Engineering Support	0	190	190
g. Integrated Logistics Support	0	793	900
h. Travel	0	100	100
i. Miscellaneous	0	600	526
Total	0	26,110	40,875

Note: Funding for AIEWS through FY97 is contained in U0954

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 51 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2309

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Advanced Integrated Electronic Warfare System (AIEWS)

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development										
DSR CAP SW Development	C/CPAF	10/97	20,678	20,678	0	0	7,500	7,314	5,864	20,678
LMIS Increment 1 EMD	C/CPAF	12/97	TBD	TBD	0	0	13,484	26,465	CONT	CONT
NRL	WR/RCP	10/97	CONT	CONT	0	0	1,628	1,605	CONT	CONT
NSWC/DD	WR/RCP	10/97	CONT	CONT	0	0	1,040	1,425	CONT	CONT
NSWC/PHD	WR/RCP	10/97	CONT	CONT	0	0	238	350	CONT	CONT
NSWC/CD	WR/RCP	10/97	CONT	CONT	0	0	330	400	CONT	CONT
AEGIS Integration	PD	01/98	CONT	CONT	0	0	1,000	2,000	CONT	CONT
Travel	WR	10/97	CONT	CONT	0	0	100	100	CONT	CONT
Miscellaneous	Various	Various	CONT	CONT	0	0	600	526	CONT	CONT

* Note: Funding for AIEWS is contained in Project U0954 for FY97 and prior.

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 52 of 62)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2309
PROJECT TITLE: Advanced Integrated Electronic Warfare System (AIEWS)

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Support and Management										
NSMO Technical Support	PD	10/94	CONT	CONT	0	0	190	190	CONT	CONT
Test and Evaluation										
AIEWS Increment 1	Various	12/98	CONT	CONT	0	0	0	500	CONT	CONT

GOVERNMENT FURNISHED PROPERTY: Not applicable

	FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Subtotal Product Development	0	0	25,920	40,185	CONT	CONT
Subtotal Support and Management	0	0	190	190	CONT	CONT
Subtotal Test and Evaluation	0	0	0	500	CONT	CONT
Total Project	0	0	26,110	40,875	CONT	CONT

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 53 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2348

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Multi Function Radar (MFR)

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U2348 Multi Function Radar (MFR)	0	0	35,573	71,660	78,529	88,371	74,675	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Multi Function Radar (MFR) will provide designated ships with an affordable, high performance radar system for ship defense well into the next century. Ships employing the MFR will achieve a level of force protection that greatly enhances ship defense capability against all threats envisioned in a littoral environment.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- Not Applicable.

2. (U) FY 1998 PLAN:

- Not Applicable.

3. (U) FY 1999 PLAN:

- (U) (\$35,573) Startup of Multi Function Radar (MFR) development program: Selection of E&MD contractor, begin E&MD phase of MFR.

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Budget Item Justification
(Exhibit R-2, Page 54 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2348

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Multi Function Radar (MFR)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
Appropriated Value:	0	0	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget	0	0	+35,573
(U) FY 1999 PRESBUDG Budget Submit:	0	0	35,573

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: FY 1999 adjustment due to transfer from classified program.
- (U) Schedule: Not applicable.
- (U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) Not applicable.

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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(U) RELATED RDT&E: Not applicable.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

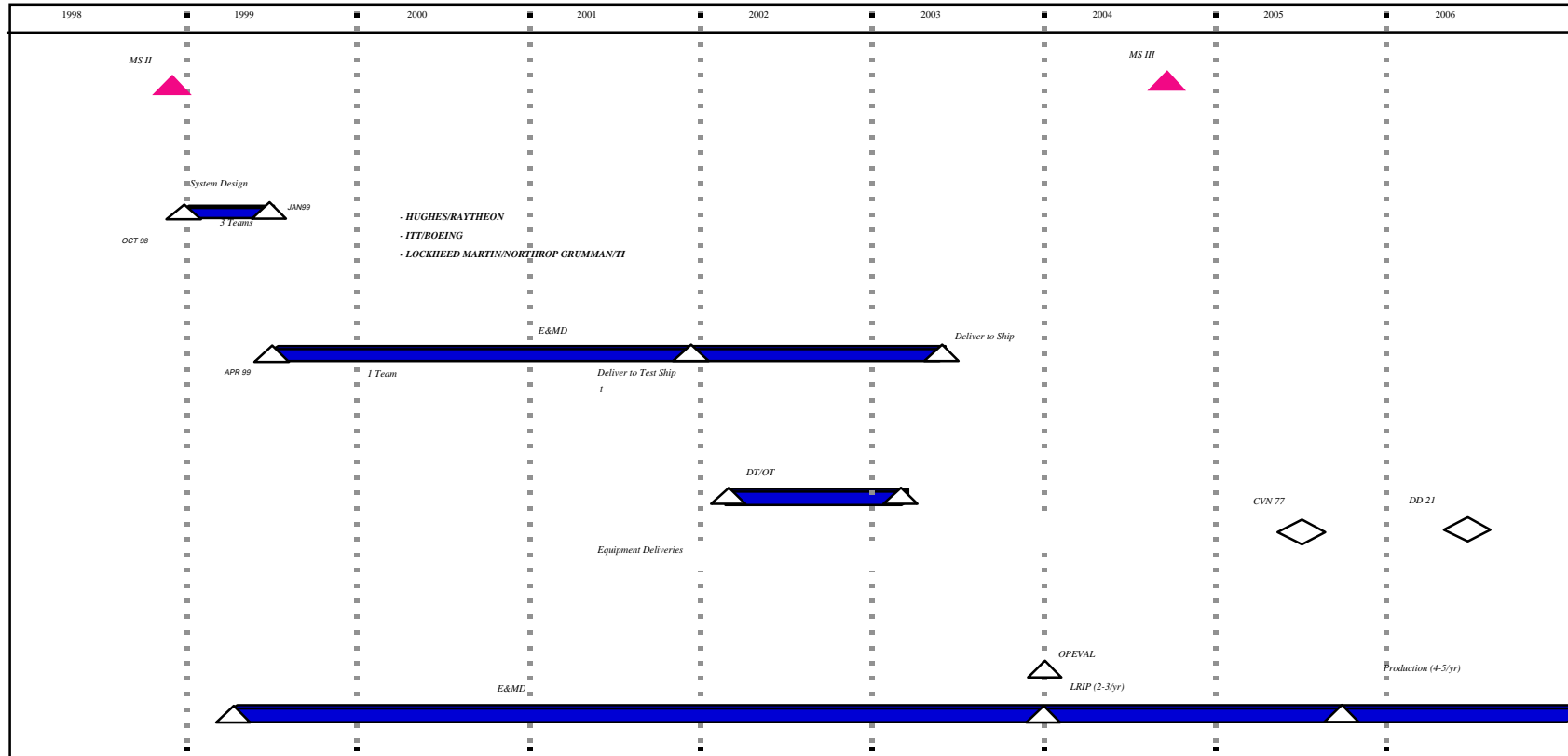
BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2348
PROJECT TITLE: Multi Function Radar (MFR)

D. (U) SCHEDULE PROFILE:

MFR PROGRAM PLAN (FY)



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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2348

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Multi Function Radar (MFR)

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories

a. E&MD Design, Fabrication, and Analysis
Total

FY 1997

FY 1998

FY 1999

0
0

0
0

35,573
35,573

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development										
3 Teams	FP/LOE	11/98	6,000	6,000	0	0	0	6,000	0	6,000
H&R Co. (Hughes-Raytheon/Joint Venture)										
Lockheed Martin, Northrop Grumman & Texas Instruments										
ITT/Boeing North America										
1 Team - TBD	CPAF/IF	4/99	TBD	272,000	0	0	0	22,373	CONT.	CONT.
Field Activities & Laboratories										
NAVSURFWARCENDIV	WR	10/98	13,400	13,400	0	0	0	2,400	CONT.	CONT.
Dahlgren, VA										
NAVAIRWARCENWPNDIV	WR	10/98	900	900	0	0	0	300	CONT.	CONT.
China Lake										

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RDT&E PE/Project Cost Breakdown
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2348

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Multi Function Radar (MFR)

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ FundType Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY1996 &Prior</u>	<u>FY1997 Budget</u>	<u>FY1998 Budget</u>	<u>FY1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development (cont)										
NAVAIRWARCENWPNDIV Pt Mugu	WR	10/98	3,100	3,100	0	0	0	100	CONT.	CONT.
NAVSURFWARCENDIV Port Hueneme, CA	WR	10/98	4,850	4,850	0	0	0	700	CONT.	CONT.
NWAD Corona, CA	WR	10/98	4,450	4,450	0	0	0	200	CONT.	CONT.
Naval Research Lab. Washington, DC	WR	10/98	2,400	2,400	0	0	0	400	CONT.	CONT.
Johns Hopkins Univ/ Applied Physics Lab.	S/CPFF	11/98	8,700	8,700	0	0	0	1,500	CONT.	CONT.
Georgia Tech Research Inst.	S/CPFF	11/98	2,900	2,900	0	0	0	500	CONT.	CONT.
Lincoln Lab./ Massachusetts Institute Tech. (LL/MIT)	S/CPFF	11/98	100	100	0	0	0	100	0	100
Test Range & Assets	Various	Various	20,000	20,000	0	0	0	0	CONT.	CONT.
Support and Management										
Support Contractor - TBD	C/CPFF	11/98	8,900	8,900	0	0	0	900	CONT.	CONT.
Travel & Miscellaneous	Various	Various	625	625	0	0	0	100	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2348

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: Multi Function Radar (MFR)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ FundType Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 &Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
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Test and Evaluation: Not Applicable

Government Furnished Property: Not Applicable

	FY1996	FY1997 & Prior	FY1998 Budget	FY1999 Budget	To Budget	Total Complete	Program
Subtotal Product Development	0	0	0	34,573	CONT.	CONT.	
Subtotal Support and Management	0	0	0	1,000	CONT.	CONT.	
Subtotal Test and Evaluation		0	0	0	0	CONT.	CONT.
Total Project	0	0	0	35,573	CONT.	CONT.	

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 59 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2442
PROJECT TITLE: I/R Search & Track

(U) COST (Dollars in thousands)

PROJECT NUMBER TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U2442 IR Search & Track	0	3,881	983	0	0	0	0	0	4,864

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The sophistication and diversity of threats facing naval surface combatants is increasing with respect to lower radar cross-section, use of passive anti-radiation missile (ARM), increased speed, and lower altitudes. This project provides funding for the Infrared Search & Track (IRST) System. The threat from Sea Skimming Anti-Ship Cruise Missiles (ASCMs) is increasing at a substantial rate and is impacting the Navy's force protection and battle space dominance capability. The IRST program bolsters ships force protection capabilities by providing fully integrated passive detection/declaration of Sea Skimming ASCM threats. Because IRST operates in the infrared portion of the electromagnetic spectrum it is immune to radar countermeasures and is not affected by atmospheric anomalies such as surface based ducting. In addition, IRST provides extremely accurate and precise elevation data at the horizon that allows immediate determination of hostile intent. IRST can also free up search radar resources by providing horizon search coverage where radar performance is marginal. The IRST provides passive augmentation to complement radar, electronic support measures(ESM)and visual surveillance systems for air targets. It will declare those air targets to the ships' combat system.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 PLAN:

- (U) (\$1,981) Complete IRST EDM design development, fabrication, and Combat Systems Integration.
- (U) (\$ 300) Perform IRST data collection to support algorithm refinement.
- (U) (\$1,200) Support IRST installation, test and development at Wallops Island.
- (U) (\$ 400) Prepare for IRST at sea testing.

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Budget Item Justification
(Exhibit R-2, Page 60 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2442
PROJECT TITLE: I/R Search & Track

2. (U) FY 1999 PLAN:
- (U) (\$833) Perform at sea testing.
 - (U) (\$150) Program IRST for extended deployment.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Appropriated Value			
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget	0	+ 3,881	983
(U) FY 1999 PRESBUDG Submit:	0	3,881	983

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Change in FY 1998 due to a Congressional Plus-Up for combat system integration and risk reduction(\$4,000) and minor pricing adjustments (\$-119). The FY 1999 increase is to complete at sea testing.

(U) Schedule: IRST development delayed one year due to delay in requirements formulation. Follow-on Engineering Development slipped two years to accommodate a 2-phase development approach.

(U) Technical: Not applicable.

- C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) Not applicable.
(U) RDT&E: Not applicable.

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Budget Item Justification
(Exhibit R-2, Page 61 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604755N

PROJECT NUMBER: U2442

PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT TITLE: I/R Search & Track

D. (U) SCHEDULE PROFILE:

	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program			
Milestones	1Q MS II		
Engineering		Complete at sea testing	
T&E			
Milestones	2Q Wallops Island LB testing		
Milestones	3Q Prepare for at sea testing		
Contract			
Milestones	2Q AWARD E&MD		

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Budget Item Justification
(Exhibit R-2, Page 62 of 62)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY:5

PROGRAM ELEMENT: 0604771N

PROGRAM ELEMENT TITLE: Medical/Dental Engineering Development

(U) COST (Dollars in thousands)

Project

Number & Title	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
M0933 Medical Dental Equipment Development	3,173	3,513	4,321	4,336	4,457	4,566	4,687	CONT.	CONT.
M2443 Casualty Monitoring	0	8,248	0	0	0	0	0	0	8,248
M2444 Navy Telemedicine	0	4,657	0	0	0	0	0	0	4,657

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose is to develop biomedical equipment and related techniques to reduce morbidity, to enhance the logistic feasibility of modern medical care for combat casualties, to sustain casualties for evacuation to fixed medical facilities for definitive care, and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a documented, authenticated military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms/industry participation in the projects.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

· (U) (\$200) HEARING PROTECTION: Developed low-cost, high efficiency hearing protection. Potential benefit is \$48M/yr Navy Dept VA claims, \$8M/yr Navy civilian claims. Patents and licenses will be enormously valuable.

· (U) (\$415) BLOOD AND BLOOD PRODUCTS: Continued advancement of freeze-dried technology with clinical trials and transition to a major pharmaceutical company now taking primary responsibility for freeze-dried platelets. Developed Good Manufacturing Practices (GMP) procedure concept for LEH blood substitutes, including safety and efficacy tests. Initiated use of Navy/Army Hemoglobin Production Facility for encapsulated blood substitutes.

· (U) (\$1468) ADVANCED FROZEN RED CELL WASHER/CLOSED LOOP BLOOD PROCESSOR: Developed initial prototype of red cell washer to clear cryoprotectant from thawed frozen banked blood. Gulf War lesson: need for automation and greater throughput. Joint Army/Navy effort.

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Exhibit R-2

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY:5

PROGRAM ELEMENT: 0604771N

PROGRAM ELEMENT TITLE: Medical/Dental Engineering Development

- (U) (\$325) SPATIAL DISORIENTATION/VESTIBULAR VEST: Two devices for novel vestibular tests have been designed and either built or contracted out for development.
- (U) (\$420) TELEMEDICINE: Began the development and integration of the Medical Information Management System (MIMS) to be deployed on tactical ships with medical responsibilities.
- (U) (\$195) ACTIVE NOISE CANCELLATION STETHESCOPE: Design test chamber to evaluate hardware as it becomes available for testing.
- (U) (\$150) MEDICAL WARGAMING: Began the development of medical wargaming models to interface with line wargaming for readiness planning, training, rehearsal, and assessment and completed the first medical oriented wargame.

2. (U) FY 1998 PLAN:

- (U) (\$276) ENHANCED HEARING PROTECTION: Continue transition and testing of developed passive hearing protection material to Navy/Marine Corps application. Continue refinement of development items.
- (U) (\$1260) ADVANCED FROZEN RED CELL WASHER/CLOSED LOOP BLOOD PROCESSOR: Continue advanced development and testing of automated red cell washer to deglycerolize (remove cryoprotectant) the thawed blood and resuspend the red cells for transfusion. Finalize prototype based on testing and updated FDA requirements for approval of the prototype system.
- (U) (\$360) SPATIAL DISORIENTATION/VESTIBULAR VEST: Complete development of clinical testing of aviator spatial disorientation. Begin demonstration to the operational forces and initial implementation into standard testing procedures with any necessary protocol and equipment refinement.
- (U) (\$420) TELEMEDICINE: Continue the development and integration of the Medical Information Management System (MIMS) to be deployed on tactical ships with medical responsibilities.
- (U) (\$230) ACTIVE NOISE CANCELLING STETHESCOPE: Continue development of medical stethoscope device for cardiac monitoring in high noise shipboard and combat environments.
- (U) (\$245) POTABLE WATER TESTING: Initiate development of simple, portable device for testing potable water quality for use in combat environments.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY:5

PROGRAM ELEMENT: 0604771N

PROGRAM ELEMENT TITLE: Medical/Dental Engineering Development

· (U) (\$344) UNDERWATER SOUND PROTECTION: Begin protection from bioeffects for divers exposed to intense underwater sound. There is no means to monitor Low Frequency Acoustic active sonar exposure on submerged divers.

· (U) (\$125) MEDICAL WARGAMING: Complete and initiate medical wargaming models to interface with line wargaming for readiness, planning, training, rehearsal, and assessment.

· (U) (\$217) LASER THREAT ANALYSIS: Begin development of mission planning tools needed minimize the emerging threat of man portable lasers to aircrews.

· (U) (\$36) CARBON DIOXIDE SENSOR: Begin development of carbon dioxide sensor for Fleet divers.

3. (U) FY 1999 PLAN:

· (U) (\$200) ENHANCED HEARING PROTECTION: Complete transition and testing of developed passive hearing protection material to Navy/Marine Corps application.

· (U) (\$1198) ADVANCED FROZEN RED CELL WASHER/CLOSED LOOP BLOOD PROCESSOR: Complete advanced development and testing of automated red cell washer to remove cryoprotectant from the thawed blood and resuspend the red cells for transfusion. Complete prototype testing and FDA approvals for industry manufacturing and use by military blood banks.

· (U) (\$500) SPATIAL DISORIENTATION/VESTIBULAR VEST: Complete demonstration to the operational forces of system effectiveness and complete implementation into standard procedures with continued monitoring of utilization and effectiveness.

· (U) (\$448) TELEMEDICINE: Complete the development and integration of the Medical Information Management System (MIMS) to be deployed on tactical ships with medical responsibilities.

· (U) (\$325) ACTIVE NOISE CANCELLING STETHESCOPE: Complete development of medical stethoscope device for cardiac monitoring in high noise shipboard and combat environments.

· (U) (\$500) POTABLE WATER TESTING: Continue development of simple, portable device for testing potable water quality for use in combat environments.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY:5

PROGRAM ELEMENT: 0604771N

PROGRAM ELEMENT TITLE: Medical/Dental Engineering Development

· (U) (\$500) UNDERWATER SOUND PROTECTION: Complete development of protection from bioeffects for divers exposed to intense underwater sound.

· (U) (\$350) LASER THREAT ANALYSIS: Begin development of mission planning tools needed minimize the emerging threat of man portable lasers to aircrews.

· (U) (\$300) CARBON DIOXIDE SENSOR: Continue development of a sensor/alarm system to warn of hazardous CO₂ levels in the closed-circuit rebreathers worn by the divers on SPECWAR, EOD and mine countermeasure missions.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	3,148	3,620	4,397
(U) Adjustments from PRESBUDG:	25	-107	-76
(U) FY 1999 Program Review Submit:	3,173	3,513	4,321

(U) CHANGE SUMMARY EXPLANATION: FY97 increase (+25K) is for minor programmatic adjustments. FY98 decrease (-107K) due to Congressional Undistributed Reductions. FY99 decrease (-76K) is for commercial non-pay purchases inflation adjustment.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) N/A

(U) RELATED RDT&E: PE 0603706N (Medical Development)

D. (U) SCHEDULE PROFILE: N/A

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Exhibit R-2

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DATE: FEBRUARY 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROGRAM ELEMENT TITLE: Navigation/ID Systems

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F0253 Navigation and Electro-optical Support	11,688	3,854	5,268	3,121	1,616	1,346	1,697	CONT.	CONT.
W0676 Improved ID Developments	1,175	0	0	0	0	0	0	0	91,627
W1253 Combat ID System	4,378	0	0	0	0	0	0	0	98,386
W2212 All Service Combat Identification Evaluation Test (ASCIET)	3,008	1,507	3,968	4,019	4,107	4,180	4,240	CONT.	CONT.
X0921 NAVSTAR GPS Equipment	28,355	25,250	26,047	10,046	9,905	10,227	21,382	CONT.	CONT.
X2303 Combat Survivor Evader Locator (CSEL)	450	461	0	0	0	0	0	0	1,291
X2313 Situational Awareness Beacon with Reply (SABER)	0	6,388	7,018	3,314	1,144	1,124	1,154	CONT.	CONT.
TOTAL	49,054	37,460	42,301	20,500	16,772	16,877	28,473	CONT.	CONT.

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Budget Item Justification
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DATE: FEBRUARY 1998

FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROGRAM ELEMENT TITLE: Navigation/ID Systems

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Reliable and secure Navigation and positive identification (ID) systems are essential elements of battle management in the naval environment. NAVSTAR Global Positioning System (GPS) is a space-based radio positioning and navigation system that provides users with worldwide, all weather, three dimensional position, velocity and precise time data based on a constellation of 21 or more satellites. In addition to distinguishing friend from foe for weapons employment, the Navy requires secure, jam resistant Identification Friend or Foe (IFF) systems for battle group air defense management and air traffic control. Identification is multifaceted and includes information received from several sensors (both cooperative and non-cooperative systems). The Combat Identification System (CIS) project (W1253) covers the Navy lead of a MK XII Waveform definition for future Aircraft IFF (AIFF) and NATO interoperability. AIFF supersedes Cooperative Aircraft Identification (CAI) per June 95 direction.

The All Service Combat Identification Evaluation Team (ASCIET) project (W2212) covers the Navy portion of a new joint service sponsored test and evaluation team effort, formerly the OSD sponsored Joint Air Defense Organization-Joint Engagement Zone (JADO-JEZ) program. The program is designed to evaluate cooperative and non-cooperative combat identification systems and tactics, as well as serve as a conduit for evaluating research and development in promising combat identification technologies. Per OSD direction, NATO participation is encouraged and performance data is exchanged to ensure the opportunity for interoperability with allied identification systems is maximized. The Improved Identification Developments project (W0676) develops Non-Cooperative Target Recognition (NCTR) and integration techniques. The Photonics Mast (F0253) is a non-hull penetrating replacement for existing optical periscopes. The Photonics Mast exploits a wide portion of the electro-magnetic spectrum utilizing advanced Electro-Optic/thermal imaging and communications reception/Electronic Warfare Support Measures (ESM). The Combat Survivor Evader locator (CSEL), project (X2303), covers the Navy portion of a joint service program to develop and procure an improved Combat Search And Rescue (CSAR) radio. The Situational Awareness Beacon with Reply (SABER) system, project (X2313), system provides critical battlefield/operating area situational awareness and friendly ID capabilities by uniting GPS and UHF/SATCOM technologies. The SABER system consists of a GPS receiver and two-way UHF radio capable of Over-The-Horizon (OTH) and Line-Of-Sight (LOS) communications.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: F0253

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F0253 Navigation and Electro-Optical Support	11,688	3,854	5,268	3,121	1,616	1,346	1,697	CONT.	CONT.
Quantity of RDT&E Articles			1 EDM						

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Photonics Mast will replace existing penetrating periscopes and exploit a wide portion of the electro-magnetic spectrum through advanced E-O/thermal imaging and ESM/Communications reception. It will provide major improvements in submarine stealth and infrared imaging capabilities. The non-hull penetrating design provides freedom in ship design as well as space savings for future design submarines. The system has been designed to satisfy Operational Requirement #365-87-94. The Photonics system, mounted on the Universal Modular Mast, on the New Attack Submarine and has been designed for backfit on the earlier ship classes, SSN-688 and SEAWOLF class submarines.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$11,558) Continued Photonics Program EMD Phase.
- U) (\$20) Completed Photonics Program Critical Design Review.
- (U) (\$50) Perform Photonics Program Test Readiness Review.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: F0253

PROGRAM ELEMENT TITLE: Navigation/ID Systems

- (U) (\$25) Perform Universal Modular Mast Functional Configuration Audit (FCA).
 - (U) (\$35) Perform Universal Modular Mast Program Physical Configuration Audit (PCA).
2. (U) FY 1998 PLAN:
- (U) (\$3,655) Continue Photonics Program Engineering and Manufacturing Development Phase.
 - (U) (\$75) Perform Photonics Program FCA and PCA.
 - (U) (\$124) Perform Photonics Program/Universal Modular Mast DT IIA testing.
3. (U) FY 1999 PLAN:
- (U) (\$2,645) Continue Program EMD Phase.
 - (U) (\$623) Perform Photonics System/Universal Modular Mast DT IIB testing.
 - (U) (\$2,000) Commence On-Board Team Trainer Development.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: F0253

PROGRAM ELEMENT TITLE: Navigation/ID Systems

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	11,976	4,005	3,326
(U) Appropriated Value:	12,505	4,005	0
(U) Adjustments from Appropriated/President's Budget	-817	-151	-1,942
(U) FY 1999 President's Budget Submit:	11,688	3,854	5,268

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 97 decrease of \$817K is a result of a Small Business Innovative Research Assessment (-\$273K) and congressional undistributed reductions (-\$544K). The FY 98 decrease of(-\$151)is a result of undistributed reductions. The FY-99 increase of \$1,942K is for the development of on-board team training, test and integration (+2,000K) and NWCf Centers (+\$27K) and undistributed reductions (-85K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) SCN line 201300	19,976	15,062	0	15,850	16,210	0	CONT.	CONT.

(U) Related RDT&E

(U) PE 0603226E (Experimental Evaluation of Innovative Technology)

(U) PE 0604558N (New Design SSN Development)

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Budget Item Justification
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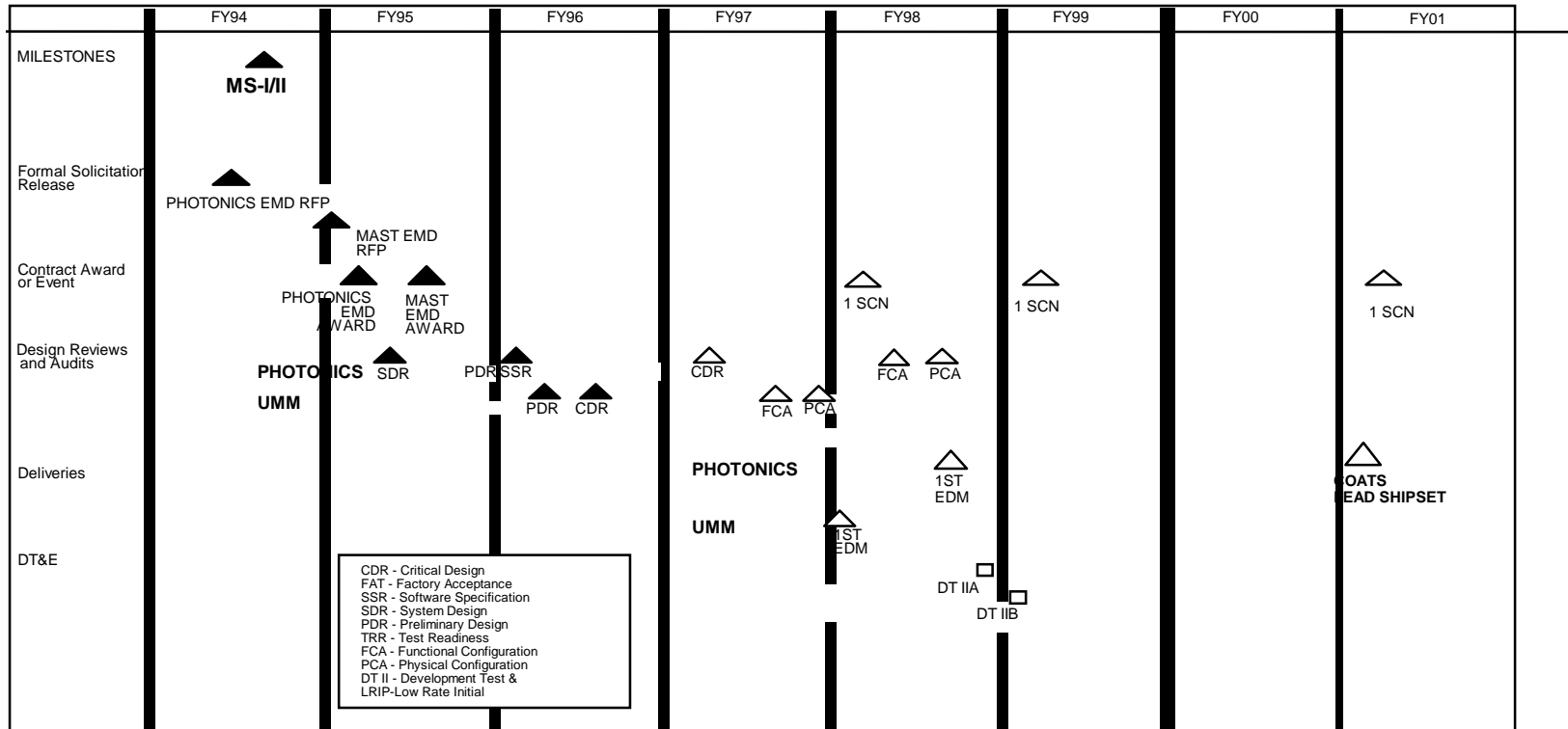
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D. (U) SCHEDULE PROFILE: See attached.

0604777N/F0253

PROGRAM SCHEDULE



SLIDE 6

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: F0253

PROGRAM ELEMENT TITLE: Navigation/ID Systems

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware/Computers	5,434	1,521	4,001
b. Project Management/Systems Engineering	1,739	925	734
c. Integrated Logistics Support	3,035	316	176
d. Installation and Test	1,480	1,092	357
Total	11,688	3,854	5,268

B. BUDGET ACQUISITION HISTORY AND PLANNING: Not Applicable.

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Budget Item Justification
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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT NUMBER: W0676
PROJECT TITLE: Improved ID
Developments

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0676 Improved ID Developments	1,175	0	0	0	0	0	0	0	91,627

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides for the development and integration of NCTR techniques for Improved Identification (IID). Project is developing an upgraded AN/SLQ-20 system (SLQ-20B).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1,175) Performed operational testing, passed Milestone III and transitioned AN/SLQ-20 Upgrade to production.

2. (U) FY 1998 PLAN:

- N/A

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W0676

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Improved ID
Developments

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	1,195	2,094	0
(U) Appropriated Value:	1,254		
(U) Adjustments from President's Budget:	-20	-2,094	0
(U) FY 1999 OSD/OMB Budget Submit:	1,175	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease \$19K resulted from Small Business Innovation Research Assessment. Decrease \$1K resulted from FY97 Supplemental Revised Economic Assumptions
FY 1998 decrease \$2,094 resulted from completion of program.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	<u>FY 1997</u>	<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>TO</u>	<u>TOTAL</u>
	<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
(U) OPN Surface ID Systems	0	0	5,321	2,921	1,673	1,690	1,684	Cont.	Cont.
(U) RELATED RDT&E:									
(U) PE 0603742F, Combat ID Systems.									
(U) PE 0603772A, Advanced Tactical Comp. Science Sensors.									
(U) PE 0602120A, Electronic Surveillance & Fusing Technologies.									
(U) PE 0604817A, Combat Identification.									

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN
FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: FEBRUARY 1998
DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W0676

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Improved ID Developments

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	2Q SLQ-20 MS III			
Engineering Milestones				
T&E Milestones	1Q SLQ-20 OT			
Contract Milestones	3Q SLQ-20B production			

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN
FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: FEBRUARY 1998
DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT NUMBER: W2212
PROJECT TITLE: All Services
Combat ID
Evaluation Test
(ASCIET)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W2212 All Service Combat Identification Evaluation Test	3,008	1,507	3,968	4,019	4,107	4,180	4,240	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: ALL SERVICES COMBAT IDENTIFICATION EVALUATION TEAM (ASCIET) PROGRAM. (Formerly, the Office of the Secretary of Defense (OSD) sponsored Joint Air Defense Organization-Joint Engagement Zone (JADO-JEZ) testing.) This is a new joint service test program whose operations have been proportionally assumed by the four Services under the oversight of the General Officer Steering Committee for Combat Identification (GOSC-CI) and the Joint Combat Identification Office (JCIDO). The program is designed to conduct periodic joint exercises to evaluate and assess cooperative and non-cooperative, direct and indirect, passive and active combat identification systems, platforms, and tactics, as well as serving as the primary test bed for evaluating research and development in promising combat identification technologies in a joint, tactical environment. Per OSD direction, NATO participation is encouraged and performance data is exchanged to ensure the opportunity for interoperability with allied identification systems is maximized.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$3,008) Conducted test and evaluation of combat identification platforms and systems in the air-to-air and ground-to-air mission areas.

Evaluation Test (ASCIET)

2. (U) FY 1998 PLAN:

- (U) (\$1,507) Conduct test and evaluation of combat identification platforms and systems in the air-to-ground and ground-to-ground mission areas.

3. (U) FY 1999 PLAN:

- (U) (\$3,968) Conduct test and evaluation of combat identification platforms and systems in the air-to-air and ground-to-air mission areas.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W2212

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: All Services Combat ID

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
• (U) FY 1998 President's Budget:	2,960	1,552	3,205
• (U) Appropriated Value:	3,085		
• (U) Adjustments from President's Budget:	+48	(45)	+763
• (U) FY 1999 President's Budget Submit:	3,008	1,507	3,968

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: FY 1997 decrease of \$78K from the Small Business Innovation Research Assessment. Decrease \$3K from FY97 Supplemental Revised Economic Assumptions. Decrease \$1K from FY97 Supplemental Revised Economic Assumptions. Increase \$130K represents minor BTR. FY 1998 decrease of \$45K from congressional undistributed adjustments including \$23K, Sec. 8043 1.5% General Reduction and \$19K Sec. 8048 R&D General Reduction and \$3K Revised Economic Adjustments. FY 1999 increase of \$900K needed for ASCIET test and evaluation of combat identification platforms and systems in the air-to-air and ground-to-air mission areas. Increase \$13K for NWCF Surcharge, decrease \$80K for Navy/OSD R&D reductions and decrease \$70K for Commercial Purchases Inflation.
- (U) Schedule: Not applicable.
- (U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) Not applicable.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN
 FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W2212

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: All Services Combat ID
 Evaluation Test (ASCIET)

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Fleet Test and Evaluation	2,956	1,507	3,968
b. Miscellaneous	40	0	0
b. Travel	12	0	0
 Total	 3,008	 1,507	 3,968

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development					0	0	0	0	Cont.	Cont.
Support and Management					0	0	0	0	Cont.	Cont.
Test and Evaluation Miscellaneous		Various			2,730	3,008	1,507	3,968	Cont.	Cont.

GOVERNMENT FURNISHED PROPERTY : Not applicable.

	<u>Total FY 1996 & Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	0	0	0	0	Cont.	Cont.
Subtotal Support and Management	0	0	0	0	Cont.	Cont.
Subtotal Test and Evaluation	2,730	3,008	1,507	3,968	Cont.	Cont.
Total Project	2,730	3,008	1,507	3,968	Cont.	Cont.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W1253

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Combat ID
Systems

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W1253 Combat ID Systems	4,378	0	0	0	0	0	0	0	98,386

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: USN has the requirement for a Cooperative Aircraft Identification (CAI) system that would replace aging Identification, Friend or Foe equipments. The Joint Chiefs of Staff/Joint Requirements Oversight Council Mission Needs Statement (JCS/JROC MNS) for Combat Identification was validated 4/92. OSD had a Milestone/Defense Acquisition Board (DAB) 0 in Aug 92 which directed "Combat ID to enter into Phase 0 for Joint Concept Exploration and Definition studies on Battlefield ID (Army lead) and CAI (Navy) with Navy as overall lead for coordination of both Phase 0 efforts." A Cost and Operational effectiveness Analysis (COEA) was underway to investigate options to be presented at DAB I; the Naval Research lab (NRL) was directing COEA studies. Events were overtaken by a DOD blue-ribbon Combat ID Task Force in FY 95 examining larger combat identification architectures. Their 4/95 DOD position and 5/95 report reduced the CAI focus to a new waveform mode for MK XII and NATO STANAG revision by the end of FY 97.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$2,700) Performed lab fabrication/test, assembled flyable hardware, drafted STANAG refinements; presented test reports and initial drafted STANAG to DOD.
- (U) (\$1,678) Continued STANAG for Level 1 Mode 5 development. Continued assembly and test of flyable hardware. Continued simulation and modeling efforts for waveform definition phase.

2. (U) FY 1998 PLAN: N/A.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W1253

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Combat ID Systems

3. (U) FY 1999 PLAN: N/A

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
• (U) FY 1998 President's Budget:	0	0	0
• (U) Adjustments from President's Budget:	4,378	0	0
• (U) FY 1999 President's Budget Submit:	4,378	0	0

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: FY 1997 increase \$4,878K resulted from 3 separate BTRs, within PE, needed to complete program. Decrease of \$500K for FY97 SBIR Transfer.
- (U) Schedule: Not applicable.
- (U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) Not applicable.

(U) RELATED RDT&E:

- (U) PE 0603772A (Advance Tactical Comp. Science Sensors)
- (U) PE 0602120A (Electronic Surveillance & Fusing Technologies)
- (U) PE 0603742F (Combat ID Systems)
- (U) PE 0604817A (Combat Identification)

B. (U) SCHEDULE PROFILE: Not applicable.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN
PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

Date: FEBRUARY 1998
PROJECT NUMBER: X0921
PROJECT TITLE: NAVSTAR GPS

BUDGET ACTIVITY: 5

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0921 NAVSTAR Global Positioning System (GPS) Equipment	28,355	25,250	26,047	10,046	9,905	10,227	21,382	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: RDT&E funds are used to perform all the non-recurring Global Positioning System (GPS) Aircraft Integration efforts required for 86 different configurations of Navy, Marine Corps and Coast Guard aircraft in response to the CNO GPS Integration Guidance (GIG) and the FY94 Authorization Act. The GIG directs GPS design functional characteristics for the aircraft and the FY94 Authorization Act directs the schedule for completion of all installations by 1 Oct 2000. The NAVSTAR GPS is a space-based radio positioning and navigation system that provides users with worldwide, all-weather, three-dimensional position, velocity and precise time data based on a constellation of 24 satellites. PMW-187 is the central office responsible for funding all GPS aircraft integration RDT&E efforts performed by over 20 NAVAIR program offices, dozens of DoD/Navy field activities and laboratories, and dozens of contractors. The aircraft installation recurring efforts are funded separately by PMW-187 and the platform program offices with APN dollars. The primary tasks to be accomplished for each of the 86 aircraft configurations include: GPS integration design studies; procurement of aircraft and lab RDT&E assets; modifications to test aircraft hardware and/or software designs; development of Integrated Logistics Support (ILS) elements to support test (operator and maintenance manuals); and Formal Navy Test and Evaluation (Development and Operational Test). Other tasks include the development of new hardware systems to meet GIG requirements when existing systems are unsuitable (GINA for the T-45A; EGI for the AH-1W, F-14A/B, and F/A-18; the Digital Data Set (DDS); the Control Display Navigation Unit (CDNU) and associated software for many different aircraft) and the development of and modifications to the GPS Mission Planning Module for the Tactical Aircraft Mission Planning System (TAMPS). PMW-187 is also responsible for the building and fielding of the Navigation Sensor System Interface (NAVSSI). NAVSSI is a surface and submarine based system that accepts and processes navigation inputs and distributes the processed output to user systems. NAVSSI provides position, velocity, time and almanac data to on-board command and control systems in real time with NAVSTAR GPS as the primary source of navigation data. NAVSSI is being fielded on 299 surface and subsurface platforms. All of the above efforts are directed by, tasked by and funded by PMW-187.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

2. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$15,356) Continued integration engineering on RC-12M, UC-12M, F-14A/B, HH-1N, VH-3D, VH-60, S-3B, EA-6B, F/A-18A, F-5, AH-1W, P-3A, C-20D, C-20G, T-34, CH-53D, RH-53D, E-2C, UH-3H, P-3C, AV-8B, C-9, F-14D, CH-53D, TH-57C, SH-60R, HC-130H aircraft.
- (U) (\$3,200) Continued efforts in areas of integration design support, data reduction, platform test support, deficiency resolution and user equipment design analysis rates.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS

- (U) (\$8,249) Continued NAVSSI upgraded and integration engineering with shipboard command and control.
 - (U) (\$850) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementing guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conducted associated C4ISR analyses and studies.
 - (U) (\$700) SSC Charleston and SSC San Diego SABER supported JWID and MEU-13 Deployment.
3. (U) FY 1998 PLAN:
- (U) (\$10,048) Continue integration engineering on F-14A/B, F/A-18A, F/A-18B, EA-6B aircraft.
 - (U) (\$6,500) Continue NAVSSI upgrade, integration engineering and testing with shipboard combat, weapons, navigation, and command and control systems. Evolutionary upgrades include GPS ephemeris and ionospheric corrections for gun and missile systems; NIMA data server for LAN capable ships; SPS-73 radar integration to meet Electronic Chart Display Information System (ECDIS) requirements; electronic navigation testing and certification; communication interface to support electronic corrections to NIMA databases; Year 2000 corrections; transition to IT 21.
 - (U) (\$3,845) Continue effort in areas of integration design support, data reduction, platform test support, deficiency resolution and user equipment design analysis.
 - (U) (\$1,000) Initiate effort to design, develop and test a suitable anti-jam GPS antenna for Navy tactical aircraft such as F/A-18 C/D/E/F, F-14, ES-3A, EA-6B, E-2C and selected helicopters. Anti-jam enhancements have been identified as a requirement in the Navigation Warfare (NAVWAR) Mission Need Statement (MNS) which has been validated by the JROC.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS
Equipment

3. (U) FY 1998 PLAN (cont.):

- (U) (\$1,500) Continue incorporation of National Air Space (NAS) Non-Precision Approach (NPA) sole/primary IFR navigation requirements into the CDNU-008 baseline demo version. (Effort started in FY 97 with funding from N88 RDT&E,N and APN-5). Perform flight tests on an actual HH-1N fully integrated helicopter. NPA GPS requirement has been identified in Federal Radio Navigation Plan (FRP), Chairman Joint Chiefs of Staff Master Navigation Plan (MNP), and CNO's Draft GPS Integration Guidance (GIG).
- (U) (\$700) Begin software/hardware requirements definition and implementation of GPS based Terrain Avoidance and Awareness System (GTAAS) in CDNU based air platforms such as P-3, C-130 and selected helicopters. Define additional CDNU capabilities required to incorporate GTAAS and other requirements.
- (U) (\$680) Initiate development of navigation prevention capabilities for use on selected Navy tactical aircraft, UAV's and ships. This requirement has been identified in the Navigation Warfare (NAVWAR) Mission Need Statement (MNS) and in the President's Decision Directive (PDD) on GPS policy (May 96).
- (U) (\$500) Perform modeling and simulation to determine GPS vulnerability aspects of Navy surface and subsurface platforms as well as Navy command, control, communication and computer and intelligence (C4I) nodes. Identify requirements necessary for POM 00 preparations.
- (U) (\$477) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

Equipment

4. (U) FY 1999 PLAN:

- (U)(\$9,015) Continue integration engineering on F-14A/B, F-14D, F/A-18A, F/A-18B, EA-6B, SH-60R, F-5E/F, TC-130G.
- (U) (\$7,000) Continue NAVSSI upgrade, integration engineering and testing with shipboard combat, weapons, navigation, and command and control systems. Evolutionary upgrades include GPS ephemeris and ionospheric corrections for gun and missile systems; NIMA data server for LAN capable ships; SPS-73 radar integration to meet Electronic Chart Display Information System (ECDIS) requirements; electronic navigation testing and certification; communication interface to support electronic corrections to NIMA databases; Year 2000 corrections; transitions to IT21.
- (U) (\$3,000) Continue effort in areas of integration design support, data reduction, platform test support, deficiency resolution and user equipment design analysis.

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BUDGET ACTIVITY: 5
FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN
PROGRAM ELEMENT: 0604777N
Date: FEBRUARY 1998
PROJECT NUMBER: X0921
PROGRAM ELEMENT TITLE: Navigation/ID Systems
PROJECT TITLE: NAVSTAR GPS

- (U) (\$1,500) Continue effort to design, develop and test a suitable anti-jam GPS antenna for Navy tactical aircraft such as F/A-18 C/D/E/F, F-14, ES-3A, EA-6B, E-2C and selected helicopters. Anti-jam enhancements have been identified as a requirement in the Navigation Warfare (NAVWAR) Mission Need Statement (MNS) which has been validated by the JROC.
- (U) (\$1,500) Continue incorporation of National Air Space (NAS) Non-Precision Approach (NPA) sole/primary IFR navigation requirements into the CDNU-008 baseline demo version. Begin incorporating 008 S/W into Naval aviation platforms. NPA GPS requirement has been identified in Federal Radio Navigation Plan (FRP), Chairman Joint Chiefs of Staff Master Navigation Plan (MNP), and CNO's Draft GPS Integration Guidance (GIG).
- (U) (\$1,500) Continue software/hardware requirements definition and implementation of GPS based Terrain Avoidance and Awareness System (GTAAS) in CDNU based air platforms such as P-3, C-130 and selected helicopters. Implement additional CDNU capabilities required to incorporate GTAAS and other requirements.
- (U) (\$1,532) Continue development of navigation prevention capabilities for use on selected Navy tactical aircraft, UAV's and ships.
- (U) (\$1,000) Continue modeling and simulation efforts to determine GPS vulnerability aspects of Navy surface and subsurface platforms as well as Navy command, control, communication and computer and intelligence (C4I) nodes. Identify requirements necessary for POM 00 preparations.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	30,706	34,115	43,894
(U) Adjustments FY 1998 PRESBDUG:	-2,351	-8,865	-17,847
(U) FY 1999 President's Budget Submit:	28,355	25,250	26,047

(U) CHANGE SUMMARY EXPLANATION:

(U) FY 1997: Funding change of -\$466K due to Small Business Innovation Research assessment and -\$1,885K is a BTR reduction for higher priority Navy programs within this PE(Combat ID Systems).

FY 1998: Funding change of -\$3,700K for accelerated Defense Meteorological Satellite Program (DSMP) development and -\$3,920K needed for Tactical Aviation Mission Planning System (TAMPS) shortfall; -\$728K for Congressional undistributed general reductions; -\$58K for economic assumptions; -\$459K for Navy/OSD R&D offsets.

FY 1999: Funding change of -\$500K redirected to develop and update overarching C4ISR mission requirements; -\$6,269K for other GPS efforts related to IT-21; -\$244K for Maritime Battle Center; -\$225K NWCF surcharge pricing adjustment; -\$10,000K deferred until FY 2000 and out to balance GPS R&D with GPS procurement and smooth funding profile; +70K for military and civilian pay rate adjustment; -\$458K for commercial purchases inflation; -\$221K for Navy/OSD R&D offsets.

(U) Schedule: None.
(U) Technical: None.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS
Equipment

(U) COST: (Dollars in thousands)

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) O&MN PE#: 0305164N	2,637	3,123	2,127	2,225	2,309	2,383	2,437	cont.	cont.
(U) OPN Line #26570	4,114	4,898	9,542	9,461	10,190	10,502	10,608	cont.	cont.
(U) APN-Common Avionics	34,219	49,801	30,168	9,469	18,276	14,438	24,845	cont.	cont.

(U) RELATED RDT&E: None

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	3,017	2,846	2,322
b. Systems Engineering	5,103	5,515	6,394
c. Software Development	4,794	4,122	4,064
d. Hardware Development	14,281	11,838	11,732
e. System Test & Evaluation	956	629	1200
f. Integrated Logistics Support	204	300	335
Total	28,355	25,250	26,047

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS
Equipment

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 To Budget Complete	Total Program
Product Dev Major Contracts									
F-14/B	SS	Aug-96	10415	10415	3330	2085	4051	2000	11466
Integ w/options Grumman Aero w/ options									
F-18A/B	SS	Jul-95	15000	15000	7404	90	5320	3096	15910
Integ w/options McDonnell Douglas St. Louis, MO									
S-3B	SS	May-95	2524	2524	2524				2524
Lockheed Aero w/options Marietta, GA									
F-14D	SS	Jul-95	19084	19084	19084				19084
Grumman Aero Corp Bethpage, NY									
C-12	SS	Jul-97	2000	2000	1000	1000			2000

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS
Equipment

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
All Other Contracts					202038	6405	1189	2173		211805
Subtotal Contracts					235380	9580	10560	7269		262789
In-House NRaD Code 31 San Diego, CA	WX	Dec-94			6668	3503	3229	4000		17400
NRaD Code 32 San Diego, CA	WX	Dec-94			10332	8249	6500	6500		31581
NAWC Indianapolis, IN	WX	Dec-94			7176	100				7276
NAWC China Lake, CA	WX	Dec-94			6170					6170
NAWC Patuxent River, MD	WX	Dec-94			6868	956	629	1200		9653
All Other less than \$1m	WX				389172	5011	3703	5878	17758	421522

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Date: FEBRUARY 1998

BUDGET ACTIVITY: 5 FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN
 PROGRAM ELEMENT: 0604777N PROJECT NUMBER: X0921
 PROGRAM ELEMENT TITLE: Navigation/ID Systems PROJECT TITLE: NAVSTAR GPS Equipment

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)
 PERFORMING ORGANIZATIONS

Contractor/ Contract Government Method/ Performing Fund Type Activity Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal In-House				426386	17819	14061	17578	17758	493602
Support and Management				12710	0	0	0		12710
All Other Contracts (Aggregate Total)				235380	9580	10560	7269		262789
Test and Evaluation All Other Field/Lab Activities				18575	956	629	1200		21360

GOVERNMENT FURNISHED PROPERTY: Not Applicable.

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	661766	27399	24621	24847	17758	756391
Subtotal Support and Management	12710	0	0	0	0	12710
Subtotal Test and Evaluation	18575	956	629	1200	0	21360
Total Project	693051	28355	25250	26047	17758	790461

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2303

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Combat

Survivor Evader Locator

(U) COST: (Dollars in thousands)

PROJECT NUMBER & FY 1997 TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2303 Combat Survivor Evader Locator (CSEL)	450	461	0	0	0	0	0	1291

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: In response to a Joint Memorandum of 21 Sept 95 from the Secretary of Defense and the Director, Intelligence Community, CSEL is being developed as a joint service program with RDT&E funding provided by the Air Force as the lead service. The memorandum directed the development and procurement of an improved Combat Search And Rescue (CSAR) system to fulfill the CSEL Mission Needs Statement (MNS) as validated by the Joint Requirements Oversight Council (JROC), to include providing GPS precision positioning service, dual frequency (Y Code) capability to the survivor and rescuers. The CSEL system consists of three segments: 1) the user segment, which includes a new self-locating hand-held survival radio with GPS and OTH data burst capability; 2) the Over-The-Horizon (OTH) Communications relay segment comprised of satellite-based data relays; and 3) the Ground segment made up of a communications distribution and display network. The OTH segment will rely on the use of existing DoD and other Agency assets to meet threshold requirements. Future improvements will evaluate use of mobile satellite commercial services for meeting objective OTH data communication requirements. The Ground segment will include the Navy UHF Base Stations, a GCCS communications segment and Joint Service Rescue Center (JSRC) for receipt and display of survivor OTH data and OTH transmissions to the survivor. Rescue Response Cells include primary locations where rescue activities are planned and coordinated, such as Joint Rescue Coordination Centers, ships and Command and Control nodes. The Navy effort consists of: (1) lead development of the ground system communications architecture; (2) acquire and install communications distribution equipment at four UHF Base Stations in Hawaii, Diego Garcia, Norfolk, VA, and Siganello, IT; (3) develop Navy Joint Maritime Command Information System (JMCIS) segment; (4) test Air Force CSEL GCCS segment before submission to DISA; and (5) procure and plan support of Navy acquisition requirements.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2303

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Combat

Survivor Evader Locator

(U) COST: (Dollars in thousands)

(U) PROGRAM PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$ 50) Tested planning & operational assessment support.
- (U) (\$100) Engineering support for hand held radio GPS receiver development & support equipment.
- (U) (\$ 25) Developed Navy User Study Report.
- (U) (\$ 25) Prepared ILS Plan.
- (U) (\$ 25) Prepared base station Navy Training Plan.
- (U) (\$ 50) Lead Joint Ground Segment Architecture IPT.
- (U) (\$ 50) Supported equipment analyses for Navy requirements.
- (U) (\$ 50) Tech Manual development, verification and validation.
- (U) (\$ 25) Participated in Joint User Training Plan Development.
- (U) (\$ 50) Developed base station maintenance requirements.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2303

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Combat

Survivor Evader Locator

2. (U) FY 1998 PLANS:

- (U) (\$70) Conduct shipboard rescue center integration analysis.
- (U) (\$116) EMD System assessment.
- (U) (\$125) Support to command and control analysis.
- (U) (\$71) Complete training requirements.
- (U) (\$9) Develop & update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop & update Naval C4ISR mission to incorporate overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.
- (U) (\$70) User survey and analysis of in-service requirements

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
• (U) FY 1998 President's Budget:	0	475	0
• (U) Appropriated Value:	0	475	0
• (U) Adjustments FY 1998 President's Budget:	+450	-14	0
• (U) FY 1999 President's Budget:	450	461	0

(U) CHANGE SUMMARY EXPLANATION:

(U) FY 1997: Funding change of +\$450K to continue development of ILS, training, and support requirements.

FY 1998: Funding change of -\$14K for Congressional undistributed general adjustments.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT NUMBER: X2303
PROJECT TITLE: Combat
Survivor Evader Locator

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN PE: 0708017N	0	4,701	11,905	16,076	16,601	7,406	14,535	0	71,224
(U) O&MN PE: 0708017N	0	1,000	1,000	1,000	1,000	1,000	1,000	0	6,000

(U) RELATED RDT&E: None

D. (U) SCHEDULE PROFILE: *

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones	4Q - MSIIIA	3Q - MSIII	3Q - MSIV
Engineering Milestones			
T&E Milestones	1Q - CDR	2Q - OA	3Q - IOT&E
Contract Milestones			3Q - Full Production

*The CSEL program is a joint service program with the Air Force as lead. The Air Force provided RDT&E funds to initiate the program and accomplish the milestones prior to FY98.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT NUMBER: X2303
PROJECT TITLE: Combat
Survivor Evader Locator

(U) COST: (Dollars in thousands)

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering	450	461	
b. Hardware Development			
c. System Test & Evaluation			
Total	450	461	

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Budget Item Justification
(Exhibit R-3, Page 28 of 33)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2313

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Situational Awareness Beacon with Reply

(U) COST: (Dollars in thousands)

PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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X2313 Situational Awareness Beacon with Reply (SABER)	0	6,388	7,018	3,314	1,144	1,124	1,154	CONT.	CONT.
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A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The SABER system provides critical battlefield/operating area situational awareness and friendly ID capabilities by uniting GPS and UHF/SATCOM technologies. The SABER system consists of a GPS receiver and two-way UHF radio capable of Over-The-Horizon (OTH) and Line-Of-Sight (LOS) communications. The GPS receiver provides an accurate position of the user. When a correctly encoded interrogation signal is received by the SABER, it transmits a reply via the UHF radio of the users identification, position, time, heading, speed, altitude, GPS diagnostics, polling acknowledge and authorization codes. The interrogating system can be any member of the user's command and control structure from a local commander using a LOS radio, to a global commander using geosynchronous satellite communications. Additionally, SABER-equipped units who are preparing to launch an attack will send an intent-to-shoot LOS transmission indicating the target position and a kill radius. All SABER units on the network will compare the area with their own position. If an overlap exists, a "Don't Shoot" reply is sent to prevent fratricide. Two basic configurations will be developed and produced: self-contained (for small amphibious craft) and NAVSSI-integrated (for ships with installed GPS and UHF radios).

(U) PROGRAM PLANS:

1. (U) FY 1998 PLANS:

- (U) (\$2,004) Develop militarized self-contained SABER: P-coded GPS, add messaging capability, encrypted waveforms, second transceiver to SABER.
- (U) (\$1,808) Systems Engineering for CDNU-integrated SABER configuration.
- (U) (\$585) Procure technical data.
- (U) (\$1,068) Develop and test software for Advance Concept Technology Demonstration (ACTD) systems.
- (U) (\$768) Conduct Operational Testing of ACTD systems.

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Budget Item Justification
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2313

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Situational Awareness Beacon with Reply

1. (U) FY 1998 PLANS cont:

- (U) (\$155) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

2. (U) FY 1999 PLANS:

- (U) (\$704) Develop and test software for CDNU-integrated SABER configuration.
- (U) (\$1,545) Systems Engineering for Shipboard C4I integration
- (U) (\$733) Conduct operational testing for militarized self-contained SABER.
- (U) (\$3,581) Prototype development of CDNU -integrated configuration.
- (U) (\$455) Procure associated technical data.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	8,129	7,506
(U) Appropriated Value:	0	8,129	7,506
(U) Adjustments FY 1998 President's Budget:	0	-1,741	-488
(U) FY 1999 President's Budget:	0	6,388	7,018

(U) CHANGE SUMMARY EXPLANATION:

- (U) FY 1998: Funding change of -\$1,500K for Navy/OSD offsets needed for higher priority programs; -\$223K for Congressional undistributed general reductions; -\$18K for revised economic assumptions.
- (U) FY 1999: Funding change of -\$165K for Navy/OSD offsets needed for higher priority programs; -\$184 needed for C4ISR; -\$37K for NWCF rate adjustments; -\$123K commercial purchases inflation; +\$21K for increase in pay rates.
- (U) Schedule: None.
- (U) Technical: None.

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Budget Item Justification
(Exhibit R-3, Page 30 of 33)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2313

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Situational Awareness Beacon with Reply

(U) COST: (Dollars in thousands)

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN #285100:	0	0	1,026	4,249	5,365	5,323	3,370	3,168	22,501
(U) O&MN #AG/SAG 1A4A:	0	968	1,111	1,976	3,428	3,785	6,415	CONT.	CONT.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones		*4Q-Milestone IIIA	4Q - Milestone III
Engineering Milestones			1Q - PDR 2Q - CDR
T&E Milestones			3Q - FAT 4Q - OPEVAL
Contract Milestones		*3Q-Acquisition Package Comp.	1Q - Contract Award 4Q - Contract Award (Production)

- The SABER program is an ACTD program. The Navy has provided the funds for concept design, test, and milestone accomplishment prior to FY98 through reprogramming within Navy PE#: 0604777N, project X0921 in the amount of \$796K in FY96 and \$700K in FY97.

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2313

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Situational
Awareness Beacon with Reply

(U) COST: (Dollars in thousands)

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering		1,963	1,545
b. Hardware Development		2,004	3,581
c. Software Development		1,068	704
d. System Test & Evaluation		768	733
e. Technical Data		585	455
Total		6,388	7,018

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Contract Government Method/ Performing Fund Type Activity Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 To Budget Complete	Total Program
Product Development Major Contracts								
Southwest Research Institute	SS	Jan-98				1,300	300	CONT. CONT.
TBD (Competitive Award OCT 98)						0	3,081	CONT. CONT.
Subtotal Major Contracts						1,300	3,381	

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: FEBRUARY 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2313

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Situational Awareness Beacon with Reply

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Support and In-House										
SSC Charleston, SC	WX	Oct-97					2,743	1,000	CONT.	CONT.
SSC San Diego	WX	Oct-97					1,283	1,604	CONT.	CONT.
Test and Evaluation							768	733	CONT.	CONT.
All Other Contracts							294	300	CONT.	CONT.
Sub Total In-House							5,088	3,637		

GOVERNMENT FURNISHED PROPERTY: Not Applicable.

	FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development			1,300	3,381	CONT.	CONT.
Subtotal Support and Management			4,320	2,904	CONT.	CONT.
Subtotal Test and Evaluation			768	733	CONT.	CONT.
Total Project			6,388	7,018	CONT.	CONT.

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N
 PROGRAM ELEMENT TITLE: Distributed Surveillance System
 (U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Fixed Distributed System X1312	21,451	0	0	0	0	0	0	0	1,247,905
Advanced Deployable System X1300	33,004	41,586	42,017	42,920	41,009	25,686	5,465	CONT	CONT
TOTAL	54,455	41,586	42,017	42,920	41,009	25,686	5,465	CONT	CONT

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Distributed Surveillance Systems are part of the Integrated Undersea Surveillance System (IUSS) in the Intelligence, Surveillance & Reconnaissance (IS&R) directorate. IUSS provides the majority of the U.S. Navy's open ocean detection capability against quiet submarines, including third world diesels. The Distributed Systems program element (PE) 0604784N consists of X1312 Fixed Distributed System (FDS) and X1300 Advanced Deployable Systems (ADS), designed to improve the effectiveness and flexibility of Undersea Surveillance. Efforts for ADS (All-Optical Deployable System), for the purpose of testing and packaging of the all-optical systems (AODS) into the ADS, and ADS Algorithm Development for the development of signal processing and detection algorithms for the ADS are also included.

(U) FDS is a low frequency passive acoustic surveillance system using hydrophones densely distributed on the sea floor. FDS will provide cueing information vital to fleet and national command authorities.

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N
PROGRAM ELEMENT TITLE: Distributed Surveillance System

(U) The Advanced Deployable System (ADS) RDT&E funds provide for the Concept Evaluation (CE), Program Definition & Risk Reduction (PD&RR) Phase of an ADS prototype and Engineering and Manufacturing Development (E&M,D) for production. ADS will provide a rapidly and covertly deployable undersea surveillance capability to operational forces involved in regional conflicts. ADS will provide timely target data to tactical platforms and uses proven technology to detect very quiet submarines in the most difficult shallow water environments with very high target position accuracy. The system will include sensors, processing and an interface to the Joint Maritime Command Information System (JMCIS) for reporting of submarine activity and other undersea activity to Joint Task Force Commanders (JTFC) and tactical assets. The program uses and expands on technology developed under the Fixed Distributed System (FDS) program, Surveillance Towed Array Sensor System (SURTASS) program, the Advanced Deployable Array (AdDA) Program, the Port Area Surveillance (PAS) Program, Navy Sonobuoy Programs, Office of Naval Research (ONR) Programs, and the ARIADNE Program.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under E&M,D because FDS project X1312 encompasses engineering and manufacturing development of a new end item prior to production approval.

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Budget Item Justification
(Exhibit R-2, Page 2 of 20)

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N
PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT NUMBER: X1300
PROJECT TITLE: Advanced Deployable System

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Advanced Deployable System X1300	33,004	41,586	42,017	42,920	41,009	25,686	5,465	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Distributed systems are part of the Integrated Undersea Surveillance System (IUSS) in the Intelligence, Surveillance & Reconnaissance (IS&R) directorate. IUSS provides the majority of the US Navy's open ocean detection capability against quiet submarines, including third world diesels. These submarines pose a significant threat to US forces as documented in the Mission Needs Statement for Undersea Surveillance in Littoral Waters dated 13 Mar 93 and the Operational Requirements Document (ORD) dated 28 Oct 94.

(U) ADS will be a deployable undersea surveillance system composed of distributed fields of sensors that can be rapidly and unobtrusively deployed in regional contingency areas for use against enemy submarines. It will be deployed prior to or during regional conflicts. ADS will build on the FDS-D test experience with distributed fields in shallow noisy water and use collected data for processing verification. It will use FDS developed processing technologies and will also incorporate advanced sensors and technology from other related programs. ADS is a system designed to detect and track modern diesel electric and nuclear submarines, and provide the capability for tracking surface ships.

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$20,745) Assembled a system for Single Node Test (SNT). Began assembly and integration of the system for the Integrated Article Test (IAT). Continued ADS risk reduction efforts for system survivability and alternate platform deployment capability.
- (U) (\$180) Continued at-sea data collection effort. Initiated detailed planning, scheduling and resource allocation for the IAT effort. Continued EOA (OT-1A).

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Budget Item Justification
(Exhibit R-2, Page 3 of 20)

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N PROJECT NUMBER: X1300
PROGRAM ELEMENT TITLE: Distributed Surveillance System PROJECT TITLE: Advanced Deployable System

- (U) (\$1,128) Continued to assess AODS 2 node system performance. Modified the prototype AODS as result of testing. Conducted comparative analysis of AODS and ADS UWS capabilities. Incorporated MANTECH initiatives into AODS manufacturing process during 8-node system development.
- (U) (\$7,682) Continued to support the system engineering design effort through the IPD process.
- (U) (\$2,481) Continued to manage the ADS program through the use of program EV monitoring and progress assessment.
- (U) (\$788) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conducted associated C4ISR analyses and studies.

2. (U) FY 1998 PLAN:

- (U) (\$18,902) Conduct the IAT. Evaluate collected test data and incorporate lessons learned into development process. Continue cable survivability and the alternate platform deployment capability risk reduction efforts. Begin assembly and integration of the Multi-Node system for the Multi-Node Test (MNT). Evaluate system performance and determine operational performance and suitability. Complete the Fleet Exercise Test (FET) test plan.
- (U) (\$596) Complete EOA (OT-1A). Initiate detailed planning of Operational Assessment (OT-1B).

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Budget Item Justification
(Exhibit R-2, Page 4 of 20)

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604784N

PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT NUMBER: X1300

PROJECT TITLE: Advanced Deployable System

- (U) (\$8,781) Continue to support the system engineering design effort through continued IPD process and testing support. Complete the analysis of the IAT data and prepare the MNT test plan. Prepare for at-sea MNT testing. Initiate the Single Process Initiative (SPI) Study to assess current and future PAS alternatives.
- (U) (\$2,586) Manage ADS program development through the monitoring of Contractor and Government efforts through technical, schedule and cost performance. Initiate Assessment of Alternatives (AOA) plan and MSII program documentation updates. Prepare E&M,D Phase Request For Proposal (RFP) package.
- (U) (\$629) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.
- (U) (\$7,569) Effort will be directed to design, document, and fabricate the All Optical Deployable system Wet End hardware and Installation Subsystems leading to design Verification tests to be conducted in the next year. Alternative design approaches will be explored. Deployment platform interface requirements will be determined as well as defining the interface requirements with the Advanced Deployable System (ADS) Processing and Analysis Segment. Comprehensive test plans from the initial Pool Tests through integrated system At-Sea tests will be developed.
- (U) (\$2,523) Engineering, software modification, and analysis of algorithms to develop and integrate the Field Processing component of the Advanced Deployable System (ADS) Processing and Analysis Segment (PAS) will be performed in support of ADS build demonstrations, and fielded testing. Algorithm development will be consistent with analysis of requirements, as well as data analysis performed using field data. Efforts will be directed to improve the current PAS feature extraction, source set formation, and event detection to support ADS PAS Field Processing performance. These improvements will be developed to be fully integrated into the existing ADS PAS system.

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Budget Item Justification
(Exhibit R-2, Page 5 of 20)

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N
PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT NUMBER: X1300
PROJECT TITLE: Advanced
Deployable System

3. (U) FY 1999 PLAN:

- (U) (\$26,302) Conduct MNT. Complete system development, integrate UWS with PAS, conduct Test Readiness Review (TRR), and carry out FET. Perform analysis of collected FET data and perform post test system assessment.
- (U) (\$2,285) Analyze data collected during MNT and FET. Conduct Operational Assessment Testing (OT-IB). Support additional developmental and operational testing.
- (U) (\$11,280) Continue to support the system engineering design effort through continued IPD process and testing support. Develop and complete AOA. Participate in Navy exercises using ADS arrays to collect target data. Installation and recovery for FET and performance analysis.
- (U) (\$2,150) Manage ADS program development through the monitoring of Contractor and Government efforts through technical, schedule and cost performance. Review requirements and exercise PD&RR Contract Option to procure a second UWS, if required. Issue E&M,D Phase RFP. Prepare and complete MSII documentation and conduct MSII review.

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Budget Item Justification
(Exhibit R-2, Page 6 of 20)

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N
PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT NUMBER: X1300
PROJECT TITLE: Advanced
Deployable System

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	33,422	33,048	38,623
(U) Appropriated Value:			
(U) Adjustments from FY98 PRESBUDG:	(418)	8,538	3,394
(U) FY 1999 President's Budget	33,004	41,586	42,017

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 97 was reduced \$418K: -\$813K Small Business Innovative Research (SBIR) Transfer; +\$395K adjustments for other Navy program priorities. FY 98 is increased by \$8,538K: -\$574K CAAS reduction, -\$96K revised economic assumptions, -\$1,192K congressional general reductions, +\$10,400K for ADS Algorithm Development and ADS AODS. FY 99 is increased by \$3,394K: +\$4,600K Unplanned expenses to maintain the ADS program baseline schedule and support essential command architecture, engineering and integration services; -\$500K realignment to develop and update overarching C4ISR mission requirements; and -\$740 commercial purchases inflation; and +\$27 pay rates adjustment.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY:

	<u>FY 1998</u>	<u>FY2003</u>	<u>TO</u>	<u>TOTAL</u>
	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
OPN# 2221		67,880	CONT	CONT

(U) RELATED RDT&E: Not applicable.

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Budget Item Justification
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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604784N

PROJECT NUMBER: X1300

PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT TITLE: Advanced
Deployable System

D. (U) SCHEDULE PROFILE:

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones				MSII 4 th Qtr
Engineering Milestones	SRR 2nd Qtr Risk Reduction 4th Qtr	Start Prototype 4th Qtr	ISR 2nd Qtr Complete SVT & IAT 2nd Qtr	Deliver Prototype 2nd Qtr SDR 4th Qtr
T&E Milestones	Commence EOA (OT-1A) 2nd Qtr		Complete EOA (OT-1A) 2nd Qtr	TRR 2nd Qtr FET 3rd Qtr MNT 1st Qtr OT-1B 1st Qtr
Contract Milestones	PAC 1st Qtr IBR 3rd Qtr		Start EMD RFP 2nd Qtr	Complete EMD RFP 2nd Qtr

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Budget Item Justification
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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604784N

PROJECT NUMBER: X1300

PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT TITLE: Advanced Deployable System

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Prime Mission Product	18,793	19,672	20,852
b. Processing & Analysis Segment (PAS)	1,950	5,273	5,450
c. Program Management	1,693	3,025	2,150
d. System Engineering	7,629	11,672	10,742
e. Test & Evaluation	180	596	2,285
f. Integrated Logistic Support	843	639	538
g. Technical Data	0	0	0
h. Special Purpose Support & Test Equipment	0	0	0
i. Operational Site Activation/Support	0	0	0
j. Special Projects	1,128	80	0
k. C4ISR Mission Requirements	788	629	0
Total	33,004	41,586	42,017

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Budget Item Justification
(Exhibit R-3, Page 9 of 20)

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N PROJECT NUMBER: X1300
 PROGRAM ELEMENT TITLE: Distributed Surveillance System PROJECT TITLE: Advanced Deployable System

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 1995 & Prior	FY 1996 Budget	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	Total Program
Product Development LMFS Manassas, VA	C/CPAF	9/95	78,887	78,887	1,785	12,703	18,795	19,672	20,852	CONT
AHA Rockville, MD	C/CPFF	3/97	2,600	2,600	0	0	900	1,100	1,000	CONT
APL/JHU Laurel, MD	SS/CPFF	11/94	3,220	3,220	175	0	1,050	1,230	1,018	CONT
ARL/UT Austin, TX	SS/CPFF	3/96	5,283	5,283	0	70	1,730	1,850	1,219	CONT
DSR Fairfax, VA	C/CPFF	6/93	4,236	4,236	0	0	1,050	1,650	1,550	CONT
OTHER CONTRACTS					3,103	1,016	494	2,318	3,470	CONT
NRL AODS Washington, D.C.	WX	10/96	7,456	7,456	3,360	1,600	951	0	0	CONT
NCCOSC San Diego, CA	WX	10/96	24,024	24,024	10,167	3,464	2,396	6,843	3,486	CONT
OTHER ACTIVITIES					3,455	1,043	2,555	2,533	3,997	CONT

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N PROJECT NUMBER: X1300
 PROGRAM ELEMENT TITLE: Distributed Surveillance System PROJECT TITLE: Advanced Deployable System

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>FY 1995 & Prior</u>	<u>FY 1996 Budget</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>Total Program</u>
Support and Management										
AMRON Arlington, VA	C/CPFF	6/94	7,041	7,041	2,236	823	1,521	1,670	986	CONT
Other Contracts					8,741	4,849	769	923	659	CONT
Other Activities					2,275	532	613	1,201	1,495	CONT

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N PROJECT NUMBER: X1300
 PROGRAM ELEMENT TITLE: Distributed Surveillance System PROJECT TITLE: Advanced Deployable System

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>FY 1995 & Prior</u>	<u>FY 1996 Budget</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>Total Program</u>
Test and Evaluation										
Other Contracts					5,221	1,293	88	60	208	CONT
NCCOSC San Diego, CA	WX	10/96	12,048	12,048	6,531	390	17	382	1,968	CONT
Other Activities					2,884	329	75	154	109	CONT

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Budget Item Justification
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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604784N

PROJECT NUMBER: X1300

PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT TITLE: Advanced
Deployable System

	<u>FY 1995</u> <u>& Prior</u>	<u>FY 1996</u> <u>Budget</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	22,045	19,896	29,921	37,196	36,592	CONT
Subtotal Support and Management	13,252	6,204	2,903	3,794	3,140	CONT
Subtotal Test and Evaluation	14,636	2,012	180	596	2,285	CONT
Total Project	49,933	28,112	33,004	41,586	42,017	CONT

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Budget Item Justification
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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604784N

PROJECT NUMBER: X1312

PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT TITLE: Fixed Distributed System

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Fixed Distributed System X1312	21,451	0	0	0	0	0	0		1,249,018

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Distributed systems are part of the Integrated Undersea Surveillance System (IUSS) in the Intelligence, Surveillance & Reconnaissance (IS&R) directorate. IUSS provides the majority of the US Navy's open ocean detection capability against quiet submarines, including third world diesels. These submarines pose a significant threat to US forces as documented in the Mission Needs Statement for Undersea Surveillance in Littoral Waters dated 13 Mar 93 and the Operational Requirements Document (ORD) dated 28 Oct 94.

(U) FDS is a low frequency passive acoustic surveillance system using hydrophones densely distributed on the sea floor. Cueing of mobile assets by IUSS Fixed surveillance systems provides essential information for the deployment of tactical systems in ASW and littoral operations and is vital to fleet and national command authorities. FY 97 funds provide for the U.S. share of design and development of a Fixed Distributed System, Commercial variant FDS-C. The system is a new low cost COTS/NDI variant of FDS that will provide critical new coverage in a high-interest ASW area and will be used in areas of the world requiring fixed surveillance ASW against current and next-generation threats. FDS funding for future production systems was eliminated in 1993, however an Engineering Development Model, FDS-1 was successfully fabricated and deployed and is currently an operational fleet asset. FDS-C will also provide for replacement of older SOSUS arrays now reaching the end of their system life in areas of high interest.

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Budget Item Justification
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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604784N

PROJECT NUMBER: X1312

PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT TITLE: Fixed Distributed System

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$17,000) Developed the performance specification for the FDS-C system and awarded two Other Transaction Agreements (OTA) for design of FDS-C. After design effort is completed, a follow-on contract to build and deploy the FDS-C system will be awarded.
- (U) (\$ 1,700) Collected acoustic information on the installation site and characterized the acoustic environment.
- (U) (\$ 850) Evaluated improved signal processing to counter a quieter threat.
- (U) (\$1,901) Conducted trade studies to evaluate alternative COTS components to reduce overall system cost.

2. (U) FY 1998 PLAN: Not applicable.

3. (U) FY 1999 PLAN: Not applicable

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Budget Item Justification
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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N PROJECT NUMBER: X1312
PROGRAM ELEMENT TITLE: Distributed Surveillance System PROJECT TITLE: Fixed Distributed System

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	22,058	0	0
(U) Adjustments from FY 1998 PRESBUDG:	-607	0	0
(U) FY 1999 OSD Budget Submit:	21,451	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:
FY 97 was increased \$22,058 by a Congressional plus-up to initiate the development of a new low-cost COTS/NDI variant of FDS. FY 97 was decreased \$580K SBIR Transfer and \$27K Revised Economic Adjustment.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN LI 222500			8,000	32,700	19,900	50,000	81,000	191,600

(U) RELATED RDT&E: Not applicable.

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Budget Item Justification
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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604784N

PROJECT NUMBER: X1312

PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT TITLE: Fixed Distributed System

D. (U) SCHEDULE PROFILE:

FY 1997

FY 1998

FY 1999

Program
Milestones

Engineering
Milestones

T&E
Milestones

Contract
Milestones

SRR 1st Qtr

PDR 1st Qtr

Complete TEMP 2nd Qtr
Testing 1st Qtr

Award of 2 OTA
for Design 4th Qtr

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Budget Item Justification
(Exhibit R-2, Page 17 of 20)

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604784N

PROJECT NUMBER: X1312

PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT TITLE: Fixed Distributed System

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Prime Mission Product	15,000	0	0
b. Processing & Analysis Segment (PAS)	850	0	0
c. Program Management	1,000	0	0
d. System Engineering	4,101	0	0
e. Test & Evaluation	300	0	0
f. Integrated Logistics Support	200	0	0
g. Technical Data	0	0	0
h. Special Purpose Support & Test Equip	0	0	0
i. Operational Site Activation/Support	0	0	0
j. Special Projects	0	0	0
Total	21,451	0	0

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Budget Item Justification
(Exhibit R-3, Page 18 of 20)

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N PROJECT NUMBER: X1312
 PROGRAM ELEMENT TITLE: Distributed Surveillance System PROJECT TITLE: Fixed Distributed System

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
SAIC McLean VA	FFP	8/97	7,500	7,500	0	7,500	0	0	0	7,500
Lockheed Martin Manassas VA	FFP	8/97	7,500	7,500	0	7,500	0	0	0	7,500
Support and Management										
TRW	CPAF	6/97	2,000	2,000	0	2,000	0	0	0	2,000
Lockheed Martin Manassas VA	CPAF	6/97	830	830	0	830	0	0	0	830
SPAWAR System Center, SD	WX	6/97	1,450	1,450		1,450				1,450
ARL/UT	FFP	8/97	1,200	1,200		1,200				1,200
Various	WX	6/97	671	671	0	671	0	0	0	671
Test and Evaluation										
Various	WX	6/97	300	300	0	300	0	0	0	300

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Budget Item Justification
(Exhibit R-3, Page 19 of 20)

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1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N PROJECT NUMBER: X1312
 PROGRAM ELEMENT TITLE: Distributed Surveillance System PROJECT TITLE: Fixed Distributed System

Contractor/ Government Performing Activity	Contract Method/ Award Fund Type Oblig Vehicle Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
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GOVERNMENT FURNISHED PROPERTY Not Applicable.

Subtotal Product Development	0	15,000	0	0	0	0	0	15,000
Subtotal Support and Management	0	6,151	0	0	0	0	0	6,151
Subtotal Test and Evaluation	0	300	0	0	0	0	0	300
Total Project	0	21,451	0	0	0	0	0	21,451

C. (U) FUNDING PROFILE:

--- Not Required ---

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Budget Item Justification
(Exhibit R-3, Page 20 of 20)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604805N

PROJECT NUMBER: S2458

PROJECT TITLE: COSSI

PROGRAM ELEMENT TITLE: Commercial Operating and Support Savings Initiative(COSSI)

(U) COST (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S2458 COSSI	0	0	28,500	31,800	32,000	31,800	31,900	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Commercial Operations and Support Savings Initiative (COSSI) program was designed by Congress and DOD to encourage industry to propose commercial technology and processes that can replace aging and expensive military equipment/processes in order to save operating and support (O&S) costs over the life cycle. The concept of the COSSI program is that Congress provides finite funds each year to DOD, and DOD funds specific projects proposed by industry that show the most technical feasibility and return on investment. The money is then given to each service to place on contracts to fund the research and development necessary to perfect the commercial product to the point it can be implemented in the service systems. In 1997, the funds were administered by DOD through the Joint Dual Use Project Office (JDUPO), and money provided to each service after service sponsored teams evaluated proposals and chose those to be funded. In 1998, there were no funds appropriated for COSSI. There is \$28.5M in the 1999 budget, and JDUPO (which is being disestablished) gave the responsibility to manage the money back to each service.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U)This program was funded by DOD under Program Element 0603805E.

2. (U) FY 1998 PLAN:

- (U)Program was to be funded under PE 0603805E; however no funds were provided in FY1998.

3. (U) FY 1999 PLAN:

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Budget Item Justification
(Exhibit R-2, Page 1 of 6)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

PROJECT NUMBER: S2458
PROJECT TITLE: COSSI

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604805N

PROGRAM ELEMENT TITLE: Commercial Operating and Support Savings Initiative(COSSI)

- (U)(\$28,500) Funds will be distributed to the appropriate program managers (project sponsors) of the projects that are ranked the highest by an all Navy/Marine Corps review team that is convened in March 1999. The money will be expended in contracts to develop these chosen commercial technologies. These program sponsors are in NAVSEA, NAVAIR, SPAWAR, NAVFAC and the Marine Corps SYSCOM.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

B. (U) PROGRAM CHANGE SUMMARY:		<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:		0	0	0
(U) Appropriated Value:		0	0	
(U) Adjustments to FY 1997/1998 Appropriated Value/FY 1998 President's Budget:				
a. Congressional Undistributed Reductions: COSSI/DUAP Increase/Transfer				+28,500
(U) FY 1999 PRESBUD Submit:				\$28,500

- (U) CHANGE SUMMARY EXPLANATION:
(U) Funding: Transfer from PE 0603805E.
(U) Schedule: Not applicable.
(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)									
Not Applicable.	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
	ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	Complete	ESTIMATE
	0	0	0	0	0	0	0	0	0

(U) RELATED RDT&E:

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Budget Item Justification
(Exhibit R-2, Page 2 of 6)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

PROJECT NUMBER: S2458

PROJECT TITLE: COSSI

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604805N

PROGRAM ELEMENT TITLE: Commercial Operating and Support Savings Initiative(COSSI)

(U) OSD PE 0603805E

D. (U) SCHEDULE PROFILE:

(U) Not yet available.

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Budget Item Justification
(Exhibit R-2, Page 3 of 6)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604805N

PROJECT NUMBER: S2458

PROJECT TITLE: COSSI

PROGRAM ELEMENT TITLE: Commercial Operating and Support Savings Initiative(COSSI)

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Software Development			
b. Systems Engineering			
c. Integrated Logistics Support			
d. Configuration Management			
e. Project Management Support			
f. Travel			
g. Miscellaneous			
TOTAL:	0	0	28,500

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Contract

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 4 of 6)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604805N

PROJECT NUMBER: S2458

PROJECT TITLE: COSSI

PROGRAM ELEMENT TITLE: Commercial Operating and Support Savings Initiative(COSSI)

<u>Government</u> <u>Performing</u> <u>Activity</u>	<u>Method/</u> <u>Fund Type</u> <u>Vehicle</u>	<u>Award/</u> <u>Oblig</u> <u>Date</u>	<u>Perform</u> <u>Activity</u> <u>EAC</u>	<u>Project</u> <u>Office</u> <u>EAC</u>	<u>Total</u> <u>FY 1996</u> <u>& Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
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Product
Development

Various

Support and Management

Test and Evaluation

GOVERNMENT FURNISHED PROPERTY: Not Applicable

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 5 of 6)

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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604805N

PROJECT NUMBER: S2458

PROJECT TITLE: COSSI

PROGRAM ELEMENT TITLE: Commercial Operating and Support Savings Initiative(COSSI)

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 BUDGET	FY 1998 BUDGET	FY 1999 BUDGET	TO COMPLETE	TOTAL PROGRAM
Product Development									
Support and Management									
Test and Evaluation									

	Total FY 1996 & Prior	FY 1997 BUDGET	FY 1998 BUDGET	FY 1999 BUDGET	TO COMPLETE	TOTAL PROGRAM
Subtotal Product Development: N/A						
Subtotal Product Development: N/A						
Subtotal Test and Evaluation						
Total Project				28,500		

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RDT&E PE/Project Cost Breakdown
(Exhibit R-3, Page 6 of 6)

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